



GAIL (India) Limited
(A Government of India Undertaking)
A Maharatna Company

**GAIL Jubilee Tower, B-35 & 36, Sector-1,
Noida- 201301, State: Uttar Pradesh, India**

TENDER ID- 2024_GAIL_188833_1

**BIDDING DOCUMENT FOR
INTERIOR, MEP AND RELATED WORKS FOR
OFFICE BUILDING AT RANCHI, JHARKHAND**

OPEN DOMESTIC COMPETITIVE BIDDING

Contact Person: Kaladhar Narayan, DGM (C&P)/ Ankit Sharma, Manager (C&P);
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Issued by
GAIL (India) Limited
(A Government of India Undertaking)
A Maharatna Company
GAIL Jubilee Tower, B-35 & 36, Sector-1, Noida- 201301, State: Uttar Pradesh, India
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SECTION-I
"INVITATION FOR BID (IFB)"

ON OPEN DOMESTIC COMPETITIVE BASIS

Ref No: GAIL/NOIDA/C&P/PROJ/INT. WORKS-OFC RANCHI/23-58

Date: 29.02.2024

To,

PROSPECTIVE BIDDERS

SUB: TENDER DOCUMENT FOR INTERIOR, MEP AND RELATED WORKS FOR OFFICE BUILDING AT RANCHI, JHARKHAND

Dear Sir/Madam,

1.0 **GAIL (India) Limited [having registered office at 16, Bhikaiji Cama Place, New Delhi 110066, CIN No. L40200DL1984GOI018976]**, the largest state-owned natural gas processing and distribution company and the youngest Maharatna, invites bids under single stage from eligible bidders for the subject job, 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 JOB / BRIEF SCOPE OF WORK	INTERIOR, MEP AND RELATED WORKS FOR OFFICE BUILDING AT RANCHI, JHARKHAND	
(B)	TENDER NO. & DATE	Tender ID: 2024_GAIL_188833_1 DATED 29.02.2024	
(C)	TYPE OF BIDDING SYSTEM	SINGLE BID SYSTEM	
		TWO BID SYSTEM	√
(D)	TYPE OF TENDER	E-TENDER	√
		MANUAL TENDER	
		E-TENDER NO: 2024_GAIL_188833_1	
(E)	COMPLETION/CONTRACT PERIOD	Time for completion for all the works shall be “Twelve months for all works” (Including 15 days for Mobilization) from the date of issue of Handing over of site.	
(F)	BID SECURITY / EARNEST MONEY DEPOSIT (EMD)	APPLICABLE	√
		NOT APPLICABLE	
		Amount: Rs. 28,83,464/- (Rupees Twenty Eight Lakh Eighty Three Thousand Four Hundred and Sixty Four Only)	



		<p>EMD exemption is not applicable to MSE bidders being a works contract. MSE bidders also have to submit EMD in order to participate in this tender.</p> <p>(Refer clause no.16 of ITB)</p>
(F1)	DECLARATION FOR BID SECURITY	Start-Ups and CPSEs (to whom exemption is allowed as per extant guidelines in vogue) are required to submit Declaration for Bid Security as per proforma at Form F-2A.
(G)	AVAILABILITY OF TENDER DOCUMENT ON WEBSITE(S)	<p>From 29.02.2024 to 28.03.2024 (1400 Hrs., IST) on following websites:</p> <p>(i) Govt. e-Procurement System of National Informatics Center (GePNIC) portal [e-tender portal] https://etenders.gov.in/eprocure/app</p> <p>[Note: E-bid to be submitted only through this portal]</p> <p>(ii) GAIL's Tender Website – www.gailtenders.in</p>
(H)	DATE, TIME & VENUE OF PRE-BID MEETING	<p>Date: 08.03.2024 Time: 1500 Hrs. Venue: <i>Pre-bid meeting will be held through video conferencing. Necessary link for video conferencing is as under:</i></p> <p>Click here to join the meeting</p> <p>Meeting ID: 447 292 845 954 Passcode: DDEoUf</p> <p>Download Teams Join on the web</p>
(I)	DUE DATE & TIME OF BID-SUBMISSION (ON OR BEFORE)	<p>Date: 28.03.2024 Time: up to 1400 Hrs.</p>
(J)	DATE AND TIME OF UN-PRICED BID OPENING	<p>Date: 01.04.2024 Time: at 1500 Hrs. Venue: <i>Bid opening will be held through video conferencing. Necessary link for video conferencing is as under:</i></p> <p>Click here to join the meeting</p> <p>Meeting ID: 433 104 631 763 Passcode: FQZ366</p> <p>Download Teams Join on the web</p>
(K)	CONTACT DETAILS OF TENDER DEALING	<p>Name : Ankit Sharma, Manager (C&P) Phone No. & Extn : 00 91 0120 2446400, 4862400</p>



	OFFICER	Extn. 11732/11718 FAX No. : 0091 1126185941 E-mail: kaladhar@gail.co.in / ankit.sharma@gail.co.in
(L)	DEALING GAIL'S OFFICE ADDRESS	GAIL Jubilee Tower, B-35 & 36, Sector-1, Noida-201301, State: Uttar Pradesh, India

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

- 3.0 Bids must be submitted strictly in accordance with Clause No. 11 of ITB (Section-III) depending upon Type of Tender [refer Clause no. 2.0 (D) above]. The IFB is an integral and inseparable part of the bidding document.
- 4.0 In case of E-Tender, bid must be submitted only on <https://etenders.gov.in/e procure/app>. Further, the following documents in addition to uploading the bid on E-tender portal shall also be submitted in Original (in physical form) within 7 (seven) days from the bid due date provided the scanned copies of the same have been uploaded in E-tender by the bidder along with e-bid within the due date and time to the address mentioned in Bidding Data Sheet (BDS) [Annexure-IV to Section-III]:-
- EMD/Bid Security/Declaration for Bid Security (as applicable)
 - Power of Attorney
 - Integrity Pact (if applicable)
 - Line of Credit (if applicable)
- 5.0 In case of Manual Tenders, bids complete in all respect should reach at the address specified in Bid Data Sheet on or before the due date & time. Bids received after the due date and time is liable to be rejected.
- 6.0 Bidder(s) are advised to quote strictly as per terms and conditions of the tender documents and not to stipulate any deviations/exceptions.
- 7.0 Any bidder, who meets the Bid Evaluation Criteria (BEC) and wishes to quote against this Tender Document, may download the complete Tender Document alongwith 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 (Section-III).
- 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 Any revision, clarification, 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. In case of manual tendering, Clarification(s)/Corrigendum(s), if any, shall be sent to the prospective bidder(s) by email/post.



- 10.0 All 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 date of receipt of tender information.
- 11.0 SAP generated Request for Quotation (RFQ), if any shall also form an integral part of the Tender Document.

This is not an Order.

For & on behalf of
GAIL (India) Limited

Ankit Sharma, Manager (C&P)
Phone: 00-91-120-2446400 Extn.11718,
E-mail: ankit.sharma@gail.co.in



DO NOT OPEN - THIS IS A QUOTATION

Bid Document No. : 2024_GAIL_188833_1

Item : **INTERIOR, MEP AND RELATED WORKS
FOR OFFICE BUILDING AT RANCHI,
JHARKHAND**

Due Date & Time : **Up to 1400 Hrs. (IST) on 28.03.2024**

From: **To:**

	<i>Kind Attn: Sh. Ankit Sharma Manager (C&P) GAIL (India) Limited 17th Floor, GAIL Jubilee Tower, B-35-36, Sector-1, NOIDA, – 201301, Dist. Gautam Budh Nagar, Uttar Pradesh (India) Phone: 00-91-120-2446400 Extn.11718, Fax: +91-11-2618594116</i>
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[To be pasted on the envelope containing Originals of Power of Attorney, Integrity Pact, EMD/ Declaration for Bid Security (as applicable), Line of Credit (if applicable); refer clause 4.0 of IFB.



SECTION-II

BID EVALUATION CRITERIA & EVALUATION METHODOLOGY



SECTION-II

BID EVALUATION CRITERIA (BEC) & EVALUATION METHODOLOGY

A. Technical Criteria

- A.1 The Bidder should have successfully completed contract(s) for Interior works of an Office/Institutional Building complex in which the scope of contract shall include Civil, MEP, HVAC, HV, LV, Furnishing works during the preceding 07 (Seven) years reckoned from the bid due date as detailed below (RCC related works shall be excluded for the purpose of executed value):

At least three completed works/ contracts of Project, each value not less than Rs. 13.61 Crores excluding cost of land

or

At least two completed works /contracts of Project, each value not less than Rs. 17.01 Crores excluding cost of land

or

At least one completed work/ contract of Project value not less than Rs.27.22 Crores excluding cost of land

Note to Clause no. A:

- (i) The work order must have brief scope of work/ services covering the parameters of BEC requirement. The completion certificates must have details like Full Name and Address of client, work order reference, start date, completion date, completed value of project, etc..
- (ii) In case of composite/ complex work, clear break-up of work done for Interior works of an Office/ Institutional Building complex including Civil, MEP, HVAC, HV, LV, Furnishing works but excluding RCC related works to be provided in the completion certificate on separate letter head issued from the end user/ owner.
- (iii) 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.
- (iv) Consortium bids are not acceptable.
- (v) Eligibility criteria in case bid is submitted on the basis of technical experience of FOREIGN BASED ANOTHER COMPANY(SUPPORTING COMPANY) which holds more than fifty percent of the paid up share capital of the bidder company or vice versa:



Offers of those bidders (not under consortium arrangement) who themselves do not meet the technical experience criteria as stipulated in the BEC and are quoting based on the experience of Foreign based another company (Supporting Company) can also be considered. In such case the supporting company should hold more than fifty percent of the paid up share capital of the bidding company or vice versa.

However, the supporting company should on its own meet the technical experience as stipulated in the BEC and should not rely on any other company or through any other arrangement like Technical collaboration agreement.

In that case as the bidding company is dependent upon the technical experience of another company with a view to ensure commitment and involvement of the companies involved for successful execution of the contract, the participating bidder should enclose the following Agreements/ Guarantees/ Undertakings along with the techno-commercial bid:

- (i) An Agreement (*as per format enclosed at Appendix- A1 to Section II*) between the bidder and the supporting company.
- (ii) Guarantee (*as per format enclosed at Appendix- A2 to Section II*) by the supporting company to GAIL for fulfilling the obligation under the Agreement along with certificate issued by Company Secretary as per *Appendix- A2A to Section II*.
- (iii) Undertaking by Supporting Company to provide a Performance Bank Guarantee (*as per format and instructions enclosed at Appendix- A3 to Section II*), equivalent to 50% of the value of the PBG which is to be submitted by the bidding company, in case of being the successful bidder.

In cases where foreign based supporting company does not have Permanent Establishment in India as per Indian Income Tax Act, the bidding company can furnish Performance Bank Guarantee for an amount which is sum of PBG amount to be submitted by the bidder and additional PBG amount required to be submitted by the supporting company subject to the condition that supporting company have 100% paid up equity share capital of the bidder either directly or through intermediate subsidiaries or vice versa.

In such case bidding company shall furnish an undertaking that their foreign based supporting company is not having any Permanent Establishment in India in terms of Income Tax Act of India.

- (iv) Undertaking from the supporting company to the effect that in addition to invoking the PBG submitted by the bidding company, the PBG provided by supporting company shall be invoked by GAIL due to non-performance of the bidding company.

Note:

- 1.0 In case Supporting Company fails to submit Bank Guarantee as per (iii) above, EMD/SD submitted by the bidder shall be forfeited.
- 2.0 The Financial BEC of tender is to be met by bidder on their own.
- 3.0 The Supporting Company shall meet conditions of 'Eligible Bidder', as per clause no. 2 of Section-III (ITB).
- 4.0 The clause J (Procurement from a bidder which shares a Land Border with India) shall be applicable to above supporting company also.

**B. Financial Criteria****B.1 Average Annual Turnover**

The minimum average annual turnover of the bidder as per the audited financial statement during preceding three financial years shall be Rs. 17.01 Crores

B.2 Net Worth

Net worth of the bidder should be positive as per the last audited financial statement of immediate preceding financial year.

B.3 Working Capital:

The minimum working capital of the bidder as per the last audited financial statement shall Rs. 3.40 Crores.

Note to Clause B:

- (i) If the bidder's working capital is negative or inadequate, the bidder shall submit a letter from their bank having net worth not less than Rs.100 crores (or equivalent in USD), confirming the availability of line of credit for working capital amount mentioned herein above. The line of credit letter from bank to be submitted strictly as per format at F-9.

Declaration Letter/Certificate for line of credit due to short fall of working capital shall be from single bank only. Letters from multiple banks shall not be acceptable. However, banking syndicate will also be acceptable wherein a group of banks can jointly provide line of credit to the bidder.

The bank shall be required to issue the letter for declaration/ certificate of line of credit on their letter head along with the contact details of the issuing authority like email id, contact number etc.

- (ii) **Average Annual Turnover:**

Preceding 3 financial years mentioned in aforesaid BEC refer to immediate 3 preceding financial years wherever the closing date of the bid is after 30th Sept. of the relevant financial year. In case the tenders having the due date for submission of bid up to 30th September of the relevant financial year, and audited financial results of the immediate 3 preceding financial years are not available, the audited financial results of the 3 years immediately prior to that will be considered.

In case the date of constitution/incorporation of the bidder is less than 3 years old, the average turnover in respect of the completed financial years after the date of constitution/ incorporation shall be taken into account for minimum Average Annual Financial Turnover criteria.



(iii) **Net Worth/Working Capital:**

Immediate preceding financial year mentioned in aforesaid BEC refer to audited financial results for the immediate preceding financial year wherever the closing date of the bid is after 30th Sept. of the relevant financial year. In case the tenders having the due date for submission of bid up to 30th September of the relevant financial year, and audited financial results of the immediate preceding financial year is not available, in such case the audited financial results of the year immediately prior to that year will be considered. Bidder is to submit Audited Financial Statement of immediate preceding financial years (as mentioned above) along with format F-10 accordingly for Net worth / Working Capital.

The original document for 'Line of Credit' should be submitted along with other physical documents required as per tender conditions or in response to commercial query failing which bid shall be rejected.

Bidder is to submit Audited Financial Statement of immediately preceding financial year (as mentioned above) along with format F-10 accordingly for Net-worth / Working Capital.

- (iv) Formula for Calculation of Annual Turnover, Net Worth and Working Capital are available in Format F-10.

C. RELAXATION OF PRIOR TURNOVER AND PRIOR EXPERIENCE FOR STARTPUS (AS DEFINED IN GAZETTE NOTIFICATION NO. D.L-33004/99 DATED 18.02.2016 AND 23.05.2017 OF MINISTRY OF COMMERCE AND INDUSTRY), AS AMENDMED TIME TO TIME –

NOT APPLICABLE

D. Exchange rate for Conversion of Currency for evaluation of documents submitted by bidders for BEC which are in other currency than specified in BEC shall be as follows:

(a) **BEC (Technical Criteria):** Bill Selling (foreign exchange) Rate of State Bank of India as prevailing on the date of award of contract submitted by bidder.

(b) **BEC (Financial Criteria):**

(i) For Annual Turnover:

The average of Bill Selling (foreign exchange) Rate of State Bank of India as prevailing on the First date and Last date of the respective Financial Year.

(ii) For Net-Worth & Working Capital:

The Bill Selling (foreign exchange) Rate of State Bank of India as prevailing on the Last date of the respective Financial Year.

(c) In case, the SBI Selling rate is not available as on the date of conversion as specified above for respective cases, the exchange rate for conversion of currency shall be taken from the internet, such as:

<https://www.xe.com/currencyconverter>

<https://economictimes.indiatimes.com/markets/forex/currency-converter>

<https://www.oanda.com/currency/converter>



- E.** 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.

After submission of bid, only related shortfall documents may be asked for in TQ/CQ and considered for evaluation. For example, if the bidder has submitted a contract without its completion certificate, the certificate may be asked for and considered. However, no new reference/ PO/WO/LOA is to be submitted by bidder in response to TQ/CQ so as to qualify and such documents will not be considered by GAIL for evaluation of Bid.

Any shortfall information / documents on the Audited Annual Report / Financial Statement of the Bidder and/or line of credit for working capital issued on or before the final bid due date can only be sought against Commercial queries (CQs). Any information/ documents issued post final bid due date shall not be considered for evaluation

Experience of bidder acquired as a subcontractor can be accepted against submission of certificate from end user by such bidder along with other specified documents.

F. DOCUMENTS TO BE SUBMITTED FOR COMPLIANCE TO BEC

Documents/Documentary Evidence required to be provided by participating bidder along with the un-priced bid to qualify/ meet the requirements of BEC:

BEC Clause no.	Description	Documents required for qualification
A	Documents Required-Technical Criteria of BEC	
A.1	Experience criteria	(a) Detailed work order along with Schedule of Rates/scope of work etc. showing BEC requirement. (b) Completion certificate issued by end user / Owner (or their consultant who has been duly authorized by owner to issue such certificate) stating that the work has been completed satisfactorily. Note: (i) The work order must have brief scope of work/ services covering the parameters of BEC requirement. The completion certificates must have details like Full Name and Address of client, work order reference, start date, completion date, completed value of project, etc. (ii) In case of composite/ complex work, clear break-up of work done for Interior works of an Office/ Institutional Building complex including Civil, MEP, HVAC, HV, LV, Furnishing works but excluding RCC related works to be provided in the completion certificate on separate letter



		head issued from the end user/ owner.
Note i) to Clause no. A.1	Jobs executed for Subsidiary / Fellow subsidiary/ Holding company	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.
B	Documents Required-Financial Criteria	
B	BEC (Financial)	A certificate for financial capability of the bidder from Practicing Chartered Accountant in prescribed format [Format F-10] as provided in the Tender Document.
B.1	Annual Turn-over	Bidder(s) shall submit copy of Audited Annual Financial Statement [Balance Sheet and Profit & Loss Account statements] along with Audit Report of three (3) preceding Financial Year(s).
B.2	Net Worth	Bidder(s) shall submit copy of Audited Annual Financial Statement [Balance Sheet and Profit & Loss Accounts statements] along with Audit Report of last Financial Year.
B.3	Working Capital	<p>Bidder(s) shall submit copy of Audited Annual Financial Statement [Balance Sheet and Profit & Loss Accounts statement] along with Audit Report of the last audited Financial Year.</p> <p>If the bidder's working capital is negative or inadequate, the bidder shall submit a letter from their bank having net worth not less than Rs.100 crores (or equivalent in USD), confirming the availability of line of credit for working capital amount mentioned herein above. Original line of credit letter from bank to be submitted strictly as per format(F-9).</p> <p>Declaration Letter/Certificate for line of credit due to short fall of working capital shall be from single bank only. Letters from multiple banks shall not be applicable. However, banking syndicate will also be acceptable wherein a group of banks can jointly provide line of credit to the bidder.</p> <p>The bank shall be required to issue the letter for declaration/ certificate of line of credit on their letter head along with the contact details of the issuing authority like email id, contact number etc.</p>

Bidder shall furnish the duly filled and signed Check list for submission of documents for qualification for Bid Evaluation Criteria (BEC) as per format F-8B.



G. AUTHENTICATION OF DOCUMENTS TO BE SUBMITTED IN SUPPORT OF BEC:

(i) Technical Criteria of BEC

All documents in support of Technical Criteria of BEC to be furnished by the bidders shall necessarily be duly certified/ attested by Chartered Engineer and Notary Public with legible stamp.

(ii) Financial Criteria of BEC

In support of financial criteria of Bid Evaluation Criteria (BEC), bidder is required to submit “Details of Financial capability of bidder” exactly in the format provided in the tender document, duly signed and stamped by a practicing Chartered Accountant.

Further, copy of audited annual financial statements including Audit report submitted in bid shall be duly certified/ attested by Notary Public with legible stamp.

In absence of requisite documents, GAIL reserves the right to reject the bid without making any reference to the bidder.

H. Apart from above, Bidder must submit all other relevant documents/ information as specified in the Scope of Work/SCC for Technical Evaluation of bid or specified elsewhere in the Tender Document, towards proof of its responsiveness.

I. EVALUATION METHODOLOGY:

The “Schedule of Rates” including GST quoted for complete scope of shall be taken up for evaluation on overall L-1 cost basis to Owner.

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

Preferences: Purchase Preference for Make In India (PPP-MII) shall be applicable as per Government Guideline in vogue.

J. PROCUREMENT FROM A BIDDER WHICH SHARES A LAND BORDER WITH INDIA

1. OM no. 7/10/2021-PPD(1) dated 23.02.2023, Department of Expenditure, Ministry of Finance, Govt. of India refers. The same are available at website <https://doe.gov.in/procurement-policy-divisions>.

2. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. For details of competent authority refer to Annexure I of Order (Public Procurement no. 4) dated 23.02.2023.

Further, any bidder (including bidder from India) having specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India, shall also require to be registered with the same competent authority.



Further the above will not apply to bidders from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects. Updated lists of countries to which lines of credit have been extended or in which development projects are undertaken are given in the website of the Ministry of External Affairs, Govt. of India

3. **"Bidder"** (including the term 'tenderer', 'consultant' 'vendor' or 'service provider' in certain contexts) **for purpose of this provision** means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.

4. **"Bidder from a country which shares a land border with India"** for the purpose of this:
 - a. An entity incorporated, established or registered in such a country; or
 - b. A subsidiary of an entity incorporated, established or registered in such a country; or
 - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
 - d. An entity whose beneficial owner is situated in such a country; or
 - e. An Indian (or other) agent of such an entity; or
 - f. A natural person who is a citizen of such a country; or
 - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

5. **"Beneficial owner"** for the purpose of above (4) will be as under:
 - i. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person(s), has a controlling ownership interest or who exercises control through other means.
Explanation—
 - a) "Controlling ownership interest" means ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company;
 - b) "Control" shall include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;
 - ii) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
 - iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen



percent of the property or capital or profits of such association or body of individuals;

- iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
 - v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
6. **"Agent"** for the purpose of this Order is a person employed to do any act for another, or to represent another in dealings with third persons

Note :

- (i) A person who procures and supplies finished goods from an entity from a country which shares a land border with India will, regardless of the nature of his legal or commercial relationship with the producer of the goods, be deemed to be an Agent for the purpose of this Order.
 - (ii) However, a bidder who only procures raw material, components etc. from an entity from a country which shares a land border with India and then manufactures or converts them into other goods will not be treated as an Agent.]
7. **"Transfer of Technology"** means dissemination and transfer of all forms of commercially usable knowledge such as transfer of know-how, skills, technical expertise, designs, processes and procedures, trade secrets, which enables the acquirer of such technology to perform activities using the transferred technology independently. (Matters of interpretation of this term shall be referred to the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade, and the interpretation of the Committee shall be final.)
8. **"Specified Transfer of Technology"** means a transfer of technology in the sectors and/or technologies, specified at Schedule-I, II & III of this order.

9. **SUBMISSION OF CERTIFICATE IN BIDS:**

Bidder shall submit a certificate in this regard as Form-I-A.

For cases falling under the category of Transfer of Technology, Bidder shall submit a certificate in this regard as Form-I-B.

If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for immediate rejection of the bid/termination and further action as per "Procedure for Action in case of Corrupt/Fraudulent/ Collusive / Coercive Practices" of tender document.

10. The registration, wherever applicable, should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender,



registration should be valid at the time of placement of order. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

11. PROVISION TO BE IN WORKS CONTRACTS, INCLUDING TURNKEY CONTRACTS:

The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. The definition of "contractor from a country which shares a land border with India" shall be as in Para 4 herein above. A Certificate to this regard is to be submitted by bidder is placed at Form-II.

[Note: Procurement of raw material, components, etc. does not constitute sub-contracting].

K. RESTRICTING PARTICIPATION OF NCLT REFERRED BIDDERS

- (i) Offer from the following type of bidders / members of consortium will not be considered:
- Bidders who are undergoing insolvency resolution process or liquidation or bankruptcy proceeding under Insolvency and Bankruptcy Code, 2016 (Code).
 - Bidders whose resolution process or liquidation or bankruptcy proceeding is initiated under the Code at any stage of evaluation of bid.
- (ii) It will be responsibility of the bidder/contractor/vendor to inform GAIL/ PMC within 15 (Fifteen) days from the date of order of insolvency resolution process or liquidation or bankruptcy proceeding passed by the Adjudating Authority Namely National Company Law Tribunal (NCLT) or Debt Recovery Tribunal (DRT) or any other similar authority under the Code.
- (iii) If bidder fails to share the information regarding their status of insolvency resolution process or liquidation or bankruptcy proceeding in their bid or at any latter stage, their offer is liable to be rejected by GAIL/ PMC.
- (iv) GAIL/ PMC reserve the right to cancel / terminate the contract without any liability on the part of GAIL/ PMC immediately on the commencement of insolvency resolution process or liquidation or bankruptcy proceeding of any party under the contract.

A declaration in this regard shall be furnished by the bidder as per proforma at Annexure-A to Section-II.

**Form-IA****UNDERTAKING ON LETTERHEAD**

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

REF: OM No. 7/10/2021-PPD(1) dated 23.02.2023 of Dept of Expenditure, Ministry of Finance,
Government of India<https://doe.gov.in/procurement-policy-divisions>

Dear Sir

We, M/s_____ (*Name of Bidder*), have read the clause regarding restrictions on Procurement from a Bidder of a country which shares a land border with India as mentioned in the tender document in line with the above referred guidelines dated 23.02.2023 for Procurement from a bidder which shares a land border with India and We certify that

- (i) Bidder is not from such a country []
- (ii) If the Bidder is from such a country []
which shares a land border with India, has been registered
with the Competent Authority.
(Evidence of valid registration by the
Competent Authority to be attached by the bidder)

(Bidder is to tick appropriate option (✓ or X) above).

We hereby certify that we fulfill all requirements in this regard and is eligible to be considered against the subject tender.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

**Form-I-B**

UNDERTAKING ON LETTERHEAD
(Applicable in case of Transfer of Technology cases only)

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

REF: OM No. 7/10/2021-PPD(1) dated 23.02.2023 of Dept of Expenditure, Ministry of Finance, Government of India

<https://doe.gov.in/procurement-policy-divisions>

Dear Sir

We, M/s _____ (*Name of Bidder*), have read the clause regarding restrictions on Procurement from a Bidder of a Country having Transfer of Technology (ToT) arrangement as mentioned in the tender document in line with the above referred guidelines dated 23.02.2023 for Procurement from a bidder which shares a land border with India and We certify that

(i) The Bidder does not have ToT with such a country []

(iii) If the Bidder is having ToT from such a country []
which share a land border with India, has been registered

with the Competent Authority.

(Evidence of valid registration by the
Competent Authority to be attached by the bidder)*(Bidder is to tick appropriate option (✓) above).*

We hereby certify that we fulfill all requirements in this regard and is eligible to be considered against the subject tender.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

**Form-II**

CERTIFICATE FOR TENDERS FOR WORKS INVOLVING POSSIBILITY OF SUB-CONTRACTING

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

REF: OM No. 7/10/2021-PPD(1) dated 23.02.2023 of Dept of Expenditure, Ministry of Finance, Government of India

<https://doe.gov.in/procurement-policy-divisions>

Dear Sir

We, M/s _____ (*Name of Bidder*), have read the clause regarding restrictions on Procurement from a Bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries as mentioned in the tender document in line with the above referred guidelines dated 23.02.2023 for Procurement from a bidder which shares a land border with India and We certify that

- (i) Bidder is not from such a country []
- (ii) If the Bidder is from such a country []
which share a land border with India, has been registered

with the Competent Authority.
(Evidence of valid registration by the
Competent Authority to be attached by the bidder)

(Bidder is to tick appropriate option (✓) above).

We further certify that we will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.

We hereby certify that we fulfill all requirements in this regard and is eligible to be considered.

Place: [Signature of Authorized Signatory of Bidder]

Date: Name:

Designation:

Seal:

**Schedule I**

List of Category-I Sensitive sectors:

Sr. No.	Sector
(i)	Atomic Energy
(ii)	Brocasting/ Print and Digital Media
(iii)	Defense
(iv)	Space
(v)	Telecommunications

Schedule II

List of Category-II Sensitive sectors:

Sr.No.	Sector
(i)	Power and Energy (including exploration/ generation/transmission/ distribution/ pipeline)
(ii)	Banking and Finance including Insurance
(iii)	Civil Aviation
(iv)	Construction of ports and dams & river valley projects
(v)	Electronics and Microelectronics
(vi)	Meteorology and Ocean Observation
(vii)	Mining and extraction (including deep sea projects)
(viii)	Railways
(ix)	Pharmaceuticals & Medical Devices
(x)	Agriculture
(xi)	Health
(xii)	Urban Transportation

**Schedule III****List of Sensitive Technologies:**

Sr.No.	Sensitive Technologies
(i)	Additive Manufacturing (e.g. 3D Printing)
(ii)	Any equipment having electronic programmable components or autonomous systems (e.g. SCADA systems)
(iii)	Any technology used for uploading and streaming of data including broadcasting, satellite communication etc.
(iv)	Chemical Technologies
(v)	Biotechnologies including Genetic Engineering and Biological Technologies
(vi)	Information and Communication Technologies
(vii)	Software



Annexure-A to Section-II

DECLARATION ON PROCEEDINGS AS PER INSOLVENCY AND BANKRUPTCY CODE 2016

To,
M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

Dear Sir,

I/ We hereby declare that I/We ,M/s _____ , declare that :
I/We am/are not undergoing insolvency resolution process or liquidation or bankruptcy proceeding as on date.

OR

I/We am/are undergoing insolvency resolution process or liquidation or bankruptcy proceeding as on date as per details mentioned below.

- (a) _____
(b) _____
(c) _____

(Attach details in separate sheet)

Further, I/We also confirms that in case there is any change in status of this declaration at any stage of tendering/ execution (in case of award), the same will be promptly informed to GAIL.

Note: Strike out either (i) or (ii) as applicable.

It is understood that if this declaration is found to be false, GAIL (India) Limited shall have the right to reject my/our bid, and forfeit the EMD/ CPS. If the bid has resulted in a contract, the contract will be liable for termination without prejudice to any other right or remedy (including banning or holiday listing) available to GAIL (India) Limited.

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



Appendix-A1 to Section II

FORMAT OF AGREEMENT TO BE EXECUTED BETWEEN BIDDER AND THEIR FOREIGN BASED SUPPORTING COMPANY ON INDIAN NON-JUDICIAL STAMP PAPER OF REQUISITE VALUE DULY NOTARIZED.

This agreement made this ___ day of ___ month ___ year by and between M/s. _____ (Fill in Bidder's full name, constitution and registered office address) _____ hereinafter referred to as bidder on the first part and M/s. _____ (Fill in full name, constitution and registered office address company which hold more than fifty percent of the paid up share capital of the bidding company or vice versa) hereinafter referred to as "Supporting Company" of the second part.

Whereas

M/s. GAIL (India) Limited (hereinafter referred to as GAIL) has invited offers vide their tender No. _____ for _____ and M/s. _____ (Bidder) intends to bid against the said tender and desires to have technical support of M/s. _____ [Supporting Company]

And whereas Supporting Company represents that they have gone through and understood the requirements of the subject tender and are capable and committed to provide the services as required by the bidder for successful execution of the contract, if awarded to the bidder.

Now, it is hereby agreed to by and between the parties as follows:

- a) M/s. _____ (Bidder) will submit an offer to GAIL for the full scope of work as envisaged in the tender document as a main bidder and liaise GAIL directly for any clarifications etc. in this context.
- b) M/s. _____ [Supporting Company] undertakes to provide technical support and expertise, expert manpower and project management including financial support, if so required, to the bidder to discharge its obligations as per the Scope of Work of the tender / Contract for which offer has been made by the bidder and accepted the GAIL.
- c) The Bidder/ Supporting Company holds more than 50% paid up equity capital of the Supporting Company/ Bidder.
- d) This agreement will remain valid till validity of bidder's offer to GAIL including extension if any and till satisfactory performance of the contract, the same is awarded by GAIL to the bidder.
- e) Supporting Company undertakes that this agreement shall remain enforceable even if their stake in Bidder is diminished during the execution of works under the contract between the Bidder and GAIL.
- f) The bidder shall have the overall responsibility of satisfactory execution of the contract awarded by GAIL, however without prejudice to any rights that GAIL might have against the Supporting Company
- g) It is further agreed that, if contract pursuant to Supporting Company shall be jointly and severally responsible to GAIL for the performance of works during contract



period and for the satisfactory execution of the contract, and for all the consequences for non-performance thereof.

In witness whereof the parties hereto have executed this agreement on the date mentioned above.

For and on behalf of
(Bidder)
M/s.

For and on behalf of
(Supporting Company)
M/s.

Witness:

- 1)
- 2)

Witness:

- 1)
- 2)



Appendix-A2 to Section II

GUARANTEE BY THE FOREIGN BASED SUPPORTING COMPANY/ GUARANTOR
(to be executed on plain paper)

THIS DEED OF GUARANTEE executed at this day of by M/s (mention complete name) a company duly established and existing under the laws of (insert country), having its Registered Office at hereinafter called “the Guarantor and/ or the Supporting Company” which expression shall, unless excluded by or repugnant to the subject or context thereof, be deemed to include its successors and permitted assignees.

FOR

M/s (bidder) a company duly established and existing under the laws of (insert country), having its Registered Office at hereinafter called the “Bidder” which expression shall, unless excluded by or repugnant to the subject or context thereof, be deemed to include its successors and permitted assignees.

TOWARDS

M/s GAIL(India) Limited, a company duly registered under the law of India having its Registered Office at 16, Bhikaiji Cama Place, R. K. Puram, New Delhi-110066, India, and having Purchase center at hereinafter called “GAIL” which expression shall unless excluded by or repugnant to the context thereof, be deemed to include its successor and assignees

WHEREAS GAIL has invited tender number for on, and the bidder has submitted it bid number..... in response to the above mentioned tender invited by GAIL.

AND WHEREAS the bidder/ Guarantor Company holds more than 50% paid up equity capital of the Supporting Company/ Bidder .

AND WHEREAS one of the condition for acceptance of Bidder’s bid against said tender is that in case the bidder is seeking to qualify upon the technical credentials of its Guarantor Company, then the bidder shall arrange a guarantee from its Guarantor Company guaranteeing due and satisfactory performance of the work covered under the said tender including any change therein as may be deemed appropriate by the GAIL at any stage.

The Guarantor represents that they have gone through and understood the requirement of the above said tender and are capable of and committed to provide technical and such other supports as may be required by the Bidder for successful execution of the same.

The Bidder and the Guarantor have entered into an agreement dated as per which the Guarantor shall be providing technical, financial and such other supports as may be necessary for performance of the work under the tender, if the contract is awarded to the Bidder.

Accordingly, at the request of the Bidder and in consideration of and as a requirement for the GAIL to enter into agreement(s) with the Bidder, the Guarantor hereby guarantees and undertakes that upon award of Contract to Bidder against bid number, made by the



Bidder under tender number.....:

1. The Guarantor unconditionally agrees that in case of non-performance by the Bidder of any of its obligations in any respect, the Guarantor shall, immediately on receipt of notice of demand by the GAIL, take up the job without any demur or objection, in continuation and without loss of time and without any cost to the GAIL and duly perform the obligations of the Bidder to the satisfaction of the GAIL.
2. The Guarantor agrees that the Guarantee contained herein shall remain valid till the satisfactory execution and completion of the work (including discharge of the warranty obligations) awarded to the Bidder.
3. The Guarantor shall be jointly and severally responsible to GAIL for satisfactory performance of works during contract period and for the satisfactory execution of the contract, and for all consequences for non-performance thereof.
4. The liability of the Guarantor, under the Guarantee, is limited of the Bidder for non- performance under the contract entered between GAIL and the Bidder. This will, however, be in addition to the forfeiture of the Performance and Advance Guarantees furnished by the Bidder.
5. The Guarantor agrees to execute a Corporate Guarantee in favour of GAIL, guaranteeing the performance of obligations by the Bidder, in case the Contract is awarded to the Bidder by GAIL.
6. The Guarantor represents that this Guarantee has been issued after due observance of the appropriate laws in force in India. The Guarantor hereby undertakes that the Guarantor shall obtain and maintain in full force and effect all the governmental and other approvals and consents that are necessary and do all other acts and things necessary or desirable in connection therewith or for the due performance of the Guarantor's obligations towards GAIL.
7. Any dispute arising out of or in connection with this contract, including any question regarding its existence, validity or termination, shall be referred to and finally resolved by arbitration. It is further agreed that Claims by and against the Guarantor, the Bidder and GAIL under the different contract to be entered pursuant to their relationship can be brought under a single reference and there shall be no bar on the consolidation of such proceedings before the same arbitral tribunal. The governing law shall be the laws of India and seat of arbitration shall be New Delhi, India. The language of arbitration shall be English.
8. The Guarantor hereby declares and represents that this Guarantee has been given without any undue influence or coercion, and that the Guarantor has fully understood the implications of the same.
9. In case of award of contract to the bidder, the Guarantor shall provide Performance Bank Security to GAIL, equivalent to 50% of the value of Performance Bank Security to be submitted by the bidding company, in the prescribed format within 15 days from the date of Fax of Acceptance, as guarantee for performance by the bidder/Supplier. The Guarantor hereby expressly agrees that if in the opinion of GAIL, the Bidder / Supplier has failed to perform its obligations under the contract in any manner, GAIL shall have unfettered right to invoke the said Bank guarantee. The guarantor hereby agrees that decision of GAIL about performance of the bidder / Supplier shall be final and shall not be questioned by the Guarantor. Guarantor shall have no objection to invocation of the Performance Bank Guarantee submitted by the Guarantor

OR

(applicable, subject to meeting the conditions stipulated in BEC in respect of



additional Performance Bank Security)

In case of award of contract to the bidder, the bidder on behalf of the Guarantor shall provide additional Performance Bank Security to GAIL, equivalent to 50% of the value of Performance bank Security to be submitted by the bidding company, in the prescribed format within 15 days from the date of Fax of Acceptance, as guarantee for performance by the bidder/Supplier. The Guarantor hereby expressly agrees that if in the opinion of GAIL, the Bidder / Supplier has failed to perform its obligations under the contract in any manner, GAIL shall have unfettered right to invoke the said Bank guarantee. The Guarantor hereby agrees that decision of GAIL about performance of the bidder / Supplier shall be final and shall not be questioned by the Guarantor. Guarantor shall have no objection to invocation of the Performance Bank Security submitted by the Bidder on behalf The Guarantor represents and confirms that the Guarantor has the legal capacity, power and authority to issue this Guarantee and that giving of this Guarantee and the performance and observations of the obligations hereunder do not contravene any existing laws.

(Strike through the clause whichever is not applicable)

- 10. The Guarantor represents and confirms that the Guarantor has the legal capacity, power and authority to issue this Guarantee and that giving of this Guarantee and the performance and observations of the obligations hereunder do not contravene any existing laws.

For & on behalf of (Supporting Company)

M/s _____

Signature_____

Name_____

Designation _____

official seal_____

Witness:

1.Signature_____

Full Name _____

Address_____

2.Signature_____

Full Name _____

Address_____

INSTRUCTIONS FOR FURNISHING GUARANTEE

- 1. The official(s) executing the guarantee should affix full signature(s) on each page.
- 2. Resolution passed by Board of Directors of the guarantor company authorizing the signatory (ies) to execute the guarantee, duly certified by Company Secretary should be furnished along with Guarantee.



Appendix-A2A to Section II

CERTIFICATE ISSUED BY COMPANY SECRETARY OF THE GUARANTOR COMPANY

“Obligations contained in deed of guarantee No. _____ furnished against tender No. _____ are enforceable against the Guarantor Company and the same do not, in any way, contravene any law of the country of which the Guarantor Company is the subject.”

The above certificate should be enclosed alongwith the Guarantee.



Appendix-A3 to Section II

PROFORMA OF "BANK GUARANTEE" TOWARDS PERFORMANCE SECURITY / SECURITY DEPOSIT BY FOREIGN BASED SUPPORTING COMPANY OF THE BIDDING COMPANY
CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT
(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

To,

To, M/s GAIL (India) Limited _____	Bank Guarantee No.	
	Date of BG	
	BG Valid up to (Expiry date)	
	Claim period up to (indicate date of expiry of claim period which includes minimum three months from the expiry date)	
	Stamp Sl. No./e-Stamp Certificate No.	

Dear Sir(s),

M/s. _____ having registered office at _____ (herein after called the "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 _____ (herein after called CONTRACT) for GAIL (India) Limited having registered office at 16, Bhikaiji Cama Place, R.K. Puram, New Delhi (herein after called the "GAIL" which expression shall wherever the context so require include its successors and assignees).

Further, M/s _____ (Name of the Supporting company) having its registered/head office at _____ based on whose experience/technical strength, the SUPPLIER has qualified for award of contract (hereinafter referred to as the 'SUPPORTING COMPANY') which expression shall, unless repugnant to the context or meaning thereof include all its successors, administrators, executors and assignees) has agreed to provide complete technical and other support to the SUPPLIER for successful completion of the contract as mentioned above, entered between GAIL and the SUPPLIER and GAIL having agreed that the 'SUPPORTING COMPANY' shall furnish to GAIL a performance guarantee for Indian Rupees/US\$ towards providing complete financial and other support to the SUPPLIER for successful completion of the contract as mentioned above,

The said M/s. _____ (Supporting Company) 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.

2. We (name of the bank) _____ registered under the laws of _____ having head/registered office at _____ (hereinafter referred to as "the Bank", which expression shall, unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and permitted assignees) do hereby guarantee and undertake to pay immediately on first demand in writing any/all moneys to the extent of Indian Rs./US\$ (in figures) _____ (Indian Rupees/US Dollars (in words) _____) without any demur,



- reservation, contest or protest and/or without any reference to the 'SUPPORTING COMPANY'. Any such demand made by GAIL on the Bank by serving a written notice shall be conclusive and binding, without any proof, on the bank as regards the amount due and payable, notwithstanding any dispute(s) pending before any Court, Tribunal, Arbitrator or any other authority and/or any other matter or thing whatsoever, as liability under these presents being absolute and unequivocal. We agree that the guarantee herein contained shall be irrevocable and shall continue to be enforceable until it is discharged by GAIL in writing. This guarantee shall not be determined, discharged or affected by the liquidation, winding up, dissolution or insolvency of the 'SUPPORTING COMPANY' and shall remain valid, binding and operative against the bank.
3. The Bank also agrees that GAIL at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance, without proceeding against the 'SUPPORTING COMPANY' and notwithstanding any security or other guarantee that GAIL may have in relation to the 'SUPPORTING COMPANY's liabilities.
 4. The Bank further agrees that GAIL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said CONTRACT or to extend time of performance by the said SUPPLIER from time to time or to postpone for any time or from time to time exercise of any of the powers vested in GAIL against the said SUPPLIER/ and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said SUPPLIER or for any forbearance, act or omission on the part of GAIL or any indulgence by GAIL to the said SUPPLIER(s) or any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
 5. The Bank further agrees that the Guarantee herein contained shall remain in full force during the period that is taken for the performance of the CONTRACT and all dues of GAIL under or by virtue of this CONTRACT have been fully paid and its claim satisfied or discharged or till GAIL discharges this guarantee in writing, whichever is earlier.
 6. This Guarantee shall not be discharged by any change in our constitution, in the constitution of GAIL or that of the 'SUPPORTING COMPANY'.
 7. The Bank confirms that this guarantee has been issued with observance of appropriate laws of the country of issue.
 8. The Bank also agrees that this guarantee shall be governed and construed in accordance with Indian Laws and subject to the exclusive jurisdiction of Indian Courts of the place from where the purchase CONTRACT has been placed.
 9. Notwithstanding anything contained hereinabove, our liability under this Guarantee is limited to Indian Rs./US\$ (in figures) _____ (Indian Rupees/US Dollars (in words) _____ only) and our guarantee shall remain in force until (indicate the date of expiry of bank guarantee) _____.
 10. 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.
 11. Notwithstanding anything contained herein:
 12.
 - 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
 13.
 - 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 GAIL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

Details of next Higher Authority of the Officials who have issued the Bank Guarantee:

Name

Designation

Yours faithfully,

Bank by its Constituted Attorney

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

E-mail :

Telephone/Mobile No. :

INSTRUCTIONS FOR FURNISHING

"PERFORMANCE SECURITY / SECURITY DEPOSIT " BY "BANK GUARANTEE"

1. The Bank Guarantee by successful Bidder(s) will be given on non-judicial stamp paper as per 'stamp duty' applicable. The non-judicial stamp paper should be in name of the issuing bank. In case of foreign bank, the said Bank Guarantee to be issued by its correspondent bank in India on requisite non-judicial stamp paper and place of Bid to be considered as Delhi.
2. 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 Purchaser as per format appended below.
3. The Bank Guarantee shall be from any Indian scheduled bank (excluding Co-operative banks and Regional Rural bank) or a branch of an International bank situated in India and registered with Reserve bank of India as scheduled foreign bank. However, in case of bank guarantees from banks other than the Nationalised Indian banks, the bank must be a commercial bank having net worth in excess of Rs 100 crores and a declaration to this effect shall be made by such commercial bank either in the Bank Guarantee itself or separately on its letterhead.



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

1	BANK GUARANTEE NO	:				
2	VENDOR NAME / VENDOR CODE	:	NAME			
			VENDOR CODE			
3	BANK GUARANTEE AMOUNT	:				
4	LOA / PO NO.	:				
5	NATURE OF BANK GUARANTEE	:				
	(Please Tick (√) Whichever is Applicable		PERFORMANC E BANK GUARANTEE	SECURI TY DEPOSI T	EM D	ADVANC E
6	BG ISSUED BANK DETAILS	(A)	EMAIL ID	:		
		(B)	ADDRESS	:		
		(C)	PHONE NO	:		
		(D)	IFSC	:		



SECTION-III

INSTRUCTION TO BIDDERS

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



SECTION-III

INSTRUCTION TO BIDDERS

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INSTRUCTIONS TO BIDDERS [ITB]
(TO BE READ IN CONJUNCTION WITH BIDDING DATA SHEET (BDS))

[A] – GENERAL

1 SCOPE OF BID

- 1.1 The Employer as defined in the "General Conditions of Contract [GCC]", wishes to receive Bids as described in the Invitation For Bid (the “**Tender Document /Bid Document**”) issued by Employer. Employer/Owner/GAIL occurring herein under shall be considered synonymous.
- 1.1 SCOPE OF BID: The scope of work/ Services shall be as defined in the Tender 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 Tender Documents, the terms 'Bid', 'Tender' & ‘Offer’ and their derivatives [Bidder/Tenderer, Bid/Tender/Offer etc.] are synonymous. Further, 'Day' means 'Calendar Day' and 'Singular' also means 'Plural'.

2 ELIGIBLE BIDDERS

- 2.1 The Bidder shall not be under a declaration of ineligibility by Employer for Corrupt/ Fraudulent/ Collusive/ Coercive practices, as defined in "Instructions to Bidders [ITB], Clause No. 39” (Action in case Corrupt/ Fraudulent/ Collusive/ Coercive Practices).
- 2.2 The Bidder is not put on ‘Holiday’ by GAIL or Public Sector Project Management Consultant (like EIL, Mecon only due to “poor performance” or “corrupt and fraudulent practices”) or banned/blacklisted by Government department/ Public Sector on due date of submission of bid. Further, neither bidder nor their allied agency/(ies) (as defined in the Procedure for Action in case of Corrupt/ Fraudulent/ Collusive/ Coercive Practices) are on banning list of GAIL or the Ministry of Petroleum and Natural Gas. If the bidding documents were issued inadvertently/ downloaded from website, offers submitted by such bidders shall not be considered for opening/ evaluation/Award and will be returned immediately to such bidders. In case there is any change in status of the declaration prior to award of contract, the same has to be promptly informed to GAIL by the bidder. It shall be the sole responsibility of the bidder to inform about their status regarding para 1 of clause 2.2 herein above on due date of submission of bid and during the course of finalization of the tender. Concealment of the facts shall tantamount to misrepresentation of facts and shall lead to action against such Bidders as per clause 39 of ITB.
- 2.3 The Bidder should not be under any liquidation court receivership or similar proceedings on due date of submission of bid. In case there is any change in status of the declaration prior to award of contract, the same has to be promptly informed to GAIL by the bidder. It shall be the sole responsibility of the bidder to inform GAIL there status on above on due date of submission of bid and during the course of finalization of the tender. Concealment of the facts shall tantamount to misrepresentation of facts and shall lead to action against such Bidders as per clause no.39 of ITB.
- 2.4 Bidder shall not be affiliated with a firm or entity:
- (i) that has provided consulting services related to the work to the Employer during the preparatory stages of the work or of the project of which the works/services forms a part of or
 - (ii) that has been hired (proposed to be hired) by the Employer as an Engineer/ Consultant for the contract.

- 2.5 Neither the firm/entity appointed as the Project Management Consultant (PMC) for a contract nor its affiliates/ JV'S/ Subsidiaries shall be allowed to participate in the tendering process unless it is the sole Licensor/Licensor nominated agent/ vendor.
- 2.6 Pursuant to qualification criteria set forth in the bidding document, the Bidder shall furnish all necessary supporting documentary evidence to establish Bidder's claim of meeting qualification criteria.
- 2.7 Power of Attorney:
Power of Attorney (POA) 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.
- 2.8 In case of change of constitution of bidder after submission of bid, the same shall be informed by the bidder to GAIL promptly. Failure to same shall be considered as misrepresentation by the bidder.

3 BIDS FROM "CONSORTIUM" : Not Applicable

4 ONE BID PER BIDDER

- 4.1 A Bidder shall submit only 'one [01] Bid' in the same Bidding Process either as single entity or as a member of any consortium (wherever consortium bid is allowed). 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 A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices. The bidder found to have a conflict of interest shall be disqualified. A bidder shall be considered to have a conflict of interest with one or more bidders in this bidding process, if:
- a) they have controlling partner (s) in common; or
 - b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or
 - c) they have the same legal representative/authorized signatory/agent for purposes of this bid; or
 - d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or



- e) Bidder participates in more than one bid in bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid.
- f) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid;
- g) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.

Bidders are required to submit a confirmation for no conflict of interest with other bidders in Format F-5..

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.
- 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.
- 4.5 Bidders are required to provide complete details of all Directors/Partners/Proprietors etc. including Father's name, Residential address, AADHAR, PAN Card details & DIN Nos. in Form F-1 & F-1(A) of ITB **and corresponding documents duly notarized by Notary Public.**

It is the responsibility of the participating Bidder(s) to assess the relationship as mentioned above.

In case any undertaking/declaration given by a Bidder(s) in this regard is found to be false, this would be a sufficient ground for rejection of Bid(s) /termination of contract and also initiation of further action as per "Procedure for Action in case of Corrupt/Fraudulent/ Collusive / Coercive Practices" of tender document

5 COST OF BIDDING

The Bidder shall bear all costs associated with the preparation and submission of the Bid including but not limited to Documentation Charges, Bank charges, all courier charges, translation charges, authentication charges and any associated charges including taxes & duties thereon. Further, GAIL 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 GAIL 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.

[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 and Clarification(s)' issued in accordance with "ITB: Clause-8 & 9":
- Section-I : Invitation for Bid [IFB]*
 - Section-II : Bid Evaluation Criteria [BEC] & Evaluation methodology
 - Section-III : Instructions to Bidders [ITB], Annexure, Forms & Format**
 - Section-IV : General Conditions of Contract [GCC]***
 - Section-V : Special Conditions of Contract [SCC]
 - Section-VI : Scope of Work /Drawing & List of Approved Makes
 - Section-VII : Schedule of Rates

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

** The subject tender is based on standard formats and applicability of some specific clauses may be seen in Annexure-IV to Section-III i.e. BDS (Bidding Data Sheet).

*** General Conditions of Contract – Works is available on GAIL's Tender website (<http://gailtenders.in/Gailtenders/gccs.asp>). Further, Hindi version of GCC is available on the GAIL's tender website for reference. However, in case of any discrepancy in English & its Hindi translation, for interpretation and legal aspects, the English version shall prevail.

For participation in E-tender, instructions are mentioned at Annexure-III to Section-III.

- 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 TENDER DOCUMENTS

- 8.1 A prospective Bidder requiring any clarification(s) of the Bidding Documents may notify GAIL in writing by email at GAIL'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 scheduled. GAIL reserves the right to ignore the bidders request for clarification if received after the aforesaid period. GAIL may respond in writing to the request for clarification. GAIL's response including an explanation of the query, but without identifying the source of the query will be uploaded on e-tender portal / communicated to prospective bidders by e-mail.



- 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', Employer 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 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. Bidders have to take into account all such corrigendum before submitting their Bid.
- 9.3 The Employer, if consider necessary, may extend the Bid Due Date in order to allow the Bidders a reasonable time to furnish their most competitive bid taking into account the addenda/corrigendum 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 GAIL shall be written in English language only. In case a document, certificate, printed literature etc. furnished by the Bidder in a language other than English, the same should be accompanied by an English translation duly authenticated by the Indian Chamber of Commerce, 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 OF MANUAL TENDERING

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

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

- (a) 'Covering Letter' on Bidder's 'Letterhead' clearly specifying the enclosed contents with index.
- (b) 'Bidder's General Information', as per 'Form F-1'.
- (c) Copies of documents, as specified in tender document
- (d) Copy of Schedule of Rate (SOR) with prices blanked out mentioning quoted / not quoted (as applicable) written against each item as a confirmation that the prices are quoted in requisite format .
- (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) Copy of 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 in original (in case of manual tendering) / copy of EMD (in case of e-Tender), as per Clause 16 of ITB. Declaration for Bid Security as per provision of ITB.
- (l) Undertaking as per *Form-2 to Annexure-V to Section-III* and Certification from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of other than companies) as per *Form-3 to Annexure-V to Section-III*
- (m) Undertaking as per *Form-I to Section-II* regarding Provisions for Procurement from a Bidder which shares a land border with India
- (n) All forms and Formats including Annexures
- (o) 'Integrity Pact' as per 'Form F-14'
- (p) 'Indemnity Bond' as per 'Form F-15'
- (q) Tender Document, its Corrigendum/Amendment/Clarification(s) duly signed on each page (in case of manual tendering)/ digitally signed (in case of e-Tender) by the Authorized Signatory holding POA.
- (r) Additional document specified in BDS, SCC, Scope of Supply or mentioned elsewhere in the Tender Document, its Corrigendum/Amendment/Clarification(s).
- (s) 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 holding POA.

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. GAIL 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 unpriced 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.

11.1.3 In case of bids invited under Single Bid System (clause no. 2.0(C) of IFB refers), all the documents as specified at Clause 11.1.1 & 11.1.2 of ITB can be submitted in single envelope /folder, as per instructions of Tender Document.



11.2 **IN CASE OF E-TENDERING:**

Bidders are requested to refer instructions for participating in e-Tendering (Annexure-I to Section III), Bidders manual kit and FAQs available in E-tender portal and bids submitted manually shall be rejected. All pages of the Bid must be digitally signed by the "authorized signatory" of the Bidder holding Power of Attorney. The Bid must be submitted on e-tender portal (<https://etenders.gov.in/eprocure/app>) 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 Security/Declaration for Bid Security, copy of Power of Attorney and copy of integrity pact should be uploaded in the technical bid in the e-tender portal.

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

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

11.2.2 **PART-II: PRICE BID**

The Prices are to be filled strictly in the Schedule of Rate of the bidding documents and provision mentioned at para 11.1.2 hereinabove and to upload in Financial bid in the e-tender portal.

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

12 **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.

Bidder shall indicate applicable rate of GST (CGST & SGST/ UTGST or IGST) in SOR.

- 12.5 Prices quoted by the Bidder, shall remain firm and fixed and valid till completion of the Contract and will not be subject to variation on any account unless any price escalation/variation is allowed elsewhere in the Tender Document.
- 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 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 Contractor only. Contractor providing taxable service shall issue an e-Invoice/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 Contractor with requisite details.
- Payments to Contractor for claiming **GST (CGST & SGST/UTGST or IGST)** amount will be made provided the above formalities are fulfilled. Further, GAIL 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 tax authority / any equivalent government agency brings to the notice of GAIL that the Contractor has not remitted the amount towards GST (CGST & SGST/UTGST or IGST) collected from GAIL to the government exchequer, then, that Contractor shall be put under Holiday list of GAIL for period of six months after following the due procedure. This action will be in addition to the right of recovery of financial implication arising on GAIL.
- 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 Contractor shall submit a copy of the 'Government Notification' to evidence the rate as applicable on the Bid due date and on the date of revision.
- Beyond the contract period, in case GAIL 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 Contractor'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 GAIL is entitled for input tax credit of **GST (CGST & SGST/UTGST or IGST)**, then statutory variation in quoted **GST (CGST & SGST/UTGST or IGST)** on supply and on incidental services, shall be to GAIL'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 GAIL is entitled to avail the input tax credit of **GST (CGST & SGST/UTGST or IGST)**:-
- 13.5.1 Owner/GAIL will reimburse the **GST (CGST & SGST/UTGST or IGST)** to the Contractor at actuals against submission of E-Invoices/Invoices as per format specified in rules/ regulation of GST to enable Owner/GAIL 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 quoted **GST (CGST & SGST/UTGST or IGST)** shall be considered for evaluation of bids, as per evaluation criteria of tender document.
- 13.6 Where GAIL is not entitled to avail/take the full input tax credit of **GST (CGST & SGST/UTGST or IGST)**:-
- 13.6.1 Owner/GAIL will reimburse **GST (CGST & SGST/UTGST or IGST)** to the Contractor at actuals against submission of E-Invoices/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 quoted **GST (CGST & SGST/UTGST or IGST)**.
- 13.7 GAIL will prefer to deal with registered supplier of goods/ services under GST. Therefore, bidders are requested to get themselves registered under GST, if not registered yet.
However, in case any unregistered bidder is submitting their bid, Bids will be evaluated as per quoted prices without loading of **GST (CGST & SGST/UTGST or IGST)**, if not quoted. 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 GAIL 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. Further, an unregistered bidder is required to mention its Income Tax PAN in bid document. Further, an unregistered bidder is required to mention its Income Tax PAN in bid document..
- 13.8 In case GAIL 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 GAIL has the obligation to discharge **GST (CGST & SGST/UTGST or IGST)** liability under reverse charge mechanism and GAIL 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 GAIL or ITC with respect to such payments is not available to GAIL for any reason which is not attributable to GAIL, then GAIL shall be entitled to deduct/ setoff / recover such amounts against any amounts paid or payable by GAIL to Contractor / Supplier.
- 13.9 Contractor shall ensure timely submission of correct invoice(s) /e-invoice(s), as per GST rules/ regulation, with all required supporting document(s) within a period specified in Contract to enable GAIL to avail input credit of GST (CGST & SGST/UTGST or IGST). Further, returns and details required to be filled under GST laws & rules should be timely filed by Contractor with requisite details.



If input tax credit is not available to GAIL for any reason not attributable to GAIL, then GAIL shall not be obligated or liable to pay or reimburse GST (CGST & SGST/UTGST or IGST) claimed in the invoice(s) and shall be entitled to deduct / setoff / recover such GST amount (CGST & SGST/UTGST or IGST) or Input Tax Credit amount together with penalties and interest, if any, against any amounts paid or becomes payable by GAIL in future to the Contractor under this contract or under any other contract.

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 Contractor may note the above and quote their prices accordingly.

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

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 in Schedule of Rates, shall be deemed as final and binding for the purpose of bid evaluation (applicable for tenders where bidder quotes 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 "Zero" or quoted GST rate, as the case may be. No request for change in GST will be entertained after submission of bids.

In cases where the successful bidder quotes a wrong GST rate, 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, GAIL shall place orders.

13.14 Wherever TDS under GST Laws has been deducted from the invoices raised / payments made to the Contractors, as per the provisions of the GST law / Rules, Contractors 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 Provision w.r.t. E- Invoicing requirement as per GST laws:

Supplier who is required to comply with the requirements of E-invoice for B2B transactions as per the requirement of GST Law will ensure the compliance of requirement of E Invoicing under GST law. If the invoice issued without following this process, such invoice can-not be processed for payment by GAIL as no ITC is allowed on such invoices.

Therefore, all the payments to such supplier who is liable to comply with e-invoice as per GST Laws shall be made against the proper e-invoice(s) only. Further, returns and details required to be filled under GST laws & rules against such e-invoices should be timely filed by Supplier of Goods with requisite details.

If input tax credit is not available to GAIL for any reason attributable to supplier (both



for E-invoicing cases and non-E-invoicing cases), then GAIL shall not be obligated or liable to pay or reimburse GST (CGST & SGST/UTGST or IGST) claimed in the invoice(s) and shall be entitled to deduct / setoff / recover such GST amount (CGST & SGST/UTGST or IGST) or Input Tax Credit amount together with penalties and interest, if any, by adjusting against any amounts paid or becomes payable in future to the supplier under this contract or under any other contract.

To ensure compliance, undertaking in requisite format is to be submitted by supplier as per format F-17 along with documents for release of payment.

- 13.16 **New Taxes & duties:** Any new taxes & duties, if imposed by the State/ Central Govt. of India after the due date of bid submission but before the Contractual Completion Date, shall be reimbursed to the Service Provider on submission of copy of notification(s) issued from State/ Central Govt. Authorities along with documentary evidence for proof of payment of such taxes & duties, but only after ascertaining it's applicability with respect to the Contract.
- 13.17 Full payment including GST will be released at the time of processing of invoice for payment, where the GST amount reflects in Form GSTR-2A of GAIL. However, in case where the GST amount doesn't reflect in Form GSTR-2A of GAIL, the amount of GST will be released after reflection of GST amount of corresponding invoice in Form GSTR-2A of GAIL.

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 GAIL 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 email. A Bidder may refuse the request without forfeiture of his EMD / Bid Security.

A Bidder agreeing to the request will not be required or permitted to modify his Bid, but will be required to extend the validity of its EMD for the period of the extension and in accordance with "ITB: Clause-16" in all respects.

16 **EARNEST MONEY DEPOSIT**

- 16.1 Bid must be accompanied with earnest money (**i.e Earnest Money Deposit (EMD)** also known as **Bid Security**) in the form of **'Demand Draft' / 'Banker's Cheque' / 'Insurance Surety Bond' / 'Fixed Deposit Receipt'** [in favour of **GAIL (India) Limited** payable at place mentioned in **BDS**] or **'Bank Guarantee (including e- bank guarantee)'** strictly as per the format given in form F-2 of the **Tender Document**. Bidder shall ensure that EMD submitted in the form of **'Bank Guarantee'** 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 bidder can also submit the EMD through online banking transaction i.e. IMPS/NEFT/RTGS etc. For this purpose, the details of GAIL's Bank Account are mentioned under BDS. While remitting, the bidder must indicate EMD and tender/E-tender no. under remarks. Bidders shall be required to submit/ upload the successful transaction details along-with their bid/e-bid in addition to forwarding the details to dealing officer through email/letter with tender reference number immediately after remittance of EMD. In absence of submitting/ uploading the remittance details, the bid is likely to be considered as bid not accompanied with EMD. Further, in case of the online transaction, submission of EMD in original is not applicable.
- 16.3 GAIL 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 (excluding Co-operative banks and Regional Rural 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. Purchaser will verify the BG from issuing bank.
- 16.4 Any Bid not secured in accordance with "ITB: Clause-16.1 & Clause-16.3" may be rejected by GAIL 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:
- If a Bidder withdraws his Bid during the 'Period of Bid Validity'
 - If a Bidder has indulged in corrupt/fraudulent /collusive/coercive practice
 - If the Bidder modifies Bid during the period of bid validity (after Due Date and Time for Bid Submission).
 - Violates any other condition, mentioned elsewhere in the Tender Document, which may lead to forfeiture of EMD.
 - In the case of a successful Bidder, if the Bidder fails to:
 - to acknowledge receipt of the "Notification of Award" / Fax of Acceptance[FOA]",
 - to furnish "Contract Performance Security / Security Deposit", in accordance with "ITB: Clause-38"
 - 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', the same must indicate the Tender Document No. and the name of Tender Document for which the Bidder is quoting. This is essential to have proper correlation at a later date.
- 16.9 **MSEs (Micro & Small Enterprises) are not exempted from submission of EMD.**



The Government Departments/PSUs are also exempted from the payment of EMD. Further, Startups are also exempted from the payment of EMD.

- 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 GAIL. The forfeiture amount will be subject to final decision of GAIL 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.

16A **DECLARATION FOR BID SECURITY**

Start-Ups and CPSEs (to whom exemption is allowed as per extant guidelines in vogue) are required to submit Declaration for Bid Security as per proforma at Form F-2A.

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

- 17.1 The Bidder(s) or his designated representative are invited to attend a "Pre-Bid Meeting" which will be held at address specified in IFB. It is expected that a bidder shall not depute more than 02 representatives for the meeting.
- 17.2 Purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage and give hands-on e-tendering.
- 17.3 Text of the questions raised and the responses given, together with any responses prepared after the meeting, will be uploaded on e-tender portal against the Tender as specified in "ITB: Clause-8. 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 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 unamendable printed literature where entry(s) or amendment(s) have been made shall be initialed by the person or persons signing the Bid.
- 18.2 The Bid shall contain no alterations, omissions, or additions, unless such corrections are initialed by the person or persons signing the Bid.
- 18.3 In case of e-tendering, digitally signed documents to be uploaded as detailed in addendum to ITB (Annexure-III to Section III).

19 **ZERO DEVIATION AND REJECTION CRITERIA**

- 19.1 ZERO DEVIATION: Deviation to terms and conditions of "Bidding Documents" may lead to rejection of bid. GAIL will accept bids based on terms & conditions of "Bidding Documents" only. Bidder may note GAIL 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. GAIL's determination of a bid's responsiveness is based on the content of the bid itself without recourse to extrinsic evidence.

Bidder is requested not to take any deviation(s)/exception(s) to the terms & conditions of Tender Document, and submit all requisite documents as mentioned in this Tender Document, failing which their Bid 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.

As a principle, clarifications from bidders after opening of tenders will not be sought. However, where clarifications / documents from the bidders on important aspects are absolutely necessary for finalization of tender, clarifications from bidder can be asked. The request for clarification shall be given in email/portal, asking the bidder to respond by a specified date, and also mentioning therein that, if the bidder does not comply or respond by the date, his tender will be liable to be rejected. Depending on the outcome, such tenders are to be ignored or considered further. No change in prices or substance of the bid including specifications, shall be offered or permitted. No post-bid clarification at the initiative of the bidder shall be entertained. The shortfall information/ documents should be sought only in case of historical documents which pre-existed bids and which have not undergone change since then.

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

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

20 E-PAYMENT

GAIL (India) Limited has initiated payments to Contractors electronically, and to facilitate the payments electronically through '**e-banking**'.



[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. Physical documents shall be addressed to the owner at address specified in IFB.
- 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 / REPRESENTATIVE /RETAINER/ ASSOCIATE etc. on behalf of a bidder/affiliate shall not be accepted.

22 DEADLINE FOR SUBMISSION OF BIDS

- 22.1 In case of e-bidding, the bids must be submitted through e-tender mode not later than the date and time specified in the tender documents/BDS.
- 22.2 In case of manual tendering EMD along with bid must be submitted within the due date & time, as specified in Clause no. 2.0 (I) of IFB and place mentioned in BDS.
- 22.3 GAIL may, in exceptional circumstances and at its discretion, extend the deadline for submission of Bids (8.0 and/or 9 of ITB refers). In which case all rights and obligations of GAIL 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 e-tender portal / communicated to the bidders.

23 LATE BIDS

- 23.1 Any bids received after the notified date and time of closing of tenders will be treated as late bids.
- 23.2 In case of e-tendering, e-tendering system of GePNIC 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 GAIL after the due date for submission of bids shall not be considered. Such late bids shall be returned to the bidder within “10 days” in ‘unopened conditions’. The EMD of such bidders shall be returned along with the un-opened bid. In case of e-tendering, where the EMD/physical documents has been received but the bid is not submitted by the bidder in the e-tendering portal, such bid bond/ physical documents shall be returned immediately.
- 23.3 EMD /physical documents 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.
- 23.4 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 – Not Applicable**

[E] – BID OPENING AND EVALUATION

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

- 25.1 GAIL 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(s) or any obligations to inform the affected Bidder(s) of the ground for GAIL's action. However, Bidder if so desire may seek the reason (in writing) for rejection of their Bid to which GAIL shall respond quickly.
- 25.2 A bidder is to be permitted to send his representation in writing to dealing officer specified in tender for rejection of bid. But, such representation has to be sent upto 10(ten) days from the date of Notification of Award/FOA. A decision on representation will be taken by GAIL within 15 (fifteen) days of the receipt of the representation. Only a directly affected bidder can represent in this regard:
- i) Only a bidder who has participated in tender can make such representation
 - ii) In case technical bid has been evaluated before the opening of the financial bid, an application for review in relation to the financial bid may be filed only by a bidder whose technical bid is found to be acceptable
- 25.3 However, following decisions of GAIL shall not be subject to review:
- a) Determination of the need for procurement;
 - b) Selection of the mode of procurement or bidding system;
 - c) Choice of selection procedure;
 - d) Provisions limiting participation of bidders in the procurement process;
 - e) The decision to enter into negotiations with the L1 bidder;
 - f) Cancellation of the procurement process except where it is intended to subsequently re-tender the same requirements;
 - g) Issues related to ambiguity in contract terms may not be taken up after a contract has been signed, all such issues should be highlighted before consummation of the contract by the vendor/ contractor; and
 - h) Complaints against specifications except under the premise that they are either vague or too specific so as to limit competition may be permissible.

26 BID OPENING

26.1 *Unpriced Bid Opening :*

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

26.2 *Priced Bid Opening:*

- 26.2.1 GAIL will open the price bids of those Bidders who meet the qualification requirement and whose bid is determined to be technically and commercially responsive. Techno-commercial bid evaluation status will be are to be informed to all bidders (including



informing the techno-commercially not qualified Bidders). Price bids are to be opened in the presence of only techno-commercially acceptable bidders, who are willing to attend the bid opening, at a pre-publicised date, time and place or on the portal in case of e-procurement. The bidder's name, bid price, discount (if any) and any such details considered appropriate shall be read out during the price bid opening. Offers should not, repeat not, be circulated amongst the bidder's representative. Bidders selected for opening of their price bid shall be informed about the date & time of price bid opening. Bidders may depute their authorized representative to witness the price bid opening. The Bidders' representatives, who are present shall sign a Price Bid Opening Register evidencing their attendance and may be required to be present even on a short notice.

26.2.2 The price bids of those Bidders who were not found to be techno-commercially responsive shall not be opened in both manual tendering and e-tendering.

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 bidders or any other person not officially concerned with such a process until the award to the successful bidder.

28 CONTACTING THE EMPLOYER

28.1 From the time of bid opening to the time of contract award, no bidder shall contact GAIL on any matter related to the bid, except on request and prior written permission.

28.2 Any effort by the bidder to influence GAIL in bid evaluation, bid comparison or contract award decisions will vitiate the process and will result in the rejection of the bidder's bid and action shall be initiated as per the GAIL's procedure for action in case Corrupt / Fraudulent / Collusive / Coercive practices in this regard apart from forfeiture of EMD/ Bid Security, if any.

29 EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS

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

- (a) Meets the "Bid Evaluation Criteria" of the Bidding Documents;
- (b) Has been properly signed;
- (c) Is accompanied by the required 'Earnest Money / Bid Security / Bid Security Declaration';
- (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 for evaluation of bid.
- 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 Tenders that do not meet the basic requirements specified in the bid documents are to be treated as unresponsive {both during Techno-commercial evaluation and Financial Evaluation in case of Two Bid System) and will be ignored. All tenders received will first be scrutinized to see whether the tenders meet the basic requirements as incorporated in the Bid document and to identify unresponsive tenders, if any. Unresponsive offers may not subsequently be made responsive by correction or withdrawal of the non- conforming stipulation. Some important points on the basis of which a tender may be declared as unresponsive and be ignored during the initial scrutiny are :
- i) The tender is not in the prescribed format or is unsigned or not signed as per the stipulations in the bid document;
- ii) The required EMD has not been provided or exemption from EMD is claimed without acceptable proof of exemption;
- iii) The bidder is not eligible to participate in the bid as per laid down eligibility criteria
- iv) The bid departs from the essential requirements specified in the bidding document (for example, the tenderer has not agreed to give the required contract performance security); or
- v) Against a schedule in the list of requirements in the tender enquiry, the tenderer has not quoted for the entire requirement as specified in that schedule (example: in a schedule, it has been stipulated that the tenderer will supply the equipment, install and commission it and also train the GAIL's personnel for operating the equipment. The tenderer has, however, quoted only for supply of the equipment).

30 CORRECTION OF ERRORS

- 30.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors in Price Schedule/Schedule of Rates (SOR) will be corrected by the Employer as follows:
- (i) When there is a difference between the rates in figures and words, the rate which corresponds to the amount worked out by the Bidder (i.e. 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 bidder shall be taken as correct and not the amount. The amount shall be re-calculated/ corrected accordingly.
- (iii) In case a Price Schedule/ Schedule of Rate is having provisions of sub-total and grand total and there is a difference between “sum of sub totals” and “grand total”, “sum of sub totals” shall be taken as correct
- (iv) 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.
- (v) 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.

30.2 The discrepancy in bid shall be conveyed to the bidder asking to respond by a target date and if the bidder does not agree with observation, its Bid is liable to be rejected, and the EMD shall be forfeited / actions shall be invoked as per Declaration for Bid Security.

30.3 The above provision of Correction of Error shall not be applicable for E-tendering.

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 on lowest bid.

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

In case there is a tie at the lowest bid (L1) position between only startup bidders and none of them has past turnover, the order/LoA will be placed on the startup who is registered earlier with Department for Promotion of Industry and Internal Trade.

33 COMPENSATION FOR EXTENDED STAY : *Not Applicable*

34 PURCHASE PREFERENCE

Purchase Preference as per Policy to Provide Purchase Preference as per Public Procurement (Preference to Make in India), Order 2017 shall be allowed as per Government instructions in vogue, as applicable from time to time.

The Policy to Provide Purchase Preference as per Public Procurement (Preference to Make in India), Order 2017 is enclosed as Annexure V to ITB herewith.

Bidders are required to select the applicable purchase preference (i.e. preference category) option while submitting the bid on GePNIC portal. However, evaluation and applicability of purchase preference policy will be based on the confirmations & documents submitted by the bidder in the their bid irrespective of selection made on GePNIC portal.



[F] – AWARD OF CONTRACT

35 AWARD

Subject to "ITB: Clause-29", GAIL 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.

“GAIL intent to place the contract directly on the address from where Goods are produced/dispatched or Services are rendered. In case, bidder wants 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”.

GAIL will place the Contract directly on the successful bidder from whom the bid has been received & evaluated and will not place order on other entities such as subsidiary, business associate or partner, dealer/distributor etc. of the Bidder.

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 GAIL either by 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 GAIL and successful Bidder (i.e. Contractor). 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. GAIL may choose to issue Notification of Award in form of detailed Letter of Acceptance without issuing FOA and in such case the Contract shall enter into force on the date of detailed Letter of Acceptance only.
- 36.2 Contract period shall commence from the date of "Notification of Award" or as mentioned in the Notification of Award. The "Notification of Award" will constitute the formation of a Contract, until the Contract has been effected pursuant to signing of Contract Agreement as per "ITB: Clause-37".
- 36.3 Upon the successful Bidder's / Contractor's furnishing of 'Contract Performance Security / Security Deposit', pursuant to "ITB: Clause-38", GAIL will promptly discharge his 'Earnest Money Deposit / Bid Security', pursuant to "ITB: Clause-16"
- 36.4 The Order/ contract value mentioned above is subject to Price Reduction Schedule clause.
- 36.5 GAIL 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 GAIL.

37 SIGNING OF AGREEMENT

- 37.1 The successful Bidder/Contractor shall be required to execute an 'Agreement' (in case the individual contract value as specified in Notification of Award is more than INR 10 Lakhs exclusive of GST) 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 of India' 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 / Action as per Bid Security declaration.

- 37.3 Bidders can request Bilingual (Hindi & English) Contract Agreement. The format for signing Contract Agreement in English is attached with this Bidding Document.

38 CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT [CPS/SD]

- 38.1 Within 30 days of the receipt of the notification of award/ Fax of Acceptance from GAIL, 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 Insurance SuretyBond or Fixed Deposit Receipt or Bank Guarantee (including e- bank guarantee) or Letter of Credit and shall be in the currency of the Contract. However, CPS shall not be applicable in cases wherein the individual 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)**.
Bank Guarantee towards CPS shall be from any Indian scheduled bank (excluding Co-operative banks and Regional Rural bank) or a branch of an International bank situated in India and registered with Reserve bank of India as scheduled foreign bank. However, in case of bank guarantees from banks other than the 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.
- 38.3 Failure of the successful bidder to comply with the requirements of this article shall constitute sufficient grounds for consideration of the annulment of the award and forfeiture of the EMD / action as per declaration for Bid Security.
- 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, Ministry of Finance (MOF) Department of financial service has issued direction for submission of Bank Guarantee through online vide letter ref number F.No.7/112/2011-BOA dated 17th July 2012. The successful bidder can submit CPS online through issuing bank to GAIL directly as per the above direction including its revisions, if any. In such cases confirmation will not be sought from issuing banker by GAIL.
- 38.6 In addition to existing specified form (i.e. Demand Draft (DD)/ Banker's Cheque/ Bank Guarantee/Letter of Credit) mentioned in tender documents for submission of Security Deposit/ Contract Performance Security, the successful bidder can also submit the Security Deposit/ Contract Performance Security through online banking transaction i.e. IMPS/NEFT/RTGS/SWIFT etc. For this purpose, the details of GAIL's Bank Account is mentioned in BDS. Further, in case a successful Bidder is willing to furnish CPS through SWIFT, the details may be obtained from Purchase Officer immediately after receipt of FOA.

While remitting such online transaction, the bidder must indicate “**Security Deposit/ Contract Performance Security against FOA/DLOA no. _____ (contractor to specify the FOA/DLOA No.)**” under remarks column of such transaction of respective



- bank portal. The contractor/vendor shall be required to submit the successful transaction details to the dealing officer immediately through email/letter and necessarily within 30 days from the date of Fax of Acceptance.
- 38.7 In case of forfeiture of Contract Performance Security/ Security Deposit in terms of GCC, the forfeited amount will be considered inclusive of tax and tax invoice will be issued by GAIL. The forfeiture amount will be subject to final decision of GAIL based on other terms and conditions of order/ contract.
- 38.8 The Contractor will also submit covering letter along with CPS as per format at F-4.
- 38.9 CPBG/Security Deposit will not be accepted in case the same has reference of 'remitter'/'financer' other than bidder on the aforementioned financial instrument of CPBG/ Security Deposit submitted by the Contractor.
- 38.10 The first payment to vendor is to be released only after submission of CPS / Security Deposit (SD).
- 38.11 Before the CPS / Security Deposit (SD) is released a "No Claim Certificate" is to be submitted by the supplier/vendor.
- 38.12 In case, GAIL allows additional time for submission of CPBG/SD beyond 30 days, a penal interest of Marginal Cost of Fund based Lending Rate (MCLR) for one year charged by SBI (applicable on due date of submission of CPBG/SD i.e. 30th day after issuance of FOA/Notification of award) plus 4.0% p.a (on CPBG/SD amount) shall be charged for delay beyond 30 days i.e. from 31st days after issuance of FOA".

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

- 39.1 Procedure for action in case Corrupt/ Fraudulent/Collusive/Coercive Practices is enclosed at Annexure-I.
- 39.2 The Fraud Prevention Policy document is available on GAIL's website (www.gailonline.com)
- 39.3 Name and contact details of nodal officer- Refer BDS for details

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

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

The Contractor/ Bidder understands and agrees that in such cases where Contractor/ Bidder has been banned (in terms of aforesaid procedure) from the date of issuance of such order by GAIL (India) Limited, such decision of GAIL (India) Limited shall be final and binding on such Contractor/ Bidder 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

- 40.1 **Exemption of EMD and benefits of purchase preference is not applicable to participating MSE's being a works tender.**



40.2 It may be noted that Government of India has implemented Trade Receivable Discounting System (TReDS) to address challenges faced by MSMEs in delayed payments (after receipt/acceptance of Material/Services) from Government buyers leading to shortfall of Working Capital. TReDS is an online electronic institutional mechanism for facilitating the financing of trade receivables of MSMEs through multiple financiers. GAIL is already registered on the following TReDS platform:

- M/s Receivable Exchange of India (RXIL), Mumbai
- M/s Mynd Solutions Private Limited (Mynd), New Delhi
- M/s A. TREDIS (Invoicemart), Mumbai

MSME Bidders are required to register on the TReDS platform. The MSME vendors can avail the TReDS facility, if they want to.

40.3 Interest payment on delayed payments to MSME is payable in line with Micro, Small and Medium Enterprises Development Act, 2006

41 AHR ITEMS [FOR APPLICABILITY REFER BDS]

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

42 VENDOR PERFORMANCE EVALUATION

Shall be as stipulated Annexure II to ITB herewith.

43 INCOME TAX & CORPORATE TAX

43.1 Income tax deduction shall be made from all payments made to the contractor as per the rules and regulations in force and in accordance with the Income Tax Act prevailing from time to time.

43.2 Corporate Tax liability, if any, shall be to the contractor's account.

43.3 TDS

(i) TDS, wherever applicable, shall be deducted as per applicable act/law/rule.

(ii) Higher rate of TDS for non-filers of ITR

As per Section 206AB of Income Tax Act, 1961, in case of any vendor/customer who does not file their Income Tax Return for both of the two previous years preceding to current year and aggregate amount of TDS is more than or equal to 50,000/- in each of those previous two years (or limit defined by Govt. from time to time), then TDS will be deducted at the higher of following rates:



- (I) Twice the rate mentioned in relevant TDS section.
- (II) Twice the rate or rates in force
- (III) 5%

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 or as amended from time to time.

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

Payment of contractor shall be processed only after fulfilment of above requirement

44 DISPUTE RESOLUTION MECHANISM

44.1 QUARTERLY CLOSURE OF THE CONTRACT AND SAMADHAN MECHANISM

During execution of orders, various issues may arise. In order to timely detect and to address the contractual issue(s) during the execution of contracts, GAIL has introduced a mechanism of Quarterly Closure of the contract, under which all the related issues /disputes will be monitored and addressed on quarterly basis for resolution. Vendor (hereinafter referred 'Vendor') should first refer any issues/disputes to Engineer-in-Charge (EIC) for LOA/contracts/ Dealing C&P Executive for Purchase Orders and co-operate them for smooth execution of the contract and to timely address the issues, if any. For applicability of 'Quarterly Closure', please refer BDS.

In case issue is not resolved by above, Supplier may submit their issue(s) to Vendor Grievance Portal "Samadhan", which will be addressed by GAIL within 15 days. The Samadhan Portal is available at <https://gailebank.gail.co.in/grievance/welcome.aspx>.

Accordingly, the methodology for resolution of issue(s)/ grievance (s) of Vendor/Supplier shall be as under:

- (i) Any issue should be first referred to EIC for LOA/contracts/ Dealing C&P Executive for Purchase Orders.
- (ii) In case issue is not resolved, Vendor may submit their issue/ grievance through online Vendor Grievance Portal-"Samadhan".
- (iii) In case, Vendor is not satisfied, there is a provision of escalation of issue to higher authority in GAIL. This option is available two times to vendor.
- (iv) Further, issue(s) can only be submitted upto 1 month after closure of respective Contract.
- (v) Vendor should refer their issue/ grievance through above mode only. Issue/ grievance received through any other mode shall not be entertained.

44.2 CONCILIATION AND ARBITRATION

1.0 CONCILIATION

GAIL (India) Limited has framed the Conciliation Rules 2010 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 as per clause no. 44.1, may be referred for conciliation in accordance with GAIL Conciliation Rules 2010 as amended from time to time A copy of the said rules have been made available on GAIL's web site i.e www.gailonline.com.

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 GAIL (India) Limited Conciliation Rules, 2010. It would be only after exhausting the option of Conciliation as an Alternate Dispute Resolution Mechanism that the Parties hereto shall 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 as provided at Clause 2.2 below, 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, GAIL shall suggest a panel of three independent and distinguished persons (Retd Supreme Court & High Court Judges only) to the other party from the Panel of Arbitrators maintained by 'Delhi International Arbitration Centre (DIAC) 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 GAIL suggesting the panel of arbitrators, the right of selection of the sole arbitrator by the other party shall stand forfeited and GAIL shall appoint the Sole Arbitrator from the suggested panel of three Arbitrators for adjudication of dispute(s). The decision of GAIL 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".

OR

2.2 If a dispute arises out of or in connection with this contract, the party invoking the Arbitration shall submit that dispute to any one of the Arbitral Institutions i.e ICADR/ICA/DIAC/SFCA and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd Supreme Court/High Court Judge to be appointed/nominated by the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged.

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

2.4 The Arbitration proceedings shall be in English language and the seat, venue and place of Arbitration shall be New Delhi, India only.

2.5 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 New Delhi.

2.6 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/GAIL has been made final and binding in terms of the Contract.

2.7. 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 New Delhi.

3. **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 New Delhi for adjudication of disputes, injunctive reliefs, actions and proceedings, if any, arising out of this Contract.

45. DISPUTES BETWEEN CPSE'S/GOVERNMENT DEPARTMENT'S/ ORGANIZATIONS

Subject to conciliation as provided above, in the event of any dispute (other than those related to taxation matters) or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs/ Port Trusts) inter se and also between CPSEs and Government Departments /Organizations), such dispute or difference shall be taken up by either party for resolution only through AMRCD as mentioned in OPE OM No. 4(1)/2013-DPE(GM)/FTS-1835 dated 22-05-2018.

Any party aggrieved with the decision of the Committee at the First level (tier) may prefer an appeal before the Cabinet Secretary at the Second level (tier) within 15 days from the date of receipt of decision of the Committee at First level, through it's administrative Ministry/Department, whose decision will be final and binding on all concerned.

The above provisions mentioned at clause no.44 & 45 shall supersede provisions relating to Conciliation, Arbitration, Governing Law & Jurisdiction and Disputes between CPSE's/ Government Department's/ Organizations mentioned in General Conditions of Contract (GCC) and elsewhere in tender document.

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

INAM-Pro (Platform for infrastructure and materials providers) is a web based platform for infrastructure provides and materials suppliers and was developed by Ministry of Road Transport and Highways (MoRT&H) with a view to reduce project execution delays on account of supply shortages and inspire greater confidence in contractors to procure cement to start with directly from the manufacturers. Presently, numerous cement companies are registered in the portal and offering cement for sale on the portal



with a commitment period of 3 years. These companies have bound themselves by ceiling rates for the entire commitment period, wherein they are allowed to reduce or increase their cement rates any number of times within the ceiling rate, but are not permitted to exceed the said ceiling rate.

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

GAIL'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. PROVISIONS FOR STARTUPS (AS DEFINED IN GAZETTE NOTIFICATION NO. D.L-33004/99 DATED 18.02.2016 AND 23.05.2017 OF MINISTRY OF COMMERCE AND INDUSTRY AND AS AMENDED FROM TIME TO TIME) [FOR APPLICABILITY REFER BDS]

As mentioned in Section-II, relaxation for Prior turnover and prior experience to Startups is not allowed in this tender.

However, the Startups are exempted from submission of EMDs (if applicable).

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

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

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

In case any financial implication arises on GAIL due to issuance of invoice without reduction in price or non-issuance of Credit Note, the same shall be to the account of



service provider. GAIL 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 GAIL in future to the service provider under this contract or under any other contract.

51. 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.

52. ANJANI PORTAL

GAIL has implemented "Anjani" e-Measurement Book & e-Billing Portal for ease in submission of measurement book/bill and reduction in paper transaction.

Accordingly, GAIL will process the Bill with Measurement Book through "Anjani" e-Measurement Book & e-Billing Portal (link: <https://gailebank.gail.co.in/MBAutomation/frmlogin.aspx>). Accordingly, Contractor/ Service Provider/ Consultant is requested to forward the RA Bill on "Anjani" e-Measurement Book & e-Billing Portal through concerned EIC/CIC/SIC, whichever is applicable.

Further, User Manual is also available on aforesaid portal.

53. DOCUMENTS FOR PAYMENT:

Payment terms shall be as mentioned in GCC-Works/SCC.

However, for release of payment, Contractor is required to submit invoice along with other documents as mentioned in SCC. The final bill is to be submitted within one month after completion.

Further, GAIL is in process of implementing Vendor Invoice Management (VIM). After implementation of same (to be communicated separately), Contractor/ Vendor to forward the invoice on VIM Collection Center or upload digital invoice on Portal (details of same will be provided separately). The copy of invoice and all other document mentioned above or in order/ contract is to be forwarded to address provided in order/contract.

54. ORDER TRANSMITTAL SYSTEM:

The complete PO/LOA along with all annexures including tender document shall be shared through order/contract transmittal system after intimation through email.

Supplier/Contractor is requested to visit <https://gailonline.com/home.html> and click on link order/contract transmittal system (It can be found under Vendor Zone (Portal For Suppliers)) or https://gailebank.gail.co.in/GOGA_AUDIT/frmUserLogin.aspx.

Therein, in order to access the detailed order/contract, supplier/contractor shall be prompted to enter your email id. Further an OTP shall be sent on your registered mobile number. After entering OTP, supplier/contractor shall be allowed to download



complete PO/LOA along with all annexures including tender document. After downloading the documents, the supplier/contractor shall be required to digitally sign the document (by authorized signatory) for uploading the documents on order/contract transmittal system towards acknowledgement of the same.

55. SUB-LETTING OF WORKS

The following is added to the Clause no. 37 of General Conditions of Contract (GCC)- Works:

- (i) Procurement of material, hire of equipment or engagement of labour will not mean sub-contracting.
- (ii) Sub-contracting by the contractor without the approval of GAIL shall be a breach of contract, unless explicitly permitted in the contract.
- (iii) However, If specified in SCC Sub-contracting for Specialized Items of Work is allowed upto certain percentage of work

56. VENDOR INVOICE MANAGEMENT (VIM)

GAIL has implemented Vendor Invoice Management (VIM) system titled as #SARATHI# for automation, digitization & centralization of Account Payable process w.e.f. 01.04.2023.

Accordingly, Supplier/ Contractor/Service Provide/ Consultant is required to upload digital invoice on 'Sparsh' portal. The system optimizes and simplifies the process of receiving, managing, monitoring and forwarding invoices for payment process. The link of 'Sparsh' portal is as under:

<https://sparsh.gail.co.in/flipper/#/login>

The 'Help Manual' hyperlink to access the detailed User Manual, Demo Videos, FAQ#s and other relevant information is available on 'Sparsh' portal.

Only digital invoice is to be uploaded on 'Sparsh' portal and all other supporting documents along with copy of invoice are to be submitted to concerned as defined in Purchase Order (PO)/ Letter of Acceptance (LoA).



Annexure-I to Section-III

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

A Definitions:

- A.1 “Corrupt Practice” means the offering, giving, receiving or soliciting, directly or indirectly, anything of value to improperly influence the actions in selection process or in contract execution.
“Corrupt Practice” also includes any omission for misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained or an obligation avoided.
- A.2 “Fraudulent Practice” means and include any act or omission committed by a agency or with his connivance or by his agent by misrepresenting/ submitting false documents and/ or false information or concealment of facts or to deceive in order to influence a selection process or during execution of contract/ order.
- A.3 “Collusive Practice amongst bidders (prior to or after bid submission)” means a scheme or arrangement designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.
- A.4 “Coercive practice” means impairing or harming or threatening to impair or harm directly or indirectly, any agency or its property to influence the improperly actions of an agency, obstruction of any investigation or auditing of a procurement process.
- A.5 “Vendor/Supplier/Contractor/Consultant/Bidder” is herein after referred as “Agency”
- A.6 “Appellate Authority” shall mean Committee of Directors consisting of Director (Finance) and Director (BD) for works centers under Director (Projects). For all other cases committee of Directors shall consist of Director (Finance) & Director (Projects).
- A.7 “Competent Authority” shall mean the authority, who is competent to take final decision for Suspension of business dealing with an Agency/ (ies) and Banning of business dealings with Agency/ (ies) and shall be the “Director” concerned.
- A.8 “Allied Agency” shall mean all concerns which come within the sphere of effective influence of the banned/suspended agency shall be treated as allied agency. In determining this, the following factors may be taken into consideration:
- Whether the management is common;
 - Majority interest in the management is held by the partners or directors of banned/ suspended agency;
 - Substantial or majority shares are owned by the banned/ suspended agency and by virtue of this it has a controlling voice.
 - Directly or indirectly controls, or is controlled by or is under common control with another bidder.
 - All successor agency will also be considered as allied agency.
- A.9 “Investigating Agency” shall mean any department or unit of GAIL investigating into the conduct of Agency/ party and shall include the Vigilance Department of the GAIL, Central Bureau of Investigation, State Police or any other agency set up by the Central or state government having power to investigate.
- A.10 “Obstructive practice”: materially impede the procuring entity's investigation into allegations of one or more of the above mentioned practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/ or by threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding GAIL's rights of audit or access to information.

B Actions against bidder(s) indulging in corrupt /fraudulent/ collusive/ coercive practice**B.1 Irregularities noticed during the evaluation of the bids :**

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

Further, such agency shall be banned for future business with GAIL 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, action shall be initiated for putting the agency on banning list.

After conclusion of process and issuance of Speaking order for putting party on banning list, 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) submitted by agency against such order (s)/ contract (s) shall also be forfeited. Further such order/ contract will be closed following the due procedure in this regard.

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.

Suspension of order/ contract:

Further, only in the following situations, the concerned order (s)/ contract(s) (where Corrupt/Fraudulent/ Collusive/ Coercive Practices are observed) and payment shall be suspended after issuance of Suspension cum Show Cause Notice:

- (i) Head of Corporate Vigilance Department/CVO based on the investigation by them, recommend for specific immediate action against the agency.
- (ii) Head of Corporate Vigilance Department/CVO based on the input from investigating agency, forward for specific immediate action against the agency.

Suspension cum Show Cause Notice being issued in above cases after approval of the competent authority (as per provisions mentioned under Clause no. D) shall also include the provision for suspension of Order (s)/ Contract (s) and payment. Accordingly, after issuance of Suspension cum Show Cause Notice, the formal communication for suspension of Order (s)/ Contract (s) and payment with immediate effect will be issued by the concerned person of GAIL.

During suspension, Contractor/ Service Providers will be allowed to visit the plant/ site for upkeep of their items/ equipment, GAIL's issued materials (in case custody of same is not taken over), demobilizing the site on confirmation of EIC, etc.

In addition to above, Recovery of payments (other than due payments) including balance advance payments, if any, made by along with interest thereon at the prevailing rate shall be recovered.

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

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

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

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

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

B.2.2 Period of Banning

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 in GAIL/PSU's PMC or banned by PSUs/ Govt. Dept., liquidation, bankruptcy & etc. and subsequently it is found otherwise, such acts shall be considered in this category.	06 Months
2	Corrupt/Fraudulent (except mentioned sl. no. 1 above) /Collusive/Coercive Practices	01 year
2.1	If an agency again commits Corrupt/Fraudulent (except mentioned sl. no. 1 above) /Collusive/ Coercive Practices in subsequent cases after their banning, such situation of repeated offense to be dealt with more severity	2 years (in addition to the period already served)
3	Indulged in unauthorized disposal of materials provided by GAIL	2 years
4	If act of vendor/ contractor is a threat to the National Security	2 years

C Effect of banning on other ongoing contracts/ tenders

- C.1 If an agency is put on Banning, such agency should not be considered in ongoing tenders/future tenders.
- C.2 However, if such an agency is already executing other order (s)/ contract (s) where no corrupt/fraudulent/collusive/coercive practice is found, the agency should be allowed to continue till its completion without any further increase in scope except those incidental to original scope mentioned in the contract.
- C.3 If an agency is put on the Banning List during tendering and no irregularity is found in the case under process:
 - C.3.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the agency shall be ignored.
 - C.3.2 after opening Technical bid but before opening the Price bid, the Price bid of the agency shall not be opened and BG/EMD submitted by the agency shall be returned to the agency.
 - C.3.3 after opening of price, BG/EMD made by the agency shall be returned; the offer of the agency shall be ignored & will not be further evaluated. . In case such agency is lowest (L-1), next lowest bidder shall be considered as L-1..

D. Procedure for Suspension of Bidder

D.1 Initiation of Suspension

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

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

D.2 Suspension Procedure:

- D.2.1 The order of suspension would operate initially for a period not more than six months and is to be communicated to the agency and also to Corporate Vigilance Department. Period of suspension can be extended with the approval of the Competent Authority by one month at a time with a ceiling of six months pending a conclusive decision to put the agency on banning list.
- D.2.2 During the period of suspension, no new business dealing may be held with the agency.
- D.2.3 Period of suspension shall be accounted for in the final order passed for banning of business with the agency.

- D.2.4 The decision regarding suspension of business dealings should also be communicated to the agency.
- D.2.5 If a prima-facie, case is made out that the agency is guilty on the grounds which can result in banning of business dealings, proposal for issuance of suspension order and show cause notice shall be put up to the Competent Authority. The suspension order and show cause notice must include that (i) the agency is put on suspension list and (ii) why action should not be taken for banning the agency for future business from GAIL.
The competent authority to approve the suspension will be same as that for according approval for banning.

D 3 Effect of Suspension of business:

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

- D.3.1 No enquiry/bid/tender shall be entertained from an agency as long as the name of agency appears in the Suspension List.
- D.3.2 If an agency is put on the Suspension List during tendering:
- D.3.2.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the agency shall be ignored.
- D.3.2.2 after opening Technical bid but before opening the Price bid, the Price bid of the agency shall not be opened and BG/EMD submitted by the agency shall be returned to the agency.
- D.3.2.3 after opening of price, BG/EMD made by the agency shall be returned; the offer of the agency shall be ignored & will not be further evaluated. In case such agency is lowest (L-1), next lowest bidder shall be considered as L-1. .
- D.3.3 The existing contract (s)/ order (s) under execution shall continue.
- D.3.4 Tenders invited for procurement of goods, works and services shall have provision that the bidder shall submit a undertaking to the effect that (i) neither the bidder themselves nor their allied agency/(ies) are on banning list of GAIL or the Ministry of Petroleum and Natural Gas and (ii) bidder is not banned by any Government department/ Public Sector.

F. Appeal against the Decision of the Competent Authority:

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



Annexure-II to Section III

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

1.0 GENERAL

A system for evaluation of Vendors/ Suppliers/Contractors/ Consultants and their performance is a key process and important to support an effective purchasing & contracting function of an organization. Performance of all participating Vendors/ Suppliers/Contractors/ Consultants need to be closely monitored to ensure timely receipt of supplies from a Vendor, completion of an assignment by a Consultant or complete execution of order by a contractor within scheduled completion period. For timely execution of projects and meeting the operation & maintenance requirement of operating plants, it is necessary to monitor the execution of order or contracts right from the award stage to completion stage and take corrective measures in time.

2.0 OBJECTIVE

The objective of Evaluation of Performance aims to recognize, and develop reliable Vendors/ Suppliers/Contractors/ Consultants so that they consistently meet or exceed expectations and requirements. The purpose of this procedure is to put in place a system to monitor performance of Vendors/ Suppliers/Contractors/ Consultants associated with GAIL 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.

3.0 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.
- 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 GAIL.
- 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.

4.0 EXCLUSIONS:

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

- i) Orders/Contracts below the value of Rs. 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 valued items (PO with material code ending with 9).



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

5.0 **PROCESS OF EVALUATION OF PERFORMANCE OF VENDORS/ SUPPLIERS/ CONTRACTORS/ CONSULTANTS**

5.1 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 shall 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 One Year**
 - (b) **Subsequent instance (s) in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Holiday (Red Card) for Two 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 Two (2) Years.
 - (b) **Second such instance in other ongoing order (s)/ contract (s) or new order (s) /contact (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) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Putting on Holiday (Red Card) for a period of Two 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)
- (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 Two (2) 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 terminated / 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 (s).
The Yellow card will be automatically revoked after a period of two years unless the same is converted into Red Card due to subsequence instances of poor/ non-performance in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant.
- (b) **Second instances** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card)** for period of One Year and they shall also to be considered for Suspension.
- (c) **Subsequent instances (more than two)** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card) for period of Two Years and they shall also to be considered for Suspension.**
- (C) Where Performance rating is “FAIR”:
Issuance of warning to such defaulting Vendor/ Supplier/Contractor/ Consultant to improve their performance.

5.2 FOR CONSULTANCY JOBS

Monitoring and Evaluation of consultancy jobs will be carried out in the same way as described in para 5.1 for Projects.

5.3 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 shall be initiated by EIC:

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 One Year**
 - (b) **Subsequent instance (s) in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Holiday (Red Card) for Two 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 Two (2) Years.
 - (b) **Second such instance in other ongoing order (s)/ contract (s) or new order (s) /contact (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) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: Putting on Holiday (Red Card) for a period of Two 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)
- (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 Two (2) 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 terminated / 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 (s).
The Yellow card will be automatically revoked after a period of two years unless the same is converted into Red Card due to subsequence instances of poor/ non-performance in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant.
 - (b) **Second instances** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card)** for period of One Year and they shall also to be considered for Suspension.
 - (c) **Subsequent instances (more than two)** in other ongoing order (s)/ contract (s) or new order (s) /contact (s) on such Vendor/ Supplier/ Contractor/ Consultant: **Holiday (Red Card) for period of Two Years and they shall also to be considered for Suspension.**
- (C) Where Performance rating is "FAIR"
Issuance of warning to such defaulting Vendors/Contractors/Consultants to improve their performance.

6.0 REVIEW & RESTORATION OF PARITES PUT ON HOLIDAY

- 6.1 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.

7.0 **EFFECT OF HOLIDAY**

- 7.1 If a Vendor/ Supplier/Contractor/ Consultant is put on Holiday, such Vendor/ Supplier/Contractor/ Consultant shall not be considered in ongoing tenders/future tenders.
- 7.2 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.
- 7.3. Effect on other ongoing tendering:
- 7.3.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the party shall be ignored.
- 7.3.2 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.
- 7.3.3 after opening of price, BG/EMD made by the party shall be returned; the offer of the party shall be ignored & will not be further evaluated. In case such agency is lowest (L-1), next lowest bidder shall be considered as L-1..
- 8.0 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.
- 9.0 If an unsuccessful bidder makes any vexatious, frivolous or malicious complaint against the tender process with the intention of delaying or defeating any procurement or causing loss to GAIL or any other bidder, such bidder will be put on holiday for a period of six months, if such complaint is proved to be vexatious, frivolous or malicious, after following the due procedure.

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

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

11. **ERRANT BIDDER**

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

Further, such bidder will be put on Watch List (Yellow Card) for a period of two 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. 5.1 (v) and 5.3 (v).

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

12. In case CBIC (Central Board of Indirect Taxes and Customs)/ any tax authority / any equivalent government agency brings to the notice of GAIL that the Supplier has not remitted the amount towards GST (CGST & SGST/UTGST or IGST) collected from GAIL to the government exchequer, then, that Supplier shall be put under Holiday list of GAIL for period of six months after following the due procedure. This action will be in addition to the right of recovery of financial implication arising on GAIL.



Annexure-1

**GAIL (India) Limited
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 - Moderate nature - low severe nature	0 marks 5 marks 10-25 marks
iii) Number of deviations	1. No deviation 2. No. of deviations ≤ 2 3. No. of deviations > 2	5 marks 2 marks 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-2

**GAIL (India) Limited
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 ≤ 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 to Section-III

**ADDENDUM TO INSTRUCTIONS TO BIDDERS
(INSTRUCTIONS FOR PARTICIPATION IN E-TENDER)**

Detailed instructions regarding bid submission procedure under e-tendering system (e-tender portal) is available on <https://gailtenders.in/Gailtenders/Home.asp> as detailed below:

The screenshot shows the GAIL Tenders website interface. At the top, there is a navigation bar with links for 'ACTIVE TENDERS', 'TENDERS SEARCH', 'CORRIGENDUM', and 'TENDER AWARDED'. Below this is a banner with the GAIL logo and the slogan "Think Digital, Be Digital". The main content area includes a 'WELCOME ! TO GAIL TENDER WEBSITE' message, a date display for Friday, November 11, 2022, and a search bar. The 'Tender Statistics' section shows 83 tenders and 28 corrigendum. The 'Todays Statistics' section shows 0 tenders and 1 corrigendum. A red-bordered box highlights the text 'ADDENDUM TO INSTRUCTIONS TO BIDDERS (INSTRUCTIONS FOR PARTICIPATION IN E-TENDER)'. Below this, there are sections for 'ACTIVE TENDERS', 'TENDERS BY CLASSIFICATIONS', and 'TENDER SEARCH'. The footer contains links for 'General Conditions of Contracts (GCCs)', 'Corporate Website', 'Corporate Intranet', 'Corporate Email', and 'Reverse Auction Training Videos'.



ANNEXURE-IV to Section-III

BIDDING DATA SHEET (BDS)

ITB TO BE READ IN CONJUNCTION WITH THE FOLLOWING:

A. GENERAL					
ITB clause	Description				
1.1	The Employer/Owner is: GAIL (India) Limited				
2.1	The name of the Works/Services to be performed is: <u>INTERIOR, MEP AND RELATED WORKS FOR OFFICE BUILDING AT RANCHI, JHARKHAND</u>				
3	BIDS FROM CONSORTIUM/ JOINT VENTURE : Not Applicable				
B. BIDDING DOCUMENT					
ITB clause	Description				
8.1	For <u>clarification purposes</u> only, the communication address is: Attention: KALADHAR NARAYAN / ANKIT SHARMA Street Address: B-35/36, GAIL JUBILEE TOWER, Sector-1, Noida, India Email: kaladhar@gail.co.in ; ankit.sharma@gail.co.in				
C. PREPARATION OF BIDS					
ITB clause	Description				
11.1.1 (u)	Additional documents to be submitted by the Bidder with its Part-I (Techno-commercial/ Unpriced bid) : SCC/Scope of Work refers				
12	Additional Provision for Schedule of Rate/ Bid Price are as under: As per Schedule of Rates (SOR) / BOQ				
12 & 13	Whether GAIL will be able to avail input tax credit in the instant tender <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">YES</td> <td></td> </tr> <tr> <td style="text-align: center;">NO</td> <td style="text-align: center;">√</td> </tr> </table>	YES		NO	√
YES					
NO	√				
14	The currency of the Bid shall be INR				
15	The bid validity period shall be THREE MONTHS from final 'Bid Due Date'.				
16.1, 16.10 and 38.6	In case 'Earnest Money / Bid Security' or "Contract Performance Security" is in the form of 'Demand Draft' or 'Banker's Cheque' or 'Insurance Surety Bond' / 'Fixed Deposit Receipt', the same should be favor of GAIL (India) Limited , payable at Noida In case of submission through online banking transaction i.e. IMPS / NEFT / RTGS / SWIFT, etc, the details of GAIL's Bank account are as under: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Correspondence address</td> <td>STATE BANK OF INDIA Corporate Accounts Group II. 4th & 5th Floor, Red Fort Capital, Parsvnath Towers, Bhai Veer Singh Marg, Near Gole Market, New Delhi 110 001.</td> </tr> <tr> <td style="text-align: center;">Account no.</td> <td style="text-align: center;">000000032849362991</td> </tr> </table>	Correspondence address	STATE BANK OF INDIA Corporate Accounts Group II. 4 th & 5 th Floor, Red Fort Capital, Parsvnath Towers, Bhai Veer Singh Marg, Near Gole Market, New Delhi 110 001.	Account no.	000000032849362991
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Account no.	000000032849362991				



Branch Code	17313
IFSC CODE	SBIN0017313
SWIFT CODE	SBININBB824
MICR CODE	110002562
PAN No. (SBI)	AAACS8577K
TAN No.	DELS55939C
Fax no. :	011-23745580
Email	Agmib.cag2del@sbi.co.in

Bidder to mention reference no. “EMD/ TENDER NO.” in narration while remitting the EMD / Bid Security amount and to mention reference no. “CPS/ TENDER NO.” in narration while remitting the CPS amount in GAIL’s Bank Account.

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.
22.3, 26 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, and Bid Opening Purpose the Owner’s address is : DGM (C&P-Projects)/Manager (C&P-Projects) GAIL (India) Limited, B-35 & 36, Jubilee tower, 17th Floor, Sector -1, Noida - 201301, Uttar Pradesh (India) Phone no. 00 91 0120 2446400, 4862400

E. EVALUATION, AND COMPARISON OF BIDS

ITB clause	Description				
32	Evaluation Methodology is mentioned in Section-II.				
33	Compensation for Extended Stay: <table border="1" style="margin-left: 40px;"> <tr> <td>APPLICABLE</td> <td><input type="checkbox"/></td> </tr> <tr> <td>NOT APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	APPLICABLE	<input type="checkbox"/>	NOT APPLICABLE	<input checked="" type="checkbox"/>
APPLICABLE	<input type="checkbox"/>				
NOT APPLICABLE	<input checked="" type="checkbox"/>				
34	The following Purchase Preference Policy will be applicable as per provisions mentioned in tender: Policy to Provide Purchase Preference as per Public Procurement (Preference to Make in India), Order 2017				

F. AWARD OF CONTRACT

ITB clause	Description		
37	State of India of which stamp paper is required for Contract Agreement: Any State		
38	Contract Performance Security/ Security Deposit <table border="1" style="margin-left: 40px;"> <tr> <td>APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	APPLICABLE	<input checked="" type="checkbox"/>
APPLICABLE	<input checked="" type="checkbox"/>		



	<table border="1"> <tr> <td>NOT APPLICABLE</td> <td><input type="checkbox"/></td> </tr> </table> <p>The value/ amount of Contract Performance Security/ Security Deposit:</p> <p>SD/CPBG @ 10% of Total Order/ Contract Value within 30 days of FOA/ notification of award.</p> <p>OR</p> <p>Initial Security Deposit (ISD) @ 5% of Total Contract Value within 30 days of FOA/ Notification of award and deduction @ 10% of the RA bill subsequently from RA bills till the total amount of security deposit (including ISD and deducted amount) reaches 10% of Total Contract value.</p>	NOT APPLICABLE	<input type="checkbox"/>		
NOT APPLICABLE	<input type="checkbox"/>				
39.2	<p>Name and contact details of nodal officer are as under:</p> <p>Sh. Sushil Kumar Gupta, CGM (C&P)</p> <p>Email: sk.gupta@gail.co.in</p>				
40	<p>Whether tendered item is non-split able or not-divisible :</p> <table border="1"> <tr> <td>YES</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>NO</td> <td><input type="checkbox"/></td> </tr> </table>	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
YES	<input checked="" type="checkbox"/>				
NO	<input type="checkbox"/>				
41	<p>Provision of AHR Item :</p> <table border="1"> <tr> <td>APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>NOT APPLICABLE</td> <td><input type="checkbox"/></td> </tr> </table>	APPLICABLE	<input checked="" type="checkbox"/>	NOT APPLICABLE	<input type="checkbox"/>
APPLICABLE	<input checked="" type="checkbox"/>				
NOT APPLICABLE	<input type="checkbox"/>				
44.1	<p>Quarterly Closure of Contract</p> <table border="1"> <tr> <td>APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>NOT APPLICABLE</td> <td><input type="checkbox"/></td> </tr> </table>	APPLICABLE	<input checked="" type="checkbox"/>	NOT APPLICABLE	<input type="checkbox"/>
APPLICABLE	<input checked="" type="checkbox"/>				
NOT APPLICABLE	<input type="checkbox"/>				
Clause no. 27.3 of GCC	<p>Bonus for Early Completion:</p> <table border="1"> <tr> <td>APPLICABLE</td> <td><input type="checkbox"/></td> </tr> <tr> <td>NOT APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	APPLICABLE	<input type="checkbox"/>	NOT APPLICABLE	<input checked="" type="checkbox"/>
APPLICABLE	<input type="checkbox"/>				
NOT APPLICABLE	<input checked="" type="checkbox"/>				
49	<p>Applicability of provisions relating to Startups:</p> <table border="1"> <tr> <td>APPLICABLE</td> <td><input type="checkbox"/></td> </tr> <tr> <td>NOT APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	APPLICABLE	<input type="checkbox"/>	NOT APPLICABLE	<input checked="" type="checkbox"/>
APPLICABLE	<input type="checkbox"/>				
NOT APPLICABLE	<input checked="" type="checkbox"/>				
53	<p>Applicability of provisions relating to Order Transmittal System:</p> <table border="1"> <tr> <td>APPLICABLE</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>NOT APPLICABLE</td> <td><input type="checkbox"/></td> </tr> </table>	APPLICABLE	<input checked="" type="checkbox"/>	NOT APPLICABLE	<input type="checkbox"/>
APPLICABLE	<input checked="" type="checkbox"/>				
NOT APPLICABLE	<input type="checkbox"/>				



ANNEXURE-V TO SECTION-III

POLICY TO PROVIDE PURCHASE PREFERENCE AS PER PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017

- 1.0 Ministry of Petroleum & Natural Gas vide Notification No. FP-20013/2/2017-FP-PNG-Part(4) (E-41432) dated 26.04.2022 has notified that Public Procurement (Preference to Make in India), Order 2017 (PPP-MII) issued by DPIIT and as amended from time to time shall be applicable to all the Public Sector Undertakings and their wholly owned subsidiaries under MoP&NG with certain modifications.
- 2.0 The Public Procurement (Preference to Make in India), Order 2017 (PPP-MII) issued by DPIIT to encourage 'Make in India' and promote manufacturing & production of goods and services in India with a view to enhancing income and employment.

3.0 DEFINITIONS:-

- (i) **Local Content** means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, in percent.

Further Local value addition through services such as transportation, insurance, installation, commissioning, training, and after sale support like AMC/CMC etc. shall be considered in local content calculation.

- (ii) **'Class-I local supplier'** means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content of equal to or more than 50%.

'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content of more than 20% but less than 50%.

'Non - Local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than or equal to 20%.

- (iii) **L1** mean the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per tender or other procurement solicitation.
- (iv) **Margin of Purchase Preference:** means the maximum extent to which the price quoted by a Class-I local supplier may be above the L1 for purpose of purchase Preference.
- (v) **Nodal Ministry** means the Ministry of Petroleum & Natural Gas
- (vi) **Procuring Entity** means GAIL (India) Limited (GAIL)
- (vi) **Works** means all the works as per Rule 130 of GFR-2017 also include 'turnkey works'



4.0 **Margin of Purchase Preference:** The margin of purchase preference shall be 20%.

5.0 **ELIGIBILITY OF 'CLASS-I LOCAL SUPPLIER'/ 'CLASS-II LOCAL SUPPLIER'/ 'NON-LOCAL SUPPLIERS' FOR DIFFERENT TYPES OF PROCUREMENT**

- (a) In procurement of all goods, services or works in respect of which the Nodal Ministry / Department has communicated that there is sufficient local capacity and local competition, only 'Class-I local supplier', shall be eligible to bid irrespective of purchase value.
- (b) Only 'Class-I local supplier' and 'Class-II local supplier', shall be eligible to bid in procurements undertaken by procuring entities, except when Global tender enquiry/ International Competitive bidding has been issued. In global tender enquiries/ International Competitive bidding 'Non local suppliers' shall also be eligible to bid along with 'Class-I local suppliers' and 'Class-II local suppliers'.
- (c) Works includes Engineering, Procurement and Construction (EPC) contracts and services include System Integrator (SI) contracts
- (d) HP-HT Operations in upstream oil and gas business activities shall be exempted from this order.

6.0 **PURCHASE PREFERENCE METHODOLOGY UNDER PPP-MII (SUBJECT TO QUANTITY DISTRIBUTION APPLICABLE TO MSES AS PER PUBLIC PROCUREMENT POLICY FOR MSE 2012, REFER EXAMPLES GIVEN BELOW):**

- (a) Purchase preference shall be given to 'Class-I local supplier' in procurements in the manner specified here under.
- (b) In the procurements of goods or works which are cover by para 5 (b) above and which are divisible in nature, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:
 - i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract for full quantity will be awarded to L1.
 - ii. If L1 bid is not a 'Class-I local supplier', 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to the Class-I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class-I local supplier' subject to matching the L1 price. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class-I local suppliers, then such balance quantity may also be ordered on the L1 bidder.



- (c) In the procurements of goods or works which are covered by para 5 (b) and which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:
- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract will be awarded to L1.
 - ii. If L1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.
 - iii. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.
 - iv. "Class-II local supplier" will not get purchase preference in any procurement.
- d) **Applicability in tenders where contract is to be awarded to multiple bidders** - In tenders where contract is awarded to multiple bidders subject to matching of L1 rates or otherwise which are covered by para 5 (b), the 'Class-I local supplier' shall get purchase preference over 'Class II- local supplier' as well as 'Non-local supplier', as per following procedure:
- i) If 'Class-I Local suppliers' qualify for award of contract for at least 50% of the tendered quantity in any tender, the contract may be awarded to all the qualified bidders as per award criteria stipulated in the bid documents. However, in case 'Class -I Local suppliers' do not qualify for award of contract for at least 50% of the tendered quantity, purchase preference should be given to the 'Class-I local supplier' over 'Class-II local suppliers'/ 'Non local suppliers' provided that their quoted rate falls within 20% margin of purchase preference of the highest quoted bidder considered for award of contract so as to ensure that the 'Class-I Local suppliers' taken in totality are considered for award of contract for at least 50% of the tendered quantity.
 - ii) First purchase preference has to be given to the lowest quoting 'Class-I local supplier', whose quoted rates fall within 20% margin of purchase preference, subject to its meeting the prescribed criteria for award of contract as also the constraint of maximum quantity that can be sourced from any single supplier. If the lowest quoting 'Class-I local supplier', does not qualify for purchase preference because of aforesaid constraints or does not accept the offered quantity, an opportunity may be given to next higher 'Class-I local supplier', falling within 20% margin of purchase preference, and so on.
- 7.0 In case a bidder (Class-I Local supplier) is eligible to seek benefit under Policy for Preference under Public Procurement (Preference to Make in India), Order 2017 as well



as Public Procurement Policy for MSE 2012 (PPP for MSE 2012), then the bidder should categorically confirm its option to choose benefits against only one of the two policies i.e. either PPP-MII and MSE policy in Form-I. The option once exercised cannot be modified subsequently.

Purchase preference benefits shall be extended to the bidder based on the declared option subject to the bidder meeting the requirements contained in that purchase preference policy.

In case a MSEs bidder opts for purchase preference based on PPP-MII, such bidder shall not be entitled to claim purchase preference benefit available to MSE Bidders under PPP-2012. However, the exemptions from furnishing Bidding Document fee and Bid security/EMD shall continue to be available to such MSE Bidder.

While for evaluating a particular bid that bidder's option (to avail any one out of two applicable purchase preference policies, i.e., PPP-MII or PPP-2012) will be considered, for price matching opportunities and distribution of quantities among bidders, the precedence shall be in the following order:-

- (i) Public Procurement Policy for MSE 2012
- (ii) Public Procurement (Preference to Make in India), Order 2017

8.0 Example to deal Various situations in case a bidder is eligible to seek benefit under Public Procurement (Preference to Make in India), Order 2017 as well as Public Procurement Policy for MSE 2012 (PPP for MSE 2012) :

(I) Non divisible item

L1 bidder is non MSE, Non Local supplier/ Class-II local supplier as per PPP-MII
 L2 bidder is Class-I Local supplier as per PPP-MII (prices within 20%)
 L3 bidder is MSE bidder (prices within 15%)
 MSE bidder shall be given preference to match the L1 price. If bidder matches the L1 price, order shall be placed on him, otherwise, option for matching the L1 price shall be given to L2 bidder (PPP-MII).

(II) Divisible item-Case 1

L1 bidder is non MSE, Non Local supplier/ Class-II local supplier as per PPP-MII
 L2 bidder is Class-I Local supplier as per PPP-MII (within 20%)
 L3 bidder is MSE bidder (within 15%)
 MSE bidder shall be given preference to match the L1 price. If bidder matches the L1 price, order shall be placed on him for the quantity specified in the bidding document for MSEs (i.e. 25% of the tendered quantity). For 50% of tendered quantity option for matching the L1 price shall be given to L2 bidder (Class-I Local supplier as per PPP-MII). Balance quantity (i.e. 25% of the tendered quantity) shall be awarded to original L1 bidder.

(III) Divisible item-Case 2

L1 bidder is non MSE, Non Local supplier/ Class-II as per PPP-MII
 L2 bidder is Class-I Local supplier as per PPP-MII (within 20%)
 L3 bidder is MSE bidder (within 15%)
 L4 bidder is MSE bidder (within 15%)



MSE bidders shall be given preference to match the L1 price. If bidders matched the L1 price, order shall be placed on each of them for 12.5% of the tendered quantity. In case L3 or L4 bidder refuses, the order shall be placed on remaining MSE bidder who matches the L1 prices for 25% of the quantity. For 50% of tendered quantity option for matching the L1 price shall be given to L2 bidder (Class-I Local supplier as per PPP-MII). Balance quantity (i.e. 25% of the tendered quantity) shall be awarded to original L1 bidder.

- (IV) In case L1 bidder is MSE bidder, the entire work shall be awarded to him without resorting to purchase preference to Class-I Local supplier as per PPP-MII.
- (V) In case L1 bidder is a Local supplier as per PPP-MII, purchase preference shall be resorted to MSE bidder as per PPP 2012 only.

8.0 VERIFICATION OF LOCAL CONTENT/ DOMESTIC VALUE ADDITION

- a. The 'Class-I local supplier'/ 'Class-II local supplier' at the time of tender, bidding or solicitation shall require to indicate percentage of local content and provide **self-certification** (as per proforma at Form-2) that the item offered meets the minimum local content for 'Class-I local supplier'/ 'Class-II local supplier' as the case may be and shall give details of the location(s) at which the local value addition is made.
- b. In cases of procurement for a value in excess of Rs. 10 crores, in addition to Form-2 'Class-I local supplier'/ 'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content as per proforma at Form -3.
- c. In case a complaint is received by the procuring agency relating to implementation of this order including the claim of a bidder regarding local content/ domestic value addition, the same shall be referred to Competent Authority who is empowered to look into procurement related complaints.
- d. Nodal Ministry may constitute committees with internal and external experts for independent verification of self-declarations and auditor's/accountant's certificates on random basis and in the case of complaints. A complaint fee of Rs.2 Lakh or 1% of the value of the domestically manufactured products being procured (subject to a maximum of Rs. 5 Lakh), whichever is higher, shall be paid by Demand Draft to be deposited with GAIL. In case, the complaint is found to be incorrect, the complaint fee shall be forfeited. In case, the complaint is upheld and found to be substantially correct, deposited fee of the complainant would be refunded without any interest.
- e. In case of false declarations, GAIL shall initiate action for banning such manufacturer/supplier/service provider as per as per GAIL's extant "Procedure for action in case Corrupt/Fraudulent/Collusive/Coercive Practices"
- f. A supplier who has been debarred by any procuring entity for violation of this Order shall not be eligible for preference under this Order for procurement by any other procuring entity for the duration of the debarment. The debarment for such other



procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, in the manner prescribed under paragraph g below.

- g. The Department of Expenditure shall issue suitable instructions for the effective and smooth operation of this process, so that:
- i. The fact and duration of debarment for violation of this Order by any procuring entity are promptly brought to the notice of the Member-Convenor of the Standing Committee and the Department of Expenditure through the concerned Ministry /Department or in some other manner;
 - ii. on a periodical basis such cases are consolidated and a centralized list or decentralized lists of such suppliers with the period of debarment is maintained and displayed on website(s);
 - iii. in respect of procuring entities other than the one which has carried out the debarment, the debarment takes effect prospectively from the date of uploading on the website(s) in the such a manner that ongoing procurements are not disrupted.

9.0 RECIPROCITY CLAUSE

- i. When a Nodal Ministry/Department identifies that Indian suppliers of an item are not allowed to participate and/ or compete in procurement by any foreign government, due to restrictive tender conditions which have direct or indirect effect of barring Indian companies such as registration in the procuring country, execution of projects of specific value in the procuring country etc., it shall provide such details to all its procuring entities including CMDs/CEOs of PSEs/PSUs, State Governments and other procurement agencies under their administrative control and GeM for appropriate reciprocal action.
- ii. Entities of countries which have been identified by the nodal Ministry/Department as not allowing Indian companies to participate in their Government procurement for any item related to that nodal Ministry shall not be allowed to participate in Government procurement in India for all items related to that nodal Ministry/ Department, except for the list of items published by the Ministry/ Department permitting their participation.
- iii. The term 'entity' of a country shall have the same meaning as under the FDI Policy of DPIIT as amended from time to time

Appendix:

- Appendix-I to ANNEXURE-II to Section-III- DOE OM No. F.1/4/2021-PPD dated 18.05.2023 regarding concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017



Appendix-I to ANNEXURE-II to Section-III

No.F. 1/4/2021-PPD
 Government of India
 Ministry of Finance
 Department of Expenditure
 Public Procurement Division

264-C, North Block, New Delhi.
 18.05.2023.

OFFICE MEMORANDUM

Subject: Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017.

The undersigned is directed to refer two Preferential Procurement Orders mandated for the Public Procurement in India, namely:

- i. Public Procurement Policy for Micro and Small Enterprises (MSEs) Order dated 23.03.2012 (PPP-MSE Order) issued by Ministry of Micro, Small and Medium Enterprises (MoMSME) in exercise of the powers conferred in Section 11 of the MSME Development Act, 2006. (Last revised on 09.11.2018)
- ii. Public Procurement (Preference to Make in India) Order, 2017 (PPP-MII order), under Rule 153(iii) of the General Financial Rules (GFRs) 2017, approved by the Cabinet. Implementation of this PPP-MII order is monitored by Department for Promotion of Industry and Internal Trade (DPIIT). (Last revised on 16.09.2020.)

2. It has been brought to the notice of this Department that concurrent application of these two orders are creating confusion to the procuring entities and different procuring entities interpret them differently. In order to bring predictability both to the procuring entities as well as bidders, following guidelines are being issued.

Guidelines

3. The Class-I local suppliers, under PPP-MII Order, participating in any government tender, may or may not be MSEs, as defined under the MSME Act. Similarly, MSEs participating in any government tender, may or may not be Class-I local suppliers. Suppliers may be categorised in following four broad categories for consideration or applicability of purchase preference:

Category	Terminology
Supplier is both MSE & Class-I local supplier.	"MSE Class-I local supplier"
Supplier is MSE but not Class-I local supplier.	"MSE but non-Class-I local supplier"
Supplier is not MSE but is Class-I local supplier.	"Non-MSE but Class-I local supplier"
Supplier is neither MSE nor Class-I local.	"Non-MSE non-Class-I local supplier"



4. The applicability of PPP-MSE Order and PPP-MII Order in various scenarios, involving simultaneous purchase preference to MSEs and Class-I local suppliers under PPP-MSE Order and PPP-MII Order respectively, shall be as under:
- a) *Items covered under Para 3(a) of PPP- MII Order, 2017 for which Nodal Ministry has notified sufficient local capacity and competition:* For these items, only Class-I local suppliers are eligible to bid irrespective of purchase value. Hence, Class-II local suppliers or Non-local suppliers, including MSEs which are Class-II local suppliers/ Non-local suppliers, are not eligible to bid. Possible scenarios can be as under:
- (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1.
 - (ii) L-1 is "Non-MSE but Class-I local supplier" - Purchase preference is given to MSEs as per PPP-MSE Order. Balance quantity is to be awarded to the L-1 bidder.
- b) *Items reserved exclusively for procurement from MSEs as per PPP-MSE Order:* These items are reserved exclusively for purchase from MSEs. Hence, non-MSEs are not eligible to bid for these items. Possible scenarios can be as under:
- (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1.
 - (ii) L-1 is "MSE non-Class-I local supplier" - Purchase preference is to be given to Class-I local supplier as per PPP-MII Order. Balance quantity, is to be awarded to L-1 bidder.
- c) *If items are neither notified for sufficient local capacity nor reserved for MSEs, then the process will be as follows:*
- c (a) *Items covered under Para 3A(b) of PPP-MII Order are divisible items and both MSEs as well as Class-I local suppliers are eligible for purchase preference. Possible scenarios can be as under:*
- (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1.
 - (ii) L-1 is "Non-MSE but Class-I local supplier" - Purchase preference is to be given to MSEs, if eligible, as per PPP-MSE Order. Balance quantity is to be awarded to L-1 bidder.
 - (iii) L-1 is "MSE but non-Class-I local supplier" - Purchase preference is to be given to Class-I local suppliers, if eligible, as per PPP-MII Order. Balance quantity is to be awarded to L-1 bidder.
 - (iv) L-1 is "Non-MSE non-Class-I local supplier" - Purchase preference is to be given to MSEs as per PPP-MSE Order. Thereafter, purchase preference is to be given to Class-I local suppliers for "50% of the tendered quantity minus quantity allotted to MSEs



above" as per PPP- MII Order. For the balance quantity, contract is to be awarded to L-1 bidder. (Kindly refer to the illustrative example in the annexure).

- c (b) Items covered under Para 3A(c) of PPP-MII Order, 2017 are non-divisible items and both MSEs as well as Class-I local suppliers are eligible for purchase preference. Possible scenarios can be as under:
- (i) L-1 is "MSE Class-I local supplier" - Contract is awarded to L-1.
 - (ii) L-1 is not "MSE Class-I local supplier" but the "MSE Class-I local supplier" falls within 15% margin of purchase preference - Purchase preference is to be given to lowest quoting "MSE Class-I local supplier". If lowest quoting "MSE Class-I local supplier" does not accept the L-1 rates, the next higher "MSE Class-I local supplier" falling within 15% margin of purchase preference is to be given purchase preference and so on.
 - (iii) If conditions mentioned in sub paras (i) and (ii) above are not met i.e. L-1 is neither "MSE Class-I local supplier" nor "MSE Class-I local supplier" is eligible to take benefit of purchase preference, the contract is to be awarded/ purchase preference to be given in different possible scenarios as under:
 - A. L1 is "MSE but non-Class-I local supplier" or "Non-MSE but Class-I local supplier" – Contract is be awarded to L1.
 - B. L1 is "Non-MSE non-Class-I local supplier" - First purchase preference to be given to MSE as per PPP-MSE Order. If MSE not eligible/ does not accept - purchase preference to be given to Class- I Local supplier as per PPP-MII Order. If Class-I Local supplier also not eligible/ does not accept – contract to be awarded to L-1.
- d) *Items reserved for both MSEs and Class-I local suppliers:* These items are reserved exclusively for purchase from MSEs as well as Class-I local suppliers. Hence, only "MSE Class-I local supplier" are eligible to bid for these items. Non-MSEs/Class-II local suppliers/ Non-local suppliers cannot bid for these items. Hence the question of purchase preference does not arise.
- e) Non-local suppliers, including MSEs falling in the category of Non-local suppliers, shall be eligible to bid only against Global Tender Enquiry.

(Kanwalpreet)
Director

Tel.:-223093811; email: - kanwal.irss@gov.in

To

1. Secretaries of all Central Government Ministries/ Departments.
2. Secretary Department of Public Enterprises with a request for issuing suitable instructions to all Central Public Sector Enterprises in this regard.

Annexure

Example explaining applicability in scenario explained in para 4 c (a)(iv)

(Scenario: Divisible items, both MSEs as well as Class-I local suppliers eligible for purchase preference and L-1 is "Non-MSE non-Class-I local supplier")

Item – Desktop computer

Qty – 50 Nos.

Details of bids received

Sr. No.	Name of bidder	Rates quoted	Price Ranking	Status of bidder
1.	A	100	L1	"Non-MSE non- Class-I local supplier"
2.	B	110	L2	"Non-MSE but Class-I local supplier"
3.	C	112	L3	"MSE but non- Class-I local supplier"
4.	D	115	L4	"Non-MSE but Class-I local supplier"
5.	E	118	L5	"MSE but non- Class-I local supplier"
6.	F	120	L6	"MSE Class-I local supplier"

- In this case, first purchase preference is to be given to MSEs as per PPP-MSE Order for 25% of tendered quantity of 50 Nos. i.e. 12.5 Nos. (rounded off to the next whole number say 13 Nos). Accordingly, invite L3 (bidder C), whose quoted rates falls within 15% margin of purchase preference to match L1 price i.e. Rs. 100/- for quantity of 13 Nos. Bidder "E" and "F", although MSEs, will not get purchase preference since their quoted rates don't fall within 15% margin of purchase preference. Bidder C will be considered for order of 13 Nos. on confirmation of reduction of price.
- For 50% of balance quantity of 37 number (tendered quantity of 50 – 13 awarded to bidder C; assuming bidder C has confirmed to accept L1 rates), purchase preference will be given to lowest Class-I local supplier as per PPP-MII Order. Accordingly, bidder B will be invited to match L-1 price for 50% of 37 Nos i.e. 18.5 (say 19 Nos of computers). If bidder "B" does not accept the L1 price i.e. price of Rs. 100/- per unit, next higher Class-I local supplier falling within 20% margin of purchase preference, i.e. bidder "D", may be invited to match L-1 price for 19 Nos. of computers and so on.
- For remaining quantity i.e. 18 Nos (50-13-19), the contract will be awarded to lowest quoting bidder i.e. Bidder "A", who is L-1 in the example.



FORM-1

UNDERTAKING FOR APPLICABILITY OF POLICY
(APPLICABLE FOR MSEs and CLASS-I LOCAL SUPPLIER ONLY)

NOT APPLICABLE



FORM-2

SELF CERTIFICATION BY BIDDER WHO CLASS-I LOCAL SUPPLIER/ CLASS-II LOCAL SUPPLIER TOWARDS MANDATORY MINIMUM LOCAL CONTENT/ DOMESTIC VALUE ADDITION (APPLICABLE FOR ALL BIDDERS INCLUDING MSEs)

To,

M/s GAIL (INDIA) LIMITED

SUB:
TENDER NO:

Dear Sir

We, M/s _____ (*Name of Bidder*) confirm that as per the definition of policy we are:

Class-I Local supplier []

Class-II Local Supplier []

(Bidder is to tick appropriate option (✓) above).

It is further confirm that M/s _____ (*Name of Bidder*) meet the mandatory minimum Local content/Domestic Value Addition requirement for Class-I Local supplier/ Class-II Local supplier (as the case may be) under Public Procurement (Preference to Make in India), Order 2017 (PPP-MII) and has value addition of%.

The details of the location (s) at which the local value addition is made is as under:

.....
.....
.....

We further confirm that in case we fail to meet the minimum local content/domestic value addition, the same shall be treated false information and GAIL will take action as per provision of tender document.

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



FORM-3

**CERTIFICATE BY STATUTORY AUDITOR/COST AUDITOR/
CHARTERED ACCOUNTANT OF BIDDER TOWARDS MANDATORY
MINIMUM LOCAL CONTENT/ DOMESTIC VALUE ADDITION
(IN CASE BIDDER IS CLASS-I LOCAL SUPPLIER/ CLASS-II LOCAL
SUPPLIER)**

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

Dear Sir

“We _____ the statutory auditor/ cost auditor/chartered accountant (not an employee of the company) of M/s. _____ (*Name of the bidder*) hereby certify that as per definition specified in policy, M/s. _____ (*Name of the bidder*) is

Class-I Local supplier []

Class-II Local Supplier []

(Bidder is to tick appropriate option (✓) above).

It is further confirm that M/s _____ (*Name of Bidder*) quoted vide offer No. _____ dated _____ against tender No. _____ meet the mandatory minimum Local content/Domestic Value Addition requirement specified for Class-I Local supplier/ Class-II Local supplier (as the case may be) under Policy for Public Procurement (Preference to Make in India), Order 2017 (PPP-MII) and has value addition of% .

Name of Audit Firm:
Signatory]

[Signature of Authorized

Date:

Name:
Designation:
Seal:
Membership no.

Note:

- (i) This certificate it to be furnished by the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies)
- (ii) The above format is indicative, the statutory auditor/ cost auditor/ cost accountant can modify the format without changing the intent of certification.



FORMS & FORMAT



LIST OF FORMS & FORMAT

Form No.	Description
F-1	BIDDER'S GENERAL INFORMATION
F-1A	ANNEXURE TO BIDDER'S GENERAL INFORMATION
F-2	PROFORMA OF "BANK GUARANTEE" FOR "EARNEST MONEY "
F-2A	PROFORMA OF DECLARATION FOR 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-8B	CHECK LIST FOR BID EVALUATION CRITERIA (BEC) QUALIFYING DOCUMENTS
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	INTEGRITY PACT
F-15	INDEMNITY BOND
F-16	FREQUENTLY ASKED QUESTIONS (FAQs)
F-17	UNDERTAKING REGARDING SUBMISSION OF ELECTRONIC INVOICE (E-INVOICE AS PER GST LAWS)
F-18	FORMAT FOR NO CLAIM CERTIFICATE FOR RELEASE OF CPS/SECURITY DEPOSIT



F-1

BIDDER'S GENERAL INFORMATION

To,
M/s GAIL (INDIA) LIMITED

TENDER NO: _____

1	Bidder Name	M/s.....
2	Status of Firm	Proprietorship Firm/Partnership firm/ Limited Liability Partnership (LLP) firm/Public Limited/ Pvt. Limited/ Govt. Dept. / PSU/ Others If Others Specify: _____ [Enclose relevant certificates / partnership deed/certificate of Registration, as applicable]
3a	Name of Proprietor/ Partners/ Directors of the firm/company including their Father's Name and residential address, Aadhar No., Pan Card Details & DIN Nos. [As per clause for 'One Bid Per Bidder' under Section-III of Tender Document]	
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	Office responsible for executing the contract with GST no. * (In case supply of works 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/ Mobile no. of address where order is to be placed	_____ (Country Code) (Area Code) (Telephone No.)



9	E-mail address	
10	Website	
11	Mobile Number:	
12	ISO Certification, if any	{ If yes, please furnish details }
13	PAN No.	
14	GST No. (refer sl. no. 7 above)	
15	EPF Registration No.	
16	ESI code No.	
17	Whether Micro or Small Enterprise	Yes / No <i>(If Yes, Bidder to submit requisite documents as specified in ITB: Clause No. 40)</i>
	Whether MSE is owned by SC/ST Entrepreneur(s)	Yes / No <i>(If Yes, Bidder to submit requisite documents as specified in ITB: Clause No. 40)</i>
	Whether MSE is owned by Women	Yes / No <i>(If Yes, Bidder to submit requisite documents as specified in ITB: Clause No. 40)</i>
	Details of registration in TReDS	Yes / No <i>If Yes, please provide the name of portal</i>
18	Whether Bidder is Startups or not	Yes / No <i>(If Yes, Bidder to submit requisite documents as specified in ITB: Clause No.50)</i>
	In case of Start-up confirm the following: (i) Date of its incorporation/ registration [The certificate shall only be valid for the entity upto ten years from the date of its incorporation/ registration] (ii) Whether turnover for any financial years since incorporation/ registration has exceed Rs.100 Crores.	

Note: * GAIL intent to place the contract directly on the address from where Works are to be supplied. In case, bidder wants contract at some other address or Works are to be supplied from multiple locations, bidder is required to provide in their bid, the address on which contract is to be placed.

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

**F-1(A)****Annexure to Bidder's General Information**

To,
M/s GAIL (INDIA) LIMITED

Tender No. :
Tender Subject :
Name of Bidder :

Sl. No.	Name of Proprietor/ Partners/ Directors	Father's Name	Residential Address	Aadhar No.	Pan Card Details	DIN Nos. (if applicable)

Note: The corresponding documents i.e. Aadhar, PAN & DIN etc. are also to be provided **duly attested by Notary Public.**

Place: [Signature of Authorized Signatory of Bidder]

Date: 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 GAIL (India) Limited _____	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 GAIL (India) Ltd., the amount _____ without any reservation, protest, demur and recourse. Any such demand made by GAIL, shall be conclusive and binding on us irrespective of any dispute or difference raised by the Tenderer.

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

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

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 GAIL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

Details of next Higher Authority of the Officials who have issued the Bank Guarantee:



Name

Designation

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.
2. The expiry date should be arrived at in accordance with "ITB: Clause-16.1".
3. The Bank Guarantee by bidders will be given from Bank as specified in "ITB: Clause-16.2".
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 / Phone from where the Earnest Money Bond has been issued as per proforma provided below.
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 or in the Bank Guarantee itself.



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

1	BANK GUARANTEE NO	:				
2	VENDOR NAME / VENDOR CODE	:	NAME			
			VENDOR CODE			
3	BANK GUARANTEE AMOUNT	:				
4	TENDER 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	:		
		(D)	IFSC DETAILS	:		



FORMAT F-2A

DECLARATION FOR BID SECURITY

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

Dear Sir

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

We, M/s _____ (*Name of 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 GAIL in this regard), 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 GAIL during the period of bid validity:
 - (i) fail or refuse to execute the Contract, if required, or
 - (ii) fail or refuse to furnish the Contract Performance Security, in accordance provisions of tender document.
 - (iii) fail or refuse to accept 'arithmetical corrections' as per provision of tender document.
- (c) having indulged in corrupt/fraudulent /collusive/coercive practice as per procedure.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:



F-3- LETTER OF AUTHORITY

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

Ref:

Date:

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

Dear Sir,

I/We, _____ hereby authorize the following representative(s) for attending any 'Meetings [Pre-Bid Meeting]', 'Un-priced Bid Opening', and 'Price Bid Opening' against the above Tender Documents:

[1] Name & Designation _____ Signature _____

Phone/Cell:

E-mail: @

[2] Name & Designation _____ Signature _____

Phone/Cell:

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:

- (i) This "Letter of Authority" should be on the "**letterhead**" of the 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 'Pre-Bid Meetings' /'Un-priced Bid Opening' / 'Price Bid Opening'.
- (ii) Bidder's authorized representative is required to carry a copy of this authority letter while attending the 'Pre-Bid Meetings' /'Un-priced Bid Opening'.

**F-4**

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

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

To, M/s GAIL (India) Limited _____	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" which expression shall wherever the context so require include its successors and assignees) have been placed/ awarded the job/work of _____ vide LOA /FOA No. _____ dated _____ for GAIL (India) Limited having registered office at 16, Bhikaiji Cama Place, R.K. Puram, New Delhi (herein after called the "GAIL" which expression shall wherever the context so require include its successors and assignees).

The Contract conditions provide that the 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 GAIL (INDIA) LIMITED, in case of default.

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

1. We _____ hereby undertake to give the irrevocable & unconditional guarantee to you that if default shall be made by M/s. _____ in performing any of the terms and conditions of the tender/order/contract or in payment of any money payable to GAIL (INDIA) LIMITED we shall on first demand pay without demur, contest, protest and/ or without any recourse to the contractor to GAIL in such manner as GAIL 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 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 GAIL in writing. However, if for any reason, the contractor is unable to complete the 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 contractor fails to perform the work fully, the bank hereby agrees to further extend this guarantee at the instance of the contractor till such time as may be determined by GAIL. 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 GAIL at its option shall be entitled to enforce this Guarantee against the bank (as principal debtor) in the first instant, without proceeding against the contractor and notwithstanding any security or other guarantee that GAIL may have in relation to the contractor's liabilities.
7. The amount under the Bank Guarantee is payable forthwith without any delay by Bank upon the written demand raised by GAIL. Any dispute arising out of or in relation to the said Bank Guarantee shall be subject to the exclusive jurisdiction of courts at New Delhi.
8. Therefore, we hereby affirm that we are guarantors and responsible to you on behalf of the 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 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.
9. 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 GAIL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

Details of next Higher Authority of the Officials who have issued the Bank Guarantee:

Name

Designation

Yours faithfully,

Bank by its Constituted Attorney

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

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.
2. The Bank Guarantee by Bidders will be given from bank as specified in cl.no. 38.3 of ITB [Section-III] of Tender Document.
3. A letter from the issuing bank of the requisite Bank Guarantee confirming that said Bank Guarantee and all future communication relating to the Bank Guarantee shall be forwarded to Employer.
4. If a Bank Guarantee is issued by a commercial bank, then a letter to Employer and copy to Consultant (if applicable) confirming its net worth is more than Rs. 100,00,00,000.00 [Rupees One Hundred Crores] or its equivalent in foreign currency alongwith documentary evidence OR in the Bank Guarantee itself.
5. Contractor shall submit attached cover letter (Annexure) while submitting Contract Performance Security



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

1	BANK GUARANTEE NO	:				
2	VENDOR NAME / VENDOR CODE	:	NAME			
			VENDOR CODE			
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	:		
		(D)	IFSC CODE	:		



F-5- AGREED TERMS & CONDITIONS

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

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

Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
1	Bidder's name, Vendor Code of GAIL (if any) and address (FOA/Order shall be released in this name)	Bidder's name : GAIL's Vendor Code: 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 (except where price escalation/variation is allowed in the Tender).	
4	Bidder confirms that they have quoted GST (CGST & SGST/ UTGST or IGST) in Price Schedule/ SOR of Price bid.	
4.1	Whether in the instant tender services/works are covered in reverse charge rule of GST (CGST & SGST/UTGST or IGST) If yes, Bidder confirms that they have quoted rate of applicable GST (CGST & SGST/ UTGST or IGST) in Price Schedule / Schedule of Rates of Price Bid	Yes/ No
4.2	Bidder confirms that they have mentioned Harmonized System Nomenclature (HSN)/Service Accounting Code (SAC) in Price Bid	
4.3	Bidder hereby confirms that the quoted prices are in compliance with the Section 171 of CGST Act/ SGST Act as mentioned as clause no. 13.10 of ITB (Anti-profiteering clause).	
4.4	Whether bidder is liable to raise E-Invoice as per GST Act. If yes, bidder will raise E-Invoice and confirm compliance to provision of tender in this regard.	
5.	Bidder confirms acceptance of relevant Terms of Payment specified in the Bid Document.	
6.	Bidder confirms that Contract Performance Security will be furnished as per Bid Document within 30 days of FOA in case of successful bidder.	



Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
7.	Bidder confirms that Contract Performance Security shall be from any Indian scheduled bank (excluding Co-operative banks and Regional Rural bank) or a branch of an International bank situated in India and registered with Reserve bank of India as scheduled foreign bank. However, in case of bank guarantees from banks other than the Nationalised Indian banks, the bank must be a commercial bank having net worth in excess of Rs 100 crores and a declaration to this effect shall be made by such commercial bank either in the Bank Guarantee itself or separately on its letterhead.	
8.	Bidders confirms compliance to Completion Schedule as specified in Bid document and the same shall be reckoned from the date of Fax of Acceptance.	
9.	Bidders confirms acceptance of Price Reduction Schedule for delay in completion schedule specified in Bid document. In case of delay, the bills / invoices shall be submitted after reducing the price reduction due to delay (refer PRS Clause).	
10.	a) Bidder confirms acceptance of all terms and conditions of Bid Document (all sections). b) Bidder confirms that printed terms and conditions of bidder are not applicable.	
11.	Bidder confirms their offer is valid for period specified in BDS from Final/Extended due date of opening of Techno-commercial Bids.	
12.	Bidder have furnished EMD/Bid Security details as under: a) EMD/ Bid Security No. & date b) Value c) Validity d) Bank Address/e-mail ID/Mobile no. [in case of BG] OR Bidder furnishes bid security declaration [applicable for MSEs, Start-Ups and CPSEs (to whom exemption is allowed as per extant guidelines in vogue)]	
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 GAIL or (ii) the bidder is not a firm in which any Director (in Board of Director) of GAIL or their relative is a partner.	



Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
15.	All correspondence must be in ENGLISH language only.	
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.	Bidder confirms that all Bank charges associated with Bidder's Bank regarding release of payment etc. shall be borne by Bidder.	
18.	<p><u>No Deviation Confirmation:</u> It may be note 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.</p>	
19.	<p>If the Bidder becomes a successful Bidder pursuant to the provisions of the Tender Document, the following Confirmation shall be automatically become enforceable:</p> <p>"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."</p>	
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 deemed to be inclusive of cost incurred for such activities unless otherