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CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE

TENDER NO.: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22
(E –TENDER NO: IGGL-100030)

DOMESTIC COMPETETIVE BIDDING THROUGH OPEN E-TENDERING

Issued by
INDRADHANUSH GAS GRID LIMITED (IGGL)
(A Public Limited Company)
5th Floor, Central Mall, G S Road, Christian Basti, Guwahati

ATTENTION

THIS IS AN ELECTRONIC TENDER

For Participation in this tender please visit the web site: Govt. CPP Portal - https://etenders.gov.in.

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SECTION-I

INVITATION FOR BID (IFB)

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SECTION-I
"INVITATION FOR BID (IFB)"

Ref No: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 **Date: 04.03.2022**

To,

SUB: CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE

Dear Sir/Madam,

1.0 **INDRADHANUSH GAS GRID LIMITED (IGGL)**, a Joint Venture (JV) of IOCL, ONGC, GAIL, OIL and NRL, having its registered office at Guwahati in the State of Assam, invites Bids from bidders for the subject, in complete accordance with the following details and enclosed Tender Documents.

2.0 The brief details of the tender are as under:

(A)	NAME OF WORK / BRIEF SCOPE OF WORK/JOB	**CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE**
(B)	TENDER NO. & DATE	**IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 (E-Tender No. IGGL-100030)**
(C)	TYPE OF BIDDING SYSTEM	SINGLE BID SYSTEM: ☐ TWO BID SYSTEM: √
(D)	TYPE OF TENDER	E-TENDER: √ MANUAL: ☐ ***E-TENDER NO: IGGL-100030***
(E)	COMPLETION/CONTRACT PERIOD	03 (Three) months from the date of issuance of LOA. For more detail refer Special condition of contract

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(F)	BID SECURITY / EARNEST MONEY DEPOSIT (EMD)	<table><tr><td>APPLICABLE</td><td>√</td></tr><tr><td>NOT APPLICABLE</td><td></td></tr></table> **Rs.10.64 Lakhs.** **Note:** Bid Security/EMD is not applicable for MSEs, Start-ups & CPSEs bidders. They shall submit the **Bid security declaration form** as per format attached in tender document. (Refer clause no.16 of ITB)
(G)	AVAILABILITY OF TENDER DOCUMENT ON WEBSITE(S)	From: 04.03.2022 to 11.03.2022 upto 13:00 Hrs, (IST) on following websites: IGGL Website – https://iggl.co.in/ Govt. CPP Portal - https://etenders.gov.in
(H)	DATE, TIME & VENUE OF PRE-BID MEETING	**Not Applicable.**
(I)	DUE DATE & TIME OF BID-SUBMISSION	Date : 11.03.2022 Time : 14:00 HRS.
(J)	DATE AND TIME OF UN-PRICED BID OPENING	Date : 12.03.2022 Time : 14:00 HRS
(K)	CONTACT DETAILS OF TENDER DEALING OFFICER	1) Name: Mr. Indranil Neog, Designation: Deputy General Manager (C&P)i/c Phone No.: 9531101227/8 (Extension 121) E-mail: indranil.neog@iggl.co.in 2) Name: Mr. Udayan Das, Designation: Chief Manager (C&P) Phone No.: 9531101227/8 (Extension 111) E-mail: udayan.das@iggl.co.in 3) Name: Mr. Santanu Bhattacharyya, Designation: Senior Manager (C&P) Phone No.: 9531101227/8 (Extension 113) E-mail: santanu.bhattacharyya@iggl.co.in

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

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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 (D) 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 the E-tendering website shall also be submitted in Original (in physical form) within **30 (Thirty) 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) EMD/Bid Security (if applicable)
(ii) Power of Attorney

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 submit their bid 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 (G) 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 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.

10.0 All the bidders including those who are not willing to submit their bid are required to submit F-6 (Acknowledgement cum Consent letter) duly filled within 7 days from receipt of tender information.

11.0 System generated Request for Quotation (RFQ), if any, shall also form an integral part of the Tender Document.

12.0 IGGL 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
Indradhanush Gas Grid Limited

(Authorized Signatory)
Name : Indranil Neog
Designation : DGM(C&P), i/c
E-mail ID : indranil.neog@iggl.co.in
Contact No. : 9531101227/8 (Extension: 121)

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PHYSICAL DOCUMENTS OF TENDER

Bid Document No.: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 (E-TENDER NO. IGGL-100030)

Description : **CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE**

Due Date & Time : **11.03.2022 at 14:00 hrs.**

From: **To:**

…… **……**	**DGM (C&P)i/c** **IGGL, 5th Floor, Central Mall, Guwahati-781005** **PHONE: :9531101227/8 (Extension: 121)**

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

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SECTION-II

BID EVALUATION CRITERIA (BEC) & BID EVALUATION METHODOLOGY

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SECTION-II

BID EVALUATION CRITERIA & EVALUATION METHODOLOGY

The intending bidders for above tender should meet the qualifications as given below:-

1.0 BID EVALUATION CRITERIA (BEC):

1.1 BEC (TECHNICAL)

1.1.1 Past Experience of having successfully completed one similar work* during last 07 (Seven) years to be reckoned from the due date of submission of bid, should be as below: -

- Single work order value of similar work costing not less than **Rs.266.00 Lakhs**

***Similar work:** "Construction of Office Interiors (in spaces/areas of minimum 6000 sq. ft or more) and Supply of Furniture and Fit outs with all Connected Services related to electrical, fire-fighting, air-conditioning, plumbing, etc. as specified in details in the SOR/scope of work."

The bidder must submit copies of relevant Work orders, SOR and Job Completion Certificates from the principal indicating final executed value in support of this criterion along with un-priced bid.

1.1.2 DOCUMENTS REQUIRED IN SUPPORT OF BEC-TECHNICAL:

DESCRIPTION	DOCUMENTS REQUIRED FOR QUALIFICATION
Technical Criteria	(a) Copy of complete work order along with detailed Schedule of Rates (SOR) (b) Completion certificate issued by end user / Owner (or their consultant who has been duly authorized by owner to issue such certificate) OR Execution certificate (issued by the end user/ owner/authorized consultant) in place of completion certificate for meeting the stipulated experience criteria provided that the asset for which the said execution certificate has been issued is ready for commercial use.

Note 1:

(i) The completion/ execution certificates submitted by the bidders as mentioned above, shall have details like work order no. & date, brief scope of work, job completion date etc.

(ii) A Job executed by a Bidder for its own plant/ project cannot be considered as experience for the purpose of meeting BEC of this Tender Document. 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 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 to meet BEC.

(iii) Experience of bidder acquired as a sub-contractor will not be accepted.

(iv) Only documents (Work Order, Completion certificate, Execution Certificate etc.) which have been referred/ specified in the bid shall be considered in reply to queries during evaluation of Bids.

1.2 BEC (FINANCIAL):

- **Annual Turnover:** The minimum annual turnover achieved by the bidder as per their audited financial results during any one of the preceding three financial years **(i.e., 2018-19, 2019-20 & 2020-21)** should be **Rs.266.00 Lakhs.**
- **Net Worth:** Net Worth of the Bidder should be positive for the preceding audited financial year.
- **Working Capital:** The minimum working capital of the Bidder for the preceding audited financial year should be **Rs.53.20 Lakhs.**

1.2.1 DOCUMENTS REQUIRED IN SUPPORT OF BEC-FINANCIAL

DESCRIPTION	DOCUMENTS REQUIRED FOR QUALIFICATION
Annual Turnover, Net Worth and Working Capital	(a) Bidder shall submit "Details of financial capability of bidder" in prescribed formats available in tender documents [Refer Section for Forms and Formats] duly signed and stamped by a Chartered Accountant. (b) Bidder(s) shall submit copy of Audited annual financial statements of preceding 03(Three) financial years along with un-priced bid.

NOTE 2 :

(i) **Annual Turnover:** In case the tenders having the bid closing date up to 30th November of the relevant financial year and audited financial results of the immediate 3 preceding financial years are not available, the bidder has an option to submit the audited financial results of the 3 years immediately prior to that. Wherever the closing date of the bid is after 30th November of the relevant financial year, bidder has to compulsorily submit the audited financial results for the immediate 3 preceding financial years.

(ii) **Net Worth/Working Capital:** In case the tenders having the bid closing date up to 30th November 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 November of the relevant financial year, bidder has to compulsorily submit the audited financial results for the immediate preceding financial year.

(iii) If the Bidder's working capital is inadequate, the bidder should supplement this with a letter from bidder's bank, having net worth of not less than Rs. 100 (Hundred) Crore confirming the availability of Line of Credit for a minimum value **of Rs.53.20 Lakhs. [Rupees Fifty Three Lakhs Twenty Thousand Only].** The letter issued by the Bank is to be specific the details of the tender Number and name of job.

(iv) **Any information/documents issued post final bid due date shall not be considered for evaluation.**

1.3 AUTHENTICATION OF DOCUMENTS SUBMITTED IN SUPPORT OF BID EVALUATION CRITERIA (BEC):

a) Technical Criteria of Bid Evaluation Criteria (BEC):

As stated above at **BEC (Technical) clause no. 1.1.2** and all documents in support of Technical Criteria of Bid Evaluation Criteria (BEC) to be furnished by the bidder shall be necessarily be **duly certified/attested by Chartered Engineer and Notary public with legible stamp.**

b) Financial Criteria of Bid Evaluation Criteria(BEC):

As stated above at **BEC (FINANCIAL) clause no. 1.2.1**, and all documents in support of Financial Criteria of Bid Evaluation Criteria (BEC) to be furnished by the bidder shall be necessarily **duly certified/ attested by notary public with legible stamp.**

NOTE 3: Due to Covid 19 outbreak submitted **bids will be evaluated based on the SELF-CERTIFIED DOCUMENTS submitted by Bidders**. These documents will have to be SELF-CERTIFIED by the authorized signatory of the bidder. The authenticated documents will be submitted by bidder, on whom order/contract is placed, after normalization of situation. **[For more details Refer ITB Clause no. 54]**

1.4 Bids from Consortium/Joint Venture shall not be accepted.

1.5 Bids from Start-ups [whether Micro & Small Enterprises (MSEs) or otherwise] shall not be accepted.

1.6 In absence of requisite documents IGGL reserves the right to reject the Bid without making any reference to bidders.

2.0 BID EVALUATION METHODOLOGY:

(i) The Price Bids of only techno-commercially acceptable bidders shall be opened and will be considered for evaluation.

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(ii) As the tendered items are non-splitable / non-divisible, EVALUATION SHALL BE DONE ON OVERALL BASIS (i.e., L1 position shall be found out on overall least cost to owner basis including GST) and complete order shall be placed on a single agency.

(iii) In case of a tie at the lowest bid (L1) position, the order/LoA will be placed on the bidder who has higher/ highest turnover in last audited financial year.

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SECTION-III

INSTRUCTION TO BIDDERS

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

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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/IGGL 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/Tender, 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 list or in banning list of IGGL or any other departments under Ministry of Petroleum & Natural Gas due to "poor performance" or corrupt and fraudulent practice or blacklisted/banned by any Government Department/Public Sector as on the due date of submission of bid/during the process of evaluation of bids. 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 IGGL 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 IGGL by the bidder.

It shall be the sole responsibility of the bidder to inform IGGL in case the bidder is put on Holiday list or in banning list of IGGL or any other departments under Ministry of Petroleum & Natural Gas due to "poor performance" or corrupt and fraudulent practice or blacklisted/banned by any Government Department/Public Sector as on the due date of submission of bid/during the process of evaluation of bids. 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 IGGL by the bidder.

It shall be the sole responsibility of the bidder to inform IGGL 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.

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2.7 **Power of Attorney:**

Power of Attorney to be issued by the bidder in favour of the authorised employee(s), in respect of the particular tender, for purpose of signing the documents including bid, all subsequent communications, agreements, documents etc. pertaining to the tender and act and take any and all decision on behalf of the bidder (including Consortium). Any consequence resulting due to such signing shall be binding on the Bidder (including Consortium).

(I) In case of a Single Bidder, the Power of Attorney shall be issued as per the constitution of the bidder as below:

a) In case of Proprietorship: by Proprietor.
b) In case of Partnership: by all Partners or Managing Partner.
c) In case of Limited Liability Partnership: by any bidder's employee authorized in terms of Deed of LLP.
d) In case of Public / Limited Company: PoA in favour of authorized employee(s) by Board of Directors through Board Resolution or by the designated officer authorized by Board to do so. Such Board Resolution should be duly countersigned by Company Secretary /MD / CMD / CEO.

(II) In case of a Consortium, Power of Attorney shall be issued both by Leader as well as Consortium Member(s) of the Consortium as per procedure defined herein above in favour of employee of Leader of Consortium.
The Power of Attorney should be valid till award of contract / order to successful Bidder.

3. **BIDS FROM "JOINT VENTURE"/"CONSORTIUM"**: **NOT APPLICABLE** (REFER BIDDING DATA SHEET (BDS)

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 More than one bid means bid(s) by bidder(s) having same Proprietor / Partners / Limited Liability Partner in any other Bidder (s). Further, more than one bids shall also include two or more bidders having common power of attorney holder.
Failure to comply this clause during tendering process will disqualify all such bidders from process of evaluation of bids.

4.3 Alternative Bids shall not be considered.

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4.4 The provisions mentioned at Sl. no. 4.1 and 4.2 shall not be applicable wherein bidders are quoting for different Items / Sections / Parts / Groups/ SOR items of the same tender which specifies evaluation on Items / Sections / Parts / Groups/ SOR items basis.

5. 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, IGGL will in no case, be responsible or liable for these costs, regardless of the outcome of the bidding process.

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 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 IGGL 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]
- Section-IV: General Conditions of Contract [GCC]
- Section-V: Forms & Format
- Section-VI: Special Conditions of Contract [SCC] & Scope of Work
- Section-VII: Schedule of Rates
- Section-VIII: Attachments

*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 IGGL in writing or by fax or email at IGGL'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. IGGL reserves the right to ignore the bidders request for clarification if received after the aforesaid period. IGGL may respond in writing to the request for clarification. IGGL's response including an explanation of the query, but without identifying the source of the query will be uploaded on IGGL's e-tendering web site [https://etenders.gov.in] / communicated to prospective bidders by e-mail/ fax.

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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 (G) 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 considered 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.

[C] – PREPARATION OF BIDS

10 LANGUAGE OF BID:

The bid prepared by the Bidder and all correspondence, drawing(s), document(s), certificate(s) etc. relating to the Bid exchanged by Bidder and IGGL shall be written in English language only. In case a document, certificate, printed literature etc. furnished by the Bidder in 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:

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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) Copies of documents, as specified in tender document.
(d) 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.
(e) 'Letter of Authority' on the Letter Head, as per 'Form F-3'
(f) 'Agreed Terms and Conditions', as per 'Form F-5'.
(g) 'ACKNOWLEDGEMENT CUM CONSENT LETTER', as per 'Form F-6'
(h) Duly attested documents in accordance with the "BID EVALUATION CRITERIA [BEC]" establishing the qualification.
(i) Power of Attorney /copy of Board Resolution, in favour of the authorized signatory of the Bid, as per clause no.2.7 of ITB
(j) EMD (if applicable) in original or "Declaration of Bid Security" in original as per Clause 16 of ITB.
(k) All forms and Formats including Annexures.
(l) List of consortium/ JV member (s), if any, and Consortium Agreement (as per format) clearly defining their involvement & responsibility in this work, wherever applicable as specified elsewhere in the IFB/RFQ/BEC.
(m) Tender Document duly signed/ digitally signed by the Authorized Signatory.
(n) Additional document specified in Bidding Data Sheet (BDS).
(o) Any other information/details required as per Bidding Document

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. IGGL 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 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://etenders.gov.in. Bids submitted manually shall be rejected, the bids must be submitted on the E-tendering website (https://etenders.gov.in) 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 (if applicable), copy of Power of Attorney should be uploaded along with the bid.

Further, Bidders must submit the original "EMD (if applicable), Power of Attorney 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 30 days from the date of un-priced bid opening.

Bidders are required to submit the EMD (if applicable) 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 30 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.

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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 digitally signed and stamped on each page. In case of any correction, the bidders shall put his signature and his stamp.

11.2.3 Bidder shall download the Price Schedule / Schedule of Rates (SOR) which is uploaded on website as an excel attachment. Bidder shall submit Price Schedule / Schedule of Rates (SOR) duly filled in and e-signed strictly as per format without altering the content of it. The duly filled Price Schedule / Schedule of Rates (SOR) shall be uploaded by bidder on web site as per e-tendering procedure.

12 SCHEDULE OF RATES / BID PRICES

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 its 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.

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, IGGL 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 CBIC (Central Board of Indirect Taxes and Customs)/ any equivalent Central Government agency/ State Government agency brings to the notice of IGGL that the Supplier of Goods / Services (Service Provider) has not remitted the amount towards **GST (CGST & SGST/UTGST or IGST)** collected from IGGL to the government exchequer, then, that Supplier of Goods / Services (Service Provider) shall be put under Holiday list of IGGL 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.

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Beyond the contract period, in case IGGL 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 IGGL 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 IGGL'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 IGGL is entitled to avail the input tax credit of **GST (CGST & SGST/UTGST or IGST)**:

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

13.6.1 Owner/IGGL 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 IGGL 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 (if applicable as per Govt. Act/ Law in vogue). Where IGGL 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.

13.8 In case IGGL 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 IGGL has the obligation to discharge **GST (CGST & SGST/UTGST or IGST)** liability under reverse charge mechanism and IGGL 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 IGGL or ITC with respect to such payments is not available to IGGL for any reason which is not attributable to IGGL, then IGGL shall be entitled to deduct/ setoff / recover such amounts against any amounts paid or payable by IGGL 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 IGGL 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 IGGL for any reason which is not attributable to IGGL, then IGGL 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 IGGL 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 IGGL. Further, in case rating of bidder is negative / black listed after award of work for supply of goods / services, then IGGL 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 IGGL.

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.

13.13 GST as quoted by the bidder, shall be deemed as final and binding for the purpose of bid evaluation (applicable for tenders where bidder quote the GST rates). In case a bidder enters "zero/blank" GST or an erroneous GST, the bid evaluation for finalizing the L1 bidder will be done considering the quoted GST rates. No request for change in GST will be entertained after submission of bids.

In case where a successful bidder quotes a wrong GST rates, for releasing the order, the following methodology will be followed:

- In case the actual GST rate applicable is lower than the quoted GST rate, the actual GST rate will be added to the quoted basic prices. The final cash outflow will be based on actual GST rate.
- In case the actual GST rate applicable is more than the quoted GST rate, the basic prices quoted will be reduced proportionately, keeping the final cash outflow the same as the overall quoted amount.

Based on the total cash outflow calculated as above, IGGL shall place orders.

13.14 Wherever TDS under GST Laws has been deducted from the invoices raised / payments made to the vendors, as per the provisions of the GST law / Rules, Vendors

should accept the corresponding GST-TDS amount populated in the relevant screen on GST common portal (www.gst.gov.in). Further, Vendors should also download the GST TDS certificate from GST common portal (reference path: Services > User Services > View/Download Certificates option).

13.15 As per rule 138 of CGST rules, e-way bill is to be generated by a person who causes the movement of goods. Effective from 1st Feb.2018, for all the supplies on FOR/FOT basis, Suppliers/vendors are required to prepare e-way bill.

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 IGGL 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 (if applicable). 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 (if applicable) 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 IGGL payable at place mentioned in BDS] or 'Bank Guarantee' or 'Letter of Credit' strictly as per the format given in form F-2/ F- 2A (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 IGGL against the risk of Bidder's conduct, which would warrant the forfeiture of EMD, pursuant to clause-16.7 of ITB.

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16.3 IGGL 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 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 IGGL 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 MSE's (Micro & Small Enterprises) are exempted from submission of EMD in accordance with the provisions of PPP-2012 and Clause 40 of ITB. However, Traders/Dealers/ Distributors /Stockiest /Wholesaler are not entitled for exemption of EMD. The Government Departments/PSUs are also exempted from the payment of EMD.

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16.10 In case of forfeiture of EMD/ Bid Security, the forfeited amount will be considered inclusive of tax and tax invoice will be issued by IGGL. The forfeiture amount will be subject to final decision of IGGL based on other terms and conditions of order/ contract."

16.11 EMD / Bid Bond will not be accepted in case the same has reference of 'remitter' / 'financer' other than bidder on the aforementioned financial instrument of EMD / Bid Bond submitted by the bidder and bid of such bidder will be summarily rejected.

Note: **Bidders (i.e., MSEs, Start-Ups & CPSEs) is required to submit Declaration for Bid Security in bid as per Form 'F-15' in Section V of this tender.**

17. PRE-BID MEETING (IF APPLICABLE): Refer Invitation for Bid (IFB)

17.1 The Bidder(s) or his designated representative are invited to attend a "Pre-Bid Meeting" which will be held at the address specified in IFB. It is expected that a bidder shall not depute more than 02 representatives for the meeting. If situation demands, pre-bid meeting will be held online. Bidders interested in attending the pre-bid meeting online, shall contact IGGL at the following e-mail ID's requesting IGGL for providing the link for online pre-bid meeting:
indranil.neog@iggl.co.in; udayan.das@iggl.co.in; santanu.bhattacharyya@iggl.co.in

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 the e-tendering website (https://etenders.gov.in) 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 unamended printed literature where entry(s) or amendment(s) have been made shall be initiated by the person or persons signing the Bid.

18.2 The Bid shall contain no alterations, omissions, or additions, unless such corrections are initiated 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. IGGL will accept bids based on terms & conditions of "Bidding Documents" only. Bidder may note IGGL 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. IGGL's determination of a bid's responsiveness is based on the content of the bid itself without recourse to extrinsic evidence. IGGL reserves the right to raise technical and/or commercial query(s), if required, 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 (if applicable)

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(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) 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.

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20. E-PAYMENT

IGGL is in the process of initiating 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

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 (if applicable) along with bid must be submitted within the due date & time.

22.3 IGGL 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 IGGL 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 IGGL's website/E-tender website/ communicated to the bidders.

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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 IGGL 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 IGGL 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 (if applicable) of such bidders shall be returned along with the un-opened bid. In case of e-tendering, where the bid bond/physical documents have 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.

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 is received by IGGL 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 IGGL 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 (if applicable) 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, IGGL shall forfeit EMD (if applicable) 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.

[E] – BID OPENING AND EVALUATION

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

IGGL 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 IGGL's action. However, Bidder if so, desire may seek the reason (in writing) for rejection of their Bid to which IGGL shall respond quickly.

26. BID OPENING

26.1 *Unpriced Bid Opening:*

IGGL 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.

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26.2 ***Priced Bid Opening***.

26.2.1 IGGL 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 priced 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: -

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(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' (if applicable);
(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.

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:

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(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.

In case of a tie at the lowest bid (L1) position between two or more start-up/non-start-up bidders, the order/LoA will be placed on the bidder who has higher/ highest turnover in last audited financial year.

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 1/5th 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 1/5th 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", IGGL 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.

"IGGL intends to place the order/contract directly on the address from where Goods are produced/dispatched or Services are rendered. In case, bidder wants order/ contract at some other address or supply of Goods/ Services from multiple locations, bidder is required to provide in their bid address on which order is to be placed".

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 IGGL 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 IGGL 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. IGGL 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.

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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", IGGL will promptly discharge his 'Earnest Money / Bid Security (if applicable)', pursuant to "ITB: Clause-16"

37. SIGNING OF AGREEMENT

37.1 IGGL 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 IGGL.

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 (if applicable).

38. CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT (For applicability refer BDS in Annexure-IV of the tender):

38.1 Within 30 days of the receipt of the notification of award/ Fax of Acceptance from IGGL, 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 individual order/contract value as specified in Notification of Award is less than INR 5 Lakh (exclusive of GST).

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.

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SD / CPBG @ 03% of Total Order / Contract value in case contract period is less than one year or 03% of Annualized Order /Contract value in case contract period is more than one year.

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 (if applicable) [Refer Clause 16 of ITB].

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.

38.5 Further, the bidder can submit CPBG on line through issuing bank to IGGL directly as per Ministry of Finance (MOF) Department of financial service direction vide letter ref number F.No.7/112/2011-BOA dated 17th July 2012. In such cases confirmation will not be sought from issuing banker by IGGL.

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

Not with standing 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 in

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INDRADHANUSH GAS GRID LIMITED (IGGL)'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 IGGL, 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 IGGL, such decision of IGGL 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 *[FOR APPLICABILITY OF THIS CLAUSE, REFER BDS]*

40.1 Following provision has been incorporated in tender for MSEs, in line with notification of Government of India, vide Gazette of India No. 503 dated 26.03.2012 proclaiming the Public Procurement Policy on procurement of goods and services from Micro and Small Enterprises (MSEs)

i) Exemption to MSEs from payment of EMD/Bid Security.

ii) In Tender, participating Micro and Small Enterprises quoting price within price band of L1+15% shall also be allowed to supply a portion of requirement by bringing own their prices to L1 price in a situation where L1 price is from someone other than a micro and small enterprises and such micro and small enterprises shall be allowed to supply up to 25% of the total tendered value. In case of more than one such Micro and Small Enterprises, the supply shall be shared proportionately (to tendered quantity). Further, out of above 25%, 4% shall be reserved for MSEs owned by SC/ST entrepreneurs.

Further, 3% shall be reserved for MSEs owned by women within above 25% reservation. The respective quota(s) shall be transferred to other MSEs in case of non-availability of MSEs owned by SC/ST entrepreneurs/ MSEs owned by Women.

The quoted prices against various items shall remain valid in case of splitting of quantities of the items above.

In case tendered item is non-splitable or non- dividable (specified in Bid Data Sheet), MSE quoting price within price band L1 (other than MSE) + 15%, may be awarded for full/ complete supply of total tendered value subject to matching of L1 price.

40.2 The MSE(s) owned by SC/ST Entrepreneurs shall mean: -

a) In case of proprietary MSE, Proprietor(s) shall be SC/ST.

b) In case of partnership MSE, the SC/ST partners shall be holding at least 51% share in the unit

c) In case of private Limited Companies, at least 51% share is held by SC/ST. If the MSE is owned by SC/ST Entrepreneurs, the bidder shall furnish appropriate documentary evidence in this regard.

The MSE(s) owned by Women shall mean: -

a) In case of proprietary MSE, Proprietor(s) shall be Women.

b) In case of partnership MSE, the Women partners shall be holding at least 51% share in the unit

c) In case of private Limited Companies, at least 51% share is held by Women. If the MSE is owned by Women Entrepreneurs, the bidder shall furnish appropriate documentary evidence in this regard.

40.3 In case bidder is a Micro or Small Enterprise under the Micro, Small and Medium Enterprises Development Act, 2006, the bidder shall submit the following:

a) Ministry of MSME vide Gazette Notification No. CG-DL-E-26062020-220191 dated 26.06.2020 had notified certain criteria for classifying the Enterprises as Micro, Small and Medium Enterprises, and specified form and procedure for filing the Memorandum (Udyam Registration) w.e.f. 01.07.2020 (for complete details of Policy, refer website of Ministry of MSME, i.e. https://msme.gov.in/). **Accordingly, Micro and Small Enterprises (MSEs) shall be required to submit Udyam Registration Certificate for availing benefits under Public Procurement Policy for MSEs-2012.**

An enterprises registered prior to 30.06.2020 and who are not re-registered with Udyam Registration, shall continue to be valid for a period upto 31.03.2022. Such enterprise shall submit EM Part-II or Udyog Aadhaar Memorandum (UAM) for availing benefits of PPP-2012.

b) If the MSE is owned by SC/ST Entrepreneurs/ Women Entrepreneur, the bidder shall furnish appropriate documentary evidence in this regard.

The above documents submitted by the bidder shall be duly certified by the Chartered Accountant (not being an employee or a Director or not having any interest in the bidder's company/firm) and notary public with legible stamp.

If the bidder does not provide the above confirmation or appropriate document or any evidence, then it will be presumed that they do not qualify for any preference admissible in the Public Procurement Policy (PPP) 2012.

Further, MSEs who are availing the benefits of the Public Procurement Policy (PPP) 2012 get themselves registered with MSME Data Bank being operated by NSIC, under SME Division, M/o MSME, in order to create proper data base of MSEs which are making supplies to CPSUs.

40.4 If against an order placed by IGGL, successful bidder(s) (other than Micro/Small Enterprise) is procuring material/services from their sub-vendor who is a Micro or Small Enterprise registered with District Industries Centres or Khadi and Village Industries Commission or Khadi and Village Industries Board or Coir Board or

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National Small Industries Corporation or Directorate of Handicrafts and Handloom or any other body specified by Ministry of Micro, Small and Medium Enterprises with prior consent in writing of the purchasing authority/Engineer-in-charge, the details like Name, Registration No., Address, Contact No. details of material & value of procurement made, etc. of such Enterprises shall be furnished by the successful bidder at the time of submission of invoice/Bill.

40.5 The benefit of policy are not extended to the traders/dealers/Distributors/ Stockiest/Wholesalers.

40.6 NSIC has initiated a scheme of Consortia and Tender Marketing Scheme" under which they are assisting the Micro & Small enterprises to market their products and services through tender participation on behalf of the individual unit or through consortia.
Accordingly, if the MSEs or the consortia, on whose behalf the bid is submitted by NSIC, is meeting the BEC and other terms and conditions of tender their bid will be considered for further evaluation. Further, in such cases a declaration is to be submitted by MSE/consortia on their letter head (s) that all the terms and conditions of tender document shall be acceptable to them.

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:

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

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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 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 fulfilment 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 MECHANISM**

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1.0 CONCILIATION

Indradhanush Gas Grid Limited (IGGL) has framed the Conciliation Rules 2019 in conformity with Part – III of the Arbitration and Conciliation Act 1996 as amended from time to time for speedier, cost effective and amicable settlement of disputes through conciliation. All issue(s)/dispute(s) arising under the Contract, which cannot be mutually resolved within a reasonable time, may be referred for conciliation in accordance with IGGL Conciliation Rules 2019 as amended from time to time. A copy of the said rules have been made available on IGGL's web site i.e. https://iggl.co.in.
Where invitation for Conciliation has been accepted by the other party, the Parties shall attempt to settle such dispute(s) amicably under Part-III of the Arbitration and Conciliation Act, 1996 and Indradhanush Gas Grid Limited (IGGL) Conciliation Rules, 2019. It would be only after exhausting the option of Conciliation as an Alternate Dispute Resolution Mechanism that the Parties hereto shall invoke Arbitration Clause. 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.

2.0 ARBITRATION

All issue(s)/dispute(s) excluding the matters that have been specified as excepted matters and listed at clause no. 2.6 and which cannot be resolved through Conciliation, such issue(s)/dispute(s) shall be referred to arbitration for adjudication by Sole Arbitrator. The party invoking the Arbitration shall have the option to either opt for Ad-hoc Arbitration as provided at Clause 2.1 below or Institutionalized Arbitration, the remaining clauses from 2.3 to 2.7 shall apply to both Ad-hoc and Institutional Arbitration: -

2.1 On invocation of the Arbitration clause by either party, IGGL shall suggest a panel of three independent and distinguished persons (Retd Supreme Court & High Court Judges only) to the other party to select any one among them to act as the Sole Arbitrator. In the event of failure of the other party to select the Sole Arbitrator within 30 days from the receipt of the communication from IGGL suggesting the panel of arbitrators, the right of selection of the sole arbitrator by the other party shall stand forfeited and IGGL shall appoint the Sole Arbitrator from the suggested panel of three Arbitrators for adjudication of dispute(s). The decision of IGGL on the appointment of the sole arbitrator shall be final and binding on the other party. The fees payable to Sole Arbitrator shall be governed by the fee Schedule of ''Delhi International Arbitration Centre'.

2.2 The cost of arbitration proceedings shall be shared equally by the parties.

2.3 The Arbitration proceedings shall be in English language and the seat, venue and place of Arbitration shall be Guwahati, Assam, India only.

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2.4 Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matter relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at **Guwahati, Assam, India**.

2.5 List of Excepted matters:

a) Dispute(s)/issue(s) involving claims below Rs 25 lakhs and above Rs 25 crores.

b) Dispute(s) / issue(s) relating to indulgence of Contractor / Vendor / Bidder in corrupt / fraudulent / collusive / coercive practices and/or the same is under investigation by CBI or Vigilance or any other investigating agency or Government.

c) Dispute(s) / issue(s) wherein the decision of Engineer-In-Charge / owner / IGGL has been made final and binding in terms of the Contract.

2.6. Disputes involving claims below Rs 25 Lakhs and above Rs. 25 crores: - Parties mutually agree that dispute(s)/issue(s) involving claims below Rs 25 Lakhs and above Rs 25 crores shall not be subject matter of Arbitration and are subject to the exclusive jurisdiction of the Court(s) situated at **Guwahati, Assam, India**.

3.0 GOVERNING LAW AND JURISDICTION: The Contract shall be governed by and construed in accordance with the laws in force in India. The Parties hereby submit to the exclusive jurisdiction of the Courts situated at **Guwahati, Assam, India** for adjudication of disputes, injunctive reliefs, actions and proceedings, if any, arising out of this Contract.

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46. **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.

IGGL'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, IGGL 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."

50. **APPLICABILITY OF TENDERED ITEMS BEING SPLITABLE / NON-SPLITABLE**

Refer BDS in ANNEXURE-IV of the tender.

51. **RELAXATION FOR START-UPS** ***[FOR APPLICABILITY OF THIS CLAUSE, REFER BDS]***

Prior turnover and prior experience for all Start-ups [whether Micro & Small Enterprises (MSEs) or otherwise] shall not be required for procurement of goods/works/services (including consultancy services) subject to their meeting the quality and technical specifications specified in tender document.

Further, the Startups are also exempted from submission of EMDs

The relaxation of prior experience and prior turnover to Start-ups [whether Micro & Small Enterprises (MSEs) or otherwise] is to be given to the specific goods/ job domains wherein they are registered for and start-ups are required to submit the documents for the same including the application submitted to DIPP.
New start-up "Certificate of Recognition" is stipulating the domain of start-up. The domain of start-up is to be considered based on "Certificate of Recognition" issued by Department of Promotion of Industry and Internal Trade (DPIIT). Start-ups having the "Certificate of Recognition" as per old format, are required to submit documents as mentioned herein above.

Further, above document should be certified by the Chartered Accountant (not being an employee or a Director or not having any interest in the bidder's company/firm) and notary public with legible stamp.

If a Start-up [whether Micro & Small Enterprises (MSEs) or other-wise] gets qualified without turnover and experience criteria specified in tender and emerges lowest bidder, the order/LoA on such Start-up shall be placed for entire tendered quantity.

However, in case of procurement of goods before supplying the total quantity, the start-up enterprise shall first demonstrate its performance by supplying 10% of total ordered quantity (rounded off to the next higher digit in terms of Unit of Measurement (UoM), wherever required) and only after successful execution of this quantity the balance 90% quantity will be cleared for supply. In case, the demonstration of performance fails, the entire order will be cancelled without any financial implication on either side.

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In case of procurement of works/services (including consultancy services), if a Start-up emerge lowest bidder, the LoA on such Start-up shall be placed for entire tendered quantity. However, EIC's of that contract should draw monthly milestones/ check points during the Kick of Meeting and they should review the performance more carefully and take action as per provision of contract in case of failure/ poor performance.

52. PROVISION REGARDING INVOICE FOR REDUCED VALUE OR CREDIT NOTE TOWARDS PRS

As mentioned in GCC, PRS is the reduction in the consideration / contract value for the goods / services covered under this contract. In case of delay in supply/ execution of contract, supplier/ contractor/ service provider should raise invoice for reduced value as per Price Reduction Schedule Clause (PRS clause). If supplier/ contractor/ service provider has raised the invoice for full value, then supplier/ contractor/ service provider should issue Credit Note towards the applicable PRS amount with applicable taxes.

In such cases if supplier/ contractor/ service provider fails to submit the invoice with reduced value or does not issue credit note as mentioned above, IGGL will release the payment to supplier/ contractor/ service provider after giving effect of the PRS clause with corresponding reduction of taxes charged on vendor's invoice, to avoid delay in delivery/collection of material."

In case any financial implication arises on IGGL due to issuance of invoice without reduction in price or non-issuance of Credit Note, the same shall be to the account of supplier/ contractor/ service provider. IGGL shall be entitled to deduct / setoff / recover such GST amount (CGST & SGST/UTGST or IGST) together with penalties and interest, if any, against any amounts paid or becomes payable by IGGL in future to the Supplier/Contractor under this contract or under any other contract.

53. UNIQUE DOCUMENT IDENTIFICATION NUMBER BY PRACTICING CHARTERED ACCOUNTANTS

Practicing Chartered Accountants shall generate Unique Document Identification Number (UDIN) for all certificates issued by them as per provisions of Tender Document.

However, UDIN may not be required for documents being attested by Chartered Accountants in terms of provisions of Tender Document.

54. AUTHENTICATION OF DOCUMENTS DURING THE PERIOD OF RESTRICTED MOVEMENTS DUE TO COVID-19 OUTBREAK

Authentication of document pertaining to BEC, Affidavit/certified documents for purchase preference policy(s), etc:

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Bids will be evaluated based on the **SELF-CERTIFIED DOCUMENTS** submitted by Bidders. These documents will have to be **SELF-CERTIFIED BY THE AUTHORISED SIGNATORY OF THE BIDDER.**

THE AUTHENTICATED DOCUMENTS WILL BE SUBMITTED BY BIDDER, ON WHOM ORDER/CONTRACT IS PLACED, AFTER NORMALIZATION OF SITUATION.

An undertaking as per FORMAT F-16 in Section-V of the Tender document shall be submitted by all participating bidders in Bid.

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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 duly appointed Committee by IGGL.

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).

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.

A.9 "Investigating Agency" shall mean any department or unit of IGGL investigating into the conduct of Agency/ party and shall include any other agency set up by the Central or state government having power to investigate.

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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 (if applicable) shall be forfeited.
Further, such agency shall be banned for future business with IGGL 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 IGGL 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 IGGL 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.

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(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 IGGL for a period specified in para-B 2.2 below from the date of issue of banning order.

B.2.2 <u>Period of Banning:</u>

The period of banning of agencies indulged in Corrupt/ Fraudulent/ Collusive/Coercive Practices shall be as under and to be reckoned from the date of banning order:

S. No.	Description	Period of banning from the date of issuance of Banning order
1	Misrepresentation/False information other than pertaining to BEC of tender but having impact on the selection process. For example, if an agency confirms not being in holiday/ banning list of PSUs/ Govt. Dept., liquidation, bankruptcy & etc. and subsequently it is found otherwise, such acts shall be considered in this category.	02 years
2 2.1	Corrupt/Fraudulent (pertaining to BEC of tender) /Collusive/Coercive Practices If an agency again commits Corrupt/Fraudulent (pertaining to BEC of tender) /Collusive/ Coercive Practices in subsequent cases after their banning, such situation of repeated offense to be dealt with more severity and following shall be the period of banning:	03 years

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	(i) Repeated once (ii) Repeated twice or more	7 years (in addition to the period already served) 15 years (in addition to the period already served)
3	Indulged in unauthorized disposal of materials provided by IGGL	7 years
4	If act of vendor/ contractor is a threat to the National Security	15 years

C. <u>Effect of banning on other ongoing contracts/ tenders:</u>

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.

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D. Procedure for Suspension of Bidder:

D.1 Initiation of Suspension:

Action for suspension business dealing with any agency/(ies) shall be initiated by IGGL when

(i) Concerned IGGL Department based on the fact of the case gathered during investigation by them recommend for specific immediate action against the agency.
(ii) Concerned IGGL 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. 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 IGGL.
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 (if applicable) 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 IGGL 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. Such an appeal shall be preferred within one month from the of receipt of banning order.

F.2 Appellate Authority of IGGL 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 of IGGL.

G. Wherever there is contradiction with respect to terms of 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.

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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 IGGL 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. 50 Lakhs and above is recommended to be drawn up. Further, Performance rating data Sheet for orders/contracts of Vendor/Supplier/Contractor/ Consultant who are on watch list/holiday list/ banning list shall be prepared irrespective of order/ contract value. 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.

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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 IGGL.

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 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. 50 Lakhs if Vendor/Supplier/Contractor/ Consultant is not on watch list/ holiday list/ banning list.

ii) Orders for Misc./Administrative items/ Non stock Non valuated 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.

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4.0 PROCESS OF EVALUATION OF PERFORMANCE OF VENDORS/ SUPPLIERS/ CONTRACTORS/ CONSULTANTS

4.1 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"** (as per Performance Rating carried out after execution of Order/Contract and where no reply/unsatisfactory reply is received from party against the letter seeking the explanation from Vendor/Supplier/Contractor/Consultant along with sharing the performance rating)**:**

Recommend such defaulting Vendor/ Supplier/Contractor/ Consultant for the following action:

(1) Poor performance on account of Quality (if marks obtained against Quality parameter is less than 20)

(a) First Instance: Holiday (Red Card) for Two Years

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(b) Subsequent instance (s) in other ongoing order (s)/ contract (s) or new order (s) / contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for Three Years

(2) Poor performance on account of other than Quality (if marks obtained against Quality parameter is more than 20)

(a) First Such Instance: Advisory notice (Yellow Card) shall be issued and Vendor/Supplier/Contractor/Consultant shall be put on watch list for a period of Three (03) Years.

(b) Second such instance in other ongoing order (s)/contract (s) or new order (s)/ contract (s) on such Vendor/Supplier/Contractor/Consultant: Putting on Holiday (Red Card) for a period of One Year

(c) Subsequent instances (more than two) in other ongoing order (s)/ contract (s) or new order (s) / contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for a period of Three Years.

B) **Where Poor/Non-Performance leading to termination of contract or offloading of contract due to poor performance attributable to Vendor/Supplier/Contractor/Consultant** (under Clause No. 32(C) of GCC-Works, Clause No. 28.3.1 of GCC-Goods, second para of Clause No. 2.17.3 of GCC-Services and Clause No. 3.16.1 of GCC-Consultancy)**:**

(a) First Instance: Advisory notice (Yellow Card) shall be issued and Vendor/Supplier/Contractor/Consultant shall be put on watch list for a period of Three (03) Years.
Further such vendor will not be allowed to participate in the re-tender of the same supply/work/services of that location which has terminate/offloaded. Moreover, it will be ensured that all other action as per provision of contract including forfeiture of Contract Performance Security (CPS) etc. are undertaken.
However, such vendor will be allowed to participate in all other tenders and to execute other ongoing order/contract (s) or new contract/order.
The yellow card will be automatically revoked after a period of three years unless the same is converted into Red card due to subsequent instances of poor/non-performance in other ongoing order (s)/contract (s) or new order (s)/contract (s) on such Vendor/Supplier/Contractor/Consultant.

(b) Second instances in other ongoing order (s) / contract (s) or new order (s)/contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for period of One Year and they shall also be considered for Suspension.

(c) Subsequent instances (more than two) in other ongoing order (s)/ contract (s) or new order (s) / contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for a period of Three Years and they shall also be considered for Suspension.

C) Where Performance rating is "FAIR":

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

4.2 FOR CONSULTANCY JOBS:

Monitoring and Evaluation of consultancy jobs will be carried out in the same way as described in para 4.1 for Projects.

4.3 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	**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

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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"** (as per Performance Rating carried out after execution of Order/Contract and where no reply/unsatisfactory reply is received from party against the letter seeking the explanation from Vendor/Supplier/Contractor/Consultant along with sharing the performance rating)**:**

Recommend such defaulting Vendor/ Supplier/Contractor/ Consultant for the following action:

(1) Poor performance on account of Quality (if marks obtained against Quality parameter is less than 20)

(a) First Instance: Holiday (Red Card) for Two Years
(b) Subsequent instance (s) in other ongoing order (s)/ contract (s) or new order (s) / contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for Three Years

(2) Poor performance on account of other than Quality (if marks obtained against Quality parameter is more than 20)

(a) First Such Instance: Advisory notice (Yellow Card) shall be issued and Vendor/Supplier/Contractor/Consultant shall be put on watch list for a period of Three (03) Years.
(b) Second such instance in other ongoing order (s)/contract (s) or new order (s)/ contract (s) on such Vendor/Supplier/Contractor/Consultant: Putting on Holiday (Red Card) for a period of One Year
(c) Subsequent instances (more than two) in other ongoing order (s)/ contract (s) or new order (s) / contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for a period of Three Years.

B) **Where Poor/Non-Performance leading to termination of contract or offloading of contract due to poor performance attributable to Vendor/Supplier/Contractor/Consultant** (under Clause No. 32(C) of GCC-Works, Clause No. 28.3.1 of GCC-Goods, second para of Clause No. 2.17.3 of GCC-Services and Clause No. 3.16.1 of GCC-Consultancy)**:**

(a) First Instance: Advisory notice (Yellow Card) shall be issued and Vendor/Supplier/Contractor/Consultant shall be put on watch list for a period of Three (03) Years.
Further such vendor will not be allowed to participate in the re-tender of the same supply/work/services of that location which has terminate/offloaded. Moreover, it will be ensured that all other action as per provision of contract including forfeiture of Contract Performance Security (CPS) etc. are undertaken.
However, such vendor will be allowed to participate in all other tenders and to execute other ongoing order/contract (s) or new contract/order.
The yellow card will be automatically revoked after a period of three years unless the same is converted into Red card due to subsequent instances of poor/non-performance in other ongoing order (s)/contract (s) or new order (s)/contract (s) on such Vendor/Supplier/Contractor/Consultant.

(d) Second instances in other ongoing order (s) / contract (s) or new order (s)/contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for period of One Year and they shall also be considered for Suspension.

(e) Subsequent instances (more than two) in other ongoing order (s)/ contract (s) or new order (s) / contract (s) on such Vendor/Supplier/Contractor/Consultant: Holiday (Red Card) for a period of Three Years and they shall also be considered for Suspension.

C) <u>Where Performance rating is "FAIR":</u>

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

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 (if applicable) 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 IGGL 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.

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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 formed by IGGL.

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, IGGL shall forfeit EMD (if applicable) 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 Watch List (Yellow Card) for a period of three years after following the due procedure However, during the period in watch list such vendor will be allowed to participate in all other tenders and to execute other ongoing order/contract (s) or new contract / order (s).

In case of subsequent instances of default in other tender (s) during aforesaid watch list period, the action shall be initiated as per provision of Sl No. 2 of para-A of Clause No. 4.1 (v) and 4.3 (v).

The Yellow card will be automatically revoked after specified period unless the same is converted into Red Card.

11. In case CBIC (Central Board of Indirect Taxes and Customs)/ any equivalent Central Government agency/ State Government agency brings to the notice of IGGL that the Supplier of Goods / Services (Service Provider) has not remitted the amount towards **GST (CGST & SGST/UTGST or IGST)** collected from IGGL to the government exchequer, then party will be put on holiday for a period of six months after following the due procedure.

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Annexure-1

IGGL
PERFORMANCE RATING DATA SHEET
(FOR PROJECTS/ CONSULTANCY JOBS)

i) Project/Work Centre :

ii) Order/ Contract No. & date :

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 Allocated				

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
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	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

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1.3 RELIABILITY PERFORMANCE 20 Marks

A.	**FOR WORKS/CONTRACTS**	
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.	**FOR SUPPLIES**	
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

IGGL
PERFORMANCE RATING DATA SHEET
(FOR O&M)

i) Location :

ii) Order/ Contract No. & date :

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 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	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

A.	**FOR WORKS/CONTRACTS**	
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.	**FOR SUPPLIES**	
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-III

ADDENDUM TO INSTRUCTIONS TO BIDDERS

(INSTRUCTIONS FOR PARTICIPATION IN E-TENDER)

Available on Govt. CPP Portal- https://etenders.gov.in/eprocure/app

https://etenders.gov.in/eprocure/app?page=BiddersManualKit&service=page

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ANNEXURE-IV

BIDDING DATA SHEET (BDS)

(TO BE FILLED BY THE CONCERNED DEALING OFFICER BEFORE ISSUANCE OF TENDER)
ITB TO BE READ IN CONJUNCTION WITH THE FOLLOWING:

==========

A. GENERAL	
ITB clause	**Description**
1.1	The Employer/Owner is: IGGL
	The Invitation for Bids/ Tender no is: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22
	The name of the Works/Services/Goods to be performed/supplied is: **CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE**
3	BIDS FROM CONSORTIUM/ JOINT VENTURE APPLICABLE [ ] NOT APPLICABLE [√]
B. BIDDING DOCUMENT	
ITB clause	**Description**
8.1	For **clarification purposes** only, the communication address is: **Attention:** Indranil Neog, Deputy General Manager (C &P)i/c **Street Address:** Indradhanush Gas Grid Limited (IGGL) 5th Floor, Central Mall, G S Road, Christian Basti Guwahati- 781005 Country: INDIA Email: indranil.neog@iggl.co.in 2)Name: Mr. Udayan Das, Designation: Chief Manager (C&P) Street Address: Indradhanush Gas Grid Limited (IGGL) 5th Floor, Central Mall, G S Road, Christian Basti Guwahati- 781005 Country: INDIA E-mail: udayan.das@iggl.co.in 3)Name: Mr. Santanu Bhattacharyya, Designation: Senior Manager(C&P) Street Address: Indradhanush Gas Grid Limited (IGGL) 5th Floor, Central Mall, G S Road, Christian Basti Guwahati- 781005 Country: INDIA E-mail: santanu.bhattacharyya@iggl.co.in

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C. PREPARATION OF BIDS	
ITB clause	**Description**
12 & 13	Whether IGGL will be able to avail input tax credit in the instant tender YES [ ] NO [√]
14	The currency of the Bid shall be **INR**
15	The bid validity period shall be **03 (Three) Months** from final 'Bid Due Date'
16.1	In case **'Earnest Money / Bid Security' (if applicable)** is in the form of **'Demand Draft'** or **'Banker's Cheque'**, the same should be favor of **Indradhanush Gas Grid Limited** payable at **GUWAHATI.**
D. SUBMISSION AND OPENING OF BIDS	
ITB clause	**Description**
18	In addition to the original of the Bid, the number of copies required is one. Not applicable in case of e-tendering.
22	The E-Tender No. of this bidding process is: IGGL-100030
22.3 and 4.0 of IFB	For **bid submission purposes** only (Manual) or the submission of physical document as per clause no. 4.0 of IFB, the Owner's address is: Attention: **Indranil Neog, Deputy General Manager (C &P)i/c** Street Address: **Indradhanush Gas Grid Limited (IGGL)** 5th Floor, Central Mall, G S Road, Christian Basti Guwahati- 781005 Country: INDIA
26	**The bid opening shall take place at:** **Online at CPP portal**

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E. EVALUATION, AND COMPARISON OF BIDS	
ITB clause	**Description**
32	Evaluation Methodology is mentioned in Section-II.
33	Compensation for Extended Stay: APPLICABLE [ ] NOT APPLICABLE [√]
F. AWARD OF CONTRACT	
ITB clause	**Description**
37	State of which stamp paper is required for Contract Agreement: _____**ASSAM**_____
38	Contract Performance Security/ Security Deposit APPLICABLE [√] NOT APPLICABLE [ ]
50	Whether tendered item is non-splitable or not-divisible: YES [√] NO [ ] ***<u>Tendered items are non-splitable or not-divisible.</u>***
41	Provision of AHR Item: APPLICABLE [√] NOT APPLICABLE [ ]

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<table>
<tr><td>49</td><td>Quarterly Closure of Contract
<table>
<tr><td>APPLICABLE</td><td></td></tr>
<tr><td>NOT APPLICABLE</td><td>√</td></tr>
</table></td></tr>
<tr><td></td><td>Bonus for Early Completion:
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<tr><td>NOT APPLICABLE</td><td>√</td></tr>
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<tr><td>51</td><td>Applicability of provisions relating to Start-ups:
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<tr><td>NOT APPLICABLE</td><td>√</td></tr>
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<tr><td></td><td>Defect Liability Period:
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<tr><td>NOT APPLICABLE</td><td></td></tr>
</table>
Applicable (i.e., for 12 months from the date of completion of work)</td></tr>
<tr><td>40</td><td>Applicability of provisions relating to MSE:
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<tr><td>NOT APPLICABLE</td><td>√</td></tr>
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SECTION-IV

GENERAL CONDITIONS OF CONTRACT (GCC)

Please refer to attachment (GCC_WORKS) in CPP E-tender portal

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SECTION-V

FORMS & FORMAT

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LIST OF FORMS & FORMATS

Form No.	Description
F-1	BIDDER'S GENERAL INFORMATION
F-2	PROFORMA OF "BANK GUARANTEE" FOR "EARNEST MONEY / BID SECURITY"
F-2A	PROFORMA OF "LETTER OF CREDIT" FOR "EARNEST MONEY / BID SECURITY"
F-3	LETTER OF AUTHORITY
F-4	PROFORMA OF "BANK GUARANTEE" FOR "CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT"
F-5	AGREED TERMS & CONDITIONS
F-6	ACKNOWLEDGEMENT CUM CONSENT LETTER
F-7	BIDDER'S EXPERIENCE
F-8	CHECK LIST
F-9	FORMAT FOR CERTIFICATE FROM BANK IF BIDDER'S WORKING CAPITAL IS INADEQUATE
F-10	FORMAT FOR CHARTERED ACCOUNTANT CERTIFICATE FOR FINANCIAL CAPABILITY OF THE BIDDER
F-11	FORMAT FOR CONSORTIUM / JV AGREEMENT
F-12	BIDDER'S QUERIES FOR PRE-BID MEETING
F-13	E-BANKING FORMAT
F-14	FREQUENTLY ASKED QUESTIONS (FAQ)
F-15	DECLARATION OF BID SECURITY
F-16	UNDERTAKING REGARDING SUBMISSION OF AUTHENTICATED DOCUMENTS RELATING TO BEC, AFFIDAVIT/CERTIFIED DOCUMENTS FOR PURCHASE PREFERENCE POLICY(S), ETC.

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F-1

BIDDER'S GENERAL INFORMATION

To,
M/s IGGL
_____

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 (**E–TENDER NO. IGGL-100030)**

1	Bidder Name	
2	Status of Firm	Proprietorship Firm/Partnership firm/Public Limited/Pvt. Limited/Govt. Dept./PSU/Others If Others Specify: _____ [Enclose certificate of Registration]
3a	Name of Proprietor / Partners / Directors of the firm/company [As per Cl. No. 4.0 of ITB]	
3b	Name of Power of Attorney Holders of bidder	
4	Number of Years in Operation	
5	Address of Registered Office:	
		City:
		District:
		State:
		PIN/ZIP:
6	Bidder's address where order/contract is to be placed	
		City:
		District:
		State:
		PIN/ZIP:
7	Address from where Goods/ Services are to be dispatched/ provided along with GST no. (In case supply of Goods/ Services are from multiple locations, addresses and GST no. of all such locations are to be provided).	City: District: State: PIN/ZIP: GST No.:
8	Telephone Number of address where order is to be placed	_____ (Country Code) (Area Code) (Telephone No.)
9	E-mail address	

==========

10	Website	
11	Fax Number:	_____ (Country Code) (Area Code) (Telephone No.)
12	ISO Certification, if any	{If yes, please furnish details}
13	PAN No.	[Enclose copy of PAN Card]
14	GST No. (refer sl. no. 7 above)	[Enclose copy of GST Certificate]
15	EPF Registration No.	[Enclose copy of EPF Registration Certificate]
16	ESI code No.	[Enclose copy of relevant document]
17	Whether Micro/Small/Medium Enterprise	Yes/No (If Yes, Bidder to submit requisite documents as specified in ITB: Cl. No. 40)
	Whether MSE is owned by SC/ST Entrepreneur(s)	Yes/No (If Yes, Bidder to submit requisite documents as specified in ITB: Cl. No. 40)
	Whether MSE is owned by Women	Yes/No (If Yes, Bidder to submit requisite documents as specified in ITB: Cl. No. 40)

Note: * *IGGL intends to place the order/contract directly on the address from where Goods are produced/dispatched are Services are rendered. In case, bidder wants order/ contract at some other address or supply of Goods/ Services from multiple locations, bidder is required to provide in their bid address on which order is to be placed*

Place:
Date:

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

==========

FORMAT F-2
PROFORMA OF "BANK GUARANTEE"
FOR "EARNEST MONEY / BID SECURITY"
(To be stamped in accordance with the Stamp Act)

To, M/s Indradhanush Gas Grid Limited (IGGL) ----------	**Bank Guarantee No.**	
	Date of BG	
	BG Valid up to	
	Claim period up to (There should be three months gap between expiry date of BG & Claim period)	
	Stamp Sl. No./e-Stamp Certificate 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 IGGL, the amount _____ _____ without any reservation, protest, demur and recourse. Any such demand made by IGGL, 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 _____.

Notwithstanding anything contained herein:

a) The Bank's liability under this Guarantee shall not exceed (currency in figures) . . . . . (currency in words only) . . . . . .
b) This Guarantee shall remain in force upto _____(this expiry date of BG should be two months beyond the validity of bid) and any extension(s) thereof; and
c) The Bank shall be released and discharged from all liability under this Guarantee unless a written claim or demand is issued to the Bank on or before the midnight of . . . . . .(indicate date of expiry of claim period which includes minimum three months from the expiry of this Bank Guarantee) and if extended, the date of expiry of the last extension of this Guarantee. If a claim has been received by us within the said date, all the rights of IGGL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

==========

WITNESS:

(SIGNATURE)
(NAME)

(SIGNATURE)
(NAME)
Designation with Bank Stamp

(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.

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F-2A

PROFORMA OF "LETTER OF CREDIT"

FOR "EARNEST MONEY / BID SECURITY"

To,

M/s IGGL

_____

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 (**E–TENDER NO. IGGL-100030)**

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 here by 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 **Indradhanush Gas Grid Limited** (IGGL), 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 IGGL 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).

==========

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

==========

F-3

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 IGGL

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 **(E–TENDER NO. IGGL-100030)**

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 IGGL.

==========

F-4

PROFORMA OF "BANK GUARANTEE" FOR "CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT"

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

To, M/s Indradhanush Gas Grid Limited (IGGL) ----------	**Bank Guarantee No.**	
	Date of BG	
	BG Valid up to	
	Claim period up to (There should be three months gap between expiry date of BG & Claim period)	
	Stamp Sl. No./e-Stamp Certificate No.	

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 **Indradhanush Gas Grid Limited (IGGL)** having registered office at 5th FLOOR CENTRAL MALL, G S ROAD, CHRISTIAN BASTI, GUWAHATI, ASSAM (herein after called the "IGGL" which expression shall wherever the context so require includes 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 IGGL, 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 IGGL we shall on first demand pay without demur, contest, protest and/ or without any recourse to the contractor to IGGL in such manner as IGGL 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 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. 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 IGGL 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 IGGL. 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 IGGL 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 IGGL may have in relation to the supplier's/contractor's liabilities.

7. The amount under the Bank Guarantee is payable forthwith without any delay by Bank upon the written demand raised by IGGL. Any dispute arising out of or in relation to the said Bank Guarantee shall be subject to the exclusive jurisdiction of courts at Guwahati.

8. 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.

9. 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.

10. Notwithstanding anything contained herein:
    a) The Bank's liability under this Guarantee shall not exceed (currency in figures) . . . . . (currency in words only) . . . . . .
    b) This Guarantee shall remain in force upto _____(this date should be expiry date of defect liability period of the contract) and any extension(s) thereof; and
    c) The Bank shall be released and discharged from all liability under this Guarantee unless a written claim or demand is issued to the Bank on or before the midnight of . . . . . .(indicate date of expiry of claim period which includes minimum three months from the expiry of this Bank Guarantee) and if extended, the date of expiry of the last extension of this Guarantee. If a claim has been received by us within the said date, all the rights of IGGL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

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 Guwahati.
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 along with Documentary evidence.

Annexure

MATTER TO BE MENTIONED IN COVERING LETTER TO BE SUBMITTED BY VENDOR ALONG WITH BANK GUARANTEE

1. BANK GUARANTEE NO. :

2. VENDOR NAME:

NAME	

3. BANK GUARANTEE AMOUNT :

4. PURCHASE ORDER/LOA NO. :

5. NATURE OF BANK GUARANTEE : please Tick (√) Whichever is Applicable

PERFORMANCE BANK GUARANTEE	SECURITY DEPOSIT	EMD	ADVANCE

6. BG ISSUED BANK DETAILS :
   (A) EMAIL ID :
   (B) ADDRESS :
   (C) PHONE NO/ MOBILE NO. :

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F-5
AGREED TERMS & CONDITIONS

To,

M/s IGGL

_____

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 **(E–TENDER NO. IGGL-100030)**

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.	Bidder confirms the currency of quoted prices is in Indian Rupees.	
3.	Bidder Confirms quoted prices will remain firm and fixed till complete execution of the order.	
4	Bidder confirms that they have quoted rate of **GST (CGST & SGST/ UTGST or IGST)** in Price Schedule/SOR of Price bid	Confirmed ……% [GST rate]
4.1	Whether in the instant tender services/works are covered in reverse charge rule of **GST (CGST & SGST/UTGST or IGST)**	Yes/ No In case of Yes, please specify **GST (CGST & SGST/UTGST or IGST)** payable by: IGGL:…….% Bidder:……..%
4.2	Service Accounting Codes (SAC)/ Harmonized System of Nomenclature (HSN)	
4.3	Bidder hereby confirms that the quoted prices is in compliance with the Section 171 of CGST Act/ SGST Act as mentioned as clause no. 13.10 of ITB	
5.	Confirm acceptance of relevant Terms of Payment specified in the Bid Document.	
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	

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Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
	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.	
8.	Confirm compliance to Completion Schedule as specified in Bid document.	
9.	Confirm acceptance of Price Reduction Schedule for delay in completion schedule specified in Bid document. In case of delay, the bills shall be submitted after deducting the price reduction due to delay	
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 (**if applicable**): a) EMD/ Bid Security No. & date b) Value c) Validity	
13.	As per requirement of tender, bidder (having status as Pvt. Ltd. or Limited company) must upload bid duly digitally signed on e-portal through class-3B digital signature (DS). In case, class of DS or name of employee or name of employer is not visible in the digitally signed documents, the bid digitally signed as submitted by the person shall be binding on the bidder.	
14.	Bidder confirms that (i) none of Directors (in Board of Director) of bidder is a relative of any Director (in Board of Director) of Owner or (ii) the bidder is not a firm in which any Director (in Board of Director) of Owner/ IGGL or their relative is not a partner.	Confirmed: ☐ Not Confirmed: ☐
15.	All correspondence must be in ENGLISH language only.	

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Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
16.	The contents of this Tender Document have not been modified or altered by Bidder. In case, it is found that the tender document has been modified / altered by the bidder, the bid submitted by them shall be liable for rejection.	
17.	Confirm that all Bank charges associated with Bidder's Bank shall be borne by Bidder.	
18.	**No Deviation Confirmation:** It may be noted that any 'deviation / exception' in any form may result in rejection of Bid. Therefore, Bidder confirms that they have not taken any 'exception / deviation' anywhere in the Bid. In case any 'deviation / exception' is mentioned or noticed, Bidder's Bid may be rejected.	
19.	**Non-Involvement of Govt. of India:** If Bidder becomes a successful Bidder and pursuant to the provisions of the Tender Document, award is given to them against subject Tender Document, the following Confirmation shall be automatically enforceable: "We agree and acknowledge that the Employer is entering into the Contract/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 Contract/Agreement and has no liabilities, obligations or rights thereunder. It is expressly understood and agreed that the Purchaser is authorized to enter into Contract/Agreement, solely on its own behalf under the applicable laws of India. We expressly agree, acknowledge and understand that the Purchaser 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."	

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Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
20.	Bidder to ensure all documents as per tender including clause 11 of Section III and all Formats are included in their bid.	
21.	Bidder understands that Tender Document is not exhaustive. In case any activity though specifically not covered in description of 'Schedule of Rates' but is required to complete the work as per Scope of Work, Conditions of Contract, or any other part of Bidding document, the quoted rates will be deemed to be inclusive of cost incurred for such activities unless otherwise specifically excluded. Bidder confirms to perform for fulfilment of the contract and completeness of the supplies in all respect within the scheduled time frame and quoted price.	
22.	**Holiday/Banning & Liquidation, Court Receivership:** Bidder hereby confirms that they are not on Holiday list or in banning list of IGGL or any other departments under Ministry of Petroleum & Natural Gas due to "poor performance" or corrupt and fraudulent practice or blacklisted / banned by any Government Department / Public Sector as on the due date of submission of bid. Further, Bidder confirms that neither they 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 IGGL or the Ministry of Petroleum and Natural Gas. Bidder also confirms that they are not under any liquidation, court receivership or similar proceedings or 'bankruptcy'. In case it comes to the notice of IGGL 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, Bidder also confirms that in case there is any change in status of the declaration prior to award of contract, the same will be promptly informed to IGGL by them.	

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Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
23.	Bidder confirms that they have read and understood the General Conditions of Contract available along with this tender document in the CPP portal & no 'exception / deviation' anywhere has been taken in the same and that they shall abide by provisions of relevant GCC.	
24.	Bidder certifies that they would adhere to the Fraud Prevention Policy of IGGL [available on IGGL's website (www.iggl.co.in)] and shall not indulge themselves or allow others (working in IGGL) to indulge in fraudulent activities and that they would immediately apprise IGGL of the fraud/suspected fraud as soon as it comes to their notice. Concealment of facts regarding their involvement in fraudulent activities in connection with the business transaction(s) of IGGL is liable to be treated as crime and dealt with by the procedures of IGGL as applicable from time to time.	
25.	Whether Bidder is Start-Up or not	Yes/No (If Yes, Bidder to submit requisite documents as specified in ITB: Clause 51)
	In case of Start-Up confirm: Date of Incorporation/Registration	
26.	Bidder confirms 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	

Place:
Date:

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

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F-6

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 IGGL issued the tender, by filling up the Format)

To,
M/s IGGL
_____

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 **(E–TENDER NO. IGGL-100030)**

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-7

BIDDER'S EXPERIENCE

To,
M/s IGGL

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 **(E–TENDER NO. IGGL-100030)**

Sl. No.	Description of the Services	LOA /WO No. and date	Full Postal Address & phone nos. of Client. *Name, designation and address of Engineer/ Officer-in-Charge (for cases other than purchase)*	Value of Contract/Order (*Specify* Currency Amount)	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:

i) Experience is to be provided related to tender and executed the same in preceding seven years from the bid opening date.

ii)Any Technical/ Commercial query (if any) is required to be sought, relevant documents in reference to experience given in Format – F7' shall be considered other than document submitted along with the bid towards BEC.

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F-8
CHECK LIST

Bidders are requested to duly fill in the checklist. This checklist gives only certain important items to facilitate the bidder to make sure that the necessary data/information as called for in the bid document has been submitted by them along with their offer. This, however, does not relieve the bidder of his responsibilities to make sure that his offer is otherwise complete in all respects.

Please ensure compliance and tick (√) against following points:

S. No.	DESCRIPTION	CHECK BOX	REFERENCE PAGE NO. OF THE BID SUBMITTED
1.0	Digitally Signing (in case of e-bidding)/ Signing and Stamping (in case of manual bidding) on each sheet of offer, original bidding document including SCC, ITB, GCC, SOR drawings, corrigendum (if any)		
2.0	Confirm that the following details have been submitted in the Un-priced part of the bid		
i	Covering Letter, Letter of Submission		
ii	Declaration for Bid Security		
iii	Digitally Signing (in case of e-bidding)/ Signing and Stamping (in case of manual bidding) of bidding document along with drawings and corrigendum (if any)		
iv	Power of Attorney in the name of person signing the bid.		
v	Details of documentary proof required against BEC Criteria		
Vi	Confirm submission of document along with unpriced bid as per bid requirement.		
3.0	Confirm that all forms duly filled in are enclosed with the bid duly digitally signed (in case of e-bidding)/ Signed and Stamped (in case of manual bidding) 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.		
5.0	Confirm that annual reports for last three financial years & duly filled in Form 10 are enclosed in the offer for financial assessment (where financial criteria of BEC is applicable).		

Place:
Date:

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

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(TO BE INCLUDED ONLY WHERE FINANICAL CRITERIA OF BEC IS APPLICABLE)

F-9

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. IGGL

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 IGGL's Tender no. ..... dated ····· for ·····(Name of the supply/work/services/consultancy) and as per the terms of the said Tender document 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 :
Email Id :
Contact No. :
Stamp

Note:
This Declaration Letter for line of credit shall be from single bank only. Letter from multiple banks shall not be applicable. However, banking syndicate will be acceptable wherein a group of banks can jointly provide line of credit to the bidder.

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F-10
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 03 (THREE) FINANCIAL 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].

Name of Audit Firm:
Chartered Accountant/CPA
Date:

[Signature of Authorized Signatory]
Name:
Designation:
Seal:
Membership No.:

(Page 1 of 2)

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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:
   a. **Annual Turnover** shall be "Revenue from operation" as per profit & Loss account of audited annual financial statements.
   b. **Working Capital** shall be "Current Assets less Current liabilities" and
   c. **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.

(Page 2 of 2)

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(TO BE INCLUDED ONLY WHERE CONSORTIUM/JV ARE ALLOWED)
F-11
FORMAT FOR CONSORTIUM/JV AGREEMENT
(ON NON- JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

CONSORTIUM/JV AGREEMENT

This Consortium/JV Agreement executed on this …. Day of ……. Between M/s ……, a company incorporated under the law of …… and having its registered/principal office at…….. (herein after called the '"Member-I'/ 'Lead Member' which expression shall include its successors, executors and permitted assigns) and M/s ……., a company incorporated under the laws of ……., and having its registered/principal office at …….. (herein after called the 'Member – II'/ 'Second Member' which expression shall include its successors, executors and permitted assigns) ……. 'and M/s ……., a company incorporated under the laws of ……., and having its registered/principal office at …….. (herein after called the 'Member – III'/ 'Third Member' which expression shall include its successors, executors and permitted assigns), for the purpose of making a bid and entering into a contract (in case of award) in response to bid document no…… for the work of ……
(Name of Project) of **M/s …….. (herein after called the 'Owner').**

WHEREAS, the Owner invited bids vide its bid document no. …… for the work of …….

AND WHEREAS as per tender documents, Consortium/JV entities will also be considered by the Owner provided they meet the specific requirements in that regard. As a pre-condition of bidding documents, the Consortium/JV bidder shall provide in its bid a Consortium/JV Agreement in an acceptable format in which the Members to the Consortium/JV are jointly and severally liable to the Owner to bind themselves to the bid conditions accept the contract award, if selected and perform all the contractual obligations thereto.

AND WHEREAS the bid is being submitted to the Owner vide our proposal dated ……. based on the Consortium/JV Agreement being these presents and the bid with its bid forms and submission documents, in accordance with the requirement of tender conditions and requirements have been signed by both the Members and submitted to the Owner.

NOW THIS INDENTURE WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the Members to this Consortium/JV do hereby now agree as follows:

1. We the Members in the Consortium/JV hereby confirm that the name and style of the Consortium/JV shall be …… Consortium/JV.

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2. In consideration of the bid submission by us to the Owner and the award of Contract by the Owner to the Consortium/JV (if selected by the Owner),we the Members to the Consortium/JV, hereby agree that the Member-I (M/s·····) shall act as the lead Member for self, and for and on behalf of Member-II/ Member-III and further declare and confirm that we shall jointly and severally be bound unto the Owner for execution of the contract in accordance with the contract terms and shall jointly and severally be liable to the Owner to perform all contractual obligations including technical guarantees. Further, the lead Member is authorized to incur liabilities and receive instructions for and on behalf of any or both Members of the Consortium/JV and the entire execution of the Contract.

3. In case of any breach of the said Contract by any of the Members of the CONSORTIUM/JV, we hereby agree to be fully responsible for the successful execution/performance of the Contract in accordance with the terms of the Contract.

4. Further, if the Owner suffered any loss or damage on account of any breach of the Contract or any shortfall in the completed equipment/plant, meeting the guaranteed performance parameters as per the technical specifications/ contract documents, the Second & Third Member of these presents undertakes to promptly make good such loss or damage caused to the Owner, on the Owner's demand without any demure. It shall neither be necessary nor obligatory on the part of the Owner to proceed against the Lead Member to these presents before proceeding against the Second & Third Member.

5. The financial liability of the Member (s) to this Consortium/JV Agreement, to the Owner with respect to the any or all claims arising out of the performance or non-performance of the Contract shall, however be not limited in any way so as to restrict or limit the liabilities of either of the Member.

6. Division of responsibilities of Scope of work among different Consortium/JV members is as per **APPENDIX I (Responsibility Matrix)** to this Consortium/JV Agreement.

7. It is expressly understood and agreed between the Members to this agreement that the responsibilities and obligations of each of the Members shall be as delineated in '**APPENDIX I'** to this agreement. It is further agreed by the Members that the above sharing of responsibilities and obligations shall not in any way be a limitation of the joint and several responsibilities of the Members under the Contract.

8. This Consortium/JV Agreement shall be governed, construed and interpreted in accordance with Laws of India courts of Guwahati shall have exclusive jurisdiction in all matters arising thereunder.

9. In case of award of contract, we the Member s to this Consortium/JV Agreement do hereby agree that we shall furnish the contract performance guarantee in favour of

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the Owner from a bank acceptable / approved by the Owner for a value as stipulated in the Contract Award and such guarantee shall be in the names of Consortium/JV.

10. It is further agreed that this CONSORTIUM/JV Agreement shall be irrevocable and shall form an integral part of the Contract and shall continue to be enforceable till the Owner discharges the same. It shall be effective date first above mentioned for all purposes and intents.
11. In case bid submitted by Joint Venture, the details of equity partnership and assets of the JV shall be attached as a separate annexure to this agreement.
12. This agreement remains in force till the end of Defects Liability Period.

IN WITNESS WHEREOF, the Members to this Consortium/JV agreement have, through their respective authorized representatives, have executed these presents and affixed their hands and common seal of their respective companies on the day, month and year first abovementioned.

1. Seal of
M/s.
has been affixed in my/our presence
pursuant to Board Resolution dated
……..
Signature ……..
Designation

For M/s. (…….. Member
……
(Signature of authorised Representative)

Name:

Designation:

1. Seal of
M/s.
has been affixed in my/our presence
pursuant to Board Resolution dated
……..
Signature ……..
Designation

For M/s. (…….. Member-II
……
(Signature of authorised Representative)

Name:

Designation:

1. Seal of
M/s.
has been affixed in my/our presence
pursuant to Board Resolution dated
……..

For M/s. (…….. Member-III
……
(Signature of authorised Representative)

Name:

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F-12

BIDDER'S QUERIES FOR PRE-BID MEETING

To,

M/s. IGGL

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 **(E –TENDER NO. IGGL-100030)**

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

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

SIGNATURE OF BIDDER: _____

NAME OF BIDDER : _____

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F-13

E-Banking Mandate Form

(To be issued on vendor's 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 IGGL 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 IGGL 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 (Signature of authorized officer of bank)

F-14

FREQUENTLY ASKED QUESTIONS (FAQs)

SL.NO.	QUESTION	ANSWER
1.0	Can any vendor quote for subject Tender?	Yes. A Vendor has to meet Bid Evaluation Criteria given under Section II of Tender document in addition to other requirements.
2.0	Should the Bid Evaluation Criteria documents be attested?	Yes. Please refer Section II of Tender document
3.0	Is attending Pre-Bid Meeting mandatory.	No. Refer Clause No. 17 of Instruction to Bidders of Tender Document. However, attending Pre-Bid Meeting is recommended to sort out any issue before submission of bid by a Bidder.
4.0	Can a vendor submit more than 1 offer?	No. Please refer Clause No. 4 of Instruction to Bidders of Tender Document.
5.0	Is there any Help document available for E-Tender?	Yes. Refer Annexure III to Instructions to Bidders of Tender Document and FAQs as available on IGGL E-Tender portal.
6.0	Are there are any MSE (Micro & Small Enterprises) benefits available?	Yes. Refer Clause No. 40 of Instructions to Bidders of Tender Document.
7.0	Are there any benefits available to Start-ups?	Refer Clause No. 51 of Instructions to Bidders of the Tender Document and BDS

All the terms and conditions of Tender remain unaltered.

F-15

DECLARATION FOR BID SECURITY

To,

M/s INDRADHANUSH GAS GRID LIMITED (IGGL)

_____

SUB: CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22.

Dear Sir,

After examining / reviewing provisions of above referred tender documents (including all corrigendum/ Addenda), we M/s _____(Name of the bidder) have submitted our offer/bid no. .....

We, M/s_____(Name of the bidder) hereby understand that, according to your conditions, we are submitting this Declaration for Bid Security.

We understand that we will be put on watch list/ holiday/banning list (as per polices of INDRADHANUSH GAS GRID LIMITED (IGGL) in this regards), if we are in breach of our obligation(s) as per following:

(a) Have withdrawn/ modified/amended, impairs or derogates from the tender, my/ our Bid during the period of bid validity specified in the form of Bid, or

(b) Having been notified of the acceptance of our Bid by the INDRADHANUSH GAS GRID LIMITED (IGGL) during the period of Bid Validity:

   i. Fail of refuse to execute the contract, if required, or

   ii. Fail of refuse to furnish the contract performance security, in accordance provision of the tender document.

   iii. Fail or refuse to accept "arithmetical correction" as per provision of the tender document.

(c) Having indulged in corrupt/fraudulent/ collusive / coercive practice as per procedure.

Place:
Date:

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

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F-16

UNDERTAKING REGARDING SUBMISSION OF AUTHENTICATED DOCUMENTS RELATING TO BEC, AFFIDAVIT/CERTIFIED DOCUMENTS FOR PURCHASE PREFERENCE POLICY(S), ETC.

TO,

M/s INDRADHANUSH GAS GRID LIMITED (IGGL)

_____

SUB: CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE

TENDER NO: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 (E –TENDER NO. IGGL-100030)

Dear Sir,

We hereby confirm that due to Covid-19 situation, we are unable to submit the Authenticated documents relating to BEC and Affidavit / Certified Documents for Purchase Preference Policy(s), etc. (wherever applicable) as specified in tender document. Hence we are submitting the self-certified documents relating to BEC and Affidavit /Certified Documents for Purchase Preference Policy(s), etc. (wherever applicable)

We hereby confirm that in case of award of contract/order, we will submit Authenticated documents relating to BEC and Affidavit / Certified Documents for Purchase Preference Policy(s), etc. (wherever applicable) as per tender provisions after normalization of situation.

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

SECTION-VI

SPECIAL CONDITIONS OF CONTRACT

&

SCOPE OF WORK

SPECIAL CONDITIONS OF CONTRACT

SUBJECT: CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE

Part 1-

- **General Information and Instruction to Bidder**
- **Specifications for Civil and Interior Workswith Make list**

Part 2

- **Specifications of Electrical, ELV, HVAC, PHE Works**
- **Make List of Above**

Special Conditions of the Contract

Name of job:
CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES

Part 1

- **GENERAL INFORMATION AND INSTRUCTION TO BIDDER**

1.0 Introduction
2.0 General
3.0 Engineer-In-Charge (EIC)
4.0 Site Information
5.0 Contract Period/ Time of Completion
6.0 DEFECT LIABILITY PERIOD
7.0 Force Majeure
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- **SPECIFICATIONS FOR CIVIL AND INTERIOR WORKS WITH MAKE LIST**

Part 2

- **SPECIFICATIONS OF ELECTRICAL, ELV, HVAC, PHE WORKS**
- **MAKE LIST OF ABOVE**

Special Conditions of the Contract
Part 1

GENERAL INFORMATION AND INSTRUCTION TO BIDDER

1.0 GENERAL

1.1 Indradhanush Gas Grid Limited (IGGL), a Joint Venture Company of IOCL, ONGCL, GAIL, OIL and NRL with equal equity contribution, has been entrusted by the Govt. of India for implementation of the prestigious North East Gas Grid (NEGG) project, an approximate 1656 Km long natural gas pipeline grid, with design capacity of 4.75mmscmd, spanning across all the eight North Eastern states i.e. Assam, Arunachal Pradesh, Meghalaya, Tripura, Mizoram, Nagaland, Manipur & Sikkim to connect to the NATIONAL GAS GRID at Guwahati through Barauni-Guwahati Natural Gas pipeline as a part of "PRADHAN MANTRI URJA-GANGA" scheme, at an estimated cost of INR 9,265 crores.

1.2 IGGL has taken up the 7th Floor of the NRL CENTRE building at GS Road and will construct their office at the said premises.

1.3 This 'Special Conditions of Contract' (SCC) is prepared as part of the tender document for this particular job. This SCC is in addition to the 'General Conditions of Contract' (GCC) and wherever same issue is covered in both SCC and GCC, SCC shall override GCC. The GCC may be downloaded.

2.0 General

2.1 In case of an irreconcilable conflict between General Conditions of Contract, Special Condition of Contract, Scope of work, Specifications, Drawings, Schedule of rates, Indian or any other applicable standards the following shall prevail to the extent of such irreconcilable conflict in order of precedence.

a) Detailed letter of work order along with statement of agreed variation, if any.
b) Letter of Award.
c) Detail Bill of Quantities of this Tender
d) Tender drawing / item specification in the drawing.
e) Job specifications/Technical Specifications/Material specifications.
f) Special Conditions of Contract.
g) General Conditions of Contract
h) Indian Standard.
i) Other applicable standard

2.2 It will be Contractor's responsibility to bring to the notice of Engineer-in-Charge any irreconcilable conflict in various parts of Contract Documents before starting the works or making the supply with reference to which the conflict exists.

2.3 The works shall be carried out in conjunction with specifications, schedule of items and the Approved Construction Drawings. The Technical specifications as given in CPWD specification and Delhi Schedule of Rate (DSR) -2019 for Building (Civil, Sanitary, water supply & electrical works) with up-to-date corrections; relevant to this work, with a

cross reference to relevant codes of practice published by the Bureau of Indian Standards, Indian Roads Congress or Assam PWD (APWD 2013-14) specification in respect of matters not covered by the CPWD specifications shall be followed for all Civil Works. For Interior Work, detail GFC drawings and Bill of quantities shall be followed and will as per best Industry standards.

2.4 All the works shall be carried out in sound workmanship and true to line, level, plumb and as per the best practice of the trade.

2.5 Rates for all items in which use of cement is involved, is inclusive of charges for curing. The intent of this section of the specification is to define the general technical requirements of the major items of Building and site development works.

2.6 The materials, design and workmanship shall satisfy the applicable standards, specifications contained herein and Codes referred to. Where the Technical Specifications stipulate requirements in addition to those additional requirements shall also be satisfied.

2.7 In the absence of any specifications, for any material, design or works, the same shall be performed /supplied/executed in accordance with the instructions/directions of the Engineer-in-Charge, which will be binding on the Contractor.

2.8 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 own cost and the Contract Price shall be deemed to have included cost of such performance and provisions, so mentioned.

3.0 Engineer-In-Charge (EIC):

Ms. Barnali Gogoi, SE (Project) shall be the "Engineer-In-Charge", herein after referred as EIC for this job. After formal LOA/Work Order is issued to the successful bidder EIC may be contacted for further instructions. The communication details of the EIC shall be communicated to the successful Contractor along with the work order for further needful

4.0 Site Information

The intending bidders shall be deemed to have visited the site and familiarized themselves with the site conditions before submitting their bids.

General Information

Job Location	NRL CENTRE, 7TH FLOOR
Address	GS ROAD, CHRISTIANBASTI, GUWAHATI
District / State / Country	Kamrup / Assam / India
Nearest Railway Station	Guwahati
Nearest Airport	Guwahati
Nearest Sea Port	Kolkata
Nearest National Highway	NH-37

Access to Site

Work site is Accessible with 3 Nos Staircase and the other Floors of the Building are currently in use for offices

5.0 Contract Period/ Time of Completion

Contract Period for this job is ***03 (three) Months*** from the date of issue of LOA.

5.1 ***The work shall be executed strictly as per time schedule agreed upon. The period of completion given includes the time required for mobilization as well as testing, rectifications, if any, retesting and completion in all respects to the entire satisfaction of the Engineer-in-Charge.***

5.2 The Contractor will prepare a joint programme of execution of work and submit to the Engineer-in-Charge for approval. This programme will take in to account the time of completion mentioned above.

5.3 Monthly/ weekly construction programme will be drawn up by Engineer-in-Charge jointly with the Contractor based on availability of work fronts and the joint construction programmes as above. The Contractor shall strictly adhere to this Targets/ Programme.

5.4 The Contractor shall give every day report on category wise labour and equipment deployed along with the progress of work done on previous day in the proforma prescribed by the Engineer-in-Charge.

6.0 DEFECT LIABILITY PERIOD

Defect Liability will be 12 months from date of completion of work.

7.0 Force Majeure:

7.1 <u>CONDITIONS FOR FORCE MAJEURE</u>

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. 180 of 300 General Conditions of Contract.

Upon the occurrence of such 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.

7.2 OUTBREAK OF WAR

7.2.1 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.

7.2.2 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.

8.0 Price reduction schedule:

8.1 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 7.0 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.

8.2 The decision of the ENGINEER-IN-CHARGE in regard to applicability of Price Reduction Schedule shall be final and binding on the CONTRACTOR.

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

9.0 COMPENSATION FOR EXTENDED STAY

9.1 Quoted Unit Rates shall remain firm till the completion of the work and no claim on account of extended stay compensation shall be admissible. In case of any delay in execution of the work beyond the completion time mentioned in the Bid Document due

to any unforeseen reason(s) not attributable to CONTRACTOR, only time extension for a maximum period of 1 month period shall be granted.

10. Insurance:

Refer to General Conditions of Contract

11. Scope of Work of Contractor

11.1 The Scope of work is as per SOR item description and conditions mentioned in the tender document. The scope of work involved shall be in general but not limited to the following:

i) Demolition and New Civil Works,
ii) Flooring Works
iii) Partition works in MDF and Ply etc.
iv) False Ceiling works
v) Glass Works and other Paneling Works
vi) Electrical works
vii) HVAC works
viii) CCTV and Access control
ix) Supply and Installation of Loose furniture and Work stations, etc.,

11.2 The scope of work shall include, inter alia, the carrying out of any and all works, and providing any and all materials / facilities, as required, for completing all the works as per terms and conditions of Contract Document.

11.3 Any other miscellaneous works connected with the above items in order to complete the work as per AFC (Approved for Construction) drawings and as instructed by the Engineer-in-Charge shall also be included in the scope of the work. It shall be clearly understood that all the works mentioned above together with all connected works as included in the drawings whether specifically mentioned or not shall be deemed to have been included in the scope of work.

11.4 The detailed Scope of Work is as per the Bill of Quantities of the various works included in the Tender.

11.5 **SPECIAL INSTRUCTION TO BIDDER**: **The Bidder shall study the Detailed Drawings, Schedule of Items with Tentative Quantities, Detailed Specifications, Schedule of Finishes, General Conditions of Contract and Special Conditions of Contract and other documents which are a part of this Tender before bidding.**

11.6 All approach to construction site shall in the scope of contractor. Accordingly, the contractor should visit the site prior to submission of bids for assessing the site conditions. The contractors/ bidders shall be deemed to have complete information about site conditions.

11.7 Any error/omission in description, quantity in the schedule of items, shall not relieve the Contractor from the execution of the whole or any part of the works comprised therein according to the Drawings and specifications or from any of his obligations under the Contract.

11.8 The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawings and figured dimensions in preference to scale. In the case of discrepancy between the schedule of items, the Specifications and/or the Drawings, the following order of precedence shall be observed: -

(a) schedule of items.
(b) Particular/ Technical Specification.
(c) Drawings.
(d) General Specification

12 SUPPLY OF WATER, POWER & OTHER UTILITIES

12.1 The Contractor shall be responsible at his own cost for arranging and providing all the required water, power and other utilities, in the quantities and at times required for performance of work under the contract. However, Power may be supplied on chargeable basis at a single point as per prevailing norms of State Electricity Authority subject to availability. The Contractor will have to make their own arrangement to tap power from the nearby tapping points with due permission from NRL.

12.2 The Contractor shall arrange the space for construction of Contractor's Temporary Site Office, Storage Area in the same floor (i.e. 7th floor of NRL Centre Building) wherein Contractor shall develop the facilities at their own cost for safe & secured storage of construction materials and equipment.

12.3 The CONTRACTOR shall remove all temporary buildings/ facilities etc. before leaving the site after completion of works in all respect.

12.4 A designated space will be provided for loading/unloading of materials/equipment by NRL Centre; but the same has to be vacated in the least possible time (as per direction from the building authorities).

13 Sub-Contracting

The contractor shall not engage any Sub-Contractor for this project without written permission from the EIC. The Contractor shall be solely responsible for the settlement/resolving any dispute/claim of the workmen during the pendency of the contract. In no circumstances, any liability on this account shall accrue to the Client. The Contractor shall ensure that the contract work or job assigned is not disrupted / disturbed or delayed on any account.

14 Statutory Compliances:

a) The Contractor shall take out a suitable **C.A.R.** Insurance policy covering entire scope of the works under this contract for the value of work as per tender conditions and arrange to keep the policy valid till completion of the job. One copy of Insurance should be handover to IGGL

b) The Contractor shall arrange ESI against Workmen's compensation as per requirements.

c) The Contractor shall apply for Labour License as per requirements, and this shall be kept valid till completion of the job.

d) Necessary PF & ESI contribution of Contractor's labourers will have to be paid by Contractor as per statutory authority's regulations and IGGL shall be absolved of all the risk.

e) Wage payment sheets along with PF challan and ESI challan shall be submitted on monthly basis along with monthly RA Bills.

f) For more details General Conditions of Contract (GCC) of IGGL may please be referred to. On failure to comply these statutory requirements, penalty shall be imposed to the contractor as deemed fit.

15 Issue of Materials by IGGL

Scope of supply of all materials, tools & tackles and labour is entirely of contactor's responsibility. However, in the event of expediting the work due to liquidity problem of the contractor IGGL may supply some essential materials on chargeable basis. IGGL shall recover the landed cost of such materials at the warehouse, from contractor's RA Bills or any other dues

16 Mobilisation Advance

No mobilization advance will be paid to the Contractor for execution of this work. However, on presentation of proof of supply order of major lead time items, the EIC shall, if necessary, authorize the RA Bill payment against supply cost of such item up to 60% of the cost of particular connected works.

17 Measurement Of Work

In addition to the provisions of clause of the GCC/GPC and associated provision thereof the following provision shall be applicable:

a) Payment will be made on the basis of joint measurements, taken by Contractor, certified by Clients Site Engineer and released by Engineer-in-Charge or his authorised representative.

b) Wherever work is executed based on instructions of Engineer-in-Charge or his authorised representative, or details are not adequate in the drawings, physical measurements shall be taken by Contractor in the presence of Engineer-in-Charge or his authorised representative.

c) In addition to the provisions of relevant clause of General Conditions of Contract (GCC) and associated provisions thereof, the provisions of SCC as mentioned for various item of works shall apply.The measurement of the work as and when necessary will be strictly as per the CPWD norm as given in DSR-2019 and following standard engineering practice.

18 Terms of Payment

16.1 Payment will be made through Running Account (RA) Bills against work done during the preceding period pro-rata basis against measurement of actual work done & as certified by engineer-in-charge (EIC) against RA bill. Interval of RA bills shall be minimum 10 days or 10% of total contract value whichever is earlier.

16.2 Payments shall be made, after satisfactory completion of the job for the work actually done and submission of bill (as explained in para 13.1 basis) in triplicate by the contractor to the Engineer-In-Charge.

16.3 Payments shall be made through electronic mode (e-banking)/ NEFT/RTGS/Cheque. Bidder shall furnish his E-Bank A/C No. including Bank Code and Name & Address of the Banker in the format given in the Bidding document to enable release of payment of running bills through e-banking.

16.4 The successful agency will have to submit Security deposit amounting to 3% (which may vary based on govt. policy) of the contract value which will be retained for the entire defect liability period of 12 months. Otherwise, security amount will be deducted from each running account (RA) bills as per prevailing rules.

16.5 Payment will be made after deduction toward TDS and other taxes as applicable. GST shall be paid extra as per Govt. Rule.

16.6 Payment shall be made based on work done & certification on completion of all contractual obligation accepted by EIC.

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

- Rates as per SOR, quoted by the Contractor.
- 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."

19 Test Certificates and Warranty

a) The contractor shall be required to submit recent test certificates for the material being used in works from the recognized laboratories. These certificates should indicate all properties of the materials as required in relevant BIS Standards or International Standards.

b) Contractor shall also submit the test certificate with every batch of material supplied which will be approved by Engineer-in-Charge. No secured advance

will be given for the materials not having test certificate. In case any test is to be carried out, the same shall be got done in the approved laboratory at the cost of contractor.

c) All items covered under Warranty and Guarantee shall be Handed over to Client before handing over of site and shall be as per specifications.

d) Contractor shall replace at his own cost if any item found defective or missed before handing over the system to Owner. The decision of Engineer-in-Charge shall be final and binding in this regard. The guarantee for such rectified / replaced item shall be for a period of 12 months from completion of such rectification / replacement.

SPECIFICATIONS OF CIVIL, INTERIOR WORKS AND MAKE LIST

CIVIL WORKS

All Civil works shall be carried out in conjunction with specifications, schedule of items and the Approved Construction Drawings. The Technical specifications as given in CPWD specification and Delhi Schedule of Rate (DSR) -2019 for Building (Civil, Sanitary, water supply & electrical works) with up-to-date corrections; relevant to this work, with a cross reference to relevant codes of practice published by the Bureau of Indian Standards, Indian Roads Congress or Assam PWD (APWD 2013-14) specification in respect of matters not covered by the CPWD specifications shall be followed.

MARBLE WORKS

All Italian marble Selected shall be as per Trade names mentioned in Bill of Quantity

All floors shall be laid to level as per drawing and no difference in lvl shall be considered between two types of flooring finish, unless otherwise mentioned in Good for Construction drawing.

All flooring to be protected by POP laid over polythene sheet during construction. Flooring to be covered over in finished condition and after uncovering to be delivered in a finished condition free of scratches, lines and any other deformities etc.

The contractor shall procure mortar, adhesive, grout etc. of approved quality design and standard and he will not change source of supply without written permission from PM and with revised samples being approved.

All marble flooring to be coated with approved sealer of appropriate specifications and recommendations of approved manufacturer to provide a five-year guarantee. Marble should be coated from below, on the thickness as well as from above and in between joints of adjacent slabs. Also, to include 2mm thick expansion joint at every 2.5m both ways, filled with Ottoseal S70 of Laticrete or equivalent approved

Contractor shall prepare and install mockups for floor and wall as per drawings. Mockups may be part of completed work if undistributed. Nothing extra shall be paid on this account.

All dados may have marbles with 'V' grooves of variable thicknesses & 'L' grooves at junctions or beveled or profiled edges at junctions. No grooves and profiling to be paid for separately. Tiles to

be neatly cut at Junction Box locations. Care to be taken while execution that no screw heads are visible from the finished side.

Skirtings to have profiled edges as per PM's instructions. No extra cost to be paid for plaster chipping, required to adjust skirtings levels. However, cost of mouldings to be indicated separately, so as to deduct cost towards the same, in case profiling is avoided.

All necessary cut outs in walls, clearing up plaster towards work required for services, not to be paid for separately, even if it is conducted subsequent to work completion. No extra for marble cutting, edge finishing required for junction boxes of electrical works, etc.

The contractor shall be responsible for protection of his own work and the work of other trades during the progress and till handover to the Employer. All flooring to be protected by POP laid over polythene sheet during construction and polished after laying. Flooring to be covered over in finished condition free of scratches and cracks etc. Cost of POP to be part of quoted rates

Book matching in Marble work as detailed in the drawings and shall not be paid extra

For Measurement, size of 225mm and below to be paid in Rmt and above 225mm to be paid in Sqm. Finished area shall be measured for payment. No deduction will be made for openings/cut outs upto 0.5 Sqm

Approved Make List: As per BOQ, trade names of Marble are given

Approved Sealer and Adhesive Made List : LATICRETE, TENAX, ENDURA

VITRIFIED TILE

All Vitrified Tile shall conform to IS:15622 and having water absorption less than 0.08%

Tiles shall be laid on minimum 20 mm thick cement mortar 1:4 (1 cement:4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm including grouting the joints with white cement and matching pigments etc.

The tiles must be cut with the zero-chipping diamond cutter only. Lying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily

Measurement for Payment shall be based on actual finished area of Tile.

Approved Make List:SOMANY, KAJARIA, RAK

CARPET TILES

Carpet Tiles shall be laid over Cement concrete Floor with underfloor of Neat cement and free of any dust and undulation

Carpet Thickness shall be Minimum Thickness of 7 mm, smoke density (ASTM E662) less than 450, antistatic less than 1.0KV (JIS-L4406 STROLL 23º, RH-25%), Electrostatic propensity-maximum average 0.5KV (AATCC 134) Colour fastness to light-Rating 5.0 =no change (AATCC 16) critical radiant flux-(ASTM E 648) Class -1, everage CRF 0.48/CM² Or higher certified.

Measurement of Payment shall be done on actual are covered by such tiles, additionally contractor has to supply spare tiles upto 3% of the overall tiles fitted free of charge.No extra payment shall be made for the same.

Approved Make List: ARMSTRONG, FLOORMASTER, MODULYSS

BAMBOO STRIP FLOOR

Bamboo Strip Planks flooring shall be tounghe-groove type and thickness 14mm. The Flooring shall be laid over Foam Sheet and under floor as per detail

6mm gap shall be maintained on all sides for thermal expansion and covered with Skirting of Planks with Profile edge as per design.

Measurement for Payment shall be based on actual finished area of Tile and running meter for skirting.

Approved Make List: EPITOME, ESES BIO

FALSE CEILING WITH GYPSUM BOARD

Gypsum Board Ceiling shall be over frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre,shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with : 12.5 mm thick tapered edge gypsum plain board conforming to IS:2095- (Part I) :2011 (Board with BIS certification marks)

Measurement for Payment of Ceiling to be paid as per area (P-line on computer) in plan only for all kinds of Shape. Cost of ceiling to include cost of lighting troughs, coffers, pattas, verticals, grooves etc complete. Cost also to include Cornices of various profile as shown in drawing, on verticals of lighting troughs also flat verticals

Finished area shall be measured for payment. No deduction will be made for openings/cut outs upto 0.5 sq.m

Rate shall include cutting holes and coordination for various electrical / light fixtures and circular holes in false ceiling, no extra shall be paid towards the same.

All Gypo Board shall be as per to IS:2095

Approved Make List: GYPROC, ARMSTRONG, BORAL

MINERAL FIBLE CEILING

Providing and fixing tiled false ceiling of size (600x600)mm in true horizontal level suspended on inter locking **Gyproc Bolt-slot metal** grid of hot dipped galvanized steel ections. It consists of main "T" runner of size 42x15x0.3x3000mm, cross "T" of size 42x15x0.3x1200mm, secondary cross "T" of size 45x15x0.3x600mm and PPGI wall angle of size 14x20x0.4x3000mm. Bottom exposed capping of width 15 mm & groove (5.6x7.5)mm size of all T-sections shall be 0.25mm thick PPGI. PPGI wall angle 4x20x0.4x3000mm{Material-GI(IS513),YS-280Mpa,Galvanised 90GSM(IS277), Finish- painted 24-27 micron top side,8-10 micron backside,)} is fixed along the perimeter of the ceiling to walls, partitions or columns etc., with wooden screws at 300mm centers or Hilti HPS 6x40mm placed at 600 mm c/c. Gyproc® soffit cleat 27x37x25x1.6mm GI(IS513)YS- 260Mpa,Finish-Galvanised 120GSM(IS277) } is fixed with Gyproc® Rawl Plug-Ø8x45mm{Material-IS 513 CR2 grade, Zinc coating (7 to 8 microns) pull out load- 6.8kN for M30 concrete grade} creating 1200mm x 1200mm grid. Main-T runners 42x15x0.3x3000mm {GI(IS513)YS- 280Mpa,Finish-Galvanised 90GSM (IS277) are then suspended at 1200mm c/c from ceiling using 4mm zinc electroplated butterfly level clips of size 85x30x0.8mm spaced at maximum 1200mm center to center along main T and not more than 150mm from spliced joints. The last hanger at the end of each main runner should not be greater than 600mm from the adjacent wall. 42x15x0.3x1200mm cross T {GI (IS513) YS- 280Mpa, Finish-Galvanised 90GSM(IS277) } is interlocked between the main T at 600mm center to center to form a grid of 1200x600 mm and then secondary cross “T" 42x15x0.3x600mm {GI(IS513) YS-280Mpa,Finish-Galvanised 90GSM(IS277) } is then interlocked at middle of the 1200x600mm grid to form grids of 600x600mm. Cross Tees at the ends having length more than 600mm are to be supported independently. Finally White coloured Celotex Fine Fissured NRE tiles of size 595x595x15mm having NRC of 0.55, CAC 35,LR 0.84 and suitable for use in Relative humidity up to 95% and temperature up to 40□C,are placed in this grid.

Approved Make List: GYPROC,ARMSTRONG, HUNTERDOUGLAS

MDF AND PLY PARTITION

Partition works shall include framing with aluminum sections as per item description and covered with MDF to achieve designed thickness, providing and fixing of item shall mean all components required for the making of partition including screws, nails, adhesives fasteners etc. All partition has to be secured to roof and floor as directed with fasteners. Partition should be ready and level without any undulation to revive any finishing material, namely, laminate, veneer, additional MDF.

Final Finish to Partition shall be as designed with Laminate, veneer, Marble or other finishing material, The method of fixing of finishing material shall be duly approved by PM and all

adhesives and headless nails, grooving pattern and other shall be included in the rate. The adhesives shall be as per approved make of this Tender. Choice of contact cement and adhesives shall be preapproved by PM. The surfaces shall be prepared free of dirt and free of any undulation.

All MDF samples to be approved before procurement and as per approved make

All necessary grooves of all thickness for sliding in tiles/ flooring/carpet and other features, inlay pattis in partitions and panellings to be included in quotations and no extra cost to be paid for the same.

Partitions and paneling to be paid for all Ply/ MDF covered surface including over the false ceiling as required. All necessary frame work required for anchoring partition above into slab above false ceiling to be included in cost of items

Partion measurement shall be measured once for every length and shall include ply/mdf on both side of partition

All extra frame work required within partitions and paneling for supporting of A.C. grills, fixing of skirting etc. and all such allied services to be included in the cost of partitions.

Rate shall include all Aluminum framing and MDF as per approved make and including all fastens, metal screws, fasteners and nails as required. Care should be taken that all surface is in level and no exposed nails etc. is visible. Headless nails shall be used as required. Adhesives shall be as per approved make

Deduction for partition quantity shall be applicable on all opening above 0.5 sqm. Any opening less than 0.5 sqm shall be measured for payment.

MDF Used shall be conforming to IS 12406, Ply Board used shall be conforming to IS 710, Marine grade ply.

Approved MDF Make List: GREENPANEL, CENTURY MDF,

Approved Ply Make List: CENTURY, GREENPLY, ARCHIDPLY

Approved Make List of Adhesives: Pidilite,

HARDWARE

Hardware shall be as per mentioned in Bill of quantities and Drawings, where not mentioned, the following may be used

Approved Make List: GEZE, EBCO, DORMA

CHAIRS AND MODULR WORKSTATIONS

The detailed description and specification of particular item shall be followed as per Bill of quantities

Approved Make list: FEATHERLITE, GEEKAN

PART 2- Section A

TECHNICAL SPECICIFICATION FOR SITC OF HVAC SYSTEM

GENERAL INSTRUCTIONS

1. The drawings and specifications lay down minimum standards of equipment and workmanship. The contractor shall prepare design, shop drawings of entire air conditioning system and all work shall be according to approved working drawings. Shop drawings shall give all dimensions and shall incorporate the requirements for consultants, architects and interior designer. Approval of drawings does not relieve the Contractor of his responsibility to meet with the intents of the specifications. All such drawings for approval shall be in quadruplicate. In addition, the contractor shall submit manufacturer's details and get them approved before ordering. This has to be done whether the materials / equipment are one of the approved makes or not..

2. The contractor shall carry out tests on different equipment as specified in various sections in the presence of Project Management Consultant / Architects and Consulting Engineers in order to enable them to determine whether the plant, equipment and installation in general comply with the specification.

3. The plant shall be handed over after satisfactory testing along with four sets of documentation each consisting of:

   i) Detailed equipment data in the proforma approved by the Consulting Engineers / Employer.

   ii) Manufacturer's maintenance and operating instructions.

   iii) Set of as-built drawings, showing plant layouts, piping, ducting instrumentation etc.

   iv) Approved Test readings for all equipment & installation.

   v) Certificates of approval from all Statutory or Local Authorities for the operation and maintenance of the installation and equipment, wherever such approval or certification is required and no extra cost shall be made separately.

   vi) List of recommended spares.

TECHNICAL INSTRUCTIONS

1.0 AHU and VAV

1.1 The air handling and fan coil and VAV units shall be tested for establishing.

1.1.1 Airside : Fresh air quantity (cmh)
Dehumidified air quantity (cmh) Total static pressure (WG) Leaving & entering conditions DB & WB Coil capacity.

1.1.2 Sensible heat (Kcal/hr)

1.1.2.1 Total heat (Kcal/hr)

1.1.2.2 Fan speed(rpm)
Power consumption of fan (watts)

1.1.3 Waterside: Water flow(lpm)
Temp. IN & OUT (deg C)
Pressure IN & OUT (M of H2O)

1.1.4 Noise level: NC level @ 1m from the unit and at the four corners of the room. Ensure that all indoor units selected shall not be more than 30 db at 1m from indoor units for IDUs of all types except high static. And for High static ductable it should not be more than 40 db from 1 m from the source without false ceiling acoustics.

Mode of measurement

a) The air handling unit complete with filters, cooling coil, mixing box, dampers, flexible connections, motor and drive and starter etc. shall form one unit (two motors, drives & starters on all 24-hourunits).

b) Automatic controls for AH units complete with damper motor, transformer, RA thermostat, damper linkage, control wiring, relays etc. shall form part of the BMS if necessary.

2.0 SHEET METAL DUCTING

2.1 Scope:

The scope of work covers supply and installation of:

a) Sheet metal ducting
b) Volume, Smoke and Fire dampers
c) Grilles and diffusers

2.2 Grilles & diffusers shall be standard products for which catalogues shall be submitted.
2.3 Smoke and Fire dampers shall be tested products.
2.4 All galvanized plain sheets shall be reasonably flat and fee from twist. The zinc shall be clean, even and free from galvanized spots. Sheets shall not crack or peel during bending or fabrication. All sheets shall be procured from approved manufacturers.

3.0 FABRICATION

3.1 All ducts for air-conditioning and ventilation shall be rectangular in cross-section and fabrication in accordance with the following table

3.2 In odd positions, the ducts shall be fabricated to suit the conditions, with the specific approval of the Engineer-in-charge.

Maximum size	Minimum thickness	Transverse	Reinforcement
Upto 400	0.63	25 mm pocket/s slip	Cross Break
401 to 600	0.63	25 x 25 x 3.2 mm Companion flanges	25x25x3.2 mm Girth angles @ 1200
601 to 800	0.8	25 x 25 x 3.2 mm Companion flanges	25x25x3.2 mm Girth angles @ 1200
801 to 1000	0.8	40 x 40 x 4 mm Companion flanges	25x25x3.2 mm Girth angles @ 900
1000 to 1500	1	40 x 40 x 4mm Companion flanges	40 x 40 x 4 mm Girth angles @ 760
1501 to 2250	1	50 x 50 x 6 mm Companion flanges	40 x 40 x 4 mm Girth angles @ 760
2251 & above	1.25	50 x 50 x 6 mm (2 x 2 x 1/4") Companion flanges	50 x 50 x 4 mm Girth angles @ 760

3.3 Girth angles and companion flanges shall be mitered and welded at corners and riveted to duct sheets at 75 mm centres. Flanged joints shall be made with 9.5 mm GI bolts spaced at 100 mm centres and provided with 3.2 mm foamed rubber gasket. All joints and seams shall be rendered air tight with approved sealant. Duct panels are not to be cross-broken, if insulated. Longitudinal seams shall be inside groove or Pitts burgh type.

3.4 Standard elbows with an R/D ratio of not less than 1.25 shall be used as far as possible. Where space restrictions do not permit use of standard radius elbow with lesser R/D ratio square elbow with equally space double thickness vanes may be used.

3.5 All ducts shall be factory made and installation shall conform to the extent modified herein, to the SMACNA standard. For Low Pressure Duct Construction. Length of taper ducts shall be at least four times the maximum size difference between the ends.

3.6 All duct lining for acoustic insulation shall be carried out as specified under sec "NOISE & VIBRATION" before the duct is installed in position.

3.7 Air turning devices shall be provided at least for first four outlet collars after every elbow and at all non-split branch take offs. Turning blades shall be fabricated out of 0.8 mm (22SWG) thick G.S sheets and equally spaced on side runner to be riveted/bolted to duct sheets.

3.8 Splitter dampers shall be installed in branches wherever split takes place. Louvres dampers shall be provided in all branches. Any duct feeding more than four outlets shall be regarded as a branch and louvre dampers provided whether shown or not.

3.9 Splitter dampers shall consist of double thickness air foil blades hinged at the downstreams edge. The operation rod shall terminate outside of the duct and insulation, and an air tight hub and locking set screw shall be provided. Damper blade thickness shall be the same as the duct in which it is installed but not less than 1.5 mm

(16G). Entire splitter damper shall be enclosed in a sheet steel ducting with flanges at both ends aligning with main run of ducting. The enclosure shall be made of sheets one size larger than the corresponding duct.

3.10 Fire dampers shall be rated for 2 hours five resistances according to BSS 476-I/1953. Damper shall be single blade (butterfly) with central pivot extending into the actuator housing. The damper together with actuator housing shall be certified by an appropriate testing authority for its fire resistance. The damper and the actuator housing shall fit into the fire rated wall.

3.11 The damper shall be actuated by a fusible element set for 70 deg C (158 deg F) fusing temperature or a motor actuator as per bill of material and dwg. Actuators shall be operable from 230 VAC 50 HZ source of supply. In case of Motorized, it shall have on, off and status feature in built with the actuator and it shall be factory fitted and suitable for the site condition considering maintenance space etc., A manual adjusting handle shall also be provided in the actuator housing which should be accessible without dismantling the ducting. Fire dampers shall be located wherever shown. An access door in the duct shall be provided as shown on drawings. All opening around the fire dampers shall be thoroughly.

3.12 400 x 400 mm access panel stud bolted with a rubber gasket shall be provided adjacent to splitter, fire, louver dampers or any other duct enclosed device.

3.13 Duct supports shall be hot dip galvanized and as follows:

Duct perimeter		Support Location
Upto 1800	40 x 40 x 3 mm MS angle with 9mm tie rod	At Transverse Joints
Over 1800 to 2500	40 x 40 x 6 mm MS angle with 12.5mm tie rod	At Transverse Joints
Over 2500	50 x 50 x 6 mm MS angle with 15mm tie rod	At Transverse Joints

3.14 Additional GI supports wherever considered necessary by the Engineer-in- charge shall be provided. Supports shall be taken from steel members grouted in the RCC work and fixing of steel members shall involve minimum damage. The entire supporting system shall be met with the approval of the Engineer-in-charge.

3.15 All duct supports, flanges, hangers shall be hot-dip galvanized before installation.

3.16 Where ducts are connected to the wall, such connections shall be made through galvanized steel frame fixed to the wall through suitable shear fasteners. Ducts connecting to air moving apparatus shall be through 15 oz mildew resistant double canvas as directed by the Engineer. On all circular spigots the flexible material is to be

screwed or clip band with adjustable screw or toggle fitting. For rectangular ducts the materials is to be flanged and bolted with a backing flat or bolted to mating flange with backing flat.

The flexible connection shall not be less than 75mm and not more than 200mm. All duct ends shall be firmly sealed with polythene sheets, during construction.

4.0 AIR DIFFUSINGEQUIPMENT

4.1 Supply air grilles shall be double deflection type with horizontal face bars and vertical rear bars placed in a rigid marginal frame. Bars shall be shaped and paced at 18mm centres with swaged pivot pins positively holding the deflection setting under all conditions of velocity and pressure. All grilles shall be provided with integral opposed blade, grille-face key operated dampers. Return grilles shall have fixed face bars shaped and set at 18 mm (3/4) centers. The grilles shall be complete with rigid marginal frames and shall be matching with the supply grilles.

4.0 Ceiling diffusers shall be round/square/rectangular face flush type horizontal air diffusion pattern. Diffusers shall have ample margins to minimize ceiling smudge. All diffusers shall be provided with face operated volume control dampers. Half diffusers shall be similar to full diffusers.

4.3 Linear diffusers/grilles shall be die formed, flush mounted type with single or double directional air flow. The diffuser /grille shall be in a mild steel frame with minimum 20 mm margin. All linear air diffusing equipment shall be fitted with a distribution sheet metal plenum as shown on drawings.

4.4 Grille types are indicated in the drawings and equivalent types of any other standard manufacturer are acceptable. Mild steel grilles and diffusers shall be fabricated out of 1.0 mm mild steel and painted with two coats of red oxide. All duct collars terminating on to a grille or diffuser shall be given two coats of black paint for a length of 300 mm. Grilles & diffusers shall be selected for an aero-dynamic noise power not in excess of NC30.

4.5 Aluminium grilles and diffusers wherever specified shall be of extruded aluminium with margins & GSS butterfly dampers. Grilles shall have horizontal face bars only.

Mode of measurement

a) All sheet metal ducting complete with duct supports(hot dip GI), turning vanes, canvas connections, erected in position shall be measured externally and paid per unit area as per actual measurement. All dampers shall be excluded in the duct area.

b) All manual control/splitter damper sections with operating linkages locking quadrant, sheet steel enclosure, frame, erection, supporting etc. shall be measured on the basis of damper cross-sectional area and paid per unit area. Intake and exhaust louvres with bird screen, sheet steel louvres and frame, erection etc. shall be measured on the basis or cross-sectional area and paid per unitarea.

c) Side wall grilles shall be measured on the basis of the core area excluding the margins and shall include dampers. Minimum payable unit is 0.1 sqm (1.0sqft).

d) In line diffusers and grilles shall be measured per unit length. The backup plenum shall be measured as additional sheet metal ducting or part of the grille as defined in the schedule or work.

e) All fire dampers with operating linkage actuator, locking quadrant plate steel enclosure, frame, fusible links, actuator, access door etc. shall be measured on the basis of cross-sectional area of damper and paid per unit area or per piece as defined in the schedule of work.

f) All duct liners for acoustic insulation shall be measured and paid as specified under 'NOISE & VIBRATION.'

5 PIPING

5.1 Scope

a) The scope of work covers supply, installation, testing & commissioning of all piping.

b) Drains shall be provided at all low points and all drain valves shall be gun metal globe type with hose bib.

c) Pressure gauges shall be "Bourdon' type with minimum 100 mm dial and required range. All gauges shall be provided with gun metal plug type gauge cocks and capillary connection to prevent system fluctuations affecting the gauge. Gauges shall be provided wherever shown.

d) Thermometers shall be industrial direct reading stem type of the required range. Thermometers shall be provided in separable wells shown on drawings.

5.2 Pipe Installation

a) Pipe installation shall be carried out in a workman-like manner in accordance with approved drawings. Pipe shall be aligned parallel to walls and ceiling and not along the room. Change of direction shall be through hydraulically formed or wrought iron welding fittings as specified. Alignment shall follow the approved drawings and wherever necessary pipe shall be rerouted under the instructions of the Engineer-in-charge in order to meet the site conditions and or interference from services.

b) Pipe supports shall be standard factory-made hot dip galvanized systems or fabricated from steel structural galvanized after fabrication. Supports shall be spaced as follows:

Size	Horizontal	Vertical
Upto 15 mm	1.25 m	1.8 m
20 to 25 mm	2.00 m	2.5 m
32 to 125 mm	2.50 m	3.0 m
150 mm & over	3.00 m	3.0 m

c) Pipe clamps shall be specially fabricated fittings for pipes. All clamps shall be of galvanized mild steel. Clamps shall take into account pipe movement owing to temperature variations & anchors, and in no case shall the clamping arrangement induce stresses beyond the safe load limits of the pipe under fully filled conditions.

Where pipes are insulated, the clamping shall interpose a hard insulation material or shall be designed so that the insulation is not compressed for more than 60% of its compression strength.

d) All pipe joints shall be welded except where flanges joints are specified hereinafter. Pipes upto 40 mm NB shall use socket-weld fittings with fillet welding and larger sizes use butt-welding type single V 35 deg weld preparation.

6.0 REFRIGERANT PIPING:

Refrigerant piping shall be heavy duty seamless copper tubes with weld-able socket type fittings

7.0 TESTING

7.1 All hydraulic testing of piping shall be carried out before equipment connections are made. No insulation shall be carried out unless and until the piping, in section, is tested and tests approved. Piping may be tested in sections, with the approval of the Engineer and in such case all open ends shall be blanked off with necessary flanges.

7.2 In such a pressure test, the system shall hold for a minimum period of 24 hours. All pipe testing shall be witnessed and certified by the Engineer-in- charge and leaks or defects found in the joints shall be rectified.

7.3 The contractor shall make all arrangements for testing & removal after testing of all water connections, if any, without causing any damage to the property of the employer or any other contractor.

7.4 After the entire piping has been tested and equipment connected, the system of water piping shall be filled and drained till all the dirt, milscale and any other foreign matter is flushed out to the satisfaction of the Engineer-in- charge. At any rate, the system shall be flushed at least 3 times before commissioning. All strainers shall be cleaned of all accumulated dirt before the system is charged.

Mode of measurement

All pipes shall be in unit length rounded off to the nearest centimetre and measured along the centre line of the pipe and all fittings, flanges etc. excluding the flange to flange distance of valves, strainers or any other equipment. The rate shall include all GI clamps, bolts , Hot dip galvanized structural steel supports, angles, studs, rods etc. cutting holes in ceiling, floor or wall and making good the same including scaffolding, staging supports, flexible, fire seals around the piping where the penetrations are made etc. and painting of piping as per the painting specifications. In general, the mode of measurement shall be as per BOQ

AHU DATA SHEET AND APPROVED MAKE LIST

AHU DATA SHEET
PROJECT: IGGL INTERIORS
LOCATION; NRL CENTRE
Date: 14/02/2022

Tag No.	Location	CFM	Total AirFlow	CFM	FreshAir	(mmof W.C)	E.S.P	Static(mmof W.C)	Total StaticPressure(mm ofW.C)	FanType	Type Of AHUs	RPM	Max. BreakKWPower(KW)	Min.Selected Motor (KW)	V/Ph/Hz	Load (TR)	Max FaceVelocity(FPM)	Pre Filter Type	FinalFilterType	Remarks
AHU-7TH-01	7THFLOOR	4700	306	50	80	BackwardCurvePlugFan	Ceilingsuspended	1450	4	5	415/3/50	10.5	500	Disposable Pleated Filter of MERV7	Microvee Filter (MERV13) of 80-90 efficiency	VFD`
AHU-7TH-02	7THFLOOR	6300	175	50	100	BackwardCurvePlugFan	Ceilingsuspended	1450	4.3	5.5	415/3/50	14	500	Disposable Pleated Filter of MERV7	MicroveeFilter(MERV13)of80-90efficiency	VFD`
AHU-7TH-03	7THFLOOR	4700	500	50	100	BackwardCurvePlugFan	Ceilingsuspended	1450	4	5	415/3/50	10.5	500	DisposablePleatedFilterofMERV7	MicroveeFilter(MERV13)of80-90efficiency	VFD`
AHU-7TH-04	7THFLOOR	6300	540	50	100	BackwardCurvePlugFan	Ceilingsuspended	1450	4.3	5.5	415/3/50	14	500	DisposablePleatedFilterofMERV7	MicroveeFilter(MERV13)of80-90efficiency	VFD`
AHU-7TH-05	7THFLOOR	3400	340	40	75	BackwardCurvePlugFan	Ceilingsuspended	1450	2.6	4	415/3/50	7.5	500	DisposablePleatedFilterofMERV7	MicroveeFilter(MERV13)of80-90efficiency	VFD`
AHU-7TH-06	7THFLOOR	3800	380	50	80	BackwardCurvePlugFan	Ceilingsuspended	1450	3.9	4.8	415/3/50	8.5	500	DisposablePleatedFilterofMERV7	MicroveeFilter(MERV13)of80-90efficiency	VFD`

1. Vendor to select the nearest higher capacity motor & efficiency shall be as per ASHRAE90.1
2. Given Motor KW power is only break KW of the motor & hence the vendor to select the installed motor capacity as per there quirement
3. Efficiency of the motor and fan shall be as per ASHRAE90.1 and shall be in line with Green building Norms in compliance with EFF3
4. Note: Static pressure may vary depending on actual duct routes of site condition.

MAKES OF APPROVED MATERIALS

SL.NO.	PARTICULARS	BRAND NAME
1.	AHU	i) Zeco ii) Carryaire iii) Edgetech iv) Blue Star v) VTS and equivalent vi) Fujitsu
2.	Condensate drain pump	i)Aspen ii)Artee and equivalent
3.	VAV	i)Dynacraft ii)Cosmos iii)Barcol Air and equivalent
4.	MS pipe	i)Nezone ii)Sail iii)Laxmi Engineering iv)Hitech metal and tubes and equivalent
5.	Copper pipes	i)Indigo metalloys ii)Jaideo enterprises iii) J Pan tubular and equivalent
6.	GI Sheets	i)Jindal ii)Sail iii)Rolastar iv)Zeco v) Ductofab and equivalent
7.	Fire Dampers	i) George Rao ii) Carryaire iii) Ravistar iv) Greenheck and equivalent
8.	Grilles & diffusers	i) CarryaireEquipments ii) Ravistar iii) Dynacraft iv) Air Products v) HPS Engg. and equivalent

9.	Duct insulation & acoustic board for AHU	i) UP Twiga ii) Kimco iii)Owens corning iv)Twiga and euivalent
9.	Nitrile Rubber Insulation	i) Armaflex ii) Kflex iii) Aeroflex and equivalent
10.	Pipe insulation	i) Armaflexl ii) Aeroflex iii) Vidoflex
11.	VRV / VRF units	i) Daikin ii) LG iii) Toshiba iv)Samsung v) Mitshubishi electric

PART 2- SECTION B

PHE-PLUMBING AND SANITARY _SPECIFICATIONS AND MAKE LIST

SECTION 1.1

GENERAL INSTRUCTIONS

1.0 Scope of work

1.1 The Contractor's scope of work covers supply, installation, commissioning and testing of the complete **Plumbing system** shows the division of work between the Contractor for above work and others

2.0 Location

2.1 The works are to be carried out at the proposed 7th floor, NRL Corporate Office Building for "IGGL (Indradhanush Gas Grid Limited)." at Guwahati,

All electrical equipment and gear shall be designed for temperatures of

i) Peak50°C
ii) Daily average40°C
v) Yearly weighted average30°C
vi) Relative Humidity:>85%

3.0 Power Supply

3.1 Power will be made available at 415/240V 3 Phase 4 wire 50 Hz earthed neutral system and all equipment shall be suitable for the above power supply with a variations of +/- 10% (Ten percent). All equipment shall operate at these voltages and any equipment/component to operating a together than the above power supply shall be provided with necessary transformer.

4.0 Drawings, Specifications & Deviations

4.1 It is not the intent to completely specify herein all details of the design and construction of the equipment/system. Nevertheless the equipment/system shall conform in all respect to the highest standards of design, engineering and workmanship and shall be capable of performing continuous satisfactory operation acceptable to the owner as well as the various statutory authorities. Any unit or equipment or accessories not specifically mentioned in the tender document but required to make the system complete, safe, operable and consistent with good engineeringpracticesshallbeprovidedbythecontractoratnoextracostandshallbe deemed to have been specified.

The drawings and specifications furnished lay down minimum standards of equipment and workmanship. Should the tenderer wish to depart from the provisions of the specifications and drawings either on account of manufacturing practice or for any other reasons, he should clearly draw attention in his tender to the proposed points of departures and submit such complete information, drawings and specifications as will enable the relative merits of the deviations to be fully appreciated. In the absence of any deviations, it will be deemed that the tenderer is fully satisfied with the intents of the specifications and drawings and their compliance with the statutory provisions and local codes. All deviations shall be set indicated in Annexure 1.1-2 shall be disregarded and shall not be binding on the contract

4.2 In case of discrepancy between the drawings and specifications, the tenderer shall assume the more stringent of the two and furnish his rates accordingly.

4.3 The drawings enclosed herewith are for the general guidance to the Contractor. The contractor

shall upon the award of the work, furnish detailed and coordinated shop drawings necessary to carry out the work at site. The contractor shall prepare shop drawings and all work shall be according to approved working drawings. Shop drawings shall give all dimensions and shall incorporate the requirements for consultants, architects and interior designer. Approval of drawings does not relieve the Contractor of his responsibility to meet with the intents of the specifications. All such drawings for approval shall be in quadruplicate. In addition, the contractor shall submit manufacturer's details and get the make proved before ordering. This has to be done whether the materials / equipment are one of the approved makes or not. The liability of the material supplied at basic rate of the owner shall be binding on the contractor and shall be covered under defects liability period.

Drawings for approval on award of the work: The contractor shall prepare and submitfollowingdrawingsandgetthemapprovedfromtheEngineer-inchargebefore the start of the work. The approval of drawings however does not absolve the contractor of his responsibility to supply the equipments/ materials as per agreement.

1)Plumbing drawings showing the layout of entire piping, dia length of pipes, hydrant, air vessel, valves and isometric showing connections to various equipment.

2)Any other drawings relevant to the work

Completion drawings: Three sets of the following drawings shall be submitted by the contractor while handing over the installation to the Department. Out of this one of the sets shall be laminated on a hard base for display in the control room. In addition one set will be given on compact disc

i) Installation drawings giving complete details of all the equipments, including their foundation.

ii) Plumbing layout drawings giving sizes and lengths of all the pipes and the sizes and locations of all types of valves, and including isometric drawings for the entire piping including the pipe connections to the various equipments.

4.2 QUALITY ASSURANCE PROGRAMME:

i) To ensure that the equipment and services under the scope of this Contract whether manufactured or performed within the supplier's Works or at his Sub- contractor's premises or at the Purchaser's site or at any other place of Work are in accordance with the specifications, the supplier shall adopt suitable quality assurance programme to control such activities at all points necessary. The detailed programme shall be submitted by the contractor after the award for reference. A quality assurance programme of the supplier shall generally cover the following:

a) His organization structure for the management and implementation of the proposed quality assurance programme.

b) Documentation control system;

c) Qualification data for bidder's key personnel.

d) The procedure for purchases of materials, parts components and selection of sub-Contractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases etc.

e) System for shop manufacturing and site erection controls including process controls and fabrication and assembly control.

f) Control of non-conforming items and system for corrective actions.

g) Inspection and test procedure both for manufacture and field activities.

h) Control of calibration and testing of measuring instruments and field activities.

i) System for indication and appraisal of inspection status.

j) System for quality audits

k) System for authorizing release of manufactured product to the Purchaser.

l) System for maintenance of records.

m) System for handling storage and delivery; and

n) A quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered

Client/consultant or his duly authorized representative reserves the right to carry out quality audit and quality surveillance of the system and procedure of the supplier/his vendor's quality management and control activities

4.3 Shop Tests

i) Shop tests of all major equipment centrifugal pumps, diesel engines, electrical drive motors, piping, valves and specialties, pressure and storage vessels, MCC, electrical panels, controls, instrumentation etc. shall be conducted as specified in various clauses and as per applicable standards/codes.

ii) Shop tests shall include all tests to be carried out at Contractor's works, works of his sub-contractor and at works where raw materials supplied for manufacture of equipment are fabricated. The tests to be carried out shall include but not be limited to the tests described as follows:

a) Materials analysis and testing
b) Hydrostatic pressure test of all pressure parts, piping,etc.
c) Dimensional and visual check.
d) Balancing test of rotating components
e) Flow rate and operational test on Flow control valves
f) Calibration tests on instruments and tests on control panel

iii) In the absence of any Code/Standard, equipment shall be tested as permutually agreed procedure between the supplier and the Employer.

iv) A comprehensive visual and functional check for panels would be conducted and will include at horough check up of panel dimensions, material of construction, panel finish, compliance with tubing and wiring specifications, quality of workmanship, proper tagging & locations of instruments/accessories. The wiring check shall be complete point to point ring out and check for agreement with installation drawings and equipment vendor prints of the complete system and an inspection of all field connection terminals and leveling.

v) All test certificates and reports shall be submitted to the Client for approval. The client's representative shall be given full access to all tests. The manufacturer shall inform the client allowing adequate time so that, if the client so desires, his representatives can witness the test.

5.0 Time of Completion

5.1 The work shall be completed as indicated in Annexure 1.1-3 'Completion Time'

6.0 Tools and Spare Parts

6.1 All tools, tackle, scaffolding and staging required for erection and assembly of the equipment and installation covered by the contract shall be obtained by the contractor himself. All other material such as foundation bolts, nuts etc. required for the installation of the plant shall also be supplied and included in the contract.

7.0 Testing &Handing Over

7.1 The contractor shall carry out tests on different equipment as specified in various sections in the presence of Project Management Consultant/Architects and Consulting Engineers in order to enable them to determine whether the plant, equipment and installation in general comply with the specifications

7.2 The Site shall be handed over after satisfactory testing along with four sets of documentation each consisting of:

i) Detailed equipment data in the proforma approved by the Consulting Engineers/Employer.

ii) Manufacturer's maintenance and operatinginstructions, if any equipment is installed.

iii) Set of as-built drawings, showing plant layouts, piping, ducting etc.

iv) Approved Test readings for all equipment &installation, if any equipment is installed.

v) Certificates of approval from Statutory or Local Authorities for the operation and maintenance of the installation and equipment, wherever such approval or certification is required.

vi) List of recommended spares, if any equipment is installed.

vii) Certificate from the contractors that they cleared the site of all debris and litter caused by them during the construction.

viii) All tests to be certified by Project Management/Consultant/Engineer-in-charge/Clerk of works

7.3 Submission of the above documentation shall form a precondition for the final acceptance of the plant and installation and final payment.

7.4 Thecontractorhastofurnishanundertakingthatallmaterialssuppliedbyhimat site shall be fully tax paid and shall produce all documents for satisfaction of the owner or taxation authorities. All liabilities of the same shall be of the contractor.

8.0 Performance guarantee

8.1 All equipment and the entire installation shall be guaranteed to yield the specified ratings and design conditions. Any equipment found short of the specified ratings as determined by the test readings shall be rejected.

9.0 Defects Liability

9.1 The Defect Liability Period for this work shall be 12 (Twelve) Months from the Date of issue of Completion Certificate and rectification of any defects noticed during defect liability period. The CONTRACTOR shall at his own cost and initiative repair andrectifyanyandalldefectsinthework.IntheeventoftheCONTRACTORfailingto do so, provisions of Clause No 84.0 of General Conditions of Contract (GCC) shall apply.

10.0 Force Majeure

10.1 "Force Majeure" shall mean and be limited to the following: "War/Hostilities, Riot or Civil Commotion, Earthquake, Flood, Tempest, Lightning or other natural physical disaster, Strike or Lock-out (only those exceeding 10 continuous days in duration) affecting the performance of the vendor's obligations, Restrictions imposed by the Government or other statutory bodies which prevents or delays the execution of the order.

11.0 Statutory Inspections

11.1 The Contractor shall be fully responsible for meeting all the statutory obligations & local inspectorates wherever applicable to the works carried out by them. The contractor should prepare all working drawings and obtain approval of competent authorities and also have the equipment and installation inspected and got approved. All official fees will be paid by the client directly against demand in writing from the appropriate authority and all other expenses for submission and approval of the various and relevant statutory/bodies shall be embodied in the tender prices.

12.0 Any increase in quantity over and above tender quantity, has to be brought to the notice of the Owner/Consultant and upon written confirmation only the contractor shall proceed further. In the absence of obtaining written permission as given above, the owner shall not assume liability for any of the works carried out.

13.0 Tenderers may indicate their comments, only as deviations from the conditions stipulated herein. Wholesale submission of their own conditions and/ or printed conditions in disregard of the conditions stipulated herein shall not be binding on this contract.

14.0 Safety Precautions

14.1 A competent, qualified and authorized Engineer shall be on the site whenever the contractor's men are at work. The Supervisor should ensure that all plant and machinery used on the site are rendered safe for working and meets with the Indian or International safety standards applicable for the use and operation of such machinery. The supervisor should also ensure that the workmen are supplied with and made to use safety appliances such as safety belts, life lines, helmets etc. The Supervisor shall not leave the work site without permission from Project Management Consultant or their nominee. The contractor shall provide organization chart of the personnel to be deployed at site for the execution of the contract.

14.2 Smoking shall altogether be strictly prohibited in areas where combustible and inflammable goods / materials are stored or lying about.

14.3 Any hot job such as welding, soldering, gas cutting shall not be carried out with out the permission of the Engineer-in-charge/Project Management Consultant. Such jobs shall not be carried out where inflammable materials are stored or lying about. All electric connections shall be through adequately sized mechanically protected cables without any joints and with proper and adequate terminals. All power supplies shall be through properly rated fuses with isolating devices. No such hot jobs shall be carried out on holidays and without the presence of the Contractor's Engineer.

14.4 It is entirely the responsibility of the contractor to practice the principles of 'Safety First' during the entire tenure of work with adequate insurance covering injury of death to workmen, loss by theft or damage to materials and property in position or not and third-party liability stipulated.

14.5 The contractor should clear the site of all debris every day to avoid accidents. In case this is not done, the owners may engage necessary labor to maintain the cleanliness of the premises and removal of debris, and debit all or part of the expenditure so incurred from the contractor/s.

14.6 No breaking of any concrete structure, without permission of the Engineer-in-charge/Consultant.

ANNEXURE 1.1 – 1

DIVISION OF WORK

By Contractor	By others

1) Installation, testing and commissioning of sanitary fittings and fixtures.
2) Supply, installation, testing and commissioning of Cold water lines
3) Supply, installation, testing and commissioning of Internal soil, waste

ANNEXURE 1.1 – 2

DEVIATION FROM TENDER

(All deviations shall be set down here. Deviations mentioned anywhere else shall not be taken cognizance of)

ANNEXURE – 1.1 -3

TIME SCHEDULE

All plumbing system works to be completed in all respects within 02 months from the date of site handover.

ANNEXURE 1.1 – 4

RECOMMENDED MAKES OF MAJOR MATERIALS

PLUMBING

1) All materials shall be of best quality and ISI Stamped
2) Final choice of makes rests with the clients.

1)SANITARY WARES			**APPROVED FITTINGS**	**EQUIVALENT MAKES IN EMERGENCY(Totally At the discretion of the owner)**
	i) W.C		Supplied by client	
	ii)Wash basins		Supplied by client	
	iii) Urinals flat back large		Supplied by client	
2) C P FITTINGS	i) Flush valve/tank		Supplied by client	

	ii) Bib cock		Supplied by client	
	ii) Pillar tap		Supplied by client	
	iii) Others		Supplied by client	
	iv) Accessories		Supplied by client	
3)PIPING & FITTING	i) Steel Mildsteelorgalvanized ii) Copper	Pipes Pipes	Jindal PrizmInternational	Tata, GST Champ,Rajco Pipes
		Fittings	Kirti	Unik,Flow Flex fitting
	iii) UPVC	Pipes	Finolex	Prince, Supreme
		Fittings	- do -	
	v) PVC Drainage Systems		Finolex	Prince, Supreme
	vi) Cast Iron Low pressure	Pipes Fittings	Neco	Isco ,Electrosteel, Hepco
	vii) Cast Iron – LA Class	Pipes	Electosteel	Kesoram, Kapilansh
		Fittings	A. HussainEsmailji	
	viii)Cement Concrete	Pipes fittings	Indian Hume Pipe	Pranali, , KK
	ix) Stone ware	Pipes fittings	Rajura	Perfect potteries, JABALPUR
4) VALVES	i) Gun Metal, gate, globe, NR		Zoloto	Leader ,RB

	iii) Steel Ball Valves		Zoloto	Leader , RB
	iv) Butterfly valves		AUDCO	Keystone, Honeywell
	v) PRV'S		**Honeywell**,	Danfoss,RB, Vari e (W3SC 20 LB atoutlet)
5)MISCELLAN E OUS	CI Manhole Covers		NECO	BC Iron Foundry, Raj Iron
6) HandDrier 7) Stainless steel Sink			AsconNirali	Kopal , Technocrat AMC, Kingston

	Urinal Sensor		AOS Systems for electrically operated system, Jaquar for the battery operated system.	

SECTION: 1.2 SANITARY SYSTEMS

1.0 Scope

1.1 Scope of work covers Supply, installation, testing and commissioning of:
i) Sanitary ware
ii) Chromium plated (CP)fittings

1.2 The client reserves the right to supply the sanitary ware and/or the CP fittings in which case, the scope of work shall cover all fixing devices, water and drain connections generally a defined under the mode of measurement and schedule of work. And it is also to be noted that the labour rate will remain same irrespective of the make of material being supplied by the client.

2.0 Standards

2.1 All sanitary ware shall generally conform to IS: 2556 Part I to VIII unless stated otherwise.

3.0 Materials

3.1 General

3.1.1 All sanitary ware and CP fittings shall be new and have approved make, type and colour. All samples of materials with catalogues, performance data, shall be submitted and got approved before use on the work. Approved samples along with other approved materials shall be neatly displayed on a board and such a display board of samples shall always be in exhibition in the construction office of the Engineer-in-charge. Such display shall be used for the day-to-day checking of the materials onsite.

3.1.2 In cases where the materials are supplied by the clients, all such materials shall be inspected and received in good condition and thereafter, it will be totally under the safe custody of the tenderer/contractor till they are handed over satisfactorily after installation, testing and commissioning

3.1.3 Wherever multiple choices of fixtures are offered, the client shall have the final choice.

3.1.4 all fixtures shall be complete with all accessories as required for the working of the said fixture as specified.

3.4 **Orissa W.C**

3.4.1 Orissa W.C shall be in white glazed vitreous chinaware of size specified. The W.C shall be provided with a 100 mm white vitreous chinaware P or S trap with or without vents as required. The size of orissa water closet shall be 58cms x 44cms.

3.4.2 Each W.C shall be provided with a low height flushing tanks.

3.5 **EuropeanW.C**

3.5.1 European W.C shall be wash down or siphonic, floor or wall- mounted in white glazed vitreous chinaware with integral P or S trap as required. Wall hung W.C shall be supported by C.I or G.I floor mounted chair. The W.C shall be provided with an exposed or concealed type brass flush valve or flushing cistern as specified in the schedule of work.

3.5.2 Each W.C shall be provided with a solid plastic seat. The seat shall be fixed to the W.C with CP brass or S. S. pillar bar hinges. Rubber buffers shall be provided for the cover.

3.6 **Urinals**

3.6.1 Urinals shall be lipped type large flat back in white glazed vitreous china ware of size 61.00cm x 40.0cm x 38cm unless specified otherwise.

3.6.2 Urinals shall be provided with:

i) 15diaspreader
ii) 32 dia CP dome waste
iii) 32 dia CP P-trap with unions.
iv) CP wall flange and pipe

All exposed pipes and fittings shall be of C.P brass. The urinals shall be fixed with C.P brass screws.

3.6.3 Urinal flushing shall be through one of the following methods as specified in the schedule of work:

i) Small urinal flush valve with pushbutton.
ii) Auto flush valve with DC long life battery or AC supply

Auto flush shall be concealed in wall and flush pipe shall be of copper or G.I except the exposed parts which shall be C.P brass

3.6.4 Waste pipe for urinals shall be any one of following:
G.I pipes ,C class heavy quality as per I.S1239

3.6.5 Urinal partitions shall be white glazed vitreous chinaware complete with CP brass screws, anchor fasteners etc. as required.

3.7 Lavatory Basin

3.7.1 Lavatorybasinsshallbewhiteglazedvitreouschinawaresyntheticorpolymarbleor any other material and have size, shape and type specified in the schedule of work.

3.7.2 Each basin shall be completewith:

i) C.I or galvanized steel supporting brackets & clips asrequired.
ii) 32 dia CP waste and overflow.
iii) Pop-up waste or rubber plug with CP chain asspecified.
iv) 32 dia CP P-trap with cleanout, unions, CP pipe to wall and wall flange
v) 15 dia CP control angle valve/s with CP connections.
vi) Mixing or CP fittings as specified

3.8 Stainless Steel Sinks

3.8.1 Each sink shall be complete with:

i) 40 dia waste fitting with brass/rubber plug &chain.
ii) 40 dia P-trap with clean out, unions, CP pipe to wall & wall flange.

iii) 20 dia CP control valve/s with CP connections.

iv) Mixing or CP fittings with spout asspecified.

3.9 Mirrors

3.9.1 Mirrors shall be plate glass electro coated copper 6 mm thick of guaran-teed to be clear, distortion-less (at all angles) non-wavy of approved make and sample. The size shall be as specified in the schedule of work.

3.9.2 Mirrors shall be provided with backing of 12 mm thick marine plywood fixed with CP brass semi round headed screws and cup washers or CP brass clamps as specific or instructed by Engineer-in-charge

4.0 Installation

4.1.1 All sanitary ware and CP fittings shall be installed in accordance with the interior requirements. Neat workmanship and maintaining exact position and level of each fixture shall be the sole objective of the installation. Care shall be taken to fix inlet and outlet pipes at correct positions. Faulty positioning shall be made good without any damage to the finished floor or wall tiling and any damage to the finished surfaces shall be made good at the tenderer/contractor's cost

4.2 In order to ensure quality of workmanship and compliance with interior requirements, one or two mock-up installations shall be done and got approved.
Fixtures used in the mock-up may be reused with the approval of the Engineer-in-charge/Architect/Employer.

4.2.1 All fixing accessories like bolts, nuts, brackets etc. may be supplied along with the ware as defined in the mode of measurement and schedule of work.

4.3 All such accessories shall be CP brass or galvanized or stainless steel as approved by the Engineer-in-charge. All exposed pipes and bends shall be of CP brass.

4.4 The Indian W.C shall be fixed in level in a neat workmanlike manner. The W.C and trap shall be set in brickbat 1:2:4 concrete mix. Joints between W.C and flush pipe shall be made with a putty or white lead and linseed oil and caulked well or with approved rubber joints. The joint between W.C and trap shall be made with 1:1 cement mortar and shall be rendered leak proof.

4.5 The Orissa W.C shall be fixed in level in an eat work man like manner. The W.C & trap shall be set in brickbat concrete 1:2:4. Joint between W.C & flush pipe shall be made with putty of white lead in linseed oil and caulked well or with approved rubber joint.JointbetweenW.C&trapshallbemadewith1:1cementsandmortarandshall be rendered leak proof.

4.6 Wall-hung European W.C shall be mounted on C.I chairs, which are fixed to the wall and floor using Anchor fasteners. The bolts and nuts used for fixing the chairs shall be stainless steel and the fixing bolts for the W.C and chairs could be CP brass or stainless steel. Floor-mounted W.C shall be fixed with Anchor fasteners using stainless steel bolts and nuts. The gap between the WC and floor or wall shall be neatly sealed with waterproof non-hardening sealant of approved colour. The sealant should not extrude beyond the footprint or WC outline.

4.7 All W.C's shall be aligned and leveled with the floor and wall tiles so as to present an integrated look. Utmost care and skill shall be exercised to achieve a good installation in keeping with the interior designs.

4.8.1 Urinals shall be fixed to the wall using Anchor fasteners and stainless steel bolts and nuts. The urinals shall be held in line and level according to the interior designs and tile modules. Partitions, wherever required to be Provided, shall also maintain line and level as shown on drawings and as required. Supply spreader and drain piping and P-trap shall be of CP brass and installed in a neat and workman like manner. No unseemly bends or wooden support pieces shall be permitted

4.9 Wall-mounted lavatory basins and sinks shall maintain line and level as specified by the interior drawings and also with the tile modules. The supply connections shall be of CP brass from the angles top valves to the pillar taps or single level fixture and shall display good workmanship. Drain connections shall have a CP P-trap with unions and exposed CP drain pipe and a wall flange or escueheon. In the case of counter mounted basins and sinks extreme care shall be taken to independently and adequately supporting the basin and aligning with the opening in the counter slab. Supply and drain connections shall be same as for wall mounted basins. The crevices between basin and wall or counter shall be neatly sealed with a non-hardening sealant of approved colour.

4.10 All accessories like the mirror, soap-tray, Towel Rod/Ring etc shall be neatly fixed as per interior designs. Good workmanship is the essence of all sanitary installation for achieving the interior design objectives.

4.11 During the construction period, the contractor shall protect all the sanitary fixtures from damage due to accidental or even intentional mechanical impact with hard objects and also misuse and vandalism.

5.0 Testing and Acceptance

The Sanitary appliances shall be generally tested for the following:

1. **Water Tests** - The water tests shall be applied before the appliances are connected & May be carried out in sections so as to limit the static head to 4.5m.It is necessary to Seal all the openings affected by the test & provide support to the plugs used as Stoppers.

A) The testing plug at the upper end of the ventilating pipe should be fitted with a tee piece with a cock on each branch, one branch being connected by a flexible tubetoamanometer.Airpressureisthenintroducedintothesystemthroughthe other branch of the tee- piece until the desired pressure is shown on the manometer scale. The pressure applied should be equal to 65 mm water gauge and should remain constant for a period of three minutes to provide the soundness of the installation.

B) Alternatively, the air pressure may be applied by passing a flexible tube from a tee - piece attached to a manometer through the water seal of the sanitary appliance, the test then being carried out as described

2. **Smoke Test** - Fault indicated by the air tests may be located by pumping smoke into the system with a smoke machine. Care should be taken to ensure that the system is filled with smoke before sealing with the plugs.
3. **Hydraulic Performances** - Discharge tests should be made from all the appliances, singly & collectively. Obstruction in any of the pipe lines should be traced & the whole system examined for proper hydraulic performances, including the retention of any adequate water in each trap

The sanitary fixtures form the final terminal units of the water supply and drainage system and should meet the performance needs as a terminal unit. Each fixture shall be inspected for scratches or chippings and alignment before acceptance.

The following design flows shall be verified and validated for acceptance.

W.C	Flushing consecutive flushes.	3 – 6 lit Fill time between two cistern		
Lavatory	CW/HWPillartaps Single lever fixture	6lpmmax.	3 lpmminBasin	or
	Full-basin	3min. &validated.	To be measured draintime	
Sink	CW/HWPillartaps Or Single lever fixture	7lpmmax.	3 lpmmin	
	Full sink	3min. &validated.	To be measured drain time	

All tests shall be conducted at each and every fixture except for flush valves, which shall be at the lowest and highest test connections to be made on each riser/down take. The contractor shall make the temporary valve connections which shall be plugged with a brass plug after validation

6.0 Tolerance Limits

The following tolerances shall be permitted:

i. **EWC-** a) on dimension 75 mm & over - (+/-)4%
b) On dimensions less than 75mm - (+/-)2mm
c) On all angles - (+/-) 3deg

ii. **Low Flush tanks** - The flush tanks shall be capable of being rapidly brought into action by the operating lever, but shall not self siphonor leak. When tested according to IS 774 the discharge rate shall be 5(+/-)0.50 liters in 3 seconds for a 5 liters tank. The tank shall be so designed that there shall be no appreciable variation in the force of flush during the flushing of the required quantity of water.

iii. **Wash Basins** - a) on dimension 75 mm & over - (+/-)4%
b) On dimensions less than 75mm - (+/-)2mm
c) On all angles - (+/-) 3deg

iv. **Kitchen / Pantry Sinks-**

a) **Thickness Criteria** - The Thickness of the stainless steel shall not be less than 1.00mm before forming & after forming shall not be less than75mm.

b) **Depth** - The depth of the sink bowl shall be 150mm minimum, when measured from the top edge of the bowl , to the base of the sink.

c) **Internal Dimensions of Bowls -** The minimum internal dimensions, when measured on the bowl center lines across the top of the bowl , shall be 380mmx340mm for rectangular bowls &360mm for round bowls

d) **Bowl Locating Limits -** The distance between the edge of the sink bowls & the end of the sink shall be 15mm minimum for sit on type sinks & 30mm minimum for inset type sinks. Depth of the collar provided for inset sinks shall be 10 (+/-)2 mm. For sinks designed for use with a 600 mm wide worktop, the distance between the edge of the sink bowl & the front of the sink shall be 50mm, minimum & in the case of sinks designed for use with 500mm wide worktop, the distance shall be 45mm minimum

Test --A) When Examined by an unaided eye of an experienced observer, from a distance of 600+/- 100mm from exposed surfaces, the sink shall be free from visible defects.

B) The visual examination shall be carried out with uniform illumination at the surface of the sink of 300 lux & with the sink positioned so that it is between the light source & the observer.

v. **Urinals-**

a) on dimension 75 mm & over - (+/-)4%
b) On dimensions less than 75mm - (+/-)2mm
c) On all angles - (+/-) 3deg

vi. **Pillar Taps/Bib Taps** - Every pillar tap, complete with its component parts shall withstand an internally applied hydraulic pressure of 20kg/sq.cm. Maintained for a Period of 2 minutes during which period it shall neither leak nor sweat.

7.0 Mode of measurement

7.1 Supply of all Sanitary ware & CP fittings shall be measured per unit and shall include the following

7.1.1 Indian WC's shall include 2# white glazed ceramic foot rests and P or Strap.

7.1.2 Orissa type WC's shall be complete with P or Strap.

7.1.3 Flushing tanks shall be complete with fixing brackets, CP flush bend.

7.1.4 European WC's shall be complete with
i) Integral low flushing tank.
ii) Flush bend

7.1.5 Urinals shall be complete with fixing accessories.

7.1.6 Urinal flush valves shall be CP brass concealed or open, manual or automatic as defined in the schedule of work.

7.1.7 Concealed shower assembly shall comprise
1 or 2 pillar taps with mixer diverter shower head, and spout with or without hand shower. Or Single lever mixer diverter, shower head and spout with or without hand shower.

7.1.8 Open shower set shall be same as above but with CP brass piping connections to make it as a whole unit.

7.1.9 The following items shall be measured and paid per number which includes supply and installation:
a) Soap solution dispenser
b) Mirrors
c) Vitreous chinaware traps
d) Urinal partitions

e) Towel rods
f) Soap trays
g) Toilet paper roll holder

7.10 Installation of the various sanitary-ware shall be as specified in the schedule of work.

7.11 In case of items which are not defined here, the description under the schedule of work shall be taken in conjunction with the specifications.

SECTION: 1.3

WATER SUPPLY SYSTEM

1.0 Scope

1.1 The scope of work shall cover supply, installation, testing and commissioning of: (Concealed and Open type).

i) Cold and Hot Water (if required) distribution piping and valves.
ii) Connections to sanitary ware, kitchen/ pantry equipment etc.
iii) Secondary storage tanks, if any.
iv) All valves, masonry valve chambers etc.
v) Insulation of pipes.
vi) Painting of pipes & supports generally as specified and show non drawings.

2.0 Standard

2.1 The following standards shall be applicable as revised up-to-date:

1)	IS2065-1983	Code of practice for water supply in buildings.
2)	IS 1239 Part 1 &Part2	Steel tubes & tubular sand fittings
3)	IS 778	Gun metal gate, globe and check valves for water steam and oil.
4)	IS1703	High pressure ball valves
5)	IS 781	Screw down Bib taps and stopcocks
6)	IS 1879 (Part -ItoX)	Malleable iron G.I. fittings
7)	IS1536	Centrifugally cast LA Class pressure pipes.
8)	IS1538	Cast Iron fittings for pressure pipes for water, gas and sewage.
9)	IS4984	High density Polyethylene pipes for potable water supplies.
10)	IS4985	Unplasticized PVC pipes for potable water supplies.
11)	IS7634	Code of practice for plastic pipe work for potable water supplies.
12)	BS EN 1057–1996	Copper Pipes &fittings

3.0 Materials

3.1 General

3.1.1 All materials shall be new of the best quality conforming to the specifications. Where

different makes are specified, the choice of make shall rest with the consultants/Architect/Employer.

3.1.2 All samples of materials with necessary catalogues, performance data shall be submitted and got approved before use on the work. Approved samples of all materials shall be neatly displayed on a board and such a display board of samples shall always be in exhibition in the sample room of the construction office of the Engineer-in-charge. Such a display shall be used for the day-to-day checking of the materials onsite.

3.1.3 In cases where the materials are supplied by the clients, all such materials shall be inspected and received in good condition and thereafter, it will be totally under the safe custody of the tenderer/contractor till they are handed over satisfactorily after installation, testing and commissioning.

3.2 Steel Pipes &Fittings

All steel pipes shall be heavy quality galvanized steel tubes conforming to IS- 1239.

3.2.1 Fittings shall be malleable iron galvanized fittings of approved make conforming to IS 1879 (I to X). All fittings shall have manufacturer's trade mark stamped on it. Fittings shall include couplings, bends, tees, reducers, nipples, union, bushes etc. All fittings shall be suitable for the class of pressure of the piping system.

3.2.2 Flanges shall be galvanized steel screwed type conforming to IS 6392 and the pressure class of the piping system. Flanges should mate with equipment or valve flanges as the case may be and shall be complete with bolts and nuts and gaskets suitable for the temperature and pressure of water in the system concerned.

3.2.3 Gasket selections shall be approved before use and samples of approved gaskets shall be put on display.

3.3 Cast Iron Pipes &Fittings

3.3.1 Cast iron pipes shall be of 'LA' class conforming to IS 1536 suitable for Drip seal jointing with spigot and socket joints and if flanged they shall be 'A' class conforming to IS 1537. Pipes shall be in maximum lengths available.

3.3.2 Fittings shall be of the class required conforming to IS 1538. If Spigot-socket, they shall be suitable for drip seal jointing.

3.3.A CPVC, Pipes &Fittings Pipes with one boat of desired shade of enamel paint. All terminations points for installation of faucets shall have brass termination fittings. Installation shall be to satisfaction of manufacturer & project Manager.

1. Joining pipes &fittings

a. Cutting:
Pipes shall be cut either with a wheel type plastic pipe cutting or hacksaw blade and care shall be taken to make square cut which provides optimal bonding area within a join.

b. Deburring /Beveling:
Burrs and fittings should be removed from the outside and inside of pipe with a pocket knife of file otherwise burrs and fittings may prevent proper contact between pipe and fittings during assembly.

c. Fitting preparation:

A clean dry rag / cloth should be used to wipe dirt and moisture from the fitting sockets and tubing end. The tubing should make contact with the socket wall 1/3 or 2/3 of the way into the fitting socket.

d. Solvent Cement Application:
Only CPVC solvent cement confirming to ASTM-F493 should be used for joining pipe with fittings. An even coat of solvent cement should be applied on the pipe end and a thin coat inside the fitting socket, otherwise too much of cement solvent can cause clogged water ways.

e. Assembly:
After applying the solvent cement on both pipe and fitting socket, pipe shouldbeinsertedintothefittingsocketwithin30seconds, and rotating the pipe¼to½turnwhileinsertingsoastoensureevendistributionofsolvent cement with the joint. The assembled system should be held for 10 seconds (approximately) in order to allow the joint to setup.

A neven bead of cement should be evident around the joint and if this bead is not continuous remake the joint to avoid potential leaks. Set & Cure times:

Solvent cement set and cure time shall be strictly adhered to as per the below mentioned table.

Ambient Temperature during Core Period	Pipe Size	
	½ "- 1"	1.1/4 "- 2"
Above 15 deg. C	1 Hr	2 Hrs
4 – 15 deg. C	2 Hrs	4 Hrs
Below 4 deg. C	4 Hrs	8 Hrs

Special care shall be exercised when assembling flow guard systems in extremely low temperature (below 4^0 C) or extremely high temperature (above 45^0 C) In extremely hot temperatures, make sure that both surfaces to the joined are still wet with cement solvent when putting them together

3.4 <u>Valves</u>

3.4.1 Valves 65 mm dia and below shall be heavy duty 20Kg/cm^2 gun metal full way valves or Globe valves conforming to IS 778 and ISI stamped along with the name stamp of the manufacturer.

3.4.2 Where specified, valves of 80 mm size and above may be cast iron flanged sluice valves with non rising spindle. Each sluice valve shall be provided with wheel for valves in exposed position and cap top for underground valves. Suitable operating keys shall be provided for sluice valves with tops. Sluice valves shall be of best quality conforming to IS 780-1969 of class specified and ISI stamped.

3.4.3 AirvalvesshallbegunmetalorC.IofsizeasspecifiedintheScheduleofWork.Each airvalve shall be provided with an isolation gun metal full way valveforsize 65mm dia and below and C.I flanged valve 80 mm diaand above.

3.4.4 Scour valves shall be gun metal full way valves for sizes upto65 mmdia.

4.0 Pipe Installation

4.1 General

4.1.2 Shop drawings for the routing of pipes shall be prepared generally on the basis of layout drawings issued. The shop drawings shall reflect the site conditions, structural beams and columns, obstructions by way of any construction elements or any other service pipes, ducts etc. The drawings should clearly indicate openings required in brick or concrete walls, drain valves at low points, air valves at high points, isolating valves, if any, and invert levels at every15 min intervals. The drawings should also indicate typical details of hangers, supports, brackets etc. After approval of the drawings, pipe routes shall be marked with a distinct colour of paint on the site and got it approved by the Engineer-in-charge.

4.1.3 All openings and chases in brick walls core cuttings shall be made neatly and refilled to a reasonable finish. However, final finishing will be done by the civil contractor. Openings in concrete walls shall, however, be made only with the approval of the Engineer-in-charge. Pipe penetrations, through wall or floor, shall be sealed with an approved fire-resistant sealant with Birla 3m

4.1.4 Good workmanship and neat pipe layout are the prerequisites of these specifications. Horizontal pipes shall be truly horizontal with necessary slopes and hangers or supports as specified and shown on drawings. Vertical pipes shall be truly vertical and shall be laid away from the walls at least by 10mm or as required by the Engineer-in-charge. All pipe runs shall be parallel to the ceiling or walls for presenting a neat appearance. Pipes buried in wall shall be laid in machine-made chases with galvanized steel anchors

4.1.4 All pipes before and after testing shall be protected with wooden or brass plugs to prevent ingress of dust, sand or any extraneous matter.

4.2 Pipe supports; hangers &clamps

4.3.1 Pipe supports, clamps, suspenders shall be pre-fabricated and galvanized (after fabrication). The support systems shall generally follow the types specified under “PIPE SUPPORTING SYSTEMS”. Application of support systems shall follow the guidelines in the above specifications. Any other types of support, suspension or clamping to meet the site conditions shall be got approved before use.

4.0 Copper / Galvanized steel piping

Supports for Copper/galvanized steel piping shall be as follows:

Size (mm)	Horizontal (m)	Vertical (m)
Upto 15	1.25	1.80
20 - 25	2.00	2.50
32 - 125	2.50	3.00
Over 125	3.00	400

Additional supports shall be provided at the bends, heavy fittings like valves and near equipment and as directed by the Engineer-in-charge.

4.3.2 All fittings shall be screwed type unless specified otherwise. However, flanged joints shall be provided at the following positions:

i) Pairs of flanges for isolation and removal of equipment.

ii) Mating flanges for equipment flange connections.

iii)Mating flanges for valves, strainers, as the case maybe

iv)Pairofflangesorunionsatevery15mcontinuousrunofpiping

4.3.3 Entire piping shall be self-draining using eccentric reducers at all change of sections and shall be pitched 0.3% towards low points where a drain outlet and shut off valve shall be provided. All high points in the piping shall have air vents with shut off valves.

4.6 Insulation

4.6.1 Wherever pipes are thermally insulated, the material shall be a flexible lightweight elastomeric material of standard manufacture with the following physical properties:

Composition	:Closed cellular with scaled internal and external faces.
Density	: 60 –100 Kg/m^3 Thermal Conductivity:0.039 w/mc @32C
Firerating	: Self-extinguishing, Lows moke confirming To ASTM D635 &UL-94V
Ozone resistance	: No craching ASTM D 1171 Water Vapour permeability : 0.15 perm ASTM C 355 Water absorption
	:3%byweightASTMD 1056

4.6.2 Insulation thickness shall be as shown in the schedule of work. In embedded situations, the pipes shall be wrapped with PVC tape as specified in the schedule.

4.6.3 Separable well is only for a future temperature sensor. Others will provide sensor. Thermometer wherever required should be dial type or industrial type with a suitable range (40 - 80C) complete with a separable well

4.7 <u>Painting</u>

4.7.1 All exposed piping shall be painted as specified under the Section "PAINTING"

5.0 <u>Acceptance, Testing &Commissioning</u>

5.1. Before testing and commissioning, water shall be filled and circulated through the piping system and flushed out to ensure clean piping. Entire piping installation with all valves fully open, except the terminal fixture valves shall be subjected to a hydraulic test pressure whichever is higher of the following:

i) 2 times the dynamic head of the pump plus the gravity head of an over- head storage or

pressure tank.

ii) 2.5 times the no-delivery head (head developed when the discharge valve is closed) of the pump

5.2 The test shall be for the entire water supply system and shall hold for a minimum of 3 hours without loss of pressure. During the testing period, the contractor should walk along the entire piping system along with the Engineer-in-charge and validate that there are no leaks anywhere in the system. Such validation shall be carried out segment by segment and recorded. Should there be any leaks in any segment, the system shall be drained, leaks attended and tested once again as above till the entire piping system is rendered leak-tight and acceptable.

The Leak Shall be determined by the formulae.

ql = ((ND* P)^0.50/3.3)

ql = the allowable leakage in cubic cm/hr

N = number of joints in the length of the pipe line D = diameter in mm.&

P = the average test pressure during the leakage testing kg/sq cm.

Should any test of pipe laid in position discloses leakage greater than that specified above the defective joints shall be repaired until the leakage is within the specified allowance.

Flow tests at each and every outlet shall be conducted as specified in Section "SANITARY SYSTEM" and all test readings and statements of verification shall form the acceptance test documentation. If the piping was tested in sections during construction phase, all such test records shall form an appendix to the above documentation.

Tolerances

For medium & heavy grade of single tube of GI pipes the tolerances for the thickness & weight shall be (+/-)10%. For the quantities per load of 10 t, for medium &heavy grade Gi pipes the tolerances shall be(+/-)7.50%.

Testing

Once an installation is completed and cored as per above mentioned recommendations, the system should be hydrostatically pressure tested at 150 psi (10 Bar) for one hour. During pressure testing, the system should be fitted with water and if a leak is found, the joint should be cut out and replacing the same with new one by using couplers

ii. Transition of Flow guard CPVC to Metals

When making a transition connection to metal threads, special Brass / plastic transition fitting (Male and female adapters) should be used. Plastic threaded connections should not be over torqued Hard right plus one half turn should be adequate

iii. Threaded Sealants

Teflon tape shall be used to make threaded connections leak proof.

iv. Solvent Cement

Only CPVC solvent cement conforming to ASTMF 493 should be used for joining pipe with fittings and valves. Flow guard CPVC cement solvent have a minimum shelf life of 1 year. Aged cement solvent will often change colour or being to thicken and become gelatinous or jelly like and when this happens, the cement should not be used. The cement solvent should be used within 30 days after openingthecompany'ssealandtightlyclosethesealafterusinginordertoavoidits freezing. The freezed cement solvent should be discarded immediately and fresh one should be used. The CPVC solvent cement usage should be adhered to as given in table below

Diameter of pipe in inch (flow guard)	½ "	¾ "	1"	¼ "	1 ½ "	2"
Approx. nos. of joints which can be mode per litre of solvent cement.	200 Nos	180 Nos	150 Nos	130 Nos	100 Nos	70 Nos

v. Hangers and supports

For Horizontal runs, support should be given at 3 foot (90 cm) intervals for diameters of one inch and below and at 4 foot (1.2 m) intervals for larger sizes.

Hangers should not have rough or sharp edges which come in contact with the tubing.

Supports should be as per the below mentioned table :

Size of Pipe	**21^0 C**	**49^0 C**	**71^0 C**	**82^0 C**
Inch	**Ft.**	**Ft.**	**Ft.**	**Ft.**
½ "	5.5	4.5	3.0	2.5
¾ "	5.5	5.0	3.0	2.5
1 "	6.0	5.5	3.5	3.0
1 ¼ "	6.5	6.0	3.5	3.5
1 ½"	7.0	6.0	3.5	3.5
2 "	7.0	6.5	4.0	3.5

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Recommended Support spacing (I feet)

Nom. Pipe size		**Temperature " C**					
(In)	**(mm)**	**23**	**38**	**49**	**60**	**71**	**82**
2 ½	65	7 ½ "	7	7	6 ½	6	3 ½
3	80	8	7	7	7	6	3 ½
4	100	8 ½	7 ½	7 ½	7	6 ½	4
6	150	9 ½	8	8	7 ½	7	4 ½
8	200	9 ½	8	8	7 ½	7	5

6.0 Mode of measurement

All pipes above ground shall be paid for the length measured along the central line of the pipe line laid and shall be inclusive of all fittings such as couplings, tees, bends, elbows,

union. Deduction for valves shall be made. Rate quoted shall be inclusive of all fittings, all structural supports and suspenders clamps, painting cutting holes chases and making good the same and all items mentioned in the specifications and schedule of work.

All pipes below buried or embedded shall be paid for length measured along the centerline of the pipeline laid and shall be inclusive of all fittings e.g. coupling, tees, bends, elbows, unions protective wrapping in lieu of supporting systems. Measurement shall be taken prior the concealing of work.

Cast iron S/S pipe laid above ground shall be paid for the length measured along the center line of the pipe line laid including all fittings joints etc. Deductions for valves shall be made. Pipe going into the socket shall not be measured. Rate shall be inclusive of supports, suspenders and clamps, laying, fixing, cutting holes and chases and making good and shall include all items mentioned in the specifications and schedule of work

Cast iron double flanged pipes laid above ground shall be measured. same as S/S. No extra payment shall be allowed for pipes of nonstandard lengths.

Castiron S/S or flanged pipes laid underground shall be measured same as for above ground but the rate shall cover excavation, concrete saddles, back fittings bitumen coating and disposed of surplus earth, cutting holes, chases and making good and all items mentioned in the specifications and schedule of work

Flanged joints for Steel pipes shall be measured by number and shall include appropriate number of bolts, nuts and washers, 3 mm thick insertion gasket of required temperature grade and all items mentioned in the specifications

Items such as gate valves, globe valves, sluice valves, non-return valves, air valves, scour valves etc. shall be measured and paid by number.

Steel Storage tanks shall be measured by weight and shall include hoisting, connections and all items mentioned in the specifications and schedule of quantities. Weight shall be calculated on the basis of actual sheet and structural used on the finished tank. Nothing extra shall be paid

Making connections to pumps, equipment heat exchanger and appliances shall be paid on the basis of unit length under the relevant items.

Steel structural supports for storage tanks etc. shall be paid by weight of actual length of member installed at site multiplied by its theoretical weight given in the manufacturer's catalogue. Rate shall be inclusive of hoisting, welding, bolting, painting, cutting and making good the walls and all items described in the schedule of work and specifications.

Special supporting systems for supporting multiple pipes of multiple agencies shall be paid on the following basis:

i) Theoretical weight of structural members used multiplied by the quoted cost per quintal.
ii) Deduct for cost of normal supports as specified at the rate of 5% on quoted rate of all the pipes supported (excluding cost of valves & insulation but including cost of fittings &flanges)

SECTION: 1.4

INTERNAL DRAINAGE SYSTEMS

1.0 Scope of Work

1.1 The scope of work shall cover:
i) Soil and waste drainage piping including:
a) soil, waste and vent stacks.
b) connections to sanitary ware
c) waste connections to kitchen, other appliances, floor trapsetc.
d) connections to external sewerage system

2.0 Standards

2.1 All materials and the installation shall meet latest of the following standards:

1) IS:3989 Centrifugally cast-iron pipes
2) IS:6163 Centrifugally cast low-pressure iron pipes
3) IS:1536 Centrifugally cast-iron pressure pipes
4) IS: 782 Pig lead.
5) IS:1726 CI manhole frames &covers.
6) IS:5329 Code of Practice for Sanitary pipe work.
7) IS:3114 Code of practice for laying of cast iron pipes
8) IS:1239 Steel tubes & tubular
9) IS:1879 Malleable iron GI fittings

3.0 Materials

3.1 General

3.1.1 Allmaterialsshallbenewandhavethebestqualityconformingtothespecifications.Where different makes are specified, the choice of make shall rest with the consultants.

3.1.2 All samples of materials with necessary catalogues and performance data shall be submitted and got approved before use on the work. Approved samples of all materials shall be neatly displayed on a board and such a display board of samples shall always be in exhibition in the sample room of the construction office of the Engineer-in-charge. Such a display shall be used for the day-to-day checking of the materials onsite.

3.1.3 In cases where the materials are supplied by the clients, all such materials shall be inspected and received in good condition and thereafter, it will be totally under the safe custody of the tenderer/contractor till they are handed over satisfactorily after

installation, testing and commissioning

3.2 Cast Iron Pipes &Fittings

3.2.1 Cast iron pipes shall be centrifugally cast low pressure cast iron spigot and socket pipesconformingtoIndianStandardsspecifiedandgenerallymeetingthefollowing

Nominal Diameter Inch (mm)	Thickness (mm)	Weight of 1.83m length (Kg)	Internal Diameter of socket (mm)	Depth of lead (mm)
50	3.5	8.5	73	25
75	3.5	12.7	99	25
100	4.0	19.2	126	25
150	5.0	35.5	178	38

Acceptable tolerance for pipes to IS 3939 -84 and IS 1729 shall be as follows

a) Wall thickness -15%

b) Length +/-20mm

c) Weight -10%

All joints shall be with lead caulking

3.2.2 Centrifugally cast low pressure iron pipes without sockets (socket-less) shall conform to IS 6163. Fittings shall be socket-less and all joints shall be with a synthetic rubber sealing collar with a stainless steel clamp with two S.S bolts for application of uniform pressure. All materials shall be from approved manufacturers. Neoprene shall be used as gasket material.

3.2.3 Wherever specified centrifugally cast pressure pipes of 'LA' classs hall be used. The pipes and fittings shall conform to IS 1536. Fittings shall be spigot and socket type suitable for molten lead caulking. Where necessary flanged pipes and fittings may be used with a Teflon gasket.

3.2.4 Fittings shall be cast iron compatible with the pipes used. Tees, bends, crosses and other specials shall have easy sweep as specified. Cleaning eyes shall be provided wherever required and shall be complete with a sealing gasket and suitable bolts. Cleaning eyes should not be along the flow (such as bends) but behind (such as Yor

T).

3.3 Steel Pipes and Fittings

3.3.1. Steel pipes shall be galvanized medium quality tubes to IS:1239. Fittings shall be galvanized malleable iron conforming to IS:1879 (i to x). Fittings shall include long radius bends, tees, reducers, unions etc.

3.4 Traps &Seals

3.4.1 All traps shall be self-cleaning and the material and the seal depth shall be as specifiedbelowwhereverthetrapsarenotintegralwiththeappliancesorware

Appliance or ware	Trap		
	Material	**Type**	**Seal depth (mm)**
Lavatory/Wash basin (1)	CP brass	P/Bottle	50
Sinks (1)	CP brass	*P/Bottle*	50
Floor drain	Cast Iron built-in	P or S P	50
Kitchen Floor drain or fabricated drain boxes	Fabricated Stainless Steel (built-in)	P P	50
Urinals (1)	C P brass	P	50
(All P-traps shall have cleaning eye or other cleaning facility)			

(1) Bottle type traps shall not be used

Any other appliance shall have an appropriate trap as specified by the Engineer-in- charge or as required

3.4.2 All floor drains shall be covered with perforated stainless steel grating of size specified or required. Roof drain outlets shall have dome grates unless specified otherwise. Plant room floor drains shall have cast iron or fabricated steel grating.

3.5 Cleanouts

3.5.1 Cleanouts other than those integral with the fitting, shall be of brass and screw down type. Wherever cleanouts are required in cast iron piping, galvanized steel adaptor shall be provided as part of the cleaning system

4.0 Drainage System Installation

4.1 General

4.1.1 Shop drawings for the routing of pipes shall be prepared generally by the contractor on the basis of layout drawings issued by the consultants.

4.1.2 However, the drawings shall reflect the site conditions, structural beams and columns obstructions byway of any construction elements or any other service pipes, ducts etc. The drawings should clearly indicate openings

4.1.3 Required in brick or concrete walls and invert levels at every 15m intervals. The drawings should also indicate typical details of hangers, supports, brackets etc. After approval of the drawings, pipe routes shall be marked with a distinct colour of paint on the site and done the Engineer-in-charge approveit

4.1.4 All openings and chases in brick walls shall be made neatly and finished but the final, finish will be by others. Openings in concrete walls shall, however, be made only with the approval of the Engineer-in-charge. Pipe penetrations, through wall or floor, shall be sealed with an approved fire-resistant sealant

4.1.5 Good workmanship and neat pipe layout are the prerequisites of these specifications. Horizontal pipes shall be truly horizontal with necessary slopes and hangers or supports as specified and shown on drawings. Vertical pipes shall be truly vertical and shall be laid away from the walls at least by 50mm or as required by the Engineer-in-charge. All pipe runs shall be parallel to the ceiling or walls for presenting a neat appearance. Pipes buried in wall shall be laid in machine-made chases with galvanized steel anchors.

4.1.6 All pipes before and after testing shall be protected with wooden or brass plugs to prevent ingress of dust, sand or any extraneous matter

4.2 Pipe supports; hangers & clamps

4.2.1 All pipe supports, hangers & clamps shall be standard pre-fabricated galvanized (after fabrication) units. Pipe supports shall generally follow the types specified under “PIPE SUPPORT SYSTEMS” and the associated drawings

4.3 Soil &Waste Piping

4.3.1. Horizontal pipes shall be suspended from the structural ceiling slab or wall brackets at the following centres:

Pipe dia	Support centres(mm)
32	1.8
50-100	2.0
Over100	2.5

Pipes shall be laid to an optimum slope of 1 in 60 as far as possible. A liberal provision of easily accessible cleanouts shall be made on all horizontal pipes. Cleaning facility shall

preferably be from the floor above the ceiling slab for all under floor installations. Where horizontal pipes are laid in a sunken floor slab, adequate slopes shall be achieved through galvanised saddles or cement mortar bedding. All such pipes, after testing, shall be covered with and set in cement concrete (1:2:4) so that the pipes are not disturbed during the filling up of the sunken floor.

4.3.2 Vertical stacks shall be truly vertical and parallel to the wall and supported on saddles so that the pipes are at least 50mm away from the finished surface. Branch pipe connections shall be aligned with the bend or tee on the stack. Where the vertical stack meets the horizontal run or a manhole, a 45° tee connection with a clean out shall be employed to facilitate smooth flow and easy clean ability.

4.3.3 The spigot shall be centered in the adjoining socket by tightly caulking in sufficient turns of tarred gasket or hemp yarn to leave unfilled half the depth of socket for lead. When gasket or hempyarn has been caulked tightly home, a jointing ring shall be placed round the barrel & against the faces of the socket. Molten Pig lead shall then be poured in to fill the remainder of the socket. The lead shall then be solidly caulked with suitable tools & hammers of not less than3Kg weight, right round the joint to make up for the shrinkage of the molten metal on cooling & shall be preferably finished 3mm behind the socket face. Lead for caulking shall conform to IS:782-1978.

4.3.4 Cast iron socket-less pipes shall be jointed by using rubber/neoprene sealing tube and a stainless steel clamp with two bolts. All materials and method of jointing shall strictly conform to manufacturer's standards and recommendations.

4.3.5 Galvanized steel drain piping shall be used for appliances, wash basins, sinks, bath tubs etc. using screwed malleable galvanized fittings with approved sealants. Elbows may be avoided as far as possible and long- sweep bends are preferred for smooth flow. Joints between the galvanized steel pipe and cast iron shall be done through appropriate fitting and lead caulking as shown on drawings or as instructed by the Engineer-in-charge

4.3.6 Where specified, lead pipes may be used for waste, vent and WC connections. Pipe size shall be as shown on drawings or as required for the appliance. Lead pipes shall be straightened by wooden mandrels and bent to shape by dry sand filling. Joints of lead pipes shall be wiped solder joints. The pipe ends to be jointed shall be cleaned with a wirebrush and freed from oxide if any. Chalk shall then be rubbed to kill the greasy nature of lead. After this plumber's black shall be applied. A fine shaving of lead shall be removed from this with shave hook. Mutton tallow shall then be smeared over the prepared surface. The molten solder, and alloy composed of 3parts Of tin and 7 parts of lead shall be poured in a thin stream from a ladle moved in an elliptical direction over the joint position including a portion of the pipe at each end beyond the mark. When sufficient solder has been poured the joint shall be wipe Withpadofwipingclothwithlongcontinuousmovementsinonedirectiononlysoas to leave a neatly formed elliptical shaped joint. Surplus solder remaining on the joint shall be removed. The joint shall be water tight, air tight and shall be free from burrs, strings or droppings and shall be 60 to 90 mm in length depending on the pipe diameter.

4.3.7 Joint between lead pipe and cast iron pipe or stoneware pipe shall be made as follows:
One end of a brass thimble shall be slipped into or over the lead pipe and jointed to it by means of a wiped solder joint. The other end of thimble shall then be inserted in to the socket of the cast iron or stone ware pipe. In case of cast iron the joint shall be made with molten lead and in case of the stone ware the joint shall be made with cement mortar1:1

4.3.8 Where specified, PVC pipes may be used for waste, vent and WC connections. Pipe size shall be as shown on drawings or as required for the appliance. Pipe connection to the cast iron piping shall be through appropriate adapter

4.3.9 All pipes shall be fixed in a gradient towards the outfalls of drains. Pipes inside a toiletroomshallbeinchaseunlessotherwiseshownondrawings.Whererequired, pipes may be run at ceiling level in suitable gradient and supports shall be as follows:

Pipe Material	Vertical (Mm)	Horizontal (Mm)
GI	3000	2400
PVC	1800	1200
Lead	1200	1200

Cast iron pipes shall be supported at every joint and 1800 centre to centre.

4.3.10 Cast iron floor drains shall be set in 1:2:4 cement concrete. Kitchen floor drain boxes shall be as shown in drawings and kept flush with the finished floor. The drain boxes shall have a minimum of 50mm water seal and a suitable perforated grating. Drain boxes shall be connected to the cast iron drain piping through a flanged galvanised steel drain connection.

4.3.11 All waste connections shall have the following minimum sizes:

Appliance	Diameter (Mm)
Washbasins	30
Sinks	50
Urinals	50
Bidets	30
Showertrays	40
Bathtubs	50
Floordrains	65/75

4.4 Vent Piping

4.4.1 Building vent stacks shall be not less than 75mm dia. Where the vent stack becomes one with the main soil or waste stack the main stack size shall not be reduced. Vent connections on any branch waste drain line shall be at least two thirds the diameter of the branch drain subject to a minimum of 25mm. Vent connection to a soil drain lineshallbeaminimumof32mmdia.Ventconnectionsshallbe as near to the crown of the trap but not farther than450mm.

4.4.2 No water shall enter a vent lines. Vent lines shall be laid vertically terminated at least150mmabovetheopen-to-air roof. Vents may be connected back to the waste or soil stack above the highest appliance connection and the said stack extends beyond the roof by at least 150mm into the air.

4.5 Cleaning plugs

4.5.1 Cleaning plugs shall be easily accessible and convenient for rodding. Such plugs shall be liberally provided so that the entire drainage system could be easily cleared of all possible chokes. All clean outs shall be behind the flow and as far as possible, plug bends may be avoided.

5.0 Acceptance, Testing & Commissioning

A) Comprehensivetestsofallappliancesshallbemadebysimulatingconditionsofuse. Overflows shall also be examined for obstructions

5.1 Pre-commissioning checks

5.1.1 A walk-through inspection shall be carried out and the following checks made:

i) Layouts are according to the drawings and identify variations.
ii) Material used areas specified, new and as per approved samples.
iii) All fixtures viz. Suspenders, brackets, clamps etc. are adequate and firmly fixed and spaced as specified.
iv) Cleaning eyes are duly plugged and are easily accessible.
v) No visible damages or cases of bad workmanship.
vi)Check water seals in traps by discharging adequate number of appliances

5.1.2 During construction, the piping shall be tested in sections so that the maximum static head of water is not more than 4.5m. All such sectional tests shall be witnessed and signed by the Engineer-in-charge. Records of these tests shall form the Acceptance Test documentation.

5.1.3 An air test shall be conducted as specified in IS:5329 with a test pressure of50mm water gauge. If the pressure is not holding, then a smoke test shall be conducted through a smoke generator to track down the leaking points. After attending to the leaks, the piping shall be air tested again.

5.1.4 Hydraulic Performance Tests shall be conducted on each stack by simultaneous release of water through various appliances like WC's and bathtubs to ensure water sealing of traps.

5.1.5 Smoke Tests Shall be carried out as - All soil pipes , waste pipes, & vent pipes & all other pipes when above ground shall be approved gas tight by a smoke test conducted under a pressure of 25mm of water & maintained for 15 minutes after all traps seals have been filled with water. A clear pungent smoke is produced by burning oily waste or tar paper or similar material in the combustion chamber of a smoke machine which consists of a bellow & a burner. If there is any leak at any point of the drain it is easily detectable by the sight as well as by the smell of the smoke. Chemical smokes are not satisfactory.

5.1.6 Tests For Straightness & Obstructions Shall be carried out as under:

1) By inserting at the high end of the sewer ordrain a smooth ball of a diameter

13mm less than the pipe bore. In the absence of any obstruction , such as yarn or mortar projecting through the joints, the ball should roll down the invert of the pipe & emerge at the lower end.

2) By means of a mirror at one end of the line & lamp at the other. If the pipe line is straight, the full circle of light may be observed. If the pipe line is not straight . This will be apparent. The mirror will also indicate obstruction in the barrel

5.1.7 **Test Records:** Complete test records of all the test shall be properly maintained.

5.1.4 Tolerances On CI spun Pipes

Tolerances on the external diameter of the barrel, the internal diameter of the socket & the depth of socket shall be as follows:

External diameter of barrel: (+/-) 4.0 Internal diameter of socket: (+/-) 3.0 Depth of socket: (+/-) 10.0

The tolerances on length of the pipes shall be (+/-) 20mm.

The tolerances on wall thickness shall be (-) 15%.No limits for plus tolerance is allowed.

6.0 Mode of measurement

6.1 Thefollowingnotesshallbetakenintoaccountwhilearrivingattheunitrates.

i) When the G.I waste piping from washbasins, sinks and bathtubs are Directly connected to C.I waste stack necessary C.I fittings shall be Provided in the C.I waste stack for making the connection, and this Shall be measured along with the waste pipe and no extra shall be Payable on this account.

ii) Tenderers are requested to indicate the material, labour & total rate For the various items in the schedule, especially for items under Sanitary Installation. It may be noted that the employer reserves the right to supply items of sanitary wares and fittings. Accessories for the Corresponding items under “Schedule of Work” will have to be Provided by the contractor

All pipes soil, vent & waste pipes shall be subjected to the smoke tests.

6.2 All CI soil, waste & vent pipes shall be measured net when fixed correct to a centimeter including all fittings along its lengths including supports, suspenders, brackets,clamps,jointingetc.Whencollarsareused,inCIsoil,wasteand vent pipes they shall be measured along with and paid as pipes and no extra shall be paid for collars or fixing them to wall with holder bat clamps. No allowances shall be made for the adjacent pipes or fittings.

6.3 CI LA class pipes shall be measured net, when fixed correct to a centimeter including all fittings along its length including supports suspenders, brackets, clamps jointing etc.

6.4 GI, PVC Polyethylene or lead pipes shall be measured per running meter correct toa centimeter for the finished work, which shall include fittings e.g. bends, tees, elbows, reducers, crosses, sockets, nipples and nuts, supports, suspenders, clamps etc. The length shall be taken along centre line of the pipes and fittings.

SECTION 1.5

PIPE SUPPORTS

1.0 Pipe Supports

1.1 All water supply and drain pipes whether horizontal or vertical shall be suitably supported using galvanized M.S clamps or Hitech brackets, angles etc. manufactured by M/s Hitech Supports (India) Pvt. Ltd. or equivalent.

1.2 Vertical Pipes

1.2.1 The pipes running vertical inside shaft shall be supported by galvanized M.S angles fixed to wall with anchor bolts and studs. The clamps shall be provided at every 3000 mm c/c or as specified in the table.

1.2.2 when the horizontal distance between the centre lines of two adjacent pipes is less than 300 mm a powder coated HITECH rail shall be fixed to wall the pipes independently clamped to the rail with 'U' bolt clamps

1.3 Horizontal Pipes

1.3.1 Pipes running horizontal shall be supported from structural beam/slab by using appropriate galvanized M.S. pipe hangers, double angles etc. of HITECH or equivalent make.

1.3.2 The spacing of supports shall be as follows:

GI PIPES / M.S PIPES		CI SPUN PIES	
Internal Dia (mm)	**Spacing (Mm)**	**Internal dia (mm)**	**Spacing (mm)**
15	1800	75-150	2700
20 , 25	2400	200-250	3000
32	2700	300	3600
40-50	3000		
65-80	3600		
100	4000		
150	4500		

1.3.3 Supports for horizontal piping longer than 15 m in a stretch shall be provided with swivel clamps. Otherwise, the clamps shall be universal clamps or rigid clamps as required by the Project Engineer.

1.3.4 When the centre line distance of two adjacent pipes is less than 300 mm a horizontal rail common for the pipes shall be provided on slab/beam and the pipes clamped to this rail with clamps as in 1.3.3above.

1.4 Fixing of clamps/rails etc

1.4.1 All clamps, rails and accessories shall be fixed to the structure (beam, slab, walls etc.) by using approved good quality anchor fasteners of appropriate size.

1.5 Mode of Measurement

1.5.1 The cost of pipe supports described above forms part of the rate quoted for piping and no extra shall be payable on the account

PART 2 – SECTION C

TECHNICAL SPECIFICATIONS FOR SUPLY, INSTALLATION, TESTING AND COMISSIONING OF ELECTRICAL AND ELV SYSTEMS

GENERAL INSTRUCTIONS

1.0 Scope of work

1.1 The Contractor's scope of work covers supply, installation, testing and commissioning of the complete Electrical & ELV Installation Works as specified. Annexure2.1-1 & 3.1 shows the division of work between the Contractor for above work and others.

1.2 This specification details the broad guidelines for supply, receive, store, erect, testing and commissioning of all the equipment's required for the Electrical and ELV Installation works.

1.3 The contractor shall furnish all the materials, labour, tools and equipment's to complete all the electrical works, as per the bill of quantities and technical specifications and drawings attached. The contractor has to execute the works as directed by the Consultant/Client's Engineer-in-charge to their complete satisfaction.

2.0 Location

2.1 The works are to be carried out at the IGGL office, GUWAHATI. All equipment shall be selected and designed for temperatures of

i) Peak50 °C
ii) Daily average30°-35°C
iii) Yearly weighted average32C
iv) Altitude 11mMSL
v) 18° 54' 6N, 72° 51' 35E
vi) AvgLowestTemp18-14decC
vii) Lowesttemp14.4degc

3.0 Power Supply

3.1 Power will be made available at 415/240V 3 Phase 4 wire 50 Hz earthed neutral system and all equipment shall be suitable for the above power supply with a variations of +/- 10% (Ten percent) with voltage drop of LT side restricted to 6% as per electricity board Norm. All equipment shall operate at these voltages and any equipment /component operating at other than the above power supply shall be provided with necessary transformer

4.0 Drawings, Specifications & Deviations

4.1 The drawings and specifications lay down minimum standards of equipment and workmanship. Should the tenderer wish to depart from the provisions of the specifications and drawings either on account of manufacturing practice or for any other reasons, he should clearly draw attention in his tender to the proposed points of departures and submit such complete information, drawings and specifications as that will enable the relative merits of the deviations to be fully appreciated. In the absence of any deviations, it will be deemed that the tenderer is fully satisfied with the intents of the specifications and drawings and their compliance with the statutory provisions and local codes. All deviations shall be set down in Annexure 2.1-2. All deviations or departures from the specifications not indicated in Annexure 2.1-2 shall be disregarded and shall not be binding on the contract.

4.2 In case of discrepancy between the drawings and specifications, the tenderer shall assume the more stringent of the two and furnish his rates accordingly.

4.3 The contractor shall prepare shop drawings and all work shall be according to approved working drawings. Shop drawings shall give all dimensions and shall incorporate the requirements for consultants, architects and interior designer. Approval of drawings does not relieve the Contractor of his responsibility to meet with the intents of the specifications. All such drawings for approval shall be in quadruplicate (Four Copies). In addition, the contractor shall submit manufacturers details and get them approved before ordering from design consultants / PMC/client. This has to be done whether the materials / equipment are one of the approved makes or not . The liability of the material supplied at basic rate of the owner shall be binding on the contractor and shall be covered under defects liability period.

4.4 Equipment data shall be submitted as per Annexure 2.1-5. Tenderers not submitting data in full will do so at the risk of their tenders being evaluated with such information as may be available with the Consultants. A list of recommended makes of materials and equipment is shown under Annexure 2.1-7. It is believed that the said makes meet the intents of the specifications and have sufficient field experience behind. However, the tenderer may propose alternate makes only at the time of tender, furnishing all the technical details, catalogues, usage experience etc. for approval by the Consultants. The client & design consultant shall have the ultimate choice of the make of material.

5.0 Time of Completion

The work shall be completed as indicated in the LOA

6.0 Tools and Spare Parts

6.1 All tools, tackle, scaffolding and staging required for erection and assembly of the equipment and installation covered by the contract shall be obtained by the contractor himself. All other materials such as foundation bolts, nuts etc. required for the installation of the plant shall also be supplied and included in the contract.

6.2 Tenderer shall quote separately for spares recommended by him for two years operation of each type of equipment covered by these specifications. These rates shall be valid for acceptance for a period of 90 days.

7.0 Testing & Handing Over

7.1 The contractor shall carry out tests on different equipment as specified in various sections in the presence of Project Management Consultant / Architects and Consulting Engineers in order to enable them

to determine whether the plant, equipment and installation in general comply with the specifications

7.2 All equipment shall be tested after carrying out the necessary adjustments and balancing to establish equipment ratings and all other design conditions. The test data shall be submitted in the Acceptance Test Forms supplied by the Consultants. At least four sets of readings shall be taken for each item tested and submitted in the form shown in Annexure 2.1-6 or any other Acceptance Test Forms supplied by the Consultants. Instruments required for testing shall be furnished by the contractor for testing with initial requirements of all consumables

7.3 The plant shall be handed over after satisfactory testing along with four sets of documentation each consisting of:

i) Detailed equipment data in the pro-forma approved by the Consulting Engineers / Employer.

ii) Manufacturing test certificates, Manufacturer's maintenance and operating instructions.

iii) Set of as-built drawings, showing MV panels, cable tray, distribution boards etc.

iv) Set of as-built drawings, showing MV panels, cable tray, distribution boards etc.

v) Certificates of approval from all Statutory or Local Authorities like Orissa Supply Company for the operation and maintenance of the installation and equipment, wherever such approval or certification is required and no extra cost shall be made separately except the legal/official charges on production of relevant documents.

vi) List of recommended spares.

vii) Certificatefromthecontractorsthattheyclearedthesiteofalldebrisandlittercausedby them during the construction.

viii) All tests to be certified by Engineer- in-charge.

ix) List of all readings etc. to be maintained at a regular basis.

7.4 Submission of the above documentation shall form a precondition for the final acceptance of the plant and installation and final payment.

7.5 The contractor has to furnish an undertaking that all materials supplied by him at site shall be fully tax paid invoice and shall produce all documents for satisfaction of the owner or taxation authorities. All liabilities of the same shall be of the contractor.

8.0 Performance guarantee

8.1 All equipment and the entire installation shall be guaranteed to yield the specified ratings and design conditions plus/minus 3% tolerance. Any equipment found short of the specified ratings by more than the allowable tolerance as determined by the test readings shall be rejected.

9.0 Defects Liability:

9.1 All equipment and the entire installation shall be guaranteed against defective materials and workmanship for a period of 12 months reckoned after the building is commissioned and handed over to the clients along with the 4 sets of completion documents and in case the testing of the plant is delayed for any reason, the defects liability shall extend for a minimum period of 6(six) months from the date the test readings are accepted. During the defects liability period, the contractor shall rectify, repair or replace defective parts and components free of cost except in the case of those which are due to normal wear & tear.

10.0 Force Majeure

10.1 If by reason of war, hostilities, strikes, lockouts, embargoes or any act of god the fulfilment of this contract becomes impossible, the contract will be deemed to be null and void and no liability shall attach to either party. However, we will be paid for whatever work has already been done and

equipment ordered or delivered to site.

11.0 Statutory Inspections

11.1 The Contractor shall be fully responsible for meeting all the statutory obligations & local inspectorates like Orissa Supply Company wherever applicable to the works carried out by them. The contractor should prepare all working drawings and obtain approval of competent authorities and also have the equipment and installation inspected and got approved. All official fees will be paid by the clients directly against demand in writing from the appropriate authority and all other expenses for submission and approval of the various and relevant statutory / bodies shall be embodied in the tender prices.

12.0 Liability due to malfunctioning of the installation of contractor which may damage any plant machinery of the owner during testing or during defects liability period shall be on account of the contractors.

13.0 Any increase in quantity over and above tender quantity, contractor shall prepare the variation statement with proposal and has to be brought to the notice of the Consultant and upon written confirmation only the Contractor shall proceed further. In the absence of obtaining written permission as given above, the owner shall not assume liability for any of the works carried out.

14.0 General Conditions

14.1 The tender shall be governed by General conditions of Contract of this tender. Wherever conflicting, the general conditions shall prevail.

14.2 Tenderers may indicate their comments, only as deviations from the conditions stipulated herein. Wholesale submission of their own conditions and/or printed conditions in disregard of the conditions stipulated herein shall not be binding on this contract.

15.0 Safety Precautions

15.1 A competent, qualified and authorized Engineer shall be on the site whenever the contractor's men are at work. The Supervisor should ensure that all plant and machinery used on the site are entered safe for working and meets with the Indian or International safety standards applicable for the use and operation of such machinery. The supervisor should also ensure that the workmen are supplied with and made to use safety appliances such as safety belts, life lines, helmets etc. The Supervisor shall not leave the work site without permission from Project Management Consultant or their nominee. The contractor shall provide organization chart of the personnel to be deployed at site for the execution of the contract.

15.2 Smoking shall not be encouraged on the site but altogether strictly prohibited in areas where combustible and inflammable goods / materials are stored or lying about.

15.3 Any hot job such as welding, soldering, gas cutting shall not be carried out without the permission of the Engineer-in-charge. Such jobs shall not be carried out where inflammable materials are stored or lying about. All electric connections shall be through adequately sized mechanically protected cables without any joints and with proper and adequate terminals. All power supplies shall be through properly rated fuses with isolating devices. No such hot jobs shall be carried out on holidays and without the presence of the Contractor's Engineer..

15.4 It is entirely the responsibility of the contractor to practice the principles of 'Safety First' during the entire tenure of work with adequate insurance covering injury of death to workmen, loss by theft or damage to materials and property in position or not and third party liability stipulated.

15.5 The contractor should clear the site of all debris every day to avoid accidents. In case this is not done, the owners may engage necessary labour to maintain the cleanliness of the premises and removal of debris, and debit all or part of the expenditure so incurred from the contractor/s

15.6 No breaking of any concrete structure, without permission of the Engineer-in-charge/Design Consultant should be done.

ANNEXURE 2.1 – 7

LIST OF APPROVED MAKES OF MATERIALS FOR ELECTRICAL SYSTEMS

S.NO	PARTICULARS	BRAND NAME
1	M.V Panels	i) ARROW Engineers ii) Zenith Electricals iii) Any CPRI Approved vendor iv) L & T v) Sterling Generators
2	Switch fuse units, isolators	i) siemens ii) Group Schnieder iii) L & T
3	Contactors	i) ABB ii) Group Schnieder iii) Culter Hammer iv) Siemens
5	Meters	i) Automatic Electric ii) IMP iii) Trinity iv) Conzerve (Enercon) v) Selec
6	Over load Relays	i) Cutler Hammer ii) Group Schnieder iii) L&T iv) Siemens
7	Indicating Lamps	i) Essen ii) Technic
8	Push Button	i) L & T ii) Vaishno iii) Siemens iv) Group Schnieder
9	AMF Logic Panel	i) AVK/SEGC
10	Bimetal overload relays	i) Siemens ii) L&T iii) GEC - Alshom iv) Group Schnieder

11	Moulded case circuit breaker	i) Legrand ii) ABB iii) Group Schnieder iv) Siemens v) L&T
12	Starting Battery (SMF) & Charger	i) Chloride ii) Standard iii) Willard iv) Amco
13	LT Cables	i) Polycab ii)Finolex iii) KEI
14	Cable end - Terminations	i) Comet ii) Dowells
1515	Cable Trays	i) Profab ii)RC Engg. iii) Asian Ancillary
16	Raceways	i) Profab ii)RC Engg. iii) Asian Ancillary
17	Conduit wiring a) Black Enameled MS / GI & PVC Conduit	i) BEC ii) Vimco iii) Precision
18	b) Wires	i) RR cable ii) Polycab iii) Finolex iv) KEI
19	c) Fire Survival Cable	Ramcro (Equ. LPCB Approved)
20	d) Modular switches & sockets	i) MK - Blenze ii) Legrand - Mosaic iii) Norisys iv) Gold medal
21	e) Metal Clad Sockets	i) Cutler Hammer ii) Crompton Greaves iii) Legrand iv) North-West
22	Distribution	
23	a) Fuses	i) Schneider ii) Siemens iii) L & T

	b) MCB's & ELCB's	i) Legrand i i)Siemens iii) ABB iv) L & T
24	Rotary switches	i) Kaycee (ii) Thakur
25	Load Manager	i) Enercon/Conzerve ii) Trinity iii) NEMO
26	C Ts & PTs	i) RECO ii) AE iii) Precise
27	Floor Junction Boxes	i)) Profab/RC Engg
28	Capacitors	i) EPCOS ii) Ducati iii) L&T-Meher
29	Inverters	i) Sukam ii)Luminous iii)Consul Neowatt
30	Inverters Battery	i) Amar Raja ii) Exide
31	Data/telephone Cable (cat-6) & Information Outlets	i) Beldon ii)Amp iii)Systemax iv) Molex v)D-Link
32	Nominated System Integrator	i) Natech solutions ii) Digital Highway iii) Sigma Byte.
33	Cable TV Wire	i) Comscope ii) Caliplast & Delton
34	Light Fixtures	i) Philips ii) Wipro iii) CG iv) Havels
35	Motor Protection Circuit Breakers	i) ABB ii) Group Schneider iii)Siemens iv)L & T
36	Control transformer	i) Pragathi ii) Precise
37	Auto Transfer Switch	i) Asco

38	Distribution Boards	I) Legrand ii)ABB iii)Siemens iv)Schneider v) L & T
39	UPS	i) Emerson. iii) Chloride. iv) Schneider/APC./Numeric
40	CCTV	Indigovision / Pelco / Axis/ Genetec/ OEM as Recommended.
41	Displays	SAMSUNG/ Sony
42	Server	Dell/ HP/ IBM/Lenovo.
43	Image capturing camera	Sony/ Samsung/ Kodak/Logitech.
44	Network Switch, Media converter/ SFP module, wifi module.	Cisco/Allied Telesis/HP/Juniper.
45	Fiber optic cable and passive FO Networking components/ accessories including LAN cable/ connectors (CAT6, RJ45 connector etc.).	Universal cables Ltd./ Systimax/ Tyco/ Finolex/ Molex/ ABB/ D-Link/ Allied Telesis/ Digilink/ Sterlite/ Neolex/ Delton/RiT Tech.

NOTES:-

1. All materials shall be of the best quality with `ISI' marking. The first brand name specified to be considered while filling up the tender. In case the considered brand is not available, then Contractor to take permission form Client / Architect / PMC for using the other specified brand.
2. The Client reserves the right to accept or reject any materials as and when necessary.
3. All materials are subject to physical check and approved by the Client / PMC before Execution

ANNEXURE 2-1-8
PREAMBLE TO BILL OF QUANTITIES

1. The rate shall need to include all necessary Structural steel supports, frames, making holes in the RCC structures, making foundation/structural fabricated stand (duly applied with 2 coat of Red- Oxide anti-corrosive paint), fire seals and giving rough finish for plastering where the chasing of wall are done that may be required to suit site conditions or stability of the items. Decision of consultant regard to the need for such additional support shall be final.

3. The rate shall also include the interconnecting cables/wire/cable trays/terminations as well.
4. All the items shall include required scaffolding, ladders, temporary supporting, machinery & equipment.
5. If contractor quotes different rates for execution in different Areas for the same item, the lowest of the quoted rates shall be considered for comparison of bid and payment for work done.
6. In case of non-availability of any specified manufacturers materials, the contractor shall submit samples of materials, catalogues, necessary test certificates with a covering letter to that effect for consultants and owners approval allowed, necessary price reduction as per consultant's scrutiny shall be passed on to the client as applicable.
7. It is required to highlight here that the any minor civil work related to this shall need to be done by this contractor including the civil foundations, breaking of walls etc.,
8. Structural plat form required for the all the works to be considered while the same design shall be approved by the Structural consultant appointed by the client for the buildings' stability and point load being given by this vendor.
9. Vendor to include shifting of the all equipment to its respective place including the cost of lifting through crane etc., as required based on the given locations and no separate payment shall be made.
10. Seamless co-ordination is required between this bidder with all the other services vendor at no extra charges.
11. It is the responsibility of this contractor to send the catalogues of the products being controlled through BMS or other to the BMS vendor or to the respective vendor and get it approved for its compatibility with the BMS prior to placing of the order with others and to ensure that the only compatible products are ordered and brought in and installed. And if the products brought found to be non-compatible then it's the sole responsibility of this contractor to replace it at free of cost immediately and please ensure that the products associated with BMS are approved and signed by the BMS vendor.
12. It is required to highlight here that the any minor civil work related to this shall need to be done by this contractor including the civil foundations, breaking of walls etc.,
13. Structural plat form required for the all the works to be considered while the same design shall be approved by the Structural consultant appointed by the client for the buildings' stability and point load being given by this vendor.
14. Vendor to include shifting of the all equipment to its respective place including the cost of lifting through crane etc., as required based on the given locations and no separate payment shall be made.
15. Seamless co-ordination is required between this bidder with all the other services vendor at no extra charges.

16. Service contractor of the given building shall need to visit the site where this building (being tendered) is going to be made and analyse and locate all existing services under this proposed building boundary and do the following.

- Identify the existing services
- Prepare the drawings for existing services
- Workout alternate route to divert the existing service to connect to the existing nearest infra lines (may be storm, sewer, water line (flushing, domestic, irrigation etc.,), electrical, LV service, HT service as applicable
- Prepare final As-built dwg and submit it to consultants, architect, client, Project managers and get it approved prior to re-route executions works
- Any other activity required in terms of diversion of existing services as required, as directed by Engineer-In-Charge.

17. Vendor to include all supports, saddle/spacers, mounting accessories, fittings etc., as required for conduiting works as part of the conduit length quote only

2.1 **TECHNICAL SPECIFICATIONS**

(Electrical, ELV System Works)

2.1-1 **M V SWITCHGEAR & POWER PANEL**

1.0 Scope

1.1 The scope of work shall cover the supply, installation, testing and commissioning of all power panels, incorporating circuit breakers, switch fuses, bus-bars, interconnections, earthing etc., meeting the requirements shown in the data sheets & drawings and specifications. This specification is intended to cover the design, manufacture, assembly, testing at manufacturer's works. Wooden packed for transportation complete in all respects with all components, fittings and accessories for efficient and trouble-free operation.

1.2 HANDLING/UNLOADING

1.2.1 Switchgears and all its accessories shall be handled/unloaded carefully in its upright position as indicated in the packing case. Lifting lugs and jacking pads shall be used for lifting of the switchgear. While using jacking pads utmost care shall be taken in proper application of jacks. Where switchgears is dragged or pulled on sleeper or rollers of the traction eyes provided at the bottom frame shall be used with suitable wire ropes and shackles.
Unloading from the lorry shall be carried out using a mobile crane or tripod with chain pulley block or rolling over to a platform

1.3 STORAGE

1.3.1 Equipment's shall be stored under shelter in a well-ventilated, dry place and covered by suitable polythene or tarpaulin covers for protection against moisture

1.4 TERMINAL BLOCKS

1.4.1 Terminal blocks shall be of 660 Volts grade of stud type. Insulating barriers shall be provided between adjacent terminals. Suitable provision shall be made to terminate control/power connections in the respective module. Terminal blocks shall have a minimum current rating of 10 Amps and shall be shrouded. Provisions shall be made for label inscriptions. The wire termination's to the blocks shall be of screw type suitable for crimp type socket.

1.5 NAME PLATE

1.5.1 The panel as well as feeders compartments shall be provided with name plate of anodized aluminium, with white engraving on black background. They shall be properly secured with self-tapping screws at the top of the cubicles. The panel/feeder descriptions shall be as indicated in the drawings. The size of the nameplates shall be proportionate to the respective equipment's

2.0 Standards & Codes

2.1 The following standards and rules shall be applicable:

1) IS: 13947 Switchgear & Control gear

2) Indian Electricity Act and Rules

All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Codes of Practice in the absence of corresponding Indian Standards

3.0 Air Circuit Breakers

3.1 Air circuit breakers shall be air break horizontal draw out type fully interlocked and meeting the requirements of Indian Standards. Breakers shall be rated for a medium voltage of 600V and rated full load amperes as indicated on drawings. Breakers shall be capable of making and breaking system short circuits specified.

3.2 Breakers shall be, unless specified otherwise, manually operated, complete with front-of-the-panel operating handle, isolating plugs with safety shutters, mechanical ON/OFF indicator, silver plated arching and main contacts, arc chutes and trip free operation. Breakers shall be capable of being racked out into 'Testing', 'Isolator' and 'Maintenance' position and kept locked in any position. Breakers for remote and automatic operation shall be motor operated spring charged with closing and trip coils.

3.3 The ACBs shall be Ics = Icu = Icw for 1sec for short circuit breaking capacity of not less than 50KA rms at 415 Volts 50Hz AC.

3.4 The ACBs shall be fully rated at ambient temperature of 43.5 deg c or the max temperature expected for the given project city. There shall not be any derating in panel temperature of 55 deg c. even in case of non-ventilated switchboards.

4.0 MCCB's

4.1 Moulded case circuit breakers shall be standard products of established manufacturers. Breakers shall be rated for system short-circuit levels and if unavoidable, backed up by HRC fuses. Breakers shall incorporate thermal and magnetic trips, unless shown otherwise. Thermal trips shall be adjustable according to the feeder rating and magnetic trips shall be fixed upto 100Amps and adjustable above 100 Amps.

4.1.1 MCCBs should have breaking capacity of (Ics) of not less than 50 KA rms at 415Volts 50 Hz AC. The service breaking capacity should be equal to ultimate breaking capacities (Icu). (i.e. Ics = Icu = 100%)

4.2 Miniature Circuit Breakers [MCB]

4.2.1 MCB shall be in 1, 2, 3 or 4, pole with B/C/D Curve as specified and versions shall be ISI marked. MCB casing shall be made of self-extinguishing, tropicalized material.

4.2.2 MCB shall comply with IS 8828-1996/IEC 898-1995. It shall be suitable for use in frequency range 40Hz to 60Hz and shall accommodate AC/DC supply according to requirements. It shall have a trip-free mechanism and toggle shall give a positive contact indication. It shall be suitable for mounting on 35mm DIN rail/surface mounting.

4.2.3 Line supply may be connected to either top or bottom terminals i.e. there shall be no line-load restriction. MCB shall be supplied with clamping terminals fully open. Contact closing shall be independent of the speed of the operator. The breaking capacity of the MCB shall be 10kA. The MCB shall be capable of being used as Incomer Circuit Breaker and shall be suitable for use as an isolator.

4.2.4 All MCBs used on UPS circuit shall be D-Curve only. MCBs for general lighting shall be C Curve and for heating loads like heater / geysers / socket outlet shall be B curve.

4.2.5 The terminals shall be protected against finger contact to IP2X Degree of protection to provide total safety to operating personnel.

4.2.6 The breaking capacity (Icn) shall be 10 kA at 415 VAC.

5.0 Switch Fuse Units & Disconnectors

5.1 Switch fuse units shall have quick-make; quick-break silver plated preferably double break contacts with operating mechanism suitable for rotary operation in the case of cubicle mounting.

All switches shall be rated according to the equipment schedule or drawings and shall withstand the system prospective fault current let through. Cam operated rotary switches with adequate terminal adaptors up to 25 A are acceptable but for all higher rating switch fuse units shall be heavy duty type.

5.2 Fuses shall be HRC cartridge type conforming to IS: 2208 with a breaking capacity corresponding to system fault level. Fuses shall be link type with visible indication. Screw type dazed fuses are not acceptable for any ratings.

5.3 All disconnecting isolators shall consist of switch units quick-make, quick-break type with silver plated contacts. The switches shall preferably have double breaks. The switches shall preferably have sheet

steel enclosure, which in turn is mounted on suitable angle iron frame work. In wet locations switches shall have cast iron enclosures. Disconnects shall have a minimum breaking capacity of 5KA at 415 Volts

6.0 Power Monitors.

6.1 Power Monitor meters shall have dual metering system and shall be capable to sense the change of supply.

6.2 It shall have LCD display and it shall be compatible of RS485 and RS232.

6.3 It shall be capable of giving V, I, kW, Hz, Kwh, Power factor,, MD of the system.

6.4 Energy meters shall be electronic two element switch board mounting type suitable for unbalanced loads. In case of two incoming feeders, a summating C.T shall be provided with the power monitor.

6.5 It shall be capable of withstanding voltage and current distortions.

6.6 Ammeters and voltmeters shall be electronic digital type. Meters shall conform to BS: 89 and have grade 'a' accuracy. Scale ranges shall meet with the requirements or as indicated on the drawing or in the Data Sheets.

6.7 The energy meters for DG Set & Transformers shall be calibrated and got certified by the respective Electricity Authority. Vendor to note that the calibration certificates of all the meters installed shall provided to the client and do the necessary calibration at site after installation and get it approved by authorized agency. It shall also be noted that there shall provision for online calibration using Master calibrator

7.0 Cubicle Boards

7.1 All boards shall be combination of 14 & 16 SWG sheet steel, free standing, extensible, totally enclosed, dust tight, vermin-proof cubicle, flush dead front and of modular construction suitable for 3 phase 415V 4 wire 50 Hertz system. All boards shall be accessible from the front or as shown on Dwgs and specified in the equipment data sheet, for the maintenance of switch fuses, busbars, cable terminations, meters etc. Cables shall be capable of entering the board both from top as well as bottom. All panels shall be machine pressed with punched openings for meters etc. All sheet steel shall be rust inhibited through a process of degreasing, acid pickling, phosphating etc. The panels shall be finished with powder coating of approved colour applied over a primer. Engraved plastic/printed labels shall be provided indicating the feeder details, and capacity and danger signs.

7.2 The boards shall accommodate air insulated bus bars, air circuit breakers, mccb's switch fuse units with HRC fuses, starters, necessary meters, relays, contactors etc. as required and arranged in suitable tiers. All breakers and switch fuses shall be suitably de-rated taking into account specified ambient temperature and ruling temperature inside the cubicle.

7.3 The switch board shall be fully compartmentalized in vertical tiers housing the feeder switches in totally enclosed independent compartments. Each compartment shall be self sufficient with switch unit, fuses, contactors, relays, indicating lamps and an inter-locked door with facility for padlocking.

7.4 Each switch or MCCB or ACB shall have provision for locking in the OFF position for life safety. Each feeder must terminate in an independent labelled terminal block. Strip type terminal block accommodating several feeders together is not acceptable. Pressure clamp type terminals suitable for aluminium wires may be used upto switches of 25A and cable lugs for higher ratings. All terminations shall be shrouded in an approved manner. The entire enclosure shall meet with IS: 2147/1962. Feeder connections shall be of solid insulated copper/aluminium wires or strips with bimetallic clamps wherever required and if insulated, the insulation shall be able to withstand the high temp at the terminals. Internal wiring, bus bar markings etc. shall conform to IS:375/1963. Internal wiring shall have terminal ferrules.

7.5 Main switch should be at an easily accessible height and the highest switch operating handle should not be over 1.75M from floor level. Cable glands shall form part of the switch board.

8.0 Bus bars shall be three phase and neutral and of Aluminium/Copper as specified and shown on drawings and rated for a temperature rise of 30 deg C over the ambient temperature specified, (IS:8084-1976). Neutral bars may be of one half the size of the phase bars or as shown on drawings. The main horizontal bus bars shall be of uniform cross section and rated for the incoming switch. The vertical bus bars for the feeder columns may be rated at 75% of aggregate feeder capacity and shall be uniform in size. Bus bars and interconnections shall be taped with PVC colour coded tape to prevent bar-to-bar accidental shorts. Each bus bar shall be directly and easily accessible on removal of the front cover. Bus bars shall be totally enclosed, shrouded and supported on non-hygroscopic insulator blocks to withstand thermal and dynamic overloads during system short circuits.

9.0 Isolators

9.1 Isolators shall be fixed on wall on self-supported angle iron frame work as required and mounted as near to the motor as possible. Where several motors are installed, isolators if required shall be provided at a central location on a common frame work.

9.2 Painting, earthing and labels shall be provided as generally indicating for MV Switchgear and shown on drawings

10.0 Earthing

10.1 Protective earthing shall be provided as shown on drawings or as follows:

Phase conductor	Protective conductor
upto 16 sqmm	equal size
16 to 35 sqmm	16 sqmm
over 35 sqmm	50% of phase conductor

In case of dissimilar materials the Protective Earth Conductor shall be suitably sized for equal conduct

10.1 Protective earthing of each switch shall be connected to the earth bar.

10.2 Protective earthing shall be provided as shown on drawings or as follows:

Phase conductor	Protective conductor
upto 16 sqmm	equal size
16 to 35 sqmm	16 sqmm
over 35 sqmm	50% of phase conductor

In case of dissimilar materials the Protective Earth Conductor shall be suitably sized for equal conductance.

10.3 Protective earthing of each switch shall be connected to the earth bar.

11.0 Installation

11.1 All panels shall be supported on MS channels incorporated in the panel during the fabrication. All such supports shall be prime coated with two finish coats after completion of the work. All panels shall be touched up for damaged painting.

11.2 All panels shall be meggered phase to phase and phase to neutral using a 1000V megger with all outgoing feeders in closed position. The meggar value should not be less than 2.5 mega-ohms between phases and 1.5 mega-ohms between phases and neutral.

11.3 Fabrication drawings of all panels shall be approved by the Consulting Engineers before fabrication

12.0 Testing & Inspection

12.1 All switch boards shall be factory inspected by the Design Consultant / PMC / Client before finishing and dispatch unless waived.

12.2 Certificate for all routine and type tests for circuit breakers in accordance with the IS:2516-1963 shall be furnished. In addition, all panels shall be meggered phase to phase and phase to phase neutral, using a 1000V meggar with all switchgear in closed position. The meggar value should not be less than

2.5 mega-ohms between phases and 1.5 mega-ohms between phase and neutral.

12.3 All energy meters shall be calibrated and tested through secondary injection tests.

12.4 All field tests shall be witnessed by PMC/Consultants and recorded unless waived. All Panels to be tested at manufacturing site prior to dispatch in presence of Rep. of Owner & Consultant, for which all expenses to be borne by the Contractor

13.0 Mode of measurement

13.1 Each panel will be considered as one unit for the purpose of measurement and shall include the following:

i) Incoming and Outgoing feeders.
ii) Interconnections and controls and instrument wiring with necessary protective fuses.
iii) ays, Indicating lamps, CT's control fuses etc.
iv) Supporting structure, sheet steel enclosure
v) Installation and testing

13.2 Isolators shall each be measured as one unit complete with:

i) mounting frame
ii) switch/fuse

13.3 Protective earthing of the panel/Isolator from the equipment earthing system will be measured separately and paid at unit rates.
13.4 Outgoing and incoming feeder terminations will be paid at the unit rates separately as specified under cabling.

2.2-2 DISTRIBUTION BOARDS

1.0 Scope

1.1 The scope of work shall cover the supply, installation, testing and commissioning of lighting and power distribution boards. Associated minor civil works required for the erection of the DB's such as opening in wall etc. are also included in the scope of this contract.

2.0 Standards

2.1 The following standards and rules shall be applicable

1)	IS:2675-1983	Enclosed distribution fuse boards and cut-outs for Voltages not exceeding 1000V.
2)	IS:375-1963	Marking and arrangement of Switchgear bus-bars main connections and auxiliary wiring.

3)	IS:8828-1978	Miniature circuit Breakers
4)	IS:2607-1976	Air break Isolators for voltages not exceeding 1000V.
5)	IS:9926-1981	Fuse wire used in Rewireable type Electric fuses up to 650 volts.

Indian Electricity Act 1910 and rules issued there under.

3.0 Distributions boards along with the controlling MCB's or Isolator as shown shall be fixed in a mild steel Box with hinged lockable door suitable for recessed mounting in wall. Distribution boards shall be made of 16 SWG sheet steel duly rust inhibited through a process of degreasing, acid pickling, phosphating and powder coated to an approved colour over a primer. Factory made with approved make of DBs of standard ready made to suit the given configuration in standard compliance to specification is also accepted subject to approval.

3.1 All components shall be mounted on DIN rails and covered totally with a sheet steel cover rendering it finger-safe. Access to the internal connections shall be only through removing the cover sheet.

3.2 Three phase boards shall have phase barriers and a wire channel for internal wiring. All DB's shall be internally prewired using copper insulated high temperature PVC wires brought to a terminal strip of appropriate rating for outgoing feeders.

3.3 Conduit knockouts shall be provided as required/shown on drawings and the entire board shall be rendered dust and vermin proof with necessary sealing gaskets.

3.4 Pole on the breaker shall be provided with inverse time thermal over load and instantaneous over current tripping elements, with trip-free mechanism. In case of multipole breakers, the tripping must be on all the poles and operating handle shall be common. Breakers must conform to IS 8828 with facility for locking in OFF position. Pressure clamp terminals for stranded/solid conductor insertion are acceptable upto 4 sq mm Aluminium or 2.5 sq mm copper and for higher ratings, the terminals shall be suitably shrouded. Wherever MCB isolators are specified they are without the tripping elements.

3.5 Fuses shall be HRC link type or rewireable with necessary fuse carriers and with S.C rating of not less than 50 KA. Bottle type fuses are not acceptable. Fuse carrier terminals shall be suitably shrouded. Re-wirable fuse carriers shall be porcelain.

3.6 Boards shall meet with the requirements of IS 2675 and marking arrangement of busbars shall be in accordance with IS 375. Bus Bars shall be of copper and rated for the incomer switch rating and sized for a temperature rise of 30 deg. C over the ambient. Neutral and earth bars shall be of copper and rated as follows:
There shall be one earth terminal for single phase boards and 2 for 3 phase boards. Circuit diagram

indicating the load distribution shall be pasted on the inside of the DB as instructed

3.7 In the case of MCB distribution boards, the backup fuses wherever shown shall be not less than 63A with a delayed characteristic and a minimum pre-arcing time of 0.5 sec. at 9 KA fault current.

3.8 All outgoing feeders shall terminate on a terminal strip which in turn is pre-wired to the MCB/Fuse base by means of insulated single conductor high temperature PVC copper wires as follows:

LDB's		2.5 sqmm
PDB's Upto	15A	4.0 sqmm
	25A	6.0 sqmm

3.9 Each DB shall have indicating lamps preferably neon type denoting power availability in the board after the switch. Indicating lamps shall be complete with fuses.

3.10 In the case of Dimmer DB's, the DB's shall incorporate the Dimmer panels as a part of the DB generally as shown on drawing and as approved

4.0 Installation & Testing

4.1 All distribution boards shall be mounted on wall or recessed, with necessary angle iron frame work. All mounting frames shall have one prime coat and two finish coats after the completion of the work. All distribution boards shall be touched up for damaged painting.

4.2 All boards shall be meggared phase to phase and to neutral using 1000V megger with all switches in closed position. the megger value should not be less than 2.5 mega-ohms between phases and 1.5 mega-ohms between phase and neutral.

4.3 GA drawings of all panel boards shall be approved by the design Consultants before fabrication and the boards inspected before dispatch, unless waived in wiring.

5.0 Mode of measurement

5.1 The distribution board complete with the various components specified, indicating lamps, supporting frame, internal wiring, erection etc., will be treated as one unit for the purpose of measurement and payment.

2.2-3 MEDIUM VOLTAGE CABLING

1.0 Scope

This specification covers the technical requirements of supply, laying, testing and commissioning of Heavy duty medium voltage cables up to 1100 Volts for power, control and lighting application for efficient and trouble free operation. The cable shall be properly packed for transportation, supply and delivery at site.

2.0 CODE AND STANDARDS

The materials covered by this specification shall unless otherwise stated as designed, constructed, manufactured and tested in accordance with latest revisions of the relevant Indian Standards.

IS 7098 (Part I) : XLPE insulated cables for working voltages up to and including 1000 V.

IS 5831 - 1984 : PVC insulation confirming to requirement of ST2 compound for Outer sheath of electric cables. IS 8130 - 1984 : Conductors for insulated electrical cables.

1) IS: 1554 Parts I & II

RATING: The cable shall be rated for a voltage rating of 1100 Volts and to a max. voltage drop of 3% of specified 415V Voltage and 15% during starting.

3.0 Cables

3.1 All cables shall be 1100 Volt grade PVC insulated, FRLS, sheathed with or without steel armouring as specified and with an outer PVC protective sheath. All cables shall be normal PVC 1100 volts grade cables and meet, ASTM norms for the smoke density and Oxygen Index norms. Cables shall have high conductivity stranded aluminium or copper conductors and cores colour coded to the Indian Standards.

3.2 All cables shall be new without any kinks or visible damage. The manufacturers name, insulating material, conductor size and voltage class shall be marked on the surface of the cable at every 600mm centres.

4.0 Installation

4.1 Cables shall be laid in the routes marked in the drawings. Where the route is not marked, the contractor shall mark it out on the drawings and also on the site and obtain the approval of the Architect/Consultant before laying the cable. Procurement of cables shall be on the basis of actual site measurements and the quantities shown in the schedule of work shall be regarded as a guide only.

4.2 Cables, running indoors shall be laid on walls, ceiling, inside shafts or trenches. Single cables laid shall be fixed directly to walls or ceiling and supported at not more than 500 mm. Where numbers of cables are run, necessary perforated cable trays shall be provided wherever shown. Perforated cable trays shall be mild steel or Aluminium as specified in the schedule of work. Perforated trays shall not be directly suspended but supported on mild steel frame work as shown on dwgs. or as approved. Cables laid in built-up trenches shall be on steel supports. Plastic identification tags shall be provided at every 30m.

4.3 Cables shall be bent to a radius not less than 12 (twelve) times the overall diameter of the cable or in accordance with the manufacturer's recommendations whichever is higher.

4.4 In the case of cables buried directly in ground, the cable route shall be parallel or perpendicular to roadways, walls etc. Cables shall be laid on an excavated, graded trench, over a sand or soft earth

cushion to provide protection against abrasion. Cables shall be protected with brick or cement titles as shown on dwgs. Width of excavated trenches shall be as per drawings. Backfill over buried cables shall be with a minimum earth cover of 900mm. The cables shall be provided with cable markers at every 35 meters and at all loop points.

4.5 The general arrangement of cable laying is shown on drawings. All cables shall be full runs from panel to panel without any joints or splices. Cables shall be identified at end terminations indicating the feeder number and the Panel/Distribution board from where it is being laid. All cable terminations for conductors upto 4 sqmm may be insertion type and all higher sizes shall have tinned copper compression lugs. Cable terminations shall have necessary brass glands and all joints shall be double compression type whether so specified or not. The end terminations shall be insulated with a minimum of six half-lapped layers of PVC tape. Cable armouring shall be earthed at both ends

5.0 Testing

5.1 MV cables shall be tested upon installation with a 500V Meggar and the following readings established:

1) Continuity on all phases
2) Insulation Resistance
(a) between conductors
(b) all conductors and ground

All test readings shall be recorded and shall form part of the completion documentation.

6.0 Mode of measurement

6.1 Cable will be measured on the basis of a common rate per unit length indoor or outdoor and shall include the following:
For cables laid indoors:

i) Cables and clamps
ii) Installation, commissioning and testing
iii) Cable marking
OR

For cable buried under-ground:

i) Cables and protective bricks & tiles
ii) Installation, commissioning & testing
iii) Cable markers

6.2 Cable trays/racks will be measured on the basis of unit length for individual sizes and shall include

i) MS powder coated cable tray of 2mm thickness and 50 mm in height with GI supports and accessories.
ii) Installation and painting in 2 coats of black bituminous paint on one coat of red oxide primer

6.3 Each cable termination will be measured as one unit for payment. Certain cable sizes are grouped together and rates shall be furnished against each group. The item shall include the following:

i) Lugs, glands, bolts, nuts
ii) All jointing materials
iii) Installations, testing and commissioning
iv) Earthing the glands

6.3 For cables buried under ground excavation shall be paid for additionally for the following per unit volume:
i) Excavation and back filling
ii) 6" Soft Earth Cushioning below and above cable
The cost of laying protective tiles shall be part of cable cost as stated above.

2.2-4 CONDUIT WIRING

1.0 Scope
1.1 The scope of work shall cover supply, installation testing and commissioning of all conduit wiring.

2.0 Standards
2.1 The following standards and rules shall be applicable:

1)	IS : 732	Code of Practice for Electrical wiring installation (System voltage not exceeding 650V)
2)	IS : 1646	Code of Practice for fire safety of building (General) Electrical Installation.
3)	IS : 1653	Rigid steel conduits for electrical wiring
4)	IS : 2667	Fittings for rigid steel conduits for electrical wiring
5)	IS : 3480	Flexible steel conduits for electrical wiring
6)	IS : 3837	Accessories for rigid steel conduit for electrical wiring
7)	IS :694	PVC insulated cables
8)	IS : 2509	Rigid non-metallic conduits for Electrical wiring
9)	IS : 6946	Flexible (Pliable) non-metallic conduits for electrical installation
10)	IS : 1293	3 pin plugs and sockets
11)	IS : 8130	Conductors for insulated electric cables and flexible cord
12)	IS : 9537 -	Specification for conduits for Electrical installations 1980

13) Indian Electricity Act 1910 and rules issued there under.

14) Regulations for the electrical equipment in buildings issued by the Tariff Advisory Committee of the Insurance Association of India.

2.2 All standards and codes mean the latest

3.0 Rigid and Flexible conduits

3.1 Conduits can be

i) mild steel - black enameled

ii) mild steel – galvanized

Rigid and hard PVC as specified and required by the schedule of work. Wall thickness in each case shall be as follows:

	Steel Black enameled	Galvanized	PVC
(a) Upto 40 mm dia	1.4	1.4	2.0 mm
(b) Over 40 mm dia	1.6	1.6	2.0 mm

3.2 PVC conduits when specified shall be used only where the conduits are embedded in concrete or wall chases with adequate cover.

3.3 Flexible conduits shall be halogen free PVC flexible of LAPP-KABEL along with suitable fittings

4.0 Accessories

4.1 Conduit fittings such as bends, elbows, reducers, chase nipples, split couplings, plugs etc. shall be heavy duty specifically designed and manufactured for their particular application. All conduit fittings shall conform to IS : 2667-1964 and IS : 3887-1966. Wherever galvanized conduits are specified in the schedule of work, the fittings also shall be galvanized. In the case of PVC conduits, heavy duty PVC fittings shall be used.

5.0 Wires

5.1 All wires shall be single core multi-strand copper halogen free. PVC insulated to IS : 694 and shall be 1100V grade as specified and required in the schedule of work.

5.2 All wires shall be colour coded as follows

Phase	Colour of wire
R	Red
Y	Yellow
B	Blue

N	Black
Earth	Green (insulated)
Control (if any)	Grey

6.0 Switches & Sockets

Switches shall be moulded plate type of modular design with silver-plated contacts. Sockets shall be universal 5 pin shuttered type ith switch and plate type cover. All switch & socket mounting boxes shall be 1.4mm thick galvanized steel or PVC specially made for the switches and sockets used. Combination of multiple switch units and sockets should be used in appropriate manner to minimize the switch boxes. All items specification should be 1st preference as per Drawing, Bill of quantities, And technical specification. Any deviation will find , contactor have take pre approval before procurement

INSTALLATION OF SWITCHES, SOCKETS AND ACCESSORIES

All the switches shall be wired on phases. Connections shall be made only after testing the wires for continuity, phase etc. with the help of megger. Regulators shall be fixed on adjustable MS flat straps inside the enclosure. The arrangement of switches and sockets shall be neat and systematic. Covers for enclosures accommodating switches, sockets etc. (point control boxes) shall be of modular type and fixed to the enclosure in plumb with counter sunk head. Outlets shall be terminated into a flush type fan box for fan points. For wall plug sockets, the conductors may be terminated directly into the switches and sockets. The outlets point control boxes etc. shall be set out as shown on the drawings. Before fixing these, the contractors shall obtain clearance from the client / consultant with regard to their proper locations. The enclosures of sockets/and 3rd pin of the sockets shall be connected to the ground through an earth continuity wires, as specified

POINT WIRING

Point wiring shall commence from the first point control box/local control box for the points connected to the same circuit. Point wiring for lights, ceiling and exhaust fans, 5A sockets, call bells etc. shall be carried out with 1100 V Grade FRLS, PVC insulated wires. The point wiring shall be inclusive of conduits of not less than 20 mm size or as specified in the boq, modular switches, wiring along with conduit accessories such as bends, inspections bends, reducers, pull boxes,junction boxes, switch boxes, fan boxes, covers etc. together with wiring accessories such as ceiling roses, brass lamp holders, T.W Blocks, loose wires up to 1 Mtr. Long (in false ceiling areas only) at outlet end connectors point control boxes (enclosure for electrical accessories) switches, etc. Point wiring shall be provided with earth continuity wire as specified for earthing 3rd pin of sockets, luminaries and fan fixtures. Light control shall be either single, twin or multiple points controlled by a switch, as specified.

The point wiring for Light/Fans/5A sockets etc. shall include the supply and installation of all materials specified above. Any item not specifically included but required for satisfactory completion of the point wiring shall also be included. No separate extra price will be allowed for any item under point wiring. A dependent socket point shall mean the combination 5A switch socket outlet/point mounted on the same switchboard as any other point/points and shall include the 5A switch and socket. The fan point shall be complete with fan hook box flush mounted in slab, control switch mounted in switch box and electronic regulator, complete with cover. The measurement will be numbers of each kind of point and as specified in Schedule of Quantities.

6.1 Weather and water proof switches / sockets of approved make shall be used in all out door situations and

bath rooms.

6.2 For heavy duty industrial applications, industrial type of sockets with a pad lockable switch in a suitable galvanized steel box/fire retarded toughened plastic box shall be used.

7.0 Installation

7.1 The size of conduit shall be selected in accordance with the number of wires permitted under table given below. The minimum size of the conduit shall be 20 mm dia unless otherwise indicated or approved. Size of wires shall be not less than 1.5 mm copper, but shall be as specified in the schedule of work

Nominal dia of wires (mm)	Nominal Cross sec. area (sqmm)	20 mm		25 mm		32 mm		38 mm	
		S	B	S	B	S	B	S	B
½.40	1.50	4	3	8	6	15	9	-	-
1/1.80	2.50	4	2	6	4	10	8	-	-
1/2.24	4.00	2	2	4	3	8	6	-	-
1/2.80	6.00	1	-	4	3	6	6	-	-

7.2 Conduits shall be kept at a minimum of 100 mm from the pipes of other non-electrical services.

7.3 Separate conduits / raceways shall be used for each of the following:

1) Normal lights and 5A 3 pin sockets on same lighting circuit
2) Power outlets - 10A or 16A or 20A industrial outlets.
3) Telephones
4) Fire alarm system, Public address system.
5) Call bell wiring from switch to bell point.

7.4 Shop drawing for Conduit layout shall be prepared by the contractor taking into account the site conditions and got approved from Design Consultant before proceeding with the work. Wiring for short extensions to outlets in hung ceiling or to vibrating equipments, motors etc., shall be installed in flexible conduits. No flexible extension shall exceed 1.25m in length.

7.5 Conduits run on surfaces shall be supported on galvanized steel 6 mm thick saddles which in turn are properly screwed to the wall or ceiling. Saddles shall be at intervals of not more than 500 mm. Fixing screws shall be with round or cheese head and of cadmium plated brass. Exposed conduits shall be neatly run parallel or at right angles to the walls of the building. Unseemly conduit bends and offsets shall be avoided by using fabricated galvanized steel junction/pull through boxes for better.

7.6 Conduits embedded into the walls shall be fixed by means of staples at not more than 500 mm intervals. Chases in the walls shall be neatly made and refilled after laying the conduit and brought to the finish of the wall but final finish will be done by the building contractor.

7.7 Conduits embedded into the walls shall be fixed by means of staples at not more than 500 mm intervals.

Chases in the walls shall be neatly made of semi finish the pipe surface and refilled after laying the conduit and brought to the finish of the wall but final finish will be done by the building contractor

7.8 Inspection boxes shall be provided for periodical inspection to facilitate withdrawal and removal of wires. Such inspection boxes shall be flush with the wall or ceiling in the case of concealed conduits. Inspection boxes shall be spaced at not more than 12 meters apart or two 90 degree solid bends or equal. All junction and pull boxes shall be covered by 6mm clear Perspex plate truly cut and fixed with cadmium plated brass screws.

These junction boxes shall form part of point wiring or conduit wiring as the case may be including the cost of removing the Perspex cover for painting and re-fixing. No separate charges shall be allowed except where specially mentioned

7.9 Conduits shall be free from sharp edges and burs and the threading free from grease or oil. The entire system of conduits must be completely installed and rendered electrically continuous before the conductors are pulled in. Conduits should terminate in junction boxes of not less than 32mm deep and the termination shall be rigid with check nuts and a smooth bushing. No wires shall be exposed in any part of the installation.

An insulated earth wire of not less than 2.5 sq.m copper shall be run in each conduit as specified in the schedule of work

8.0 Lighting & Power Wiring

8.1 All final branch circuits for lighting and appliances shall be single conductor cables run inside conduits. The conduit shall be properly threaded and screwed into sockets, bends, junction boxes. No part of the wiring shall be open without a suitable conduit piping.

8.2 Branch circuit conductor sizes shall be as shown in the schedule of quantities and or drawings.

8.3 Final branch circuits shall preferably be kept in a separate conduit up-to the Distribution Board. No other wiring shall be bunched in the same conduit except those belonging to the same phase. Each lighting branch circuit shall be loaded conservatively so that the circuit current is substantially lower than the current carrying capacity of the conductor or as shown on drawings. Each conduit shall not hold more than three branch circuits.

8.4 Flexible cords for connection to appliances, fans and pendants shall be 1100V grade (three or four cores i.e. with insulated neutral wire of same size) with tinned stranded copper wires, insulated, twisted and sheathed with strengthening cord. Colour of sheath shall be subject to the Engineer's approval. The rate includes fixing & SITC of ceiling fan.

8.5 Looping system of wiring shall be used. Wires shall not be jointed. All the looping are taking from switch board to switch board

8.6 Control switches shall be connected in the phase conductors only and shall be 'ON' when knob is down. Switches shall be fixed in 3 mm thick galvanized steel boxes with cover plates as specified. Cadmium plated brass screws shall be used.

8.7 Power wiring shall be distinctly separate from lighting wiring. Conduits not less than 25 mm and wires not less than 2.5 sq.mm copper shall be used as specified in the schedule of work. Power outlets belonging to two phases shall maintain a minimum distance of 2.0m as per approved shop drawing

8.8 Every Circuit and point wiring shall be provided with identification ferrules and terminated with copper pin lugs at Switch board side and also DB side matching the drawings.

9.0 Testing

9.1 The entire installation shall be tested for:

a) insulation resistance

i) Between phases

ii) Between each phase and earth

b) Earth continuity and wire continuity test for point wiring, circuit wiring.

c) Polarity of single pole switches

No installation shall be commissioned unless and until the insulation resistance is 2.0 mega-ohms between phases and 1.0 mega-ohms between phase and neutral. All tests shall be witnessed by the Engineer-in-charge and attested.

A test certificate shall be submitted by the contractor for individual DB.

10.0 Mode of measurement

As per BOQ items

2.2-5 LIGHT FIXTURES

1.0 Scope

1.1 The scope of work shall cover the supply, installation and testing of LED light fixtures.

1.2 Where fixtures are supplied by client, the scope shall cover installation only with all the accessories as specified in the schedule of work.

2.0 Standards

2.1 The following standards and rules shall be applicable:

1) S 3646 – 1968---------- Code of practice for interior illumination.
2) IS 1913 – 1969---------- General and Safety requirements for electric lighting fittings.
3) IS 8030 – 1976---------- Luminaries for hospitals
4) Indian Electricity Act and Rules issued there under

All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Codes of Practice

3.0 General Requirements

3.1 All fixtures shall be complete with accessories and fixings necessary for installation whether so detailed under fixture description or not.

3.2 Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box or fixture opening.

3.3 Fixtures shall be installed at mounting heights as detailed on the drawings or instructed on site by the Architects/Consultants and individually earthed with 2.5 Cu wire.

3.4 Fixtures and/or fixture outlet boxes shall be provided with hangers to adequately support the complete weight of the fixture. Design of hangers and method of fastening other than shown on the drawings or herein specified shall be submitted to the Architect/Consultant for approval.

3.5 Pendant fixtures within the same room or area shall be installed plumb and at a uniform height from the finished floor. Adjustment of height shall be made during installation as per Architect's/Consultant's instructions.

3.6 Flush mounted and recessed fixtures shall be installed so as to completely eliminate light leakage within the fixture and between the fixture and adjacent finished surface.

3.7 Fixture mounted on outlet boxes shall be tightly secured to a fixture stud in the outlet box. Extension pieces shall be installed where required to facilitate proper installation.

3.8 Fixture shall be completely wired and constructed to comply with the regulations and standards for Electric Lighting Fixtures, unless otherwise specified. Fixtures shall bear manufacturer's name and the factory inspection label unless otherwise approved.

3.9 Wiring within the fixture and for connection to the branch circuit wiring shall be not less than 1.5 sqmm copper for 250 volt application. Wire insulation shall suit the temperature conditions inside the fixture and wires bypassing the choke shall be heat protected with a heat resistant sleeve.

3.10 Metal used in lighting fixtures shall be not less than 22 SWG or heavier if so required to comply with the specification or standards. Sheet steel reflectors shall have a thickness of not less than 20 SWG. The metal parts of the fixtures shall be completely free from burrs and tool marks. Solder shall not be used as mechanical fastening device on any part of the fixture.

3.11 Ferrous metal shall be bonderized and given a corrosion resistant phosphate treatment or other approved rust inhibiting prime coat to provide a rust-proof base before application of finish.

3.12 Non-reflecting surfaces such as fixture frames and trim shall be finished in baked enamel paint.

3.13 Light reflecting surface shall be having a reflection factor of not less than 80%. All parts of reflector shall be completely covered by finish and free from irregularities. Finish shall be capable of withstanding 72 hours continuous exposure to an ultraviolet sun lamp placed 10 cm from the surface without discoloration, hardening or warping and retain the same reflection factor after exposure. Test results shall be furnished for each of fixtures.

3.14 Fixture with visible frames shall have concealed hinges and catches. Pendant fixtures and lamp holders shall be provided with ball type aligners or similar approved means. Recessed fixtures shall be constructed so as to fit into an acoustic tile ceiling or plaster ceiling plaster rings/flanges shall be provided for plaster ceiling. Fixtures with hinged diffuser doors shall be provided with spring clips or other retaining device to prevent the diffuser from moving.

3.15 Detailed catalogue cuts for all fixtures, or, if so required by the Architect/ Consultants sample fixtures shall be submitted for approval to the Architect/Consultants before orders for the fixtures are placed. Shop drawings for non-standard fixture types shall be submitted for approval to the Architect/Consultant.

3.16 Recessed fixtures shall be constructed so that all components are replace- able without removing housing from the ceiling.

4.0 Mode of measurement

4.1 Each fixture shall be measured as a unit complete with accessories, lamp, connectors, earthing, mounting arrangement, clamps etc.

4.2 Suspension stems for light fittings shall be measured as bare conduits and paid at the rate per unit length.

4.3 Where light fixtures and fans are supplied by the client, the installation shall be paid per unit and the cost shall include all suspension, and installation materials.

2.2-6 PROTECTIVE EARTHING

1.0 SCOPE

1.1 The scope of work shall cover earthing stations, laying G.I. / pipes and connecting the power panels, DBs and switchboards.

2.0 STANDARDS

2.1 The following standards and roles shall be applicable:

1) IS:3043 - 1966 Code of Practice for earthing.

2) Indian Electricity Act and Rules

2.2 All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Code of Practice..

3.0 Pipe-in-Pipe Earthing Station i.e. Safe Earthing Electrodes (ASHLOK)

3.1 The substation earthing shall be with copper plate earthing station unless otherwise specified.

3.1 The earthing station shall be as shown on the drawing. The two earth electrodes shall be 80mm & 40 mm dia GI pipes plate. The earth resistance shall be maintained with a suitable crystalline conductive materials and back fill compound.

3.2 The resistance of each earth station should not exceed 1 ohms.

3.3 The earth lead shall be connected to the earth pipe through copper/brass bolts.

3.4 The pipe-in –pipe earth station shall be as shown on the drawing and shall be used for equipment protective earth grid.

3.5 The earth electrodes shall be galvanized pipes 3.0 long with outer pipe 80 mm dia & inner pipe 40 mm dia. The outer pipe shall be plated with 100 microns & inner pipe shall be plated with 250 microns.

3.6 Crystalline Conductive material-Mixture of nature minerals and a chemical compound, highly conductive and non corrosive, which prevents the inner pipe from corrosion and dissipates the current evenly.

3.7 Back fill compound - Moisture retaining compound having 13 times more (Hygroscopic) water retaining capacity than its dry volume.

3.8 The earth lead shall be fixed to the pipe with a clamp and safety set screws. The clamps shall be permanently accessible

4.0 EARTH LEADS AND CONNECTIONS

4.1 Earth lead shall be bare copper or aluminum or galvanized steel as specified with sizes shown on drawings. Copper lead shall have a phosphor content of not over 0.15 percent.

4.2 All earth strip shall be jointed as follows:

Copper: Copper riveting with 80mm fish plate and brazing

Aluminium : Riveting with 2Nos 100mm long bimetal fish plates using copper rivets

Galvanised : Lap welding with 50mm minimum lap Steel

All strips shall be run on walls/beams with 6mm thick galvanised steel earth saddles at 500mm centre to centre as shown on drawings

5.0 EQUIPMENT EARTHING

5.1 All apparatus and equipment transmitting or utilising power shall be earthed in the following manner:

The protective earth continuity conductor may be drawn inside the conduit in which case, it should be insulated.

Copper earth wires shall be used where copper wires are specified. Aluminium wires may be used where aluminium phase wires are specified unless otherwise indicated in the schedule of work and drawings.

5.2 Metallic conduit shall not be accepted as an earth continuity conductor. A separate insulated/bare earth continuity conductor of size related to phase conductor shall be provided. Non-metallic conduit shall have an insulated earth continuity conductor of the same size as above. All metal junction and switch boxes shall have an inside earth stud to which the earth conductor shall be connected. The earth conductor shall be distinctly coloured (green) for easy identification.

5.3 Armoured cables shall be bonded to the earth by 2 distinct earth connections to the armouring at both the ends and the size of connection being as above. In multiple cables entering a panel/DB, the cable joints shall be bonded together using a bonding wire selected on the basis of the largest size of cable in the group.

In the case of unarmoured cable, an earth continuity conductor shall either be run outside along the cable or should form a separate insulated core of the cable. 3 Ph. power panels and distribution boards shall have 2 distinct earth connections of the size correlated to the incoming cable size. In case of 1 Ph. DB's a single earth connection is adequate. Similarly for 3 Ph and 1 Ph. isolating switches there shall be 2 and 1 earth connections respectively, sizes being correlated to the incoming cable.

5.4 3 Ph. motors and other 3 Ph. apparatus shall have 2 distinct earth connec-tions of size equal to incoming feeder size. For 1 Ph motor and 1 Ph apparatus, the single earth connections shall be provided of the above size.

6.0 ELECTRICAL INSTALLATION

6.1 All work shall be carried out in accordance with local Electrical Inspectorate, and IS Code of Practice 732. Reference to above codes, specifications and regulations shall mean the latest.

6.2 All materials used on the installation shall be new and of approved make. Tenderer should indicate makes of materials proposed to be used on the job

7.0 TESTING

7.1 The following earth resistance values shall be measured with an approved earth meggar and recorded the values should be less than 1 ohm

1) Each earthing station
2)System as a whole
3)Earth continuity

8.0 MODE OF MEASUREMENTS

8.1 Providing earthing station complete with excavation, electrode, watering pipe, soil treatment, masonry chamber with cast iron cover etc. shall be treated as one unit of measurement.

8.2 The following items of work shall be measured and paid per unit length covering the cost of the earth wires/strips clamps, labour etc.

(a) Main protective earth terminal and connections to the earthing stations
(b) Connections to the switchboard, power panels, distribution boards etc

8.3 The cost of earthing the following items shall become part of the cost of the item itself and no separate payment for earthing shall be made.

(a) Motors - earthing forming part of the cabling/wiring for the motors.
(b) Isolating switches and starters should form part of mounting frame, switch starter etc.
(c) Light fittings - form part of installation of the light fittings.
(d) Conduit wiring - should form part of the wiring
(e) Cable armouring - should form part of the cable termination.
(f) Street lighting - should form part of the external cable which shall incorporate a protective earth-conductor which shall be used for earthing of the pole etc.

2.2-7 LIGHTNING PROTECTION SYSTEM

1.0 SCOPE

1.1 The scope of work shall cover supply, installation and testing of air and earth terminations and down conductors. It also covers the supply and installation of aircraft warning lights.

2.0 STANDARDS

2.1 The following standards shall apply

1)	IS 2309 – 1989	Code of practice for the protection of buildings and allied structures against lightning(reaffirmed 1995)
2)	IS:3043 – 1966	Code of practice for earthing.
3)	IS:5216 - 1969	Safety procedures and practice in electrical work.

Indian Electricity Act 1910 and Rules issued thereunder. British Standard Code of Practice 326 - 1965.

2.2 All codes and standards means the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Codes of practice or the relevant British Standard Codes of Practice in the absence of Indian Standard.

3.0 AIR FINIAL

3.1 The air terminations may consist of point type air terminations or strip type or a combination.

3.2 The point type air termination shall be multiple point type of copper/brass material generally as shown on drawings. The stem and multipoint head shall be erected on the roof with a 150 x 150 x 6mm brass base plate with a threaded socket of the same material welded to it. The base plate shall be embedded in a concrete block to hold the elevation rod in a vertical position. The elevation rod shall be one single rod without any joints.

3.3 Strip type air termination shall consist of metal strips of not less than 3mm thickness run along the perimeter high points, stair housing, lift machine rooms, atrium sky lights, across the roof so that no point is more than 9m from the conductor. Conductors shall be of copper, aluminium or galvanised steel as shown on drawings and schedule of work. The installation of the strips shall be generally as per "PROTECTIVE EARTHING" strip.

4.0 DOWN CONDUCTOR

4.1 The down conductor shall follow the most direct path possible between the air termination and the earth termination generally as shown on the drgs. Sharp bends, upturns and kinks shall be avoided. The down conductor shall be clamped to the stem of the air termination by means of gun metal clamps for the point terminal and riveted to the strip terminal. Each down conductor shall have an independent earth termination. Minimum size of the down conductor shall be 25 x 3 copper or aluminum or galvanized steel as specified and shown on the drawing

4.1.1 The down conductor shall be clamped to the building outer wall at 600 mm centres. Joints in the down conductors shall be avoided as far as possible. However, joints shall not be made below ground level. Where joints are made care shall be taken so as to exclude any moisture. Bimetalic connectors shall be used where dissimilar metals are to be jointed. All joints shall be tinned, soldered or double riveted.

4.1.2 A testing link shall be provided for each down conductor. Testing links shall be of gun metal

5.0 EARTH TERMINATION

The earth terminals and earth leads shall be as specified for earth station and earthing leadsunder section 'EARTHING'.

TESTING

Suitable testing links be provided at required points as per the code of practice CP 326/IS 2309. The contractor shall carry out tests on completion of the installation and submit the readings for approval

6.0 MODE OF MEASUREMENT

6.1 Each point air termination shall be measured as one unit for payment and shall include:

i) Elevation rod and Multiple point head
ii) Base plate and concrete block
iii) Terminal connection
iv) Bimetallic connection, if any Strip conductors shall be measured per unit length.

6.2 Each earth terminations shall be measured as one unit for payment and shall include:

i) Electrode, lead wire & fixing accessories
ii) Soil treatment
iii) Excavation and refilling
iv) Masonry chamber and cast iron cover
v) Watering pipe

6.3 Earthing lead shall be measured on the basis of unit length for payment and shall include.

i) Earth lead, clamps and fixing accessories
ii) Excavation and corrosion treatment of the earth leads at the earth termination.
iii) Terminal connection at air and earth termination.

6.4 The wiring for each aircraft warning lights will be measured as one point for payment and shall include:
i) 3C 2.5 mm PVC insulated armoured cable, clamp and fixing accessories
ii) Junction box with cover, painting, control switch.
iii) Interconnections

2.2-8 RACEWAY/TRUNKING INSTALLATION

1.0 Scope

1.1 The scope of work shall cover supply and installation of floor raceways/Trunking. All minor civil work such as removing tiles and mortar etc. involved shall be covered in the scope of this contract.

2.0 Raceways

2.1 The raceway shall be fabricated out of heavy guage (14 Gauge) Galvanized sheet steel/Aluminium sheet openable/closed as mentioned in BOQ. The raceway shall comprise two compartments for carrying:

a) Data & Voice cables
b) Power cables

Sizes and compartments shall be as indicated on drawings and schedule of work/

2.2 Single compartment large size raceways are to be similar to the 2-compartment raceway. Such raceways are used as trunk feeders of electrical and data cables into the 2-compartment raceways. Fabrication and other construction details shall be similar. Such large raceways may be run above false ceiling duly supported by hangers.

2.3 All sheet steel shall be rust inhibited through a process of degreasing, acid pickling, phosphating etc. the raceway shall be finished with 2 coats of enamel paint over two coats of red oxide primer.

2.4 All the junction boxes, joints and right angle bends shall be prefabricated as per the details shown on the drawings or as per approved shop drawings.

3.0 Installation

3.1 The raceway installation shall comprise the following:

a) Marking on site
b) Chasing of floor to the required depth, including removal of tiles.
c) Leveling of surface using a thin layer of cement screed.
d) Placing of raceway and final leveling
e) Alignment of raceway and grouting of the left out portion.
f) Installation of extension box and SS cover plate.

3.2 The raceway layout shall be marked on the floor prior to the chasing and shall be got approved.

3.3 Proper care shall be taken to avoid choke up of raceways with cement screed

4.0 Data & voice cabling

4.1 Data and voice cables shall be Cat 6 laid in the raceways/conduit as specified. These cables shall be terminated in a Simplex/Duplex information outlet mounted on the furniture as instructed by the Engineer –in-charge. The cables shall be laid from the Jack or Patch panels in the communication room or closet upto the information outlet without any joint or splicing. Final cable runs from the under floor raceway to the information outlets shall be run in a galvanised steel flexible conduit neatly fixed on the furniture or run through the cable management system, if any

5.0 Mode of Measurement

5.1 The raceway system shall be measured as follows:

a) Supply of raceway complete with cover, blank plates, connecting flanges, right angle bends shall measured per unit length.

b) Installation of raceways as specified and shall be measured and paid per unit length including all right angle bends, joints, which shall be measured along the centre for determining the length.

5.2 Outlet junction boxes mounted over the raceway or on the side shall be measured per piece.

5.3 Laying Cat 5 and Cat 6 cable in the raceways and flexible conduits on the furniture shall be measured per unit length. Cost of flexible conduit for the final connection shall be included in the laying cost per unit.

5.4 Fixing of duplex information outlet on the furniture where outlet box with its back box are supplied by the owners.

5.5 Making end termination by AT&T authorised person shall be measured as one point.

5.6 Conduit rate shall be measured separately as per DWG.

2.2-10 TELEPHONE DISTRIBUTION SYSTEM

1.0 Scope

1.1 The scope of work shall cover supply, installation, commissioning and testing of :

i) Telephone cables
ii) Telephone Tag Blocks
iii) Telephone wiring in conduits

1.2 The telephone exchange and the hand sets shall be supplied by the clients.

2.0 Conduits

2.1 Conduits shall be as given below:

Indoor:

a) Surface run: Heavy gauge MS black enamelled.
b) Concealed: Heavy gauge MS black enamelled.
c) Recessed: Hard PVC conduit.

The conduits shall generally be as specified under section 'CONDUIT WIRING.'

3.0 Cables and Wires

3.1 The type of cables and the services shall be as follows:

INDOOR

i)	Laid on cable tray	Multipair, PVC insulated & armoured and sheathed of specified diameter
ii)	Inside conduit	CAT 6 UTP Cable

OUTDOOR Multipair PVC insulated jelly filled and armoured and with wires of specified diameter.

3.2 All multi pair cables and wires shall be of tinned copper conductor of not less than 0.5 mm dia. and shall be colour coded twisted pairs with rip cord.

3.3. The electrical characteristic shall be as follows: Conductor

Conductor (dia) mm	0.5 to 0.6
Loop resistance	190 ohm/km/ (max)
Insulation resistance	1500 Mega-ohms/km (max)
Capacitances unbalance	550 PF/km @ 1 Khz (pair/pair)

3.4 Cables laid underground or locations subject to dampness and flooding shall be filled with poly-ethene compound and shall have sufficient protection against moisture and water ingress and armoured as mechanical protection.

3.5 All armouring shall be of galvanized steel wires and protected against corrosion by an outer sheath of PVC in the case of indoor cables and polythene in the case of outdoor cables. Outer sheathing must be fire-retarding and anti-termite.

3.6 All armoured single core cables and inner sheath of armoured cables shall be provided with ripcord.

3.7 All single pair cable for final extension to the telephone outlet box shall be un-armoured tinned copper conductors of not less than 0.5 mm dia and shall be drawn in conduits. All telephone outlets shall consist of 2A 2 pair polythene connector in galvanized box with a telephone socket.

4.0 Tag blocks

4.1 The telephone tag blocks shall be KRONE or equivalent suitable for the multi-core telephone cables and shall accommodate tin-plated phosphor bronze connectors providing economical and reliable splicing. Connectors shall splice un-skinned cables upto 0.6 mm dia and shall terminate both 'in' & out lines.

4.2 The tag blocks shall be mounted inside fabricated galvanized sheet steel boxes with removable hinged covers and shall be fully accessible. The enclosure shall be painted with 2 coats of red oxide and stove enameled

5.0 Installation

5.1 The installation of conduits shall generally be as specified under section 'CONDUIT WIRING.'

5.2 All cables shall be on cable racks and neatly stitched together.

5.3 The final branch connections with single pair cables in conduits and the maximum number of cables in each conduit shall be as follows:

Conduit dia mm	Max. no of cables
25	4 nos

6.0 Mode of measurement

6.0 The main telephone cable shall include supply and laying of multi-pair cables on ceiling/wall/on cable trays/racks including all supports and shall be measured and paid on running length basis.

6.1 Cable trays/racks shall be paid for separately per unit length for width specified.

6.2 All outdoor jelly filled cables shall also be paid for per unit length excluding excavation and back filling which will be paid extra as specified under 'CABLING.'

6.3 The multi-pair tag block shall consist of telephone connector KRONE or equivalent make and shall be measured and paid as one unit complete with galvanised enclosure box.

6.4 The conduit wiring for telephone out shall include cat 6 UTP cable in conduits and shall include junction boxes, pull boxes and shall be paid per unit length with no. of pairs as shown in the schedule of work.

Telephone outlets shall be paid per unit and shall cover outlet terminal connector, plate-type outlet

box, wiring etc

2-11 CLOSE CIRCUIT TELEVISION SYSTEM (CCTV)

1.0 Scope

The system shall consist of separate components to comprise a system which is as follows:

High Resolution Color Dome Camera

High Resolution Color PTZ camera with night mode operation witch as applicable. Network Video Recorder

The Contractor will install, test, & commission the system as per drawings. The Viewing angle, clarity, brightness function of all the cameras has to be as per given technical specification. Please refer the SLD for cable connection between camera and NVR to switches.

Network monitoring is required. Centralized Power supply unit is required with overload protection. Cameras to be installed in various areas as shown in drawing.

2.1 GENERAL

A. This product shall be manufactured by a firm whose quality system is in compliance with the ISO-9001

B. All equipment and materials used shall be standard components that are regularly manufactured and used in the manufacturer's system.

C. All systems and components shall have been thoroughly tested and proven in actual use.

D. All systems and components shall be provided with comprehensive repair and spare parts replacement. The manufacturer on warranty and non-warranty items shall guarantee the spare parts and the repair.

E. All systems and components must be in compliance with FCC, CE, UL and RoHs requirements.

F. All materials furnished under this item shall be compliant with 802.3 Ethernet standard.

(A) 1.3 MEGAPIXEL NETWORK IR MINI DOME CAMERA

1. GENERAL

a. This product shall be manufactured by a firm whose quality system is in compliance with the ISO-9001

b. All equipment and materials used shall be standard components that are regularly manufactured and used in the manufacturer's system.

c. All systems and components shall have been thoroughly tested and proven in actual use.

d. All systems and components shall be provided with comprehensive repair and spare parts replacement. The manufacturer on warranty and non-warranty items shall guarantee the spare parts and the repair.

e. All systems and components shall have been thoroughly tested and proven in actual use.

f. All systems and components must be in compliance with FCC, CE, UL and RoHS requirements.

g. All materials furnished under this item shall be compliant with 802.3 Ethernet standards

2. HD 1.3 MEGAPIXEL OUTDOOR NETWORK IR DOME CAMERA

a. The network camera shall offer dual video streams with up to 1.3MP resolution (1280×960) in progressive scan CMOS format, with H.264 video compression.

b. The network camera shall provide true & day night (ICR) low-light capabilities with sensitivity down to 0.01Lux @(F1.2,AGC ON), 0 Lux with IR; 0.028Lux @(F2.0,AGC ON) ,0 Lux with IR

c. The network camera shall support Back-Light Compensation (BLC) with selectable zones.

d. The camera shall offer video compression of H.264 and MJPEG. Dual H.264 streams shall be supported with independent resolution, bit rate and frame rates for the main and sub streams.

e. The network camera shall include embedded Linux OS and support IE and client software for network preview, and be capable of performing firmware upgrades through a network using a software-based device utility or thru the web interface.

f. The network camera shall be equipped with built-in password protection which is not dependent on a server.

g. The network camera shall support standard IT protocols including: TCP/IP, HTTP, DHCP, DNS, DDNS, RTP, RTSP, PPPoE, SMTP, NTP, UPnP, ICMP, IGMP, SNMP, FTP, QoS.

h. The network camera shall support industry standard Power over Ethernet (PoE) IEEE 802.3af for powering the camera over the network in addition to 12VDC local power.

i. The camera shall provide the ability to take snapshot and record video clips from the web interface and store on the local computer.

j. The camera shall support video motion detection with user defined areas and configurable sensitivity levels. In addition, the motion detection shall be supported by an arming schedule with the audible warning, surveillance center notification, email, ftp upload, and alarm output triggered as supported events.

k. The camera's web interface shall permit settings to be exported to and imported from a configuration file via the web interface, API and camera manufacturer's client software.

l. L .The camera shall conform to ONVIF, PSIA and CGI standards for integration with 3rd party

m. Video management systems (VMS). The camera may also support custom firmware for specific integration with a 3rd party VMS.

n. The camera shall be supported as necessary by a free DDNS service which is provided free of charge by the camera's manufacturer.

o. The camera shall be compatible with a Video Management Software (VMS) package and Mobile Phone Application from the same manufacturer which is provided free of charge. The VMS shall not be a restricted use version of the manufacturer's full featured version.

2. POWER

Power Supply ----------12V DC±10%, PoE (802.3af)

Power Consumption---------- Max. 5 Watt.

3. CAMERA

A.	Image Sensor	1/3” Progressive Scan CMOS
B.	Min. Illumination	0.01Lux @(F1.2,AGC ON) ,0 Lux with IR
		0.028Lux @(F2.0,AGC ON) ,0 Lux with IR
C.	Shutter Time	1/3s to 1/100,000s
D.	Iris Mode	Manual
E.	Lens	4mm @ F2.0 (2.8mm, 6mm optional)
		Angle of view: 73.1°(4mm), 92.5°(2.8mm), 46°(6mm)
F.	Angle Adjustment	Pan:-30°- 30°, Tilt: 0°- 75°, Rotation: 0°- 360°
G.	Lens Mount	M12
H.	Max. Image Resolution	1280×960
I.	Resolutions supported	Main Stream: (1280 × 960, 1280 × 720,
		704 × 576, 640 × 480)@25/30fps
		Sub Stream: (704 × 576, 352 × 288, 320 × 240)@25/30fps
J.	Day & Night	Day, Night, Auto, Schedule, Triggered by alarm input are
		selectable
K.	Sensitivity	If you choose auto day/night switch, you can choose the
		sensitivity of the switch as high, normal and low
L.	Digital WDR	On/ Off
M. BLC Area		BLC area is the area sense the light intensity; Close, Up, Down,
		Left, Right and Center are selectable
N.	Back Light Compensation	On/ Off, Zone configurable
O.	Digital Noise Reduction	Close, Normal Mode and Expert Mode are selectable
P.	Noise Reduction Level	For adjusting the noise reduction level and only valid when the
		DNR function is enabled
Q. Scene Mode:		Choose the scene as indoor or outdoor.
R.	Rotate Mode:	On/ Off
S.	Image Settings	Saturation, Brightness, Contrast, Sharpness
T.	Image rotation	Mirror(Left/Right, Up/Down, Center, Close)
U. White Balance		MWB, AWB1, AWB2, Locked WB, Fluorescent Lamp,
		Incandescent Lamp, Warm Light Lamp, Natural Light

4. VIDEO SPECIFICATIONS

A.	Compression	Main stream: H.264
		Sub stream: H.264, MJPEG
B.	Dual Stream	Yes; Main stream up to 1280×960; sub-stream up to 4CIF
C.	Video Bit Rate	32 bps ~ 12 Mbps
D.	Audio Compression(-S)	G.711ulaw/G.711alaw/MP2L2/G.726.
E.	Audio Bit Rate(-S)	64Kbps(G.711) / 16Kbps(G.722.1) / 16Kbps(G.726) /32-128Kbps(MP2L2) Built-in microphone
F.	Rate Control	Constant, Variable
G.	H.264 profiles	Main profile
H.	Max. Frame Rate(main)	25/30fps@1280×960, 1280×720, 704 × 576, 640 × 480
I.	Sub-stream	4CIF, CIF, QVGA

5. PHYSICAL

A.	Operating Conditions		-30 °C ~ 60 °C (-22 °F ~ 140 °F)
B.	Humidity, all models		95% or less (non-condensing)
C.	IR Range		Up to 10m
D.	Dimension		99.3×96.7×52.8 mm
E.	Weight		600g (1.32lbs)
F.	Construction		
	a.	Body Material	Toughened Plastic
	b.	Body Color	White
	c.	Screws	Stainless Steel, Security Torx

6. NETWORK

	ger	Motion detection, tampering alarm, intrusion detection, line
		crossing detection, network disconnect, IP address conflict,
		storage exception
		VCA information can be written in streams, and back-end devices
		can search for video clips contain specified type of events
		TCP/IP, ICMP, HTTP,HTTPS, FTP, DHCP,DNS, DDNS, RTP,
		RTSP, RTCP, PPPoE, NTP, UPnP, SMTP, SNMP, IGMP,
		802.1X, QoS, IPv6, Bonjour (SIP optional)
		User authentication, watermark
	mpatibility	ONVIF, PSIA, CGI, ISAPI
	torage	Built-in Micro SD/SDHC/SDXC card slot, up to 64 GB

7. WEB BROWSER REQUIREMENTS

A.	Operating System	PC (Intel® Core® 2 Duo microprocessor, 2.6 GHz) with Microsoft® Windows® XP, Windows Vista®, or Windows® 7
B.	Web User Interface	DirectX for Windows XP, Windows Vista, Windows 7
C.	RAM	2 GB
D.	Ethernet Card	100 Mbps
E.	Web Brower	Internet Explorer® 7.0 or later; Firefox, Chrome
F.	Screen Resolution	1024 x768 pixels or higher, 16- or 32-bit pixel color resolution

8. NETWORK VIDEO RECORDER

1. GENERAL

a. This product shall be manufactured by a firm whose quality system is in compliance with the ISO-9001.

b. All equipment and materials used shall be standard components that are regularly manufactured and used in the manufacturer's system.

c. All systems and components shall have been thoroughly tested and proven in actual use.

d. All systems and components shall be provided with comprehensive repair and spare parts replacement. The manufacturer on warranty and non-warranty items shall guarantee the spare parts and the repair.

e. All systems and components must be in compliance with FCC, and CE requirements.

f. All materials furnished under this item shall be compliant with 802.3 Ethernet standards.

2. NETWORK VIDEO RECORDER SPECIFICATIONS:

			Compliance (Yes/No)	Deviations
Video/ Audio Input	IP Video Input:	8-ch		
	Two-way Audio:	1-ch BNC(2.0Vp-p, 1kΩ)		
Video/Audio Output	VGA Output:	1-ch, resolution:		
		1920×1080P/60Hz,1600×1200/60Hz, 1280×1024/60Hz,		
		1280×720/60Hz, 1024×768/60Hz		
	CVBS Output:	1-ch, BNC (1.0 Vp-p, 75 Ω)		
		Resolution: 704×576 (PAL); 704× 480 (NTSC)		
	HDMI Output:	1-ch, resolution:		
		1920×1080P/50Hz, 1920×1080P /50Hz, 1600 × 1200 /50Hz, 1280 × 1024 /50Hz, 1280 × 720		
		/50Hz, 1024 × 768 /50Hz		
	Recording resolution:	5MP/3MP/1080P/UXGA/720P/ VGA/4CIF/DCIF/2CIF/CIF/QCIF		
	Audio Output:	1-ch BNC(Linear electrical level, 600Ω)		
	Playback Resolution:	5MP/3MP/1080P/UXGA/720P/ 4CIF/VGA/DCIF/2CIF/CIF/QCIF		
	Synchronous Playback:	4-ch		
	Interface Type:	2 SATA interfaces		

Hard Disk Driver	Capacity:	Up to 4TB capacity for each disk		
	e-SATA Interface:	1 eSATA interface		
External Interface	Network Interface:	1 RJ45 10M/100M/1000M adaptive Ethernet Interface,		
		8 independent 100Mbps PoE Ethernet interfaces		
	USB Interface:	1 USB2.0 interfaces		
	Serial Interface:	1 RJ45 RS-232 interface; 1 RS-485 interface; 1 RS-485 keyboard interface		
	Alarm Input:	4-ch		
	Alarm Output:	1-ch		
General	Power Supply:	100~240VAC, 50~60Hz		

3. Display Monitor (32 " LED)

Type	LED
Size	32 inch
Resolution	HD - High Definition
Viewing angle	Wide - > 160 deg
Picture in Picture	Selectable / sizable

4 Mode of Measurements:-

The Mode of measurement shall be as per bill of quantities

2.2-12 UNINTERRUPTED POWER SUPPLY SYSTEM (UPS)

1.0 The Scope

1.1 The Contractor's scope of work covers supply, installation, commissioning and testing of the complete UPS System Installation as specified. Annexure 2.1 shows the division of work between the Contractor for above work and others.

2.0 <u>System features</u>

2.1 The system shall be standard tried out product of an established manufacturer and shall compromise minimum number of components with maximum MTBF & minimum MTTR. The system shall have high operating efficiency, front access and self diagnostics. There shall be sufficient redundancy in all vital parts achieving a breakdown -free operation of the system.
The System shall essentially consists of following major components.

2.1.1 Thyristerised SCR based converter .

2.1.3 Converter input, system battery contactor, system battery, maintenance bypass, static bypass input with circuit breakers.

2.1.4 Battery system

2.1.5 Microprocessor based Menu driven software for operation, control and management as well as microprocessor controlled diagnostics.

2.2 All sections shall be incorporated in a 1.8 mm sheet steel cubicle type panel with dead-front access. The sheet steel shall be pre-treated for rust inhibition through a 7-tank process of degreasing and phosphating and adequately treated before being powder coated in an approved colour. Ventilation for the system shall be provided with a adequate redundancy to maintain component temperature within the limits. All air entries shall be protected with cleanable filters. All heat producing devices shall be mounted on ample heat sinks.

3.0 Thyristerised SCR basedConverter

3.1 The converter should be thyristerised SCR based .The converter should have the following important features.

* Power conversion
* Battery charging
* Power factor improvement
* Current harmonic reduction
* Voltage regulation
* Transient recovery
* Automatic synchronization
* Over current protection
* Over temperature protection
* Control power failure protection
* Short circuit protection
* High speed switching to reduce heat Dissipation (6 KHz)

3.2 The converter should meet the with the following specifications in addition to other requirements stated herein.

3.2.1 Input Voltage

The converter will be fed from the commercial source.

3.2.2.1	Nominal voltage	:	415V, 3 phase/250, 1 phase
3.2.2.2	Voltage range	:	+15%/-30% AC
3.2.2.3	Nominal frequency	:	50HZ □ 10%
3.2.2.4	Frequency range	:	□ 5% (□ 2.5 Hz)
3.2.2.5	Input power factor	:	0.98 lagging or more at full load (PF improvement)
3.2.2.6	Input harmonic current THD	:	<5% at 100% load 6% maximum at 50% load
3.2.2.7	Duty	:	Continuous at 50 deg. C

3.2.2.8	Cooling	:	Forced cooling using fans with thermal relays using a latched cut out for re-setting as protection for cooling fans. Each individual fan has its own thermal relay.
3.2.2.9	Ambient operating temperature Range	:	0 to 50 ^{0}C maximum
3.2.2.10	Operating Relative Humidity	:	0-95% non-condensing
3.2.2.11	Operating altitude	:	Sea level to 1,000 meters
3.2.2.12	Magnetized sub-cycle inrush Current	:	Typically 8 times normal full load current.
3.2.2.13	Converter walk-in time	:	1 through 60 seconds (every 1 second selectable, (0 to 100% rated load) Default setting: 20 seconds.

3.2.2. The converter will meet the following specifications in addition to other requirements stated herein

SL. NO.	PARAMETERS	DESIRED RANGE
1	UPS capacity	KVA = KW
2	UPS Rating	…….KVA / KW
3	UPS configuration	Stand Alone with Parallel Compatibility in future
4	Battery sizing parameters & backup time	Power factor : 0.8, ECV : 1.7 V/cell, 15 Mins. Backup time
5	Make of batteries & Type Of Battery	Amara Raja Quanta/Panasonic/Hoppecke 12V SMF VRLA batteries
6	No of Battery Per UPS	Vendor to Substantiate with calculation
7	Ampere Hour Capacity	12V x AH Of Batteries x No. of Batteries
8	Input Supply & Variation	380/400/415V AC (304-477V AC) 50/60 Hz (45-65 Hz) 3 phase 4 wire connection
9	Input power factor	>0.99
10	Output Supply & Variation	380/400/415 V AC 50/60 Hz +/- 0.1% Hz free running
11	Technology	True on line double conversion (VFI-SS-111 topology as per IEC 62040-3 guidelines) IGBT based PFC rectifier and PWM inverter

12	Static Switch	Bypass path and output path Static Switch for transferring the load to the input source during clearing overloads that exceeds the capability of power electronics Special hybrid bypass transfer switch is used (Make before brake technology). Bypass Switch shall be 3P Automatic to make it adaptable to all kind of earthing system (TN, TT & IT).
13	Duty condition	UPS Shall able to operate at 0 - 40 deg C continuous
14	Output load unbalancing capability	100% unbalanced non-linear load
15	Power walk in (time required for UPS to take rated load at the time of starting)	1 Sec. through 30 Seconds (every 1 Second selectable (0-100% rated loads) Default setting 20 seconds.
16	Step load change	100% step load change
17	Overload Capacity	110% for 60 min, 125% for 10 min, 150% for 1min
18	Crest factor	minimum 3:1
19	Output voltage distortion	<3% for linear load <5.5% for 100% non-linear load
20	Noise level	<60 dBA
21	Nominal Output Power Factor	Unity (1.0)
22	1 Year Warranty with UPS and 2 years with Batteries	To be included in rates
23	Efficiency of UPS (AC/AC) at 100% load	>94.5%
24	Breakers within UPS frame	ıt, Bypass, Maintenance Bypass Breakers are required (Isolator or Fuse Link not aceptable)
25	EPO Switch on UPS Enclosure	Required
26	User replaceable dust filters	Required for each UPS. If there is derating of UPS capacity due to dust filter, then vendor to consider next higher rated model. Vendor to share derating chart accordingly
27	Conformal Coating on PCBs	Required to protect from moisture and corrosive agents
28	Battery Protection	The DC protection shall be ensured by a DC MCCB with under voltage trip coil to isolate the Battery Bank from UPS during fault at the either side of the DC bus. It shall provide protection against deep discharge of the batteries by automatically disconnecting battery bank from UPS after low battery shutdown. It shall also isolate the battery bank from UPS during activation of EPO command.

29	Min DC Breaker	Vendor to Substantiate with calculation
30	Display	Separate Mimic panel & LCD display
31	Modbus Card	Required
32	SNMP Card	Required
33	UPS Input / Output Cable entry & Exit	y & Exit required from Bottom for CU Flexible Cable.
34	The unit should be able to work without the batteries connected to it.	Required
35	Regularly UPS component check with/without load bank at site with burn-in test for 8 hours at 100% load for each UPS. Load bank and cabling from UPS to load bank in UPS vendor scope	Required for each UPS

4.0 Static Inverter

4.1 The static inverter should be of solid-state type with proven pulse width modulation technique. The inverter should utilise insulated gate bipolar transistor or power module transistor.

The inverter should incorporate following essential features.

* Voltage regulations
* Transient recovery
* Automatic synchronization
* Over current protection
* Over temperature protection
* Control power failure protection
* Short circuit power protection
* Variable switching Frequency
* Frequency control through an isolator internet to the UPS module logic
* Inviting of output voltage harmonic distortion
* Inverter overloads protection through MCB's.

4.2 The inverter should meet the following specifications in addition to other requirements stated herein.

Three Phase UPS/Single phase Nominal 384V DC (Range 290V to 414V DC to maximum DC bus voltage during charging the batteries)

4.2.2	Nominal Voltage Output	415V □1% AC 3 pahse/250V, 1 phase
4.2.3	Inverter capacity	As per BOQ
4.2.4	Voltage Regulation	
	For 0 to 100% loading :	<□ 1%
	Inverter DC input voltage : varies from max. to mini.	<□1%
	Environmental conditions : given below	<□ 1%
4.2.5	Transient voltage regulation	
	At 100% step load change :	<□3%
	At loss or return of AC input :	<□3%
	At load transfer from Bypass : to Inverter	<□ 3%
4.2.6	Time to recover from transient : normal voltage	< 10 milli seconds
4.2.7	Wave Form :	Purely Sinusoidal 50
	Normal frequency :	Hz
	Frequency regulation for all conditions of input supplies, loads and temperature occurring simultaneously or in any combination (automatically controlled)	□0.01%
	Synchronization limits for synchronism between the inverter and standby AC source	49 Hz to 51 Hz
	Field adjustment range for above	50 □0.25 Hz to 50 □ 1.5 Hz
4.2.8	Total voltage harmonic distortion :	<2% THD for 100% linear load <4% THD for 100% non-linear load

4.2.9	Phase voltage displacement	120° □ 1° for balanced load 120° □ 2° for unbalanced load
4.2.10	Duty	Continuous
4.2.11	Cooling	Forced cooling using fans.
4.2.12	Ambient operating temperature : range	-5 to 50 ^{0} C maximum continuous
4.2.13	Operating Relative Humidity	0-95% non-condensing
4.2.14	Operating altitude	Sea level to 1,000 meters
4.2.15	Crest Factor	3.5 : 1
4.2.16	Overload	165 % for 1 min. 125 % for 10 min.
4.2.17	at 100 % Non Linear Load At 100 % Linear Laod	< 3 % < 2 %
4.2.18	Efficiency AC/AC At 100 % Load At 75 % Laod At 50 % Load At 25 % Load	 94.5 % 95 % 95 % 92 %
4.2.19	Protection Against	Overload Short Circuit Input & Output Over voltage Battery over Charging Battery Over Discharging
4.2.20	Manual Bypass Static Bypass	Standard & Inbuilt with UPS system Standard & Inbuilt with UPS system
4.2.21	Noise Level MTBF MTTR	< 65 dbA 200000 hrs/unit 1000000 hrs for Parallel

4.2.22	Remote Operation	Output Signals : Overload Inverter Function Fault Rectifier Charger ON Rectifier Charger Fault Transfer to By Pass Inhibited Transfer to inverter function fault Input Signals : Transfer to By Pass Inhibited Transfer with load interruption to By Pass Inhibited

Bypass & Static Transformer switch

5.1 Bypass circuit is provided as on alternate source of power other than the inverter. A high speed switch and wrap around contactor should be used to assume the critical load during automatic transfers to the bypass circuit. The static switch & wrap around contactor drives power from an upstream bypass feed circuit breaker internal to the UPS module provided for overload protection. The wrap around contactor should be electrically connected in parallel to static switch and should be at the same time as a static switch energized and upon closure, maintains the by pass source. The bypass circuit should be capable of supplying the UPS rated load current and also provide fault clearing current. UPS system logic should employ sensing which causes the static switch to energies within 150 microseconds thus providing an uninterrupted transfer to the bypass source when any of the following limitations are exceeded.

5.1.1 Automatic Retransfer

In the event, if the critical load has to be transferred to the bypass source due to an overload, the UPS system logic monitors the overload conditions and upon the overload being cleared, automatic retransfer back to the inverter output should be possible.

5.1.2 Manual transfer

UPS should be capable of transferring the critical load to/from the bypass source via LCD touch panel . When performing manual transfers to inverters or automatic retransfers, the UPS system logic should force the inverter output voltage to match the bypass input voltage and then parallel the inverter & bypass source providing a make before break transition allowing a controlled load current to inverter

5.0.1 Maintenance Bypass switch

UPS should include an maintenance bypass switch to enable maintenance inside the UPS.

6.0 Battery System

The battery system should be provided for the specified minutes back up time to the inverter when the UPS is supplying 100% rated load.

In case the grid power fails, the inverter derives its input from the battery system thus providing uninterrupted power to the critical load. The transition should be achieved without any switching and with no interruption of power to the critical load.

On restoration of grid power, the converter should automatically reactivate and provide DC power to the inverter, simultaneously recharging the system battery.

The batteries should be specially developed for UPS application with the specified discharge rate and should be of sealed maintenance free dry type.

5.0.1 Inverter output under voltage or over voltage
5.0.2 Overload beyond the capability of the inverter
5.0.3 DC circuit under voltage or over voltage
5.0.4 Final End voltage of system battery is reached
5.0.5 (Bypass source present and available)
5.0.6 System failure (eg:logic fail, fuse blown, etc.,……)
5.1 The static switch should also confirm to the following minimum requirements.
5.1.1 Capacity continuous equal to 100% of continuous rating of the inverter.
5.1.2 Capacity overload equivalent to overload characteristics specified for UPS.
5.1.3 Nominal bypass input voltage : 415V/240V, 3 phase/1 phase
5.1.4 Voltage range : □ 10% nominal
5.1.5 Nominal frequency : 50 Hz
5.1.6 Frequency range : □ 2%
5.1.7 Current : 1000%
5.1.8 Duration : 20 milli seconds
5.1.9 Ambient operating : 0 to 50 degree C. continuous
5.1.10 Operating Relative Humidity : 0-95% non-condensing
5.1.11 Operating altitude : Sea level to, 1000 meters
5.1.12 Cooling : Natural convection
5.1.13 Duty : Continuous

5.1.14 Automatic Retransfer

In the event, if the critical load has to be transferred to the bypass source due to an overload, the UPS system logic monitors the overload conditions and upon the overload being cleared, automatic retransfer back to the inverter output should be possible.

5.1.15 Manual transfer

UPS should be capable of transferring the critical load to/from the bypass source via LCD touch panel . When performing manual transfers to inverters or automatic retransfers, the UPS system logic should force the inverter output voltage to match the bypass input voltage and then parallel the inverter & bypass source providing a make before break transition allowing a controlled load current to inverter.

5.1.16 Maintenance Bypass switch

UPS should include an maintenance bypass switch to enable maintenance inside the UPS.

2.2-13 AUTOMATIC LIGHTING CONTROL SYSTEM:.

2.0 Specification & Functional requirement

2.1 Function: Automatic Room Lighting Control System via Occupancy/Vacancy Sensor.

2.2 Occupancy/vacancy sensors:

2.3 Occupancy/vacancy sensors which shall automatically turn lights on when a person enters a room and off when he leaves.

2.4 Operating principle of the sensing mechanism: Passive Infrared (PIR)/Ultrasonic technology/ Dual-technology etc. as per bidder's selection to suit the requirement of the tender documents.

2.5 Operating modes:

2.5.1 Mode 1: automatically turns lights on when a person enters a room and off when he leaves.

2.5.2 Mode 2: automatically turns lights off when person leaves a room but he needs to manually turn them on when he walks into a room.

Note: Exact operating mode shall be finalized during detailed engineering stage as per site requirement.

2.6 Self-adaptive sensors that automatically adjust sensitivity/ timing etc.

2.7 Output: Potential free contact output to control the lights as per sensing/ switching activities of the sensor mechanism/ contact rating: As per the connected load subject to minimum 6 A.

2.8 Adjustable delay.

2.9 Adjustable daylight response threshold.

2.10 Elegant Decor styling.

2.11 Housing: ABS, flame retardant/ Metallic.

2.12 Mounting: Wall-mounting/ ceiling-mounting and shall be decided during detailed Engineering stage.

2.13 Coverage angle: As per bidder's selection/ design to the meet the requirement of the tender document.

SECTION-VII

PRICE SCHEDULE

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SCHEDULE OF RATES (SOR)

SUB: CONSTRUCTION OF OFFICE INTERIORS AND SUPPLY OF FURNITURE AND FIT OUTS WITH ALL CONNECTED SERVICES FOR IGGL'S CORPORATE OFFICE.

Tender No.: IGGL/GHY/C&P/HR/OFFICE-INTERIOR/03-22 (E –TENDER NO. IGGL-100030)

Name of Bidder: M/s_____

Sl. No.	PARTICULARS	UNIT	QUANTITY	Rate (In Rs.)	Amount (In Rs.)
PART-A	***CIVIL & RELATED INTERIOR WORKS***				
1	**DEMOLITION WORK:** Dismantling and demolishing existing structure or part of it (0 to 300mm Thk), inclusive of all fittings and fixtures and taking away to approved locations or sorting / stacking of salvagable material as per directions of PM, cleaning of debris upto place of disposal as approved by local authurity & in fashion as directed or stored as directed by PM, required strengthening and providing safety measures during demolition, providing temporary partitions, obtaining insurance for work and labour, doing breaking during non working hours of office to avoid any hindrance to offices functioning, accounting for required security checks, providing and maintaining required tools and tackle, coordinating with the Architect, Structural Consultant, PM all complete. No extra claim shall be allowed on the method of dismantling adopted for any type of structural member. Damage caused to structure or part thereof which is not supposed to be dismantled, during the process of dismantling the required portions shall be made good by the Contractor at his own cost. All as above in location :Seventh Floor	Sq m	25.11		
2	**MASONRY WORK**				
2.10	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:4 (1 cement : 4 coarse sand). All in location : Seventh Floor	Cum	15.17		
2.20	Providing and laying autoclaved aerated cement blocks masonry with 150mm/230mm/300 mm thick AAC blocks in super structure above plinth level up	cum	7.20		

	to Vth Floor level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. (The payment of RCC band and reinforcement shall be made for seperately). All as above in Level: Seventh Floor				
2.30	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers,abutments, pillars, posts, struts, ttresses, string or lacing courses,parapets, coping, bed blocks, anchor blocks, plain window sills, fillets,sunken floor etc., up to floor five level, excluding the cost of centering, shuttering and finishing: Proportion 1:1½:3 (1 cement : 1½ coarse sand (zone-III) derived fromnatural sources : 3 graded stone aggregate 20 mm nominal size derived from atural sources).**All as Above in Location : Seventh Floor**	cum	3.57		
2.40	Centering and shuttering including strutting, propping etc. and removal of form for : Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc	sqm	52.49		
2.50	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level	KG	47.24		
3.00	**PLASTER WORK**				
3.10	Providing and applying 12mm thick plaster in cement mortar mix ratio CM 1:4 (1 cement : 4 sand) mixed with polypropylene fibers as per instruction of the approved anufacturer, to internal surfaces of concrete and masonry work; including raking out joints, hacking concrete surfaces and applying approved chemical bonding agent and applying a scratch coat over concrete surfaces by bonding / adhesive chemical coat as directed by approved manufacturer to create a key, cleaning / grooving deep junctions of concrete & masonry, grouting then back by mortar mixed with non shrinking compound along with packing of clean, fresh square cut aggregate; also providing and fixing 20 gauge GI chicken mesh @ 150 mm wide to junctions of concrete and masonry, preparing jambs, sills, grooves, pattas, wattas, rounding of corners, any circular works, ramps etc. all complete as per architectural drawings, specifications and finished smooth with wooden rundha etc. or as specified by the PM at all leads, depth and lifts, doing independent double-legged scaffolding, cleaning of surfaces, curing, etc. complete	Sqm	234.78		

	as per specification and to the approval of the PM. **All as above in Location :Seventh Floor**				
4	**FLOORING WORK**				
4.10	**SCREED CONCRETING FOR MAINTAINING LVL AS PER FFL OF FLOOR:** Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : (For Floor Screed Works, the contractor will provide for preparation of surface by cleaning, hacking and exposing aggregate to achieve the best bond) etc. all complete at all heights and leads to the entire satisfaction of the PM. In Proportion 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources) for Concreting above Level V At Location :Seventh Floor	cum	77.50		
4.20	**CEMENT CONCRETE UNDER FLOOR FOR CARPET AND PLANKS** Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete. 40 mm thick with 20 mm nominal size stone aggregate. **At Location :Seventh Floor**	sqm	561.00		
4.30	**500MM X 500MM CARPET TILES** Supply & Installation of 100% commercial grade nylon carpet tile of 500*500mm of solution dyed nylon 6 (AquafilEcony) quality or equivalent Imported and other than Chinese Product Acceptable), Machine Gauge 1/10'' or more and having baking of Glass fibre + PVC and made of basic fabric of Nonwoven Polyester, Nominal Thickness of 7 mm, smoke density (ASTM E662) less than 450, antistatic less than 1.0KV (JIS-L4406 STROLL 23º, RH-25%), Electrostatic propensity-maximum average 0.5KV (AATCC 134) Colour fastness to light-Rating 5.0 =no change (AATCC 16) critical radiant flux-(ASTM E 648) Class -1, everage CRF 0.48/CM² Or higher certified. It is absolutely mandatory that the anufacturer has valued certifications of CRI PLUS Certified, GLP 8200, Certified from Singapore Green Building Council or Certified of Japanese Industrial Standard (JIS) Mark and approved by PM [**Carpet - 1 Flooring]**	Sq m	453.00		
4.40	**BAMBOO PLANKS FLOORING**				

4.41	Providing and installing pre STRAND WODEN STRIP BAMBOO 14mm Thickness flooing as approved by the PM. underlayment of 4mm thick expanded polyethylene foam sheets having density 40kg/cum, over prepared surface. Sub strata shall be damp proof and free of contaminations. Method of fixing shall be as recommended by the approved manufacturer and approved by the PM. (Location : As per Drawing (Basic Rate - 350/Sqft)	Sq m	108.00		
4.42	100mm high Bamboo Plank Skirting as per Flooring. (Location : Meeting room 1 & 2, ED/GM Cabins, ED/GM Secretary, Cabin 1 to 12)	Rmt	108.00		
4.50	**VITRIFIED TILE FLOORING AND DADO:** Providing and laying Vitrified tiles in floor in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement:4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm ncluding grouting the joints with white cement and matching pigments etc. The tiles must be cut with the zero chipping diamond cutter only . Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily.: **Double charge vitrified tile polished finish of sized 600mm x 1200 mm**				
4.51	1200mm x 600mm Vitrified tile Flooring (Location : As per Drawing and Basic Rate - 900/Sqm)	Sq m	353.75		
4.52	Same as above item 4.51 but with Vitrified 600 mm x 600 mm Matt/ Anti Skid (Basic Rate 750/Sqm)	Sq m	63.96		
4.53	Providing and fixing 100mm high skirting made out of same tiles as that of flooring fully homogeneous Vitrified tile to walls/columns as shown in drawing or as directed by the Architect. Tiles shall be fixed with approved compatible tile adhesive of approved make to correct line, level and plumb. Joints are well cleaned and grouted with matching colour of approved quality with polymer based grouts (Bal / Laticrete or equivalent approved) to match shade of the tile and cured, cleaned and including finishing junction of plaster, protecting etc. all complete at all heights, lifts and leads to the entire satisfaction of the PM.	Rmt	200.00		

	(Location : As Drawing (Basic Rate - 900/sqm)				
4.54	TILE DADO "Providing and fixing approved quality, colour, design and shade fully homogeneous Vitrified tile, (confirming to IS 15622) dado to walls/columns, as shown in drawing or as directed by the PM. Tile fixed with approved compatible adhesive (Bal / Laticrete or equivalent approved) over concrete surface. Joints are well cleaned grouted with matching colour approved quality polymer based readymade grout, curing, cleaned and where specified or shown in drawing etc. complete to the entire satisfaction of the PM. 'VT1 - 600mm x 600mm Vitrified tile dado (Location : Pantry, Toilet) (Basic Rate - 800/sqm)	Sq m	264.20		
4.60	**ITALIAN MARBLE FLOORING , DADO AND CILL** Providing and laying 19-20mm thick Marble flooring of machine cut, machine polished in pattern and size as detailed in drawing or as directed by the PM. Stone to be bedded in mechanically mixed cement sand mortar mix ratio 1:6 (1 white cement : 6 sand) overall about 25mm thick including cleaning and preparing the surface for bedding, spreading neat cement slurry by using minimum cement about 2 kg/sqm prior to bedding and spreading white cement paste using minimum cement about 4.5 kg/sqm over bedding, joints to be cleaned and grouted with matching colour approved quality polymer based readymade compatible grout, curing, cleaning, polishing,protecting with HDP sheet / POP till handing over etc. to required line, level, etc. all complete at all heights and leads to the entire satisfaction of the PM.				
4.61	Crema noce Marble , Brown Armani, Beige Travertin0 Flooring (Location : Corridor, Reception, Lift Lobby, Recreation area, Lounge, Toilet) (Basic Rate - 550/Sqft)	Sq m	116.29		
4.62	Providing and fixing approved machine cut, machine polished 19-20mm thick Marble dado as shown in drawing or as directed by the PM. Stone fixed with approved compatible adhesive complying with class C2TE OF BS EN 12002 and BS EN 12004 over plastered surface or PLY Surface to correct line, level and plumb. Joints are well cleaned and grouted with matching colour polymer based approved quality polymer based readymade grout and cured, cleaned, junctions with plaster finished smooth, etc. all complete at all heights and leads to the satisfaction of the PM. [Crema noce Marble , Brown Armani, Beige Travertin0	Sq m	5.00		

	Flooring (Location : Corridor, Reception, Lift Lobby, Recreation area, Lounge, Toilet) (Basic Rate - 550/Sqft)]				
4.63	Providing and fixing about 100mm high approved machine cut, machine polished 19-20mm thick Marble stone skirting over plastered surface or as detailed in drawing. Stone fixed by approved compatible adhesive (Bal or Laticrete or equivalent approved) on back to correct line, level and plumb. Joints are well cleaned grouted with matching colour ploymer based readymade approved quality grout, curing, cleaned and where specified or shown in drawing exposed edge of stone rounded / chamfered and polished, making grooves above skirting etc. complete to the entire satisfaction of the PM.Crema noce Marble , Brown Armani, Beige Travertin0 Flooring (Location : Corridor, Reception, Lift Lobby, Recreation area, Lounge, Toilet) (Basic Rate - 550/Sqft)	RM	60.00		
4.64	Providing and fixing in place 6mm thk and 38mm high s.s plate inserted on the floor within the junction of the carpet/tile/marble and as per instruction.	Rmt	160.00		
4.70	**COUNTER TOP IN MARBLE AND GRANITE**				
4.71	Providing and fixing of 19-20mm thick machine cut, machine polished Marble stone of approved quality wash basin counter top about 600mm wide fixed and bedded over 19mm thick Indian Marble; with mirror polished Marble fascia in verticle profile as detailed in drawing. Stones for 200mm wide fascia fixed with epoxy adhesive; exposed faces / edges, rounded / chamfered, mirror polished etc. complete to the approval of the PM. All junctions shall be sealed with silicon sealant. Further to include required GI framing, drilling, cutting of holes, SS pins, anchors, clamps, finishing junctions with plaster etc. complete as directed by the PM to his entire satisfaction. ['Brown Armani marble stone counter. (Location : Toilets) (Basic Rate - 550/Sqft)]	Rmt	11.00		
4.14	Providing, constructing **Granite platform** as per Architectural drawing; out of a) 18 mm thick 600 mm wide mirror polished approved Granite stone exposed faces / edges rounded and mirror polished. (Top of the counter) b) 18 mm thick 75 mm wide granite fascia exposed edges mirror polished and moulded as detailed. c) 18mm thick 50mm high approved Granite stone back splash exposed edges mirror polished and moulded as detailed.	Rmt	3.60		

	Granite stones shall be anchored and grouted with stainless steel pins, clamps and anchor fasteners into concrete and wall, Granite stone at bed shall be bedded in cement sand mortar (1:4) with required cement punning, fascia shall be fixed with epoxy resin work shall include require drilling of hole, making notches, grooves, grouting with epoxy and cement finishing, curing all complete as per detail drawing of Architect and as per instruction from PM from time to time. Further work shall include required cutting in granite to receive stainless steel sink polishing of cut edges to the approval of PM. All joints with masonry stone work and stainless steel sink shall be sealed with silicon sealant. (Basic Rate - 250/Sqft)				
4.15	**ITALIAN MARBLE CILL WORKS:** Providing and fixing about machine cut, polished approved Marble stone sills, jambs, soffits etc., in required shape with required grooves, mouldings, chamfering / rounding edges, polishing etc. also include required pins / cram etc. for holding down complete including fixing with approved tile adhesive (Bal or Laticrete), pointing, curing, cleaning, polishing etc. complete to the approval of the PM. Sill width not less than 300mm and not wider than 500mm. [b) Crema noce marble Window sill. (Basic Rate - 550/Sqft)]	Rmt	92.79		
5.	**FALSE CEILING**				
5.10	**GYPSUM BOARD CEILING** Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre,shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, ncluding fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and	Sq m	854.75		

	30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with : **12.5 mm thick tapered edge gypsum plain board** conforming to IS:2095- (Part I) :2011 (Board with BIS certification marks)				
5.20	**MINERLA FIBRE TILE CEILING** Providing and fixing tiled false ceiling of size (600x600)mm in true horizontal level suspended on inter locking Gyproc Bolt-slot metal grid of hot dipped galvanized steel ections. It consists of main "T" runner of size 42x15x0.3x3000mm, cross "T" of size 42x15x0.3x1200mm, secondary cross "T" of size 45x15x0.3x600mm and PPGI wall angle of size 14x20x0.4x3000mm. Bottom exposed capping of width 15 mm & groove (5.6x7.5)mm size of all T-sections shall be 0.25mm thick PPGI. PPGI wall angle 4x20x0.4x3000mm{Material-GI(IS513),YS-280Mpa,Galvanised 90GSM(IS277), Finish- painted 24-27 micron top side,8-10 micron backside,)} is fixed along the perimeter of the ceiling to walls, partitions or columns etc., with wooden screws at 300mm centers or Hilti HPS 6x40mm placed at 600 mm c/c. Gyproc® soffit cleat 27x37x25x1.6mm GI(IS513)YS-260Mpa,Finish-Galvanised 120GSM(IS277) } is fixed with Gyproc® Rawl Plug-Ø8x45mm{Material-IS 513 CR2 grade, Zinc coating (7 to 8 microns) pull out load-6.8kN for M30 concrete grade} creating 1200mm x 1200mm grid. Main-T runners 42x15x0.3x3000mm {GI(IS513)YS- 280Mpa,Finish-Galvanised 90GSM (IS277) are then suspended at 1200mm c/c from ceiling using 4mm zinc electroplated butterfly level clips of size 85x30x0.8mm spaced at maximum 1200mm center to center along main T and not more than 150mm from spliced joints. The last hanger at the end of each main runner should not be greater than 600mm from the adjacent wall. 42x15x0.3x1200mm cross T {GI (IS513) YS- 280Mpa, Finish-	Sq m	199.96		

	Galvanised 90GSM(IS277) } is interlocked between the main T at 600mm center to center to form a grid of 1200x600 mm and then secondary cross "T" 42x15x0.3x600mm {GI(IS513) YS-280Mpa,Finish-Galvanised 90GSM(IS277) } is then interlocked at middle of the 1200x600mm grid to form grids of 600x600mm. Cross Tees at the ends having length more than 600mm are to be supported independently. Finally White coloured Celotex Fine Fissured NRE tiles of size 595x595x15mm having NRC of 0.55, CAC 35,LR 0.84 and suitable for use in Relative humidity up to 95% and temperature up to 40°C,are placed in this grid.				
5.30	**VENNER /MDF CEILING** All as in item 5.1 but with 12mm MDF in place of 12.5mm Gypsum Board with final top layer of 4mm veener. Complete with Melamine polish and as directed by PM	Sq m	56.25		
5.40	**TRAP DOOR CEILING IN LAMINATE FINISH** Providing and Fixing TRAP DOOR Ceiling with 1mm LAMINATE FINISH (Solid color) . Trap door shall be made of Marine Ply 19mm Thick and supported on Metal Subrame as per site fixed to roof Slab with full threaded steel bars and fixed with Fasters as per weight class. Trap door will be fixed with SS Hinges and embeded screw for locking in place. All as directed by PM	Sq m	72.80		
5.50	**TRAP DOOR CELING IN VENEER FINISH** Providing and Fixing TRAP DOOR Ceiling with 4mm Veeneer Finish and Melamine Polished . Trap door shall be made of Marine Ply 19mm Thick and supported on Metal Subrame as per site fixed to roof Slab with full threaded steel bars and fixed with Fasters as per weight class. Trap door will be fixed with SS Hinges hidden from view and embeded screw for locking in place. All as directed by PM. (Venner Basic Rate - 200/Sqft)	sqm	12.00		
5.60	**ACOUSTIC ENCLOSURE FOR CEILING SUSPENDED AHU:** Providing and Fixing Acoustic Panels in all location including Ceilings, Trap Doors , AHU sides in Soffit with with Two sides 12 mm MDF and Internal frame with 50 x 25 mm Alumium Section filled with Glass wool 50mm Thick of 24kg/M3 density . KNAUFF OR EQUIVALANT. The cost of suspending from ceilings and other framing required to fix in soffits shall be included in the price. Measurement shall be made of actual sandwich panel/partition size as made. LOCATION - FOR ENCLOSING CEILING SUSPENDED AHU	Sqm	54.00		

6.	**WALL PANELING & PARTITIONS**				
6.10	**BASIC WALL PARTITION** Providing, constructing & fixing in place MDF board Partitions of overall thickness 75mm thk with Aluminium framing . Tube of Size 25X50 for verticle members and 25 X 50mm for horizontal members, tube thicknes of 1.2 mm . Verticle Framing at 450mm c/c and horizontal frame to achive 450mm x 610mm grid size. Covered with 12mm thick MDF board (conforming to IS 12406) of approved make on both sides. Framing members are to fixed with "L" Clamps at jooints and secured to RCC soffit and Floor with Anchor Fastners and Metal Screws. All other salient features such as pattas, grooves, inlay pattis & extra frame work and all other features indicated in drawing or as per instructions of PM to be the same as items of panelling. Mode of measurements also to be same as that of mentioned in panelling items. Cost of partition also to include providing, constructing & fixing ply frame with necessary rebates as required to enable fixing of doors (on 3 sides of opening produced). All complete as per PM instructions and specifications. Cost also to include 50mm thick glass wool insulation of 48kg/cum density inside partitions. Cost also to include 50mm thick glass wool insulation (of approved make) as specified in drawings as per instruction of PM. Mode of measurement shall be as per Specifications. Openings of size more than 0.5 sqm shall not be counted for measurement for payment. [FINISHING ITEMS FOR PARTITIONS & PANELING: Final Finished area in elevation shall be measured for payment. No deduction will be made for openings/cut outs upto 0.5 sq.m for all area units under this Head "FINISHING ITEMS FOR PARTITIONS & PANELING". Rates shall be inclusive of all operations included in the item. VENEER FINISH (Eucalyptus Design as per sample approved by PM)]	Sq m	879.70		
6.20	**VENEER FINISH (Eucalyptus Design as per sample approved by PM)** 'Providing and fixing 4mm veneer plus 8 mm MDF panelling over 75mm partition system(75mm parition system is to be paid for separetly)and including finishing with Matt Melamine polishing in approved shade as per design and / or instructions of PM. (Venner Basic Rate - 200/Sqft). Veener shall be pasted with approved adhesives with necessary grooves and other patterns as per design , all including as reqiuired.	Sq m	5.00		
6.30	**LAMINATE FINISH**	Sq m	55.58		

	Providing & Fixing 1mm laminate finished over MDF Partition/Paneling.				
6.40	**FABRIC FINISH** 'Providing and fixing approved Fabric-1 on panelling fixed with 19mm thick 'U' foam having 24 kg/cum density (Mikron or equivalent) wound over existing MDF partition. Fabric paneling having stitching of matching colour on all sides as per design and / or instructions of PM. (Basic Rate - 1000/RMT)	Sq m	94.92		
6.50	**LACCQUER GLASS FINISH** 'Providing, constructing and fixing in place 6mm thick Lacquered glass of approved make and colour fixed on panelling/Partition.	Sq m	17.50		
6.60	**WOODEN MARGINS** Providing and Fixing 25mm x 25 mm Wood batten over Ply box/ MDF Partition with Headless Nails and Adhesives	Sq m	3.60		
6.70	**WOODEN MARGINS** '25mm x 25mm Wood batten finished in Melamine Polish include intermidiate Groove 12mm x 25 mm to achive the pattern.	Sq m	3.60		
6.80	**DUCO PAINT** **MDF JAALI IN DUCO PAINT:** Providing and fixing 12mm MDF Jaali finished with DUCO paint. 12mm Thick, including cost of providing and fixing and making Jaali with CNC machine	Sq m	4.00		
6.90	**WALL PAPER** Providing and fixing wall paper of approved make, design, shade and colour including preparing surfaces, filling up with gypsum or approved filler, cleaning and making surface dust-free, applying a sealer or primer coat as recom mended by approved manufacturer, required scaffolding, cleaning and protecting till the handing over of site to the employer all complete to the entire satisfaction of the PM. (Basic Rate- 75/ SQFT)	Sq m	18.00		
6.10	**MIRROR** Providing and fixing 6mm thick Mirror of approved make over paneling/partition/wall fixed on 18mm thick MDF with 3M tape, including beveling of mirror edges,countersunk SS screws, wood beading and edging etc. all	Sq m	13.20		

	complete as per drawings and to the entire satisfaction of PM.				
6.11	**GLASS IN URINAL** 'Providing and fixing 6mm thick Lacquered glass sandwiched urinal partition.	Nos.	3.00		
6.12	**ROLLERBLINDS** 'Providing and fixing manually operated roller blinds (with Partial Blackout fabric in spring mechanism) of approved make, shade and colour including all accessories track, chain etc. The blinds shall extend minimum by 100 mm beyond all four sides of the opening. All complete at all levels and as per approved manufacturer's specification and direction of PM. Area of opening shall be measured for payment. (Basic Rate - 350/Sqft)	Sq m	218.88		
6.13	**MDFPELMEETS** 'Providing and fixing Pelmet with 18 mm thick MDF Box as per Drawing , inlcuding paiting with emulsion paint on inside and Laminate Finish on outside facing Glass. MDF boards of approved make and confirming to IS 3087, including fixing with Galvanized metal support frame fixed to Mother Slab with Rawl plugs etc at rehular interval as per PM . MDF Box of overall cross sectional size 900mm x 250mm to be considered.	Rmt	151.80		
6.14	Providing and Fixing extra MDF Panelling with 12mm thk MDF over subframe made with 25mm Aluminum tube/MDF/Ply and to achive overall thickness raised by upto 37mm approximately and as per deisgn and directed by PM	Sqm	50.00		
6.15	**VENNER WORKS (Eucalyptus Design sample approved by PM):** 'Providing and fixing 4mm veneer over previously made 75mm partition system, or other ply surface with approved adhesives and icluding any patterns and grooves as directed (75mm parition system , ply sturucture etc is to be paid for separetly)and including finishing with Matt Melamine polishing in approved shade as per design and / or instructions of PM. (Venner Basic Rate - 200/Sqft)	Sqm	1116.663		
6.16	**FIBRE CEMENT PANELLING FOR SPANDREL:** Providing and fixing Fibre Cement Board 12mm Thickness over framing with Light gauge steel frame work fixed with self-drilling / taping screws / fasteners @ 60cm c/c of approved make, Screws shall be of counter sunk rib head of 1.60mm to 4 mm thick or 8 to 10 gauge of length varying from 25 to 45 mm. Proper taping and jointing to be done	Sqm	194.40		

	using fiber mesh tape and epoxy and acrylic based jointing compound for seamless finish.Cement Fiber Board as per IS 14862:2000 of type B (High pressure Steam Cured).				
7.	**JOINERY WORK**				
7.10	Providing, making and fixing Hard wood door JAMB frames made out of approved quality teak wood, kiln-seasoned, anti-termite treated, shaped, grooved, mitered joint arrangement including using mealamine polish and matching with Veneer polish color with necessay wodden color dyes by ICA , complete as per satisfaction of the Architect Consultancy [100mm x 60mm]	Rmt	192.50		
7.20	Providing and fixing Door of total Thickness of 55mm with Internal core of factory made 35mm thick solid core flush shutters conforming to IS 2202 Part I, and with 6mm MDF and 4mm Venner over Both sides and finished with Melamine Finish ,edges of shutters shall be provided with 43 mm x 6mm thick teakwood beading using exterior quality synthetic adhesive, headless GI nails, screws, beading finished with melamine polish, etc. (Beading Kiln seasoned, antitermite treated) including ironmongeries as per schedule and drawings all complete to entire satisfaction of the PM. Doors shll be fitted with conceled Door closure as per approved Make and paid for separetly				
7.21	D1 - Single leaf door shutter (Structural opening size - 1100mm x 2400mm) (Location : As per Drg) [Ironmongery of approved make: a) S.S ball bering butt hinges 102mm x 76mm x 3mm - 4 Nos., b) SS Handle 900mm Long - 1 Nos., c) SS Tower Bolt 150mm long - 1 No.,d) SS Door Stopper - 1 No.]	Nos.	13.00		
7.22	DO as Item7.21 but of size - D2- Single leaf door shutter (Structural opening size - 900mm x 2400mm) (Location : As per Drg) [Ironmongery of approved make: a) S.S ball bering butt hinges 102mm x 76mm x 3mm - 4 Nos., b) SS Handle 900mm Long - 1 Nos., c) SS Tower Bolt 150mm long - 1 No., d) SS Door Stopper - 1 No.]	Nos.	20.00		
7.30	Providing and fixing Door of total Thickness of 49mm with Internal core of factory made 35mm thick solid core flush shutters conforming to IS 2202 Part I, and 8mm MDF and 1mm Laminate over Both sides ,edges of shutters shall be provided with 49 mm x 6mm thick teakwood beading using exterior quality synthetic adhesive, headless GI nails, screws, beading finished with melamine polish, etc. (Beading	Nos.	11.00		

	Kiln seasoned, antitermite treated) including ironmongeries as per schedule and drawings all complete to entire satisfaction of the PM. Doors shll be fitted with conceled Door closure as per approved Make and paid for separetly. [D3- Single leaf door shutter (Structural opening size - 900mm x 2400mm) (Location : Archive room 3 & 4, Lounge, Gents & Ladies toilet, Executive toilet)] [Ironmongery of approved make: a) S.S ball bering butt hinges 102mm x 76mm x 3mm - 4 Nos.,b) SS mortise main door lock - 1 Nos., c) SS Door Hook, d) SS Tower Bolt 150mm long - 1 No., e) SS Door Stopper - 1 No., f) SS Pull handle 700mm long - 1 pair]				
7.40	**EXTRA FOR DOOR CLOSER** Providing and Fixing Conceled Door Closer of load capacity 85 kg and suitable for inserting in 50mm dooor thickness. All including making good door and testing of testing of operation as directed by PM	Each	44.00		
7.50	**EXTRA FOR DOOR LOCKS** Supply and Installing Morticse Pin Cylinder Lock with Separate Latch Handle and Separate Rosette. Complete Set . "C"Type Handle in Matt chrome Finish	Each	18.00		
7.60	**GLASS PARTITION** Single Glazed Partition with 10 mm thick clear toughened glass plate with polished edges. The linear joints between the glazed modules are provided with aluminium 'H' profiles sealed with high bonding double – side adhesive tape. The partition will be fixed to Typical MDF Partition on Aluminum rame with necessary Teak bead margin on One side. One side rebate shall be created in Partition. In case of wider openings, SS trip in between two glass panes shall be fixed and included in rate.	Sq m	120.72		
7.70	**GLASS DOOR** Glass doors with frames of 60 x 60 mm in extruded tubular aluminium duly powder coated/ annodized and 12 mm thick clear toughened glass door. The door will be provided with hinges, 450 mm H handle, exposed door closer and floor mounted door stopper all of Geze make. Double Leaf Opening of Size 2400 x2400mm approx and as per Drawing	Sq m	5.60		
7.80	**GRAPHIC FILM OVER GLASS** 'Providing and fixing in place glass graphic film of 3M (or equivalent approved) on	Sq m	45.27		

	glass in approved pattern, shade etc. complete as per PM's instructions.				
7.90	**IN BUILT STORRAGE IN VENEER AND LAMINATE** Providing, constructing and fixing in place storage units to be constructed as follows : a) Shutter shall be made out of 19mm thick approved marine grade ply and finished with approved veneer and satin melamine polish/polycoat lamination on both sides. b) Internal surfaces and Shelf shall be made out of 19mm thick approved marine grade ply & finished with 1mm Laminate on both sides. c) Cost also to include approved quality hard wood (kiln seasoned, antitermite treated) edges, framing and lipping patti including melamine/polycoat lamination finish as per drawing and as per PM 's directions. d) Cost to include providing & fixing SS hinges, Godrej multi purpose SS locks, SS handles / knob, synthetic resin adhesive etc. complete wherever required. All complete as shown in drawings and entire satisfaction of the PM. (Location: Pantry)	Sq m	18.50		
7.92	**AUTOMATED SLIDING DOOR** Automatic Sliding Door- Dorma ES 200 Easy Double Leaf Sliding Door Operator (Body Finish: Standard Silver Anodized) ES 200 Easy 4150 mm Automatic Double Leaf sliding door operator with profile length of 4150 mm for double door operation, with self-learning mechanism, micro-processor controlled drive unit, program selector, motion detector (Eagle six radar), mechanical component, tooth belt, cover profile, glass clamping rail – 2 nos, and floor guide system for glass door.	Nos	2.00		
7.93	Supply and Installation of ROUND DRAWER LOCKS, 4 key Set , Brass body, Satin Chrome Finish	Nos	20.00		
7.94	**GLAZING IN OUTER WALL** Providing and Fixing Single Glazed Fixed Panel Glass with 12 mm thick clear toughened glass plate with polished edges. The verticle linear joints between the glazed modules are provided with aluminium 'H' profiles sealed with high bonding double – side adhesive tape. The GLASS will be fixed with Aluminum Section at Top and Bottom of size 50 x 100 mm or Similar section good for securing in place glass ensuring minimum vibration and tightly fit in place. SS trip in between two glass panes shall be fixed and included in rate.	Sqm	49.50		

8.	**PAINTING WORK**				
8.10	**EMULSION PAINT** 'Providing and applying Emulsion paint in all locations including walls and ceilings of approved make and colour conforming to IS in two coats (surface and finish acceptable to the PM must be achieved by the contractor and any additional coats if required shall be at the cost of the contractor); including preparing surfaces, filling up with gypsum or approved crack filler, binder; cleaning and making the surface dust-free, applying a sealer or primer coat of paint as recommended by approved paint manufacturer, applying two coats of paint (of approved make and shade), required scaffolding, cleaning and protecting till the handing over of site to the employer all complete to entire satisfaction of the PM. .	Sq m	940.23		
8.20	**POLYCOAT LAMINATION** 'Providing and applying White Polycoat paint of approved make and colour conforming to IS in two coats (surface and finish acceptable to the PM must be achieved by the contractor and any additional coats if required shall be at the cost of the contractor); including preparing surfaces, filling up with gypsum or approved crack filler, binder; cleaning and making the surface dust-free, applying a sealer or primer coat of paint as recommended by approved paint manufacturer, applying two coats of paint (of approved make and shade), required scaffolding, cleaning and protecting till the handing over of site to the employer all complete to entire satisfaction of the PM.	Sq m	10.00		
8.50	**DUCO PAINT** 'Providing and applying two under coats and one finish coat of Duco paint of approved colour over approved priming coat on existing ply wood paneling conforming to IS (surface and finish acceptable to the PM must be achieved by the Contractor and any additional coats if required shall be at the cost of the Contractor) including preparing surfaces, required scaffolding etc. all complete at all leads and lifts to entire satisfaction of the PM.	Sq m	10.00		
9.	**FURNITURE WORK AND CHAIRS**				
9.10	**STORAGE UNIT IN VENEER:** Providing, constructing and fixing in place Storage Unit to be constructed with 19mm thick marine, shutters to be finished with veneer and satin melamine polish inside and outside including internal verticles, shelves,	Sq m	4.95		

	drawers as directed by the PM also including necessary fitting / fixtures and hardware etc. complete to the entire satisfaction of the PM.				
9.20	**RECEPTION TABLE:** Providing, constructing and placing in position Reception table of size (2400mm L x 900mm W x 1200mm H). With 2 nos Pedestral of sixe 450mm x500mm. [a) Table Front and sides made of made out of approved Solid Surface (Corian) finish ., b) Top of Table Finished with Veenerr and Melamaine Polish , Cost to include providing and fixing approved teak wood beading with melamine finish, chamfering, rounding edges, hardware (i.e. handle, hinges, lock, etc.), making cut-outs in tables wherever required as shown in the drawings or as per Consultancy's directions. All complete as shown in drawings and entire satisfaction of the Architect Consultancy].	Nos.	1.00		
9.30	**CONFERENCE TABLE**				
9.31	CONFERENCE TABLE 1: Providing, constructing and placing in position Board Room Table of size 2400mm x 1400mm x 750mm(CONFERENCE TABLE 1), made out of : [a) Table top made out of 19mm thick marine grade Plywood in two layers with approved burl veneer and polycoat finish on all exposed sides. Necessary wooden marging and beading as per design and final finish in Polycoat. The supporting structure shall be made in 19 Ply in single layer or double layer as per drawing with necessary 12mm MDF cladding to cover curves etc. All including adhesives of approved make, headless nails, countersunk screws and fitted with hinges and flip up electricbox etc all,as per drawing] Cost to include providing and fixing approved teak wood beading with polycoat finish, chamfering, rounding edges, hardware (i.e. handle, hinges, lock, etc.), making cut-outs in tables wherever required as shown in the drawings or as per PM's directions. All complete as shown in drawings and entire satisfaction of the EIC. Top area in plan shall be measured for payment purpose.	Nos.	1.00		
9.32	CONFERENCE TABLE 2: Providing, constructing and placing in position Board Room Table of size 3200mm x 1600mm x 750mm(CONFERENCE TABLE 2), made out of : [a) Table top made out of 19mm thick marine grade Plywood in two layers with approved burl veneer and polycoat finish on all exposed sides. Necessary wooden marging and beading as per design and final finish in Polycoat. The supporting structure shall be made in 19 Ply in single layer or double layer as per drawing with necessary 12mm MDF cladding to cover curves	**Nos.**	1.00		

	etc. All including adhesives of approved make, headless nails, countersunk screws and fitted with hinges and flip up electricbox etc all,as per drawing] Cost to include providing and fixing approved teak wood beading with polycoat finish, chamfering, rounding edges, hardware (i.e. handle, hinges, lock, etc.), making cut-outs in tables wherever required as shown in the drawings or as per PM's directions. All complete as shown in drawings and entire satisfaction of the PM. Top area in plan shall be measured for payment purpose.				
9.33	CONFERENCE TABLE 3: Providing, constructing and placing in position Board Room Table of size 7000mm x 2200mm x 750mm(CONFERENCE TABLE 3), made out of : [a) Table top made out of 19mm thick marine grade Plywood in two layers with approved burl veneer and polycoat finish on all exposed sides. Necessary wooden marging and beading as per design and final finish in Polycoat. The supporting structure shall be made in 19 Ply in single layer or double layer as per drawing with necessary 12mm MDF cladding to cover curves etc. All including adhesives of approved make, headless nails, countersunk screws and fitted with hinges and flip up electricbox etc all,as per drawing] Cost to include providing and fixing approved teak wood beading with polycoat finish, chamfering, rounding edges, hardware (i.e. handle, hinges, lock, etc.), making cut-outs in tables wherever required FOR AUDIO VISUAL AND PA SYSTEM as shown in the drawings or as per PM's directions. All complete as shown in drawings and entire satisfaction of the PM. Top area in plan shall be measured for payment purpose.	Nos	1.00		
9.40	**TABLE - L TYPES IN CABINS**				
9.41	Providing, constructing and placing in position **L-shape Table** of size ((2000mm x 1200mm X750mm) with Pedestral (450mm x 500mm) and Side unit (1200 mm x500mm) as per drawing , Complete all for three Units as mentioned and shown : a) Table top made out of 19mm thick marine grade Plywood in two layers with approved Venner/polycoat finish as per detail drawing., b) Table and all units to be finished in Burl venner and Polycoat finished as shown in drawing., c) Shutters and drawers shall be made out of 19mm thick approved marine grade ply and finished with approved veneer/polycoat on both sides., Cost to include providing and fixing approved teak wood beading with polycoat finish, chamfering, rounding edges, hardware (i.e. handle, hinges, lock, etc.), making cut-outs in tables	Nos.	2.00		

	wherever required as shown in the drawings or as per PM's directions. All complete as shown in drawings and entire satisfaction of the PM.				
9.42	Providing, constructing and placing in position **L-shape Table** of size ((1800mm x 1200mm X750mm) with Pedestral (450mm x 500mm) and Side unit (900 mm x500mm) as per drawing , Complete all for three Units as mentioned and shown : a) Table top made out of 19mm thick marine grade Plywood in two layers with approved Venner plus Melamine finish as per detail drawing., b) Table tops and all units to be finished in Venner and Melamine finished on visible surfaces as shown in drawing., c) Shutters and drawers shall be made out of 19mm thick approved marine grade ply and finished with approved Lamintae on Inside faces ., Cost to include providing and fixing approved teak wood beading with melamine finish, chamfering, rounding edges, hardware (i.e. handle, hinges, lock, etc.), making cut-outs in tables wherever required as shown in the drawings or as per PM's directions. All complete as shown in drawings and entire satisfaction of the PM.	Nos	3.00		
9.43	Same as Item 9.42 but of Table of size ((1800mm x 900mm x 750 mm)+ Pedestral (450mm x500mm) and Side unit (900mm x500mm)	Nos.	14.00		
9.50	**PERSONAL SECTRETARY TABLES**				
9.51	Providing, constructing and placing in position **Personal Secretary Table** of size 1200mm x 600mm x 750mm + Side Unit of size 1200mm X 450mm X 750mm. Made out of :a) Table top made out of Veneer/Melamaine finish., b) Sides & front of table shall be made out of Solid Surface (Corian) Finish, c) Drawers to be finished in veneer/melamine and to have profile handle below the table top., Cost to include providing and fixing approved teak wood beading with melamine finish, chamfering, rounding edges, hardware (i.e. handle, hinges, lock, etc.), making cut-outs in tables wherever required as shown in the drawings or as per PM's directions. All complete as shown in drawings and entire satisfaction of the PM. Top area in plan shall be measured for payment purpose. (Location: PS Tables)	Nos.	4.00		
9.60	**SOFA SETS**				
9.61	Providing and Placing Sofa Set 2 + 1 Seater , Fully Upholstered withFaux Leather Finish (Basic Price 650/ Meter. With arms all Upholstered	Nos.	4.00		

9.62	Providing and Placing Sofa Set 2+1 Seater , Fully Upholstered with Wooven Fabric Finish (Basic Price 900/ Meter. With arms all Upholstered	Nos.	3.00		
9.63	Providing and Placing Corner Tables in Seasoned Teak Wood , polished in Melamine Finish, Size 450mm x 4500mm	Nos.	7.00		
9.70	**CEO CABIN CHAIR:** Providing and supplying a HIGH BACK chair with ergonomic design, comfortable & aesthetically appealing. The seat shall be made of 15mm thick hot pressed commercial plywood padded with high resilience polyurethane foam (30+25)mm thick having density (40 & 32)kg/m³ and the back shall be made of (15+6)mm thick double layered moulded plywood padded with high resilience polyurethane foam 30mm thick having density 32kg/m³. The same shall be upholstered with leatherite tapestry 1mm thick. The backrest shall be made by keeping the natural curvature of the spine which helps to provide lumbar support & full back support as well as head support. The chair shall be supplied with cushion arm with leatherite covering top completely joint with seat and back. For seating durability the chair shall have, Synchro knee tilt 360 degree revolving mechanism having four position locking and tilt tension adjustment with anti-shock feature which provides back strength for the chair. The pneumatic seat height adjustment for healthy seating, user can adjust seat height up to 65mm with BIFMA standard class-3 gas-lift to suit them using the lever under the seat. The gas-lift mechanism should be tested as per ANSI/BIFMA X5.1-2011 standards. The Pedestal should have five legged made of Aluminium having pitch circle dia. 640 mm fitted with 5 nos. twin wheel castors. The castors of the chair shall be injection moulded in black 30% glass filled nylon, confirming to ANSI/BIFMA X5.1-2011 standards tested to perform 98,000 cycles with 250lbs load. The seat size shall be 515±10 mm(D) X 500±10 mm(W) and back size shall be 600±10 mm(W) X 790±10 mm(H) from seat. Overall height shall be = 1210±10 mm, overall depth/width = 740±10 mm. The OEM must have all the prevalent quality & safety related certifications like ISO:9001. Published MRP Rate not less than Rs 35000	NOS	2.00		
9.80	**KMP AND CABIN III CHAIRS AND BOARD ROOM:** Providing and supplying a HIGH BACK chair with ergonomic design, comfortable & aesthetically appealing. The seat and back shall be made of double layered moulded (15+6)mm thick hot pressed commercial plywood padded with high resilience polyurethane foam (40+30+19)mm thick having density (40 & 32)kg/m³ in seat and (40+25)mm thick	NOS	36.00		

	having density 32kg/m³ in back. The seat and back shall be upholstered with leatherite tapestry 0.8mm thick and 535 GSM. The backrest shall be made by keeping the natural curvature of the spine which helps to provide full back support as well as head support. The chair shall be supplied with chrome plated arm with cushion having leatherite covering top and MS powder coated steel spine shall be fixed with seat and back. For seating durability the chair shall have synchro knee tilt 360 degree revolving mechanism with four position locking and tilt tension adjustment which provides back strength for the chair. The pneumatic seat height adjustment for healthy seating, user can adjust seat height up to 65mm with BIFMA standard class-3 gas-lift to suit them using the lever under the seat. The gas-lift mechanism should be tested as per ANSI/BIFMA X5.1-2011 standards. The Pedestal should have five legged made of PP chrome having pitch circle dia. 660 mm fitted with 5 nos. twin wheel castors. The castors of the chair should be injection moulded in black 30% glass filled nylon, confirming to ANSI/BIFMA X5.1-2011 standards tested to perform 98,000 cycles with 250lbs load. The seat size shall be 500±10 mm(D) X 525±10 mm(W) and back size shall be 530±10 mm(W) X 680±10 mm(H) from seat. Overall height shall be = 1150±10 mm, overall depth = 630±10 mm & overall width = 650±10 mm. The OEM must have all the prevalent quality & safety related certifications like ISO:9001. Published MRP Rate not less than Rs 22000				
9.90	**VISITORS CHAIRS AND CONFERENCE:** Providing and supplying a LOW BACK chair with ergonomic design, comfortable & aesthetically appealing. The seat and back shall be made of double layered moulded (15+6)mm thick hot pressed commercial plywood padded with high resilience polyurethane foam (40+30+19)mm thick having density (40 & 32)kg/m³ in seat and (40+25)mm thick having density 32kg/m³ in back. The seat and back shall be upholstered with leatherite tapestry 0.8mm thick and 535 GSM. The backrest shall be made by keeping the natural curvature of the spine which helps to provide full back support as well as head support. The chair shall be supplied with chrome plated arm with cushion having leatherite covering top and MS powder coated steel spine shall be fixed with seat and back. For seating durability the chair shall have synchro knee tilt 360 degree revolving mechanism with four position locking and tilt tension adjustment which provides back strength for the chair. The pneumatic seat height adjustment for healthy seating, user can adjust seat height up to 65mm with BIFMA standard class-3 gas-lift to suit them using the lever under the seat. The	NOS	105.00		

	gas-lift mechanism should be tested as per ANSI/BIFMA X5.1-2011 standards. The Pedestal should have five legged made of PP chrome having pitch circle dia. 660 mm fitted with 5 nos. twin wheel castors. The castors of the chair should be injection moulded in black 30% glass filled nylon, confirming to ANSI/BIFMA X5.1-2011 standards tested to perform 98,000 cycles with 250lbs load. The seat size shall be 500±10 mm(D) X 525±10 mm(W) and back size shall be 530±10 mm(W) X 680±10 mm(H) from seat. Overall height shall be = 1150±10 mm, overall depth = 630±10 mm & overall width = 650±10 mm. The OEM must have all the prevalent quality & safety related certifications like ISO:9001. Published MRP Rate not less than Rs 8000				
9.91	**WORK STATION CHAIR :** The 640mm dia (26 inches) five pronged base is nos each made out of GF nylon – Reinforced with bottomribbing for additional buttress and strength. Tested prudently and igorously as per ANSI/BIFMA X5.1-2011 General Purpose Office Chair Standards Castors: Twin Castors 50mm dia castors compling to ANSI / BIFMA X 5.1 – 2002 Gaslift: Class 4 ested -ANSI BIFMA performance standards Upholstery Seat Cushion with pre oulded foam of 50 - 60 density Density -- 52 kg/m3 Hardness -- 12.6kgf at 25% Mechanism: Self Calibrating Multilock Mechansim Tested as per BIFMA Standards. Back Frame is inserted with Mesh & DynamicAdaptable Lumbar Support Tension Control : Tension control is below the Seat.Armrest : Moulded polyurethene Arms confirming to IS 7078 with steel inserts for long Moulded self skinned polyurethene Arms confirming to IS 7078 with steel insets for long life. one way adjustable - 3Height Adjustable. Fabric: Seat is duly upholstered with approved fabric Self Calibrating: Mechanism that adapts to the user's body weight to offer the optimum resistance without requiring any manual adjustments. The pronounce frame design coupled with the adjustable lumbarsupport fine tunes the perfect posture that provides adequate seating comfort for long hours. Published MRP not less than Rs 12000	NOS	54.00		
9.92	**PLY BOX FOR FEATURE AND OTHER:** Providing and fixing Ply Box with 19mm Ply and Covered in 8mm MDF , ready to recieve, Wood, Veeneer, Marble or other surface cladding material. Depth of Box not more than 750mm. Mesurement of surface area shall exclude all opening over 0.50 sqm. Payment on surface area of box on one sise only	Sqm	12.00		

10.0	**MODULAR WORK STATIONS:** L Shape Workstations of size 1500(W)mm + 1500mm(L) x 600mm (D) x 1150mm (H) AND Mobile Pedestral as below: Type : Desk based system,Table top : 25mm thick prelaminated table top with Aluminum Flipup provision. Size: 500mm(W)x120mm(d) in Anodized finish only.Main spine - 30mm thick : Above table top:- Inside half Magnetic board-half glass marker and out side fabric hard board size of 1500Wx400HReturn spine - 30mm thick - Not connecting to Main spine.. : Above table top:- Inside Magnetic board and out side fabric hard board size of 1350Wx400HUnderstructure : End Legs : MS Powder coated SOLE Slant legs and Mid legs: MS Powder caoted metal mid legs with metal beams cosnsidered for table support.Wire management : MS Powder coated full length wire tray & vertical cable risers considerd for wire management.CBelow table top - Modesty : 350H - Sharing WS 450H - Non sharing WS, MS Powder coated perforated metal modesty @ Below table top main spine & Return spine..Leg - Modesty : 450H - MS Powder coated perforated metal Leg modesty for All legs..PLB Mobile Pedestal - 2D+1F2 Pencil drawers + 1 filing drawer. Size :400mm(W) x 450mm(D) x 650mm(H) with central locking system & Aluminum D ypte / Depress handles.FEATHERLITE OR EQUIVALENT	Nos.	54.00		
11.0	**Supply and Placing - Meeting Table , Glass Top, Chrome Legs as per PM. Size 1200 Diameter**	Nos.	1.00		
12.0	**PANTRY/ CANTEEN: TABLE:-** Table top : 25mm thick E1 Grade prelaminated table top with matching edgebanding . Table Understructure - Foldable : Ms powder coated folfdable under structure with X base support	**Nos**	5.00		
13.0	**CHAIR:-** Supplying & Placing Cafe Chair. The seat shall be made of 15mm thick hot pressed plywood upholstered with high resilience polyurethane foam 19mm thick having density 40kg/m³ with black leatherite tapestry 0.8mm thick and 535 GSM and the back shall be made of metal frame upholstered with high resiliance polyurethane foam 12mm thick having density 23kg/m³ with black leatherite tapestry 0.8mm thick and 535 GSM. The seat and back shall be fixed with plywood & metal frame. The frame structure shall be supported by four legs made up of SS with shiny chrome finish square pipe of size 20mm X 20mm with 1.6mm thick. There shall be PPCP shoe provided at the base to avoid scratches on the	**Nos**	20.00		

	floor. The Seat size shall be 410±10 mm(D)X430±10 mm(W) and back size shall be 420±10 mm(W)X400±10 mm(Ht) from seat. Overall height shall be = 860±10 mm.				
PART-B	**ELECTRICAL & ELV INSTALLATION BOQ**				
14	**EARTHING SYSTEM: Providing of Earth Pit Stations:**				
14.1	**Cu Maintenance Free Earth Pi**t With 50mm Dia, 3.00mtr Long Pure Copper Pipe Electrode, Along with Two Bags (20kg. each) of Eco-friendly Conductive Hygroscopic backfill Compound. The earth pit shall have Round Type FRP (heavy duty) Inspection Chamber of size, (10" x 13" x 13") with its cover.	**Nos.**	2.00		
14.2	Supply, laying & termination of following size of Earth Strips with all accessories as required of size 25 x 6mm GI	**RM**	250.00		
14.3	Supply, laying & termination of following size of Earth Strips with all accessories as required of size 25 x 6mm CU	**RM**	100.00		
14.4	Supply, laying & termination of following size of Earth wires with all accessories as required of size8swg Cu Wire.	**RM**	50.00		
14.5	Supply, laying & termination of following size 1CX10Sqmm CU.MULTI STANDARD FLEX.CABLE in 25mm dia MMS PVC Conduit as per requiremnt.	**RM**	150.00		
15	**L.T. PANELS & DB's**				
15.1	SITC of following MCCB/MCB, distribution boards. Those distribution boards shall be totally enclosed, Indoor Type, with double door, vertical, surface mounting type. The Outer door shall be hinged type with push in type spring / magnetic lock & Inner door shall be fixed up with screws with cutouts for MCB operation. The proper size of Copper Busbar of at least 1.5 times the rating of incomer MCB / MCCB, with adequate space for termination of incoming and outgoing cables shall be provided inside DB. Removable undrilled Gland Plates, fabricted using 14swg, CRCA Sheet, has to be provided at top & bottom of each DB. Proper type of brackets, fabricated using 40 x 6mm, MS Strip/Flat, shall be provided at back side of DB, for mounting it on wall or column by providing MS Frame. In case of MCCB as an Incomer, the MCCB shall be provided in separate	**EA**	2.00		

	compartment. The MCCB shall have front drive mechanism and door interlock. The DB shall be fabricatedout of 1.6 mm thick CRCA sheet steel. DB shall be completely wired up, up to incoiming and outgoing terminals by PVC insulated flexible copper wire of adequate rating. All ELCB installed in LDB and PDB shall be rated for 30ma leakage current respectively. All MCB in Lighting as well as in Power DB shall be suitable for Motive power (Curve C). Wherever standard DB's of MCB manufacturers are available, same shall be used.APPROVED MAKE- LEGARND/ SCHNEIDER /HAVELLS **8 WAY PPI TPN FOR UPDB-1 & UPDB-2 Consisting With : Incomer - 40Amp, TPN, 10KA MCB ,SUB INCOMER - 3 NOS. 25A DP RCCB OUTGOING - 10A, SP, MCB - 24 Nos. AS PER DB SCHEDULE**				
15.2	SITC of following MCCB/MCB, distribution boards. Those distribution boards shall be totally enclosed, Indoor Type, with double door, vertical, surface mounting type. The Outer door shall be hinged type with push in type spring / magnetic lock & Inner door shall be fixed up with screws with cutouts for MCB operation. The proper size of Copper Busbar of at least 1.5 times the rating of incomer MCB / MCCB, with adequate space for termination of incoming and outgoing cables shall be provided inside DB. Removable undrilled Gland Plates, fabricted using 14swg, CRCA Sheet, has to be provided at top & bottom of each DB. Proper type of brackets, fabricated using 40 x 6mm, MS Strip/Flat, shall be provided at back side of DB, for mounting it on wall or column by providing MS Frame. In case of MCCB as an Incomer, the MCCB shall be provided in separate compartment. The MCCB shall have front drive mechanism and door interlock. The DB shall be fabricatedout of 1.6 mm thick CRCA sheet steel. DB shall be completely wired up, up to incoiming and outgoing terminals by PVC insulated flexible copper wire of adequate rating. All ELCB installed in LDB and PDB shall be rated for 30ma leakage current respectively. All MCB in Lighting as well as in Power DB shall be suitable for Motive power (Curve C). Wherever standard DB's of MCB manufacturers are available, same shall be used.APPROVED MAKE- LEGARND/ SCHNEIDER /HAVELLS **6WAY PPI TPN FOR POWER DB-1 &PDB-2, PDBConsisting With :- Incomer - 40Amp, TPN, 10KA MCB ,SUB INCOMER - 3 NOS. 40A DP RCCB ,OUTGOING - 16A, SP, MCB - 18 Nos. AS PER DB SCHEDULE**	**EA**	2.00		

15.3	SITC of following MCCB/MCB, distribution boards. Those distribution boards shall be totally enclosed, Indoor Type, with double door, vertical, surface mounting type. The Outer door shall be hinged type with push in type spring / magnetic lock & Inner door shall be fixed up with screws with cutouts for MCB operation. The proper size of Copper Busbar of at least 1.5 times the rating of incomer MCB / MCCB, with adequate space for termination of incoming and outgoing cables shall be provided inside DB. Removable undrilled Gland Plates, fabricted using 14swg, CRCA Sheet, has to be provided at top & bottom of each DB. Proper type of brackets, fabricated using 40 x 6mm, MS Strip/Flat, shall be provided at back side of DB, for mounting it on wall or column by providing MS Frame. In case of MCCB as an Incomer, the MCCB shall be provided in separate compartment. The MCCB shall have front drive mechanism and door interlock. The DB shall be fabricatedout of 1.6 mm thick CRCA sheet steel. DB shall be completely wired up, up to incoiming and outgoing terminals by PVC insulated flexible copper wire of adequate rating. All ELCB installed in LDB and PDB shall be rated for 30ma leakage current respectively. All MCB in Lighting as well as in Power DB shall be suitable for Motive power (Curve C). Wherever standard DB's of MCB manufacturers are available, same shall be used.APPROVED MAKE- LEGARND/ SCHNEIDER /HAVELLS **6 WAY PPI TPN FOR LDB-1 & LDB-2 onsisting With,Incomer - 40Amp, TPN, 10KA MCB ,SUB INCOMER - 3 NOS. 40A DP RCCB ,OUTGOING - 10A, SP, MCB - 18 Nos. AS PER DB SCHEDULE**	**EA**	2.00		
15.4	Supply, installation, testing & commissioning of 500V Distribution Boards as specified& shown on drawing with i) Copper busbars together with tapped neutral bar for individual phases. ii) Copper earth strip with tapping for EECiii) Busbar mounting mcb's individually lockable in off position.' iv) Interconnections and earthing. v) Sheet steel enclosure suitable for recessed or surface mounting with hinged lockable doors interlocked with the incomer switch.vi) Phase to phase barriers in case of 3Ph boards.'vii) Necessary support frame & painting labelling etc complete.viii) circuit wiring Power coated MS connector trunking as required with cover for the complete perfect dressing, Emergency Lighting Distribution Boards as specified Emergency Lighting Distribution Board **ELDB 12 Way SPN DB consisting of 2.0 KVA Inverter with 15 minutes Battery Backup with required rack to mount battery & inverter & shall comprise of Incomer : i) 25 Amp DP ELMCB 100mA**	**EA**	1.00		

	Outgoing :i) 10# 6/10/16 Amp SP MCB				
15.5	Supply, installation, testing and commissioning of cubicle type panels as specified in the technical specification and shown on drawing. i) Main Aluminium busbars as specified in the drawings with bar type feeder connections & all internal wiring (with FRLS wires) and connections.ii) Earthing all components,frame etc. to a common internal earth bar.iii) Painting all sheet metal works.iv) All accessories & supporting structure.v) Brass glands and crimping lugs for sending and receiving ends. vi) All ammeters with C.T's and voltmeter and energy meters with necessary fuses as shown and as required.vii) All Load Managers to have parameters like KW,KVA, A, V,KWhr,Hz, PF,KVAR, Active & Reactive component of power, RS 485 port to have BMS compatibility as required & desired to complete the system.vii) Panel components as specified.viii) MS base frame with finish as per specification.ix)All switch gear to have short circuit levels as specified. **7th floor Ph-1 PANEL** - as shown in Power Schematic SLD.	**EA**	1.00		
15.6	Supply, installation, testing and commissioning of cubicle type panels as specified in the technical specification and shown on drawing. i) Main Aluminium busbars as specified in the drawings with bar type feeder connections & all internal wiring (with FRLS wires) and connections.ii) Earthing all components,frame etc. to a common internal earth bar.iii) Painting all sheet metal works.iv) All accessories & supporting structure.v) Brass glands and crimping lugs for sending and receiving ends. vi) All ammeters with C.T's and voltmeter and energy meters with necessary fuses as shown and as required.vii) All Load Managers to have parameters like KW,KVA, A, V,KWhr,Hz, PF,KVAR, Active & Reactive component of power, RS 485 port to have BMS compatibility as required & desired to complete the system.vii) Panel components as specified.viii) MS base frame with finish as per specification.ix)All switch gear to have short circuit levels as specified. **7th floor Ph-2 PANEL** - as shown in Power Schematic SLD.	**EA**	1.00		
15.7	Supply, installation, testing and commissioning of cubicle type panels as specified in the technical specification and shown on drawing. i) Main Aluminium busbars as specified in the drawings with bar type feeder connections & all internal wiring (with FRLS wires) and connections.ii) Earthing all components,frame etc. to a common internal earth bar.iii) Painting all sheet metal works.iv) All accessories & supporting structure.v) Brass glands and crimping lugs for sending and receiving	**EA**	1.00		

	ends. vi) All ammeters with C.T's and voltmeter and energy meters with necessary fuses as shown and as required.vii) All Load Managers to have parameters like KW,KVA, A, V,KWhr,Hz, PF,KVAR, Active & Reactive component of power, RS 485 port to have BMS compatibility as required & desired to complete the system.vii) Panel components as specified.viii) MS base frame with finish as per specification.ix)All switch gear to have short circuit levels as specified. 7th floor UPS PANEL - as shown in Power Schematic SLD.				
15.8	SITC of MS enclosure with 63A MCCB.	**EA**	2.00		
15.9	**VTPN :** Supply, installation, testing & commissioning of double door 500V Distribution Boards as specified with i) Copper busbars together with tapped neutral bar for individual phases. ii) Copper earth strip with tapping for EECiii) Busbar mounting MCB's individually lockable in off position.' iv) Interconnections and earthing. v) Sheet steel enclosure suitable for recessed or surface mounting with hinged lockable doors interlocked with the incomer switch.vi) Phase to phase barriers in case of 3Ph boards.'vii) Necessary support frame & painting labelling etc complete.viii) circuit wiring Power coated MS connector trunking as required with cover for the complete perfect dressing, 4 way VTPN I/C of: 40 A , O/G circuits of 2 Nos.40 A TP MCB. Make:L&T, C&S, Schnieder. Note: Switchgeras and DB should be of same make.	**EA**	1.00		
16	**POWER AND CONTROL ARMOURED CABLES :**				
16.1	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor cables of size: **3.5 c x 95 mm2 AL**	**RM**	90.00		
16.2	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor cables of size: **3.5 c x 50 mm2 AL**	**RM**	90.00		
16.3	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor cables of size: **4 c x 25 mm2 AL**	**RM**	250.00		
16.4	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor	**RM**	350.00		

	cables of size: **4 c x 10 mm2 CU**				
16.5	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor cables of size:**4 c x 6 mm2 Cu**	**RM**	350.00		
16.6	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor cables of size:**4 c x 4 mm2 Cu**	**RM**	50.00		
16.7	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor cables of size:**3 c x 6 mm2 Cu**	**RM**	200.00		
16.8	Supply and laying of XLPE insulated, inner extruded PVC sheath, 1.1Kv Grade, 3/3.5/4 Core, XLPE, FRLS Armoured stranded ALMINUM / C0PPER conductor cables of size:**3 c x 1.5 mm2 Cu**	**RM**	450.00		
17	**CABLE GLANDING & TERMINATION**				
17.1	Supply and making of End Termination with double compression type, long head, Cable glands of Brass Material, along with solderless crimping type tinned **AL/Cu** lugs for the following XLPE insulated PVC sheathed 1100V, grade stranded **Aluminum / Copper** conductor Armoured Cable. The cost is inclduing cost of ferrules / cable sockets, glands, insulation tape and other accessories as required **3.5 c x 50 mm2 AL**	**EA**	2.00		
17.2	Supply and making of End Termination with double compression type, long head, Cable glands of Brass Material, along with solderless crimping type tinned AL/Cu lugs for the following XLPE insulated PVC sheathed 1100V, grade stranded Aluminum / Copper conductor Armoured Cable. The cost is inclduing cost of ferrules / cable sockets, glands, insulation tape and other accessories as required **3.5 c x 95 mm2 AL**	**EA**	2.00		
17.3	Supply and making of End Termination with double compression type, long head, Cable glands of Brass Material, along with solderless crimping type tinned AL/Cu lugs for the following XLPE insulated PVC sheathed 1100V, grade stranded Aluminum / Copper conductor Armoured Cable. The cost is inclduing cost of	**EA**	10.00		

	ferrules / cable sockets, glands, insulation tape and other accessories as required **4 c x 25 mm2 AL**				
17.4	Supply and making of End Termination with double compression type, long head, Cable glands of Brass Material, along with solderless crimping type tinned AL/Cu lugs for the following XLPE insulated PVC sheathed 1100V, grade stranded Aluminum / Copper conductor Armoured Cable. The cost is inclduing cost of ferrules / cable sockets, glands, insulation tape and other accessories as required **4 c x 10,4C x 06, 4c x 04,3 c x 06 mm2 CU**	**EA**	60.00		
18	**GI LADDER & PERFORATED TYPE CABLE TRAYS**				
18.1	Supply, installation, testing and commissioning of Hot Deep Galvanised, 2.0 mm thick, **Perforated Cable Tray**, for carrying Electrical / IT / TEL. cables. All the Trays will be supported either by fully threaded rods or by providing M.S.Angle / Channel supports. The rates shall be inclusive of providing of Threaded rods with Anchor fasteners, Clamps, bolts, nuts including all the necessary required material. The fabrication of structural steel shall be paid seperately.**200 x 50 mm**	**RM**	150.00		
18.2	Supply, installation, testing and commissioning of Hot Deep Galvanised, 2.0 mm thick, Perforated Cable Tray, for carrying Electrical / IT / TEL. cables. All the Trays will be supported either by fully threaded rods or by providing M.S.Angle / Channel supports. The rates shall be inclusive of providing of Threaded rods with Anchor fasteners, Clamps, bolts, nuts including all the necessary required material. The fabrication of structural steel shall be paid seperately.**100 x 50 mm**	**RM**	150.00		
18.3	Supply and fabrication of various sizes of MS angles / brackets / channels / frames, etc. of Structural Steel with one coat of red oxide and two coat of enamel approved paint for supporting equipment / cables, etc. (Paint shade will be as per Architect / Cliet Approval)	**Kgs**	250.00		
19	**LIGHT FITTINGS**				
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with	**EA**	130.00		

	all necessary accessories of Recess mounted glare free round LED Downlight with pressure die cast Aluminium housing and high transmitive Polycarbonate diffuser, (15W- 18 W), 1500-1600 Lumens(minimum), IP-20, CCT/CRI- 4000K/80, .Electronic ballast Similar to Wipro make, Mollis-LD06-221-XXX-40-XX or its equivalent item of Philips /Havells/Jaquar Lighting/Lighting technology . as per tender specification & Clients/EIC approval. Fixture code: LF01. The design shall be as per EIC/Clent approval on receipt of sample.				
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Recess mounted Round LED COB adjustable Downlight with pressure die cast Aluminium housing and reflector with power consumption (7W-9 W) having system lumen output of 700-900 Lumens, IP-20, CCT/CRI-3000K/80,.Electronic Balast similar to Wipro-(LD98-131-038-40-XX) or its equivcalent item of Philips/Havells/ Jaquar Lighting/ Lighting Technology as per tender specification & Clients/EIC approval. Fixture Code: LF02.The design shall be as per EIC/Clent approval on receipt of sample.	**EA**	210.00		
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Ceiling Suspended decorative hanging light with aluminium powder coated housing IP-20, 25W(max)-2000 Lumens, CCT/CRI-4000K/80, ElecBalast similar to Wipro make -Orbit ring or its equivalent item of Philips/ Havells /Lighting technology). as per tender specification & clients/ EIC approval. Fixture Code: LF03. The design shall be as per EIC/Clent approval on receipt of sample.	**EA**	9.00		
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Ceiling Suspended decorative hanging light with aluminium powder coated housing IP-20, 25W(max)-2000 Lumens, CCT/CRI-3000K/80, ElecBalast similar to Wipro make -Picaso Dome or its equivalent item of Philips/ Havells /Lighting technology). as per tender specification & clients/ EIC	**EA**	5.00		

	approval. Fixture Code: LF03. The design shall be as per EIC/Clent approval on receipt of sample.				
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Ceiling recessed (Clip On Type) end to end connected linear light with high extruded aluminium housing and high transmitive PMMA diffuser, IP-20, (25-30W)/m (2200-3300)Lumens/m(minimum), CCT/CRI-4000K/80, Length- 7800mm, Width maximum upto 100 mm, Electronic Balast similar to Wipro make-Lineos LED or its equivalent item of Philips/ Abby Lighting/ Jaquar Lighting/ Havels) as per tender technical specification & clients/ EIC approval.	**EA**	8.00		
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Ceiling recessed (Clip On Type) end to end connected linear light with high extruded aluminium housing and high transmitive PMMA diffuser, IP-20, (25-30W)/m (2200-3300)Lumens/m(minimum), CCT/CRI-4000K/80, Length- 7200mm, Width maximum upto 100 mm, Electronic Balast similar to Wipro make-Lineos LED or its equivalent item of Philips/ Abby Lighting/ Jaquar Lighting/ Havels) as per tender technical specification & clients/ EIC approval.	**EA**	4.00		
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Ceiling recessed (Clip On Type) end to end connected linear light with high extruded aluminium housing and high transmitive PMMA diffuser, IP-20, (25-30W)/m (2200-3300)Lumens/m(minimum), CCT/CRI-4000K/80, Length- 4800mm, Width maximum upto 100 mm, Electronic Balast similar to Wipro make-Lineos LED or its equivalent item of Philips/ Abby Lighting/ Jaquar Lighting/ Havels) as per tender technical specification & clients/ EIC approval.	**EA**	2.00		

19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Ceiling recessed (Clip On Type) end to end connected linear light with high extruded aluminium housing and high transmitive PMMA diffuser, IP-20, (25-30W)/m (2200-3300)Lumens/m(minimum), CCT/CRI-4000K/80, Length-2400mm, Width maximum upto 100 mm, Electronic Balast similar to Wipro make-Lineos LED or its equivalent item of Philips/ Abby Lighting/ Jaquar Lighting/ Havels) as per tender technical specification & clients/ EIC approval.	**EA**	3.00		
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of Ceiling recessed (Clip On Type) end to end connected linear light with high extruded aluminium housing and high transmitive PMMA diffuser, IP-20, (25-30W)/m (2200-3300)Lumens/m(minimum), CCT/CRI-4000K/80, Length-1200mm, Width maximum upto 100 mm, Electronic Balast similar to Wipro make-Lineos LED or its equivalent item of Philips/ Abby Lighting/ Jaquar Lighting/ Havels) as per tender technical specification & clients/ EIC approval.	**EA**	8.00		
19.1	Supply, Installation, testing & commissioning of customised chandlier light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories, MS supports.	**EA**	1.00		
19.1	Supply, Installation, testing & commissioning of light Fixtures complete with: a) All fixing accessories & mounting bracket. b) Earthing of fittings. c) Connections from the ceiling rose or junction box to the light fixtures including the terminations with all necessary accessories of flexible LED strips 15W/m(maximum) IP33, Strip light system lumen output should be minimum 800lm /m , CCT/ CRI -3000K/80 , Electronic Balast similar to Wipro make- 0r its equivalent product of Philips/ Jaquar Lighting/ Lighting technology as per technical specification & clients/ EIC approval.	**RM**	800.00		

19.1	Supply Installation Testing & commissioning of occupancy sensors(PIR Based) a complete set consisting of occupancy sensor/switch with other accessories for Automatic Room Lighting control system as per specification	**EA**	30.00		
20	**INTERNAL CIRCUIT & POINT WIRING FOR POWER SOCKETS :**				
20.1	Conduit wiring for lights fan socket outlets as per the mode of measurements described in the specifications consisting of : a) Wiring in 25/32/40/50 mm Dia PVC FRLS conduit & FR FLEXIBLE Conduit using multiple circuits as per specification as required/raceway as required.b) 1100V grade PVC insulated Cu multi-stranded ZHFR wires/Cables.c) Lighting Point wiring Shall be done in Black colour Pvc FRLSConduit.Insulated or base protectived) Emergency Lighting Point wiring Shall be done in Black colour Pvc FRLS Conduit with Red colour 30mm Round Strip Tape at 1mtrinterval. e) Power Point wiring Shall be done in Grey colour Pvc FRLS Conduit .f) UPS Power Point wiring for work station area Shall be done in Floor Truncking & Pvc FRLS Conduit using ZHFR cables sizes mentioned as in DB SLD.g) Task lighting Point wiring for work station area Shall be done in Floor Truncking using flexible white black ZHFR cables.h) Insulated or base protective earth----- **Primary Circuit wiring for all power points/SB using 2x4 + 1x2.5PE Cu PVC wires.**	**EA**	50.00		
20.2	Conduit wiring for lights fan socket outlets as per the mode of measurements described in the specifications consisting of : a) Wiring in 25/32/40/50 mm Dia PVC FRLS conduit & FR FLEXIBLE Conduit using multiple circuits as per specification as required/raceway as required.b) 1100V grade PVC insulated Cu multi-stranded ZHFR wires/Cables.c) Lighting Point wiring Shall be done in Black colour Pvc FRLS Conduit.Insulated or base protectived) Emergency Lighting Point wiring Shall be done in Black colour Pvc FRLS Conduit with Red colour 30mm Round Strip Tape at 1mtr interval. e) Power Point wiring Shall be done in Grey colour Pvc FRLS Conduit .f) UPS Power Point wiring for work station area Shall be done in Floor Truncking & Pvc FRLS Conduit using ZHFR cables sizes mentioned as in DB SLD.g) Task lighting Point wiring for work station area Shall be done in Floor Truncking using flexible white black ZHFR cables.h) Insulated or base protective earth----- **Primary Circuit wiring for all Light points/SB using 2x2.5 + 1x2.5PE Cu PVC wires.**	**EA**	60.00		

20.3	Conduit wiring for lights fan socket outlets as per the mode of measurements described in the specifications consisting of : a) Wiring in 25/32/40/50 mm Dia PVC FRLS conduit & FR FLEXIBLE Conduit using multiple circuits as per specification as required/raceway as required.b) 1100V grade PVC insulated Cu multi-stranded ZHFR wires/Cables.c) Lighting Point wiring Shall be done in Black colour Pvc FRLS Conduit.Insulated or base protectived) Emergency Lighting Point wiring Shall be done in Black colour Pvc FRLS Conduit with Red colour 30mm Round Strip Tape at 1mtr interval. e) Power Point wiring Shall be done in Grey colour Pvc FRLS Conduit .f) UPS Power Point wiring for work station area Shall be done in Floor Truncking & Pvc FRLS Conduit using ZHFR cables sizes mentioned as in DB SLD.g) Task lighting Point wiring for work station area Shall be done in Floor Truncking using flexible white black ZHFR cables.h) Insulated or base protective earth----- **secondary Circuit wiring for all equipments/SB using 2x2.5 + 1x1.5PE Cu PVC wires.**	**EA**	60.00		
20.4	Conduit wiring for lights fan socket outlets as per the mode of measurements described in the specifications consisting of : a) Wiring in 25/32/40/50 mm Dia PVC FRLS conduit & FR FLEXIBLE Conduit using multiple circuits as per specification as required/raceway as required.b) 1100V grade PVC insulated Cu multi-stranded ZHFR wires/Cables.c) Lighting Point wiring Shall be done in Black colour Pvc FRLS Conduit.Insulated or base protectived) Emergency Lighting Point wiring Shall be done in Black colour Pvc FRLS Conduit with Red colour 30mm Round Strip Tape at 1mtr interval. e) Power Point wiring Shall be done in Grey colour Pvc FRLS Conduit .f) UPS Power Point wiring for work station area Shall be done in Floor Truncking & Pvc FRLS Conduit using ZHFR cables sizes mentioned as in DB SLD.g) Task lighting Point wiring for work station area Shall be done in Floor Truncking using flexible white black ZHFR cables.h) Insulated or base protective earth----- **secondary Circuit wiring for all Light points/SB using 2x1.5 + 1x1.5PE Cu PVC wires.**	**EA**	350.00		
20.5	Supply Installation switch, sockest with G. I. back box with earthing. etc. incuding complete accessiors to finish the job. Make:- Legrand Mosaic RANGE/MK-Blenze/Clipsal- zencelo/Norisys/Goldmedal SUBJECT TO CLIENTS/ARCHITECTS APPROVAL---**1#15A Switch+1#5/15A socket +3#5A switch with required back box & face plate with required back boxes & there**	**EA**	15.00		

	Face plate.				
20.6	Supply Installation switch, sockest with G. I. back box with earthing. etc. incuding complete accessiors to finish the job. Make:- Legrand Mosaic RANGE/MK-Blenze/Clipsal- zencelo/Norisys/Goldmedal SUBJECT TO CLIENTS/ARCHITECTS APPROVAL---**1#5A Switch+2#5/15A socket +2#of data with required back box & face plate with required back boxes & there Face plate.**	**EA**	10.00		
20.7	Supply Installation switch, sockest with G. I. back box with earthing. etc. incuding complete accessiors to finish the job. Make:- Legrand Mosaic RANGE/MK-Blenze/Clipsal- zencelo/Norisys/Goldmedal SUBJECT TO CLIENTS/ARCHITECTS APPROVAL---**1#15A Switch+1#5/15A socket with required back box & face plate.**	**EA**	50.00		
20.8	Supply Installation switch, sockest with G. I. back box with earthing. etc. incuding complete accessiors to finish the job. Make:- Legrand Mosaic RANGE/MK-Blenze/Clipsal- zencelo/Norisys/Goldmedal SUBJECT TO CLIENTS/ARCHITECTS APPROVAL---**1#5A Switch+2#5/15A socket+1 # data+1# voice** with required back box & face plate.	**EA**	20.00		
20.9	Supply Installation switch, sockest with G. I. back box with earthing. etc. incuding complete accessiors to finish the job. Make:- Legrand Mosaic RANGE/MK-Blenze/Clipsal- zencelo/Norisys/Goldmedal SUBJECT TO CLIENTS/ARCHITECTS APPROVAL---**5#5A Switch+1#5/15A socket with required back box & face plate.**	**EA**	15.00		
20.91	Supply Installation switch, sockest with G. I. back box with earthing. etc. incuding complete accessiors to finish the job. Make:- Legrand Mosaic RANGE/MK-Blenze/Clipsal- zencelo/Norisys/Goldmedal SUBJECT TO CLIENTS/ARCHITECTS APPROVAL---**4#5A Switch+1#5/15A socket with required back box & face plate.**	**EA**	35.00		
20.92	Supply Installation switch, sockest with G. I. back box with earthing. etc. incuding complete accessiors to finish the job. Make:- Legrand Mosaic RANGE/MK-Blenze/Clipsal- zencelo/Norisys/Goldmedal SUBJECT TO CLIENTS/ARCHITECTS APPROVAL---**1#5A Switch+1#5/15A socket with**	**EA**	65.00		

	required back box & face plate.				
20.93	Supply, Installation, testing and commissioning of Modular Type Switch and Sockets using all required hardware, internal wiring and connections using lugs,ferruling::**RG6 sockets for TV points**	**EA**	10.00		
20.94	Supply, Installation, testing and commissioning of Modular Type Switch and Sockets using all required hardware, internal wiring and connections using lugs,ferruling::**HDMI sockets with complete connection for TV connectivity**	**EA**	10.00		
21	**WORKSTATION (POWER SOCKET , DATA & TELEPHONE POINTS)**				
21.1	Supply, installation, testing and commissioning of workstation as described below complete with: 1) PVC box of suitable size with earthing 2) Plate type switches & sockets. General office work station complete with: i) 2# 5/15A plate type sockets ii)1# 15A switch with indicating lamp iii) 1# data and 1 #voice iv) 1#usb point. with face plate.	**EA**	90.00		
21.2	SITC of HDMI Cable - 15 mtrs for TV connectivity with connectors and connection both ends	**EA**	10.00		
21.3	SITC of 8 way TV splitter in enclosure with connection and BNC connector	**EA**	10.00		
21.4	Conduit wiring forworkstations,cabins through raceways/floor trunking per the mode of measurements described in the specifications consisting of : a) 1100V grade PVC insulated Cu multi-stranded ZHFR wires/Cables. UPS Power Point wiring for work station area Shall be done in Floor Truncking & Pvc FRLS Conduit using ZHFR cables sizes mentioned as in DB SLD.b) Insulated or base protective earth-----The scope covers Supply of cables,laying, terminations in Db and workstations with proper ferrulling, earthing etc.------ **Primary Circuit wiring for all COMPUTER points Area using 3x2.5 Cu FLEXIBLE PVC WHITE COLOUR CABLE from UPDB-1 & UPDB-2.**	**EA**	40.00		
21.5	Conduit wiring for workstations,cabins through raceways/floor trunking per the mode of measurements described in the specifications consisting of : a) 1100V grade PVC insulated Cu multi-stranded ZHFR wires/Cables. UPS Power Point wiring for work station area Shall be done in Floor Truncking & Pvc FRLS Conduit using ZHFR cables sizes mentioned as in DB SLD.b) Insulated or base protective	**EA**	65.00		

	earth-----The scope covers Supply of cables,laying, terminations in Db and workstations with proper ferrulling, earthing etc.------ **Secondary looping Circuit wiring for all COMPUTER points Area using 3x2.5 Cu FLEXIBLE PVC WHITE COLOUR CABLE.**				
22	**FLOOR TRUNKING FOR POWER . DATA & TELEPHONE OUTLETS:**				
22.1	RACEWAY INSTALLATION: Supply & installation of multi compartment extruded G.I raceway for computer power, data & voice with thickness 1.6mm as shown on drg. complete with:'a) Floor chasing/making.'b) Raceway including cover plate etc. as per details and as specified and shown on drawings.c) All bends, T joints junctionboxes etc. as specified and shown complete.d) All Power raceways should have Phase Compartments wherever it requires ---- **300 X 38 mm**	**RM**	80.00		
22.2	RACEWAY INSTALLATION: Supply & installation of multi compartment extruded G.I raceway for computer power, data & voice with thickness 1.6mm as shown on drg. complete with:'a) Floor chasing/making.'b) Raceway including cover plate etc. as per details and as specified and shown on drawings.c) All bends, T joints junctionboxes etc. as specified and shown complete.d) All Power raceways should have Phase Compartments wherever it requires ---- **200 X 38 mm**	**RM**	250.00		
22.3	RACEWAY INSTALLATION: Supply & installation of multi compartment extruded G.I raceway for computer power, data & voice with thickness 1.6mm as shown on drg. complete with:'a) Floor chasing/making.'b) Raceway including cover plate etc. as per details and as specified and shown on drawings.c) All bends, T joints junctionboxes etc. as specified and shown complete.d) All Power raceways should have Phase Compartments wherever it requires ---- **100 X 38 mm**	**RM**	200.00		
22.4	RACEWAY INSTALLATION: Supply & installation of multi compartment extruded G.I raceway for computer power, data & voice with thickness 1.6mm as shown on drg. complete with:'a) Floor chasing/making.'b) Raceway including cover plate etc. as per details and as specified and shown on drawings.c) All bends, T joints junctionboxes etc. as specified and shown complete.d) All Power raceways should have Phase Compartments wherever it requires ---- **50 X 38 mm**	**RM**	80.00		
23	**UPS SYSTEM**				

23.1	Scope of work covers supply, unloading ,Installation, testing and commissioning of 20 KVA UPS as per the technical specification & technical data sheet, installation cost shall include testing & commissioning also.Necessary cabling between UPS and batteries / battery breaker etc. shall be a part of UPS tender.UPS input & output cable from UPS shall be supplied & terminated by other vendors.Necessary control cabling between different units of UPS shall be a part of UPS offer (If required). UPS installation cost shall include supply of 400mm MS Angle for UPS for bottom cable terminations. The angle frame shall be powder coated with shade same asUPS.Vendor to submit dimensional GA drawing of UPS / Batteries /Isolation Transformer along with offer. 50 KVA online, double conversion, operating in Parallel configuration(1+1) 3 Phase Input & 3 phase output with SNMP Card. # AC - AC Efficiency in Double Conversion mode upto 96%. # Power Factor Compatibility from 0.9 lagging to 0.9 leading. # Low Input Current Harmonic Distortion of < 3%. # Input Power Factor > 0.99 Operating in parallel redundant configuration(1+1) and as per the specifications and drawings. (please refer tender drawings and specs)alongwith : a) 12 V Lead Acid SMF batteries suitable for 30 mins back up time on each UPS b) Powder Coated MS Racks c) Interconnection cable between UPS & Battery breaker , battery interconnecting cable , c) MCCB breaker for Battery Isolation d)Base Angle of 400 mm Height e) For safety purpose there should be PVC cover above batteries f) Inbuilt isolation Transformer.	EA	2.00		
24	**CCTV .**				
24.1	Supply, installation, testing and commissioning of following indoor/outdoor cameras and equipments as specified in the specifications complete with all interconnection lens coverage adjustment as per site conditions,mounting accessories,GI arm/rod, interconnecting wires etc. 2MP IP Fixed Dome Camera: 1/2.8"Progressive Scan CMOS, 1920 × 1080 at 25fps, 2.8 mm fixed lens, 0.01 Lux at F1.2, ICR, ONVIF, support H.265/MJPEG, 120dB Wide Dynamic Range, BLC, 3D Digital Noise Reduction, 12 VDC & PoE (802.3af), IR range: 30m, Support on-board storage up to 128 GB (SD card not included), IP67, IK10, Line crossing detection, intrusion detection, Motion detection, face detection,video tampering, UL, CE ,FCC certified equivalent to Hikvision DS-2CD2123G0-I(2.8mm Lens)	**EA**	10.00		
24.2	32ch Network Video Recorder: Connect Up to 32 IP Cameras, Linux OS, Up to 8	**EA**	1.00		

	Megapixels Resolution, HDMI / VGA Output , Support H.265/MJPEG, Incoming Bandwidth 256Mbps, 4 SATA Hard Disks, ANR Technology, 4 SATA interfaces for 4 HDDs and capacity of each HDD upto 6TB, front panel: 2 × USB 2.0 rear panel: 1 × USB 3.0, Alarm I/O 16/4,RS-485, RS-232, 2 RJ-45 10 /100/1000 Mbps self-adaptive Ethernet interface, Multiple network monitoring: Web viewer, CE, FCC, UL certified equivalent to Hikvision DS-7732NI-K4				
24.3	SITC of 6TB Surveillance Hard Disk (1 month storage space required for continuous recording at 25FPS)	**EA**	1.00		
24.4	SITC of 4 port Unmanaged Network PoE Switch: 4 port PoE Switch with PoE standard of IEEE 802.3af , IEEE 802.3at, PoE port, Uplink ports equivalent to Hikvision DS-3E0109P-E	**EA**	1.00		
24.5	SITC of 16 port Unmanaged Network PoE Switch: 16 port PoE Switch with PoE standard of IEEE 802.3af , IEEE 802.3at, PoE port, Uplink ports equivalent to Hikvision DS-3E0318P-E	**EA**	1.00		
24.6	SITC of 32" Monitor for 24X7 Surveillance equivalent to Hikvision make DS-D5032FC	**EA**	1.00		
24.7	SITC of 4pair cat-6 UTP cable with all necessary accessories with required in 20/25mm dia FRLS MMS PVC conduit with all accessories.	**RM**	200.00		
24.8	SITC of RJ45 connectors with connections/crimping for CCTV system.	**EA**	20.00		
25	**NETWORKING & TELEPHONE**				
25.1	SITC of 6 Port LIU For data with all necessary accessrioes.	**EA**	1.00		
25.2	SITC of 24 Port loaded swicth patch box jack panel	**EA**	4.00		
25.3	SITC of Cat6 3ft Patch Cord (Rackside)	**EA**	74.00		
25.4	SITC of 6 Core OM2 Multimode Outdoor Armoured Fiber Optic Cable including all necessary accessories & equipemnt for data transfer	**RM**	80.00		
25.5	SITC of Cat6 3ft Patch Cord (Rackside)	**EA**	90.00		

25.6	SITC of Cat6 3ft Patch Cord (Fieldside)	**EA**	90.00		
25.7	SITC of 42 U 800*1000 floor mount server rack with keyboard tray, monitor tray,power strip and accessories.	**EA**	1.00		
25.8	SITC of CAT6 cable.	**RM**	3500.00		
25.9	Crimping of Cat6 Cable with RJ45 connector.	**EA**	400.00		
25.10	SITC of EPBAX SYSTEM	**Lot**	1.00		
25.11	SITC of Cat6 3ft Patch Cord (Rackside)	**EA**	90.00		
25.12	SITC of Cat6 3ft Patch Cord (Fieldside)	**EA**	90.00		
25.13	SITC of 100 PAIR Telephone armrored cable from supplier side to the 150 pair tag block including cron & all reuired intermmidetate equipment/ accessories for termination at server room	**RM**	80.00		
PART-C	**PHE WORKS**				
26	**SANITARY FIXTURES: Installation of Sanitary fixtures Suplied by Client**				
26.1	Installing, testing and commissioning of approved make off **white Colored wall mounting European water closet** 'P' trap outlet Concealed dual type flush valve 3/6 liters per flush to enable flushing, pipe work concealed shut off provision & rectangular dual flush plate behind wall supporting MS bracket with CP bolts and nuts, seat cover, 40mm diameter SCH 40 ASTM pipe from flush valve to water closet,110 mm diameter (OD) PVC Pan connector with lip ring of approved make & color with rubber buffers, flap, CP hinges, CP bolts and nuts, all of approved make etc., complete. all necessary accessories etc. complete. The MS angle shall be provided with two coats of red oxide primer and two coats of synthetic enamel paint of make, brand and color of approved make. Joints/gaps between all sanitary appliances/fixtures and the floor/walls shall be caulked with an approved mildew resistant sealant, having antifungal properties, of color and shade to match that of the appliances/fixture and the floor/ wall to the extent possible.(All jointing material will be in vendor scope like glue, M-seal, Teflon tape etc.) **Make-Vitra**	Each	7.00		

26.2	Installing, testing and commissioning of approved make off **WALL HUNG WC CISTERN**(All jointing material will be in vendor scope like glue, M-seal, Teflon tape etc.), all necessary accessories etc. complete.	Each	7.00		
26.3	Installing, testing and commissioning of approved make **2 way Bibcock**(All jointing material will be in vendor scope like glue, M-seal, Teflon tape etc.) all necessary accessories etc. complete.	Each	7.00		
26.4	Installing, testing and commissioning of approved make off **white Colored wall mounting Urinal** and sensor Set flush time to 20sec with maximum flow of 0.5lpf sensotronic Mini Concealed Type Flushing Valve for Urinal, S.S. Satin, fixed with screws other required all accessories. pipe work concealed, CP bolts and nuts, all of approved make etc., Joints/gaps between all sanitary appliances/fixtures and the floor/walls shall be caulked with an approved mildew resistant sealant, having antifungal properties, of color and shade to match that of the appliances/fixture and the floor/ wall to the extent possible.(All jointing material will be in vendor scope like glue, M-seal, Teflon tape etc.) all necessary accessories etc. complete. **Make-Vitra**	Each	4.00		
26.5	Installing, testing and commissioning of Client's/Architect's approved, accessories for the **URINALS FLUSHER with Sensor** all necessary accessories etc. complete.	Each	4.00		
26.6	Installing, testing and commissioning of approved make white Colored over counter **wash basin** with overflow and with the following CP fittings and fixtures like 32 mm CP brass waste coupling, single lever basin mixer with pop up waste system counter mounted with 450 mm long braided hose and brass nuts, P trap of chrome plated, 40 mm OD PVC waste pipe concealed in wall and taken up to the floor trap with necessary specials, 15 mm CP brass angular stop cock with wall flange with necessary fittings etc., complete. (All jointing material will be in vendor scope like Teflon tape etc.)Flow rate of WHB tap/faucet shall be 4lpm by using PCA technology flow aerator. **Make-Vitra**	Each	8.00		
26.7	Installing, testing and commissioning of Client's/ Architect's approved make **angle**	Each	12.00		

	valves with necessary fittings & accessories all complete.				
26.8	Installing, testing and commissioning of Client's/ Architect's approved make **Health Faucet with 1m long easy flex tube , extension nipple, all necessary accessories etc. complete.**	Each	8.00		
26.9	Installing, testing and commissioning of Client's/Architect's approved, accessories for the **SINGLE LEVER BASIN MIXER** all necessary accessories etc. complete.	Each	8.00		
26.91	Installing, testing and commissioning of Client's/Architect's approved, accessories for the **BOTTLE TRAP** all necessary accessories etc. complete.	Each	8.00		
26.92	Installing, testing and commissioning of Client's/Architect's approved, accessories for the **LIQUID SOAP DISPENSER** all necessary accessories etc. complete.	Each	12.00		
26.93	Installing, testing and commissioning of Client's/Architect's approved, **toilet paper holder** (WC Area) with necessary fittings.	Each	7.00		
26.94	Installing, testing and commissioning of **GRAB RAIL.** all necessary accessories etc. complete.	Each	1.00		
26.95	Installing, testing and commissioning of Client's/Architect's approved, accessories for the **PAPER TOWEL DISPENSER** all necessary accessories etc. complete.	Each	5.00		
26.96	Installing, testing and commissioning of **ROBE HOOK** all necessary accessories etc. complete.	Each	7.00		
26.97	Installing, testing and commissioning of Client's/Architect's approved, accessories for the **HAND DRIER** all necessary accessories etc. complete.	*Each*	*5.00*		
26.98	Installing, testing and commissioning of Client's/Architect's approved, accessories for the **AUTO SANITIZER** all necessary accessories etc. complete.	*Each*	*1.00*		
27	**Supply and installation of sanitary fixtures for 4 nos additional toilet**				
27.1	Supply,Installing, testing and commissioning of approved make off **white Colored**	Each	3.00		

	wall mounting water closet 'P' trap outlet Concealed dual type flush valve 3/6 liters per flush to enable flushing, pipe work concealed shut off provision & rectangular dual flush plate behind wall supporting MS bracket with CP bolts and nuts, seat cover, 40mm diameter SCH 40 ASTM pipe from flush valve to water closet,110 mm diameter (OD) PVC Pan connector with lip ring of approved make & color with rubber buffers, flap, CP hinges, CP bolts and nuts, all of approved make etc., complete. all necessary accessories etc. complete. The MS angle shall be provided with two coats of red oxide primer and two coats of synthetic enamel paint of make, brand and color of approved make. Joints/gaps between all sanitary appliances/fixtures and the floor/walls shall be caulked with an approved mildew resistant sealant, having antifungal properties, of color and shade to match that of the appliances/fixture and the floor/ wall to the extent possible.(All jointing material will be in vendor scope like glue, M-seal, Teflon tape etc.) PUBLISHED MRP RATE NOT LESS THAN Rs 13000)				
27.2	Supply,Installing, testing and commissioning of approved make off **WALL HUNG WC CISTERN** (All jointing material will be in vendor scope like glue, M-seal, Teflon tape etc.), all necessary accessories etc. complete. (PUBLISHED MRP RATE NOT LESS THAN Rs 6000)	Each	3.00		
27.3	Supply,Installing, testing and commissioning of approved make off **2 way Bib Cock Faucet** (All jointing material will be in vendor scope like glue, M-seal, Teflon tape etc.) all necessary accessories etc. complete.	Each	3.00		
27.4	Supply, Installing, testing and commissioning of approved make white Colored **Under counter wash basin** with overflow and with the following CP fittings and fixtures like 32 mm CP brass waste coupling, single lever basin mixer with pop up waste system counter mounted with 450 mm long braided hose and brass nuts, P trap of chrome plated, 40 mm OD PVC waste pipe concealed in wall and taken up to the floor trap with necessary specials, 15 mm CP brass angular stop cock with wall flange with necessary fittings etc., complete. (All jointing material will be in vendor scope like Teflon tape etc.)Flow rate of WHB tap/faucet shall be 4lpm by using PCA technology flow aerator.	Each	3.00		
27.5	Supply,Installing, testing and commissioning of Client's/ Architect's approved	Each	3.00		

	make **2 WAY Bib cock.**wih necessary fittings & accessories all complete.				
27.6	Supply,Installing, testing and commissioning of Client's/ Architect's approved make **Health Faucet with 1m long easy flex tube , extension nipple, all necessary accessories etc. complete.**	Each	3.00		
27.7	Supply,Installing, testing and commissioning of Client's/Architect's approved, accessories for the **SINGLE LEVER BASIN MIXER Faucet** all necessary accessories etc. complete. Faucet should be Deck mounted with SS/CP/Brushed steel finish on brass, with aerator, with in-built hot & cold water mixer and complete manual temperature/flow control. (PUBLISHED MRP RATE NOT LESS THAN Rs 7000)	Each	3.00		
27.8	Supply,Installing, testing and commissioning of Client's/Architect's approved, accessories for the **BOTTLE TRAP** all necessary accessories etc. complete.	Each	3.00		
27.9	Supply,Installing, testing and commissioning of Client's/Architect's approved, accessories for the **LIQUID SOAP DISPENSER** all necessary accessories etc. complete.	Each	3.00		
27.91	Supply, Installing, testing and commissioning of Client's/Architect's approved, **toilet paper holder** (WC Area) with necessary fittings.	Each	3.00		
27.92	Supply, Installing, testing and commissioning **FLOOR TRAP** approved make cockroach trap (150x150x70mm) assembly complete with ring, outer cup, inner cup, jali etc. As directed by Engineer-in-charge, all necessary accessories etc. complete. **FLOOR TRA**P should have provision for installation of marble/tiles so that the traps matches with the flooring	Each	18.00		
27.93	Supply, Installing, testing and commissioning of Client's/Architect's approved, accessories for the **PAPER TOWEL DISPENSER** all necessary accessories etc. complete.	Each	3.00		
27.94	Supply, Installing, testing and commissioning of **ROBE HOOK** all necessary	Each	3.00		

	accessories etc. complete.				
27.95	Supply, Installing, testing and commissioning of Client's/Architect's approved, accessories for the **HAND DRIER** all necessary accessories etc. complete.	*Each*	*1.00*		
27.96	Supply, Installing, testing and commissioning of Client's/ Architect's approved make **angle valves** with necessary fittings & accessories all complete.	*Each*	*16.00*		
28	**Water Supply Works**				
28.1	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c ixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed work, including cutting chases and making good the walls etc. (INTERNAL TOILETS). Cost shall be inclusive of (a)Making maximum of 7.5 x 7.5 cm chasing in wall and floors for the pipe, making good the same by using 1:1 cement mortar over the wire mesh and providing protection to embedded pipes and fittings (in wall chase) by wrapping two layers of 400 micron polythene sheet including proper overlaps on joints complete as required. Hard PVC pipe sleeves suitable higher size shall be provided wherever the pipes are crossing the walls / floors slab and sealing the sleeves with glass wool in between and sealant compound at either end all as per Project Manager's / Consultant requirement. All termination points for installation of faucets shall have brass termination fittings. Installation shall be to as per Technical Manual of manufacturer of pipes & fittings.nical Manual of manufacturer of pipes & fittings. (for hot and cold water inside the toilet)				
28.1.1	15 mm	Rm	90.00		
28.1.2	20 mm	Rm	230.00		
28.1.3	25 mm	Rm	164.00		
28.1.4	32 mm	Rm	36.00		

28.1.5	40 mm	Rm	42.00		
28.1.6	50 mm	Rm	30.00		
28.2	Supply, instalation, testing & commissioning of **forged brass**, male or female threaded isolation control valve **(Ball Valve)**, confirming to latest IS, PN 10, with necessary specials, union, nipples etc., to complete the job.				
28.2.1	32mm	Each	4.00		
28.2.2	25mm	Each	8.00		
28.2.3	20mm	Each	5.00		
28.2.4	15mm	Each	3.00		
29	**INTERNAL DRAINAGE (Note : In Case of Non availabity of CI Pipes, corresponding UPVC SWR PIPE may be used as direntced by PM)**				
29.1	Supply, fixing, jointing, testing and commissioning spun/centri **C.I. pipe** for soil, waste installation conforming to IS:3989 cut to required lengths including all necessary fittings and specials such as Bends, junctions, offsets, access pieces (plain or door) & vent cowl. Fixing at wall/ceiling level supported by galvanized steel clamps & hangers etc. duly epoxy coated. Making proper connection with drip seal PJS joint or pig lead joint of required depth as per manufacturer. Cutting, chases/holes in floors / walls / slab. Cost shall also be inclusive of painting the pipes & fittings with two coats of synthetic enamel paint of approved shade over a coat of primer along with any chasing of walls to be done for installation of the pipes. **(Pipes inside toilet).**				
29.1.1	80 mm dia. o/d	Rm	*12.00*		
29.1.2	110 mm dia.o/d	Rm	*15.00*		
29.2	Supply, fixing, jointing, testing and commissioning of **UPVC SWR pipes (type B pipes for soil,waste & Antisyphonage system)** confirming to IS:13592 for above 65 mm dia pipe, and confirming to IS:4985 for pipe upto 50 mm dia cut to required lengths including all necessary fittings and specials such as bends, junctions offsets, access pieces (plain or door). Making proper connection with				

	cement solvent joint as per BIS manufacturer.Fixing at wall /ceiling level supported by G.I. clamps, hangers etc **(Pipes inside toilet). The pipes should be compatible with the exisiting C.I Drainage system and scope of any specialised joint to connect SWR to C.I Pipes included in the scope of contractor**				
29.2.1	80 mm dia. o/d	Rm	24.00		
29.2.2	110 mm dia. o/d	Rm	45.00		
29.3	**UPVC 'P' trap:** Supply,Installation and testing of 75 mm inlet and 100 mm outlet with 35mm water seal - 'P' Trap (PT) for waste water of Utility area with Jali.	No.	12.00		
29.4	**C.I 'P' trap:** Supply,Installation and testing 75 mm inlet and 100 mm outlet - 'P' Trap (PT) for waste water of Utility area	No.	12.00		
PART-D	**BILL OF QUANTITIES (HVAC WORKS) (Both material & installation included; wherever appliacble)**				
30	**CHILLED WATER AIR HANDLING UNITS:** Supply, installation, testing and commissioning)of double skin air handling units each comprising of following as per the specifications (with necessory supports arrangement) (Air Handling Units -Ceiling Suspended): (a) [Supply, installation, testing & commissioning of Factory Built, Ceiling Suspendedchilled water based double skin type Air Handling Units made of 40 mm thk. Panels consisting of hot dip G.I. Casing of thickness of 0.6 mm pre -coated and pre -plastisised GI for outer skin and 0.6 mm plain GI for Inner Skin encasing with 40mm polyurethane foam insulation having a density of 40 Kg. / CuM factory injected between them by injection moulding machine, complete with Direct drive Plug type backward curve fan section & Motor shall be VFD compatible (All AHU VFDs shall be provided with open protocol to communicate with third party BMS system with necessary enclosure and interconnecting cables/wires from AHU to vfd with necessary cable tray, saddles etc.,) suitable for static pressure as detailed below, cooling coil section with hydrophilic				

	Aluminum finned copper tube cooling coil, filter sections with 50 mm thk.,mixing box, air pre -filters, package with TEFC motor suitable for operation on 415 (+/-) 10%, 50 Hz, A.C Supply insulated drain pan and drain connections] (b) Casing - Double Skin Casing of thermal break profile with 40mm thick with 0.6mm inner and outer skins with 120 GSM Zinc coating, insulated by PUF. and complete with inspection doors and marine light, limit switch including control wiring as required. Access doors(Hinged Type Access door) for both motor and filters section to be provided. (c)Coil - The coil shall be of Copper construction with Aluminum fins. The drain pan shall be of SS. A secondary inclided drain pan shall also be provided extending at least 100mm after the main drain pan. (d)Fan - Direct driven Plug type backward curve fan with aerofoil blades with VFD suitable for static pressure as detailed below. The motor shall be IE3 efficiency suitable for 3 phase supply. All AHU VFDs shall be provided with open protocol to communicate with third party BMS system with necessary enclosure and interconnecting cables/wires from vfd to ahu with necessary cable tray, saddles etc., (e) Filter - Each unit shall be provided with a factory assembled filter section containing washable synthetic type air filters having GI frame. Filter media and frame shall be rust proof and corrosion resistant.The filter shall have minimum 90% efficiency down to 10 microns. Pre filter of 50mm thick washable synthetic fiber(MERV 8). Fine / bag filter of MERV 13 grade shall be provided. Velocity across the filter shall not exceed 500FPM. (f)Pre commisioning filter to be considered. (g) AHU Noise level shall be less than 60 dba at 1mt inside AHU room. (h) Supply connection - Supply flanges shall be provided for duct connection. AHU outlet will be fire retardant canvass cloth with provision of gauge for the measurement. (i) All the AHU's dimensions should be as per the site conditions and to the available AHU room dimensions. (j) Please Refer attached Techanical Datasheet for the detailed Specification				

30.1	AHU-7TH-01	Nos	1.00		
30.2	AHU-7TH-02	Nos	1.00		
30.3	AHU-7TH-03	Nos	1.00		
30.4	AHU-7TH-04	Nos	1.00		
30.5	AHU-7TH-05	Nos	1.00		
30.6	AHU-7TH-06	Nos	1.00		
31	**CONDENSATE DRAIN PUMP:** The maximum head of water lift should be 10m with a maximum flow of 12L/hr, through the 6mm outlet. The noise level should be no greater than 21dB(A) at 1m and power supply of 0.1A with a 3.0A safety switch wired to the Split unit. It should also include a drain connector kit and anti-syphon device.	Nos.	6.00		
32.0	**VALVES & PIPING INSULATION (MS PIPES): Providing , laying, testing & Commissioning of following classes MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets etc., complete.**				
32.1	**C-CLASS MS PIPES**				
32.1.1	65 mm dia	Rmt	10.00		
32.1.2	50 mm dia	Rmt	55.00		
32.1.3	40 mm dia	Rmt	52.00		
32.1.4	32 mm dia	Rmt	15.00		
32.2	**Supply & installation, testing and commissioning of Nitrile rubber for MS pipe with a coat of zinc chromate primer.**				

32.2.1	65 mm dia	Nos.	10.00		
32.2.2	50 mm dia	Nos.	50.00		
32.2.3	40 mm dia	Nos.	52.00		
32.2.4	32 mm dia	Nos.	15.00		
32.3	**SITC of Manually operated Butterfly valves complete with Nitrile rubber insulation holding & mating flange joints.**				
32.3.1	50 dia Nominal Bore	Nos.	6.00		
32.3.2	40 dia Nominal Bore	Nos.	6.00		
32.4	**SITC of `Y' strainers complete with Nitrile rubber insulation mating flange joints.**				
32.4.1	50 dia Nominal Bore	Nos.	3.00		
32.4.2	40 dia Nominal Bore	Nos.	3.00		
32.5	**SITC of instruments gauges and sundries etc. as specified.**				
32.5.1	Thermowells with thermometer Providing and fixing in position SS 304 the mercury-in- glass 150MM industrial dial type thermometers.	Nos	12.00		
32.6	**PRESSURE INDEPENDENT CONTROL VALVE:**2 way Modulating Balancing Cum Flow Control Valves with Nitrile rubber insulation Supply, Installation, testing and commissioning of Pressure independent type 2 way modulating Control valves in a single Unit of Valve. PN16 Rating. DN 15 to DN 32 Brass Body Ext. Threaded DN 40 & DN 50 Cast Iron Body, Ext. Threaded DN 65 to DN 100 Cast Iron body, Flanged Ends Conection				

	Duly mounted with Modulating actuator IP54 Type suitable for 24V AC. and should have the below mentioned features. 1. Diff Pressure should be of Diaphragm with Spring self adjusting table. 2. Manual Over ride to the Actuator should be possible for Manual Opening Or Closing of Valve if required. 3. Actuator Should be Linear Operational, Electricaly operated and not thermal actuator.				
32.6.1	50 dia Nominal Bore	Nos	3.00		
32.6.2	40 dia Nominal Bore	Nos	3.00		
32.7	**SITC of BTU METER complete with Nitrile rubber insulation mating flange joints.**				
32.7.2	65mm dia `Y' strainer	Nos	1.00		
32.7.3	50mm dia `Y' strainer	Nos	1.00		
32.7.4	40mm dia `Y' strainer	Nos	1.00		
33.1	SHEET METAL DUCTING & AIR TERMINAL DEVICES: Supply, fabrication and erection of galvanised sheet metal ducting generally as specified and completely factory fabricated with: i) Hot dip Galvanised companion flanges girth angles. ii)Turning vanes. iii) Hot dip Galvanised structural support systems. iv) Closed cell neoprene gasket. v) Making openings in walls and Closing with necessary Civil Work, finishing with suitable 2hr fire seal (Hilti/Promate). (need to necessarily included here) vi) Ducting shall be as per SMACNA Standard				
33.1.1	0.63mm (24 SWG) galvanised sheet steel	Sq.m	875.00		
33.1.2	0.80mm (22 SWG) galvanised sheet steel	Sq.m	125.00		
33.1.3	1.00mm (20 SWG) galvanised sheet steel	Sq.m	50.00		

33.1.4	1.00mm (18 SWG) galvanised sheet steel	Sq.m	15.00		
33.2	Manual Volume control dampers Manual control Volume control damper in 16G construction as specified, Al dampers (Low leakags), with TDF flange-Supply, installation and testing of AL construction of 16G opposed blade volume control dampers within ducts to be provided with suitable links, levers and quadrants for manual control of volume of air flow.The end flanges should be of TDF. Motorized Volume control dampers with actuator Supply, installation, testing & commissioning of multi blade, motorised vcd dampers with spring return actuator. VCD in 16G construction , Al dampers (Low leakags), Supply, installation and testing of AL construction of 16G opposed blade volume control dampers It shall be complete with control panel, actuator, sensor and inter-locking / wiring / connection. Actuators for the above volume control dampers-- Contacts shall be provided in the actuator to receive signals for opening and closing the damper Power for the actuator shall be derived from LCP of the AHU by the Contractor.				
33.2.1	Up to 0.36 Sqm	Nos	12.00		
33.2.2	0.37 to 0.6 Sqm	Nos	12.00		
33.3	Motorised Fire dampers: Fire & Smoke dampers as specified complete with single/double actuators as required and the Fire sleeves are to be necessarily only of factory fitted and of the same make as that of the fire dampers. (the location of the actuators are to be decided by the prevailing site conditions only and actuator to give on/off/status facility as well): The damper shall be of atleast 2 hr. fire rating with 450 mm duct sleeve. The damper shall be UL 555 S certified. The damper shall be constructed out of 16G galvanised sheet steel. It shall be complete with control panel, actuator, sensor and inter-locking / wiring / connection for tripping of AHU fan motor. (for AHU rooms /battery room /				

	electrical rooms) the vendor should furnish the UL test certificate at the time of delivery & UL symbol should be there in all fire dampers				
33.3.1	Up to 0.36 Sqm	Nos	12.00		
33.3.2	0.37 to 0.6 Sqm	Nos	12.00		
33.4	Manual Volume control dampers	Sq.m	1.00		
33.5	Supply and installation of continuous air grilles/ air diffusers extruded aluminium, 'powder coated complete with : i) Face bars horizontal/vertical,adjustable/non-adjustable. ii) 20mm margins with PVC gasket iii) Sidewall or linear as shown in drgs.				
33.5.1	150 mm Linear grille	Rm	50.00		
33.5.2	Air diffuser with VCD	sqm	2.50		
33.5.3	Air diffuser without VCD	sqm	2.50		
33.5.4	15 degree ,550x150 supply Grille With Damper	Nos	25.00		
33.5.5	15 degree ,550x150 supply Grille Without Damper	Nos	25.00		
33.5.6	550x150 supply Grille With Damper	Nos	15.00		
33.5.7	550x150 supply Grille Without Damper	Nos.	15.00		
33.6	Supply and installation of powder coated opposed blade collar dampers of Aluminium construction				
33.7	Collar dampers for Grilles and Diffusers	Sq.m	15.00		
34.0	**THERMAL & ACOUSTIC INSULATION**				
34.1	**THERMAL INSULATION:** 'Thermal insulation of Ducts with Class 'O' Plus(FM approved & in accordance to UL 94(HB, VO, 1996) Closed Cell Nitrile Rubber with				

	antimicrobial and antifungal properties having following thikness. Thermal Conductivity is 0.033 w/m.k and having µ value ≥ 10000.				
34.1.1	Supply Air Duct - 19 mm thick	Sq.m	650.00		
34.1.2	Return Air Duct - 12 mm thick	Sq.m	50.00		
34.2	ACOUSTIC INSULATION: 'Acoustic Insulation of Duct should be Open Cell Nitrile Rubber, having density 140 - 180 kg/m³ and specs as per RISAC Chart in specfication sheet. Thermal Conductivity not exceeding 0.047 w/m.k @ 20 Deg. C The Insulation shall pass Air Erosion Resistance Test in accordance to ASTM Standard C 1071 - 05 as well it should have antimicrobial properties as per DIN EN ISO 846 Method A and DIN EN ISO 846 Method C (thikness as per actual calculation): 15 mm thick	Sq.m	350.00		
35	**DRAIN PIPING:**Supply and laying of UPVC piping for drain piping 'complete with 13 mm thick nitrile rubber insulation as specified with all adhesives, solvent				
35.1	40 dia Nominal Bore	Rm	55.00		
35.2	32 dia Nominal Bore	Rm	50.00		
35.3	25 dia Nominal Bore	Rm	20.00		
36	**RECTANGULAR VARIABLE AIR VOLUME BOX:** Supply, installation, testing & commissioning of variable air volume box for supply and return air,Casing from GSS ,Internal fibre glass insulation lining (density 32 Kg/m3)with a protective marglass facing suitable for velocities of up to 20 m/s.The insulation material should be tested to BS 476 Part 6,1989 and part 7 ,1997 for fire propagation and surface spread of flame respectivaly.Control damper from sheet steel with tip seal, aluminium sensor tubes ,polyurethane plain bearings . As per ISO 5220,1981 on Airodynamic testing and rating of constant and variable dual and single duct boxes and single units,ISO 3741,1988 for the determination of Sound Power levels on noise controle.Casing Air Leakage rating according to Class A DW				

	144,1998.with communicable controller and digital thermostat.All plastic materials should be UL listed fire retardant material.The VAVs shall be used in standalone mode complete with own temperature sensor and controller and shall perform the function of maintaining the temperature and airflow. The VAVs shall be BMS compatible to enable to network the VAVs to a network control unit and onto BMS. In this mode all VAV data shall be available at the BMS workstation and it shall be possible to change set points and flow setting from the BMS workstation.				
36.1	1150-CFM	Nos	4.00		
36.2	1000-CFM	Nos	3.00		
36.3	800-CFM	Nos	4.00		
36.4	750-CFM	Nos.	2.00		
36.5	700- CFM	Nos.	3.00		
36.6	650-CFM	Nos	1.00		
36.7	600-CFM	Nos	1.00		
36.8	450-CFM	Nos	7.00		
36.9	300-CFM	Nos	2.00		
36.91	250-CFM	Nos	8.00		
37.0	**AIR COOLED VRV /VRF DX UNITS**				
37.1	Supply, installation, commissioning & testing of aircooled D-X type VRV/VRF Condensing Unit with all accessories and consisting of:a)Inverter type Compressr (min two), condenser, fans , microprocesser based inbuilt control unit etc., b) Necessary vibration isolators c) Painting of supports and pipes d) Pressure				

	testing.e) Making openings in walls and Closing with necessary 'Civil Work finishing with suitable 2hr FR fire seal (Hilti/Promat) (need to necessarily included here).g)with necessary mounting steel structure, all accessories, antii corrosive painting, final finsh painting, bolts, nuts, foundation bolts, civil foundation, anti vibration mounting pads,springs etc., and if any additional item required to cover the installtion of ODU to be included.c)condenser, Noiseless fans, evaporator, Electronic Expansion Valve(EEV) etc.,d) Microprocessor based control panel e) Central controller for remote on/off, status screen etc.,g) Eco-friendly and IGBC approved Refrigerant to be used.h) suitable for mainly cooling and secondarily heating too when necessary.i) all wiring shall be FRLSj) refrigerants pipe & nitrile rubber insulation(class O) only to be on perforated powder coated MS cable trays both at bottom and removable cover laid in trench or in open as required.k) NC level not more than 55 db from 1 m from source i)First fill refrigerant gas charge (till handover to the client) for the given area including all required material, laboure etc.,				
37.1.1	**VRF OUTDOOR UNIT:** 5 HP-SERVER & UPS / BATTERY ROOM	Nos	2.00		
37.1.2	VRV INDOOR UNITS: Supply, Installation, commissioning & testing of DX type VRV/VRF Multi- split systems as 'specified and shown in the drawings, equipment schedule complete with the following and suitable for cooling:- a) Outdoor units complete with scroll compressors, MS. Supporting stands, necessary vibration isolators., etc as specified b) Indoor units of types mentioned below complete with cordless remote controller, mounting arrangements, All The Indoors should have drain pump except High wall Units FCU and Ductable should be with Corded remote and with drain pump. Indoor Unit [FCU 2.5TR -1000 CFM (2+2)]	Nos	4.00		
37.2	Structural stand support with all necessary civil Foundation for all outdoor units.	Nos	2.00		
37.3	First fill refrigerant gas charge (till handover to the client) for the given apartment including all required material, laboure etc., for whole project.	Lump sum	1.00		

37.4	**REFRIGERENT PIPING :** Supply , installation, testing & comissioning of refrigerant copper piping with all accessories between evaporator coil in the Inddor unit and condensor unit covered with Nitrile Foam insulation as per Indoor & Outdoor Unit location Specified in Dwg.The piping will be complete with necessary Refnet joint between IDU and ODU,G I Saddle support, cable tray and all other support systems etc., required to complete the job.				
37.4.1	Suction Line with Thick Class 'O' Nitrile Rubber Insulation(or more if required).	Rmt	31.00		
37.4.2	Liquid Line with (min or more if required) Thick Class 'O' Nitrile Rubber Insulation.	Rmt	31.00		
37.4.3	Refnet valves as required,	Nos	10.00		
37.5	**COMMUNICATION CABLING:** SITC of communication cable from idu to odu FRLS pvc sheathed, copper flexible wires (2c 1.5sqmm shielded and twisted) of suitable size with necessary mounting (accessories required for termination, fixing etc.,)	Rmt	50.00		
				Total amount excluding GST:	
				GST @ 18@:	
				Total amount including GST:	

NOTE:

1) **Bidders are requested to submit the blank SOR with "QUOTED / NOT QUOTED" remarks along with the un priced bid without mentioning any price/rate.**

2) ***PRICE / RATES TO BE ENTERED ONLY IN THE PRICED BID FORMAT/BOQ AVAILABLE IN THE E-TENDERING PORTAL***

SECTION-VIII

ATTACHMENTS

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ATTACHMENT - I

PROFORMA FOR CONTRACT AGREEMENT

LOA No/PO No.: IGGL/

Contract Agreement for the work of ---------- of IGGL 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 IGGL 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

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.

   AND

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,

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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 and lying on the SITE.

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 **IGGL**	Signed and Delivered for and behalf of **M/s**_____
Date: _____	Date: _____
Place: _____	Place: _____

IN PRESENCE OF TWO WITNESSES

1. _____	1. _____
2. _____	2. _____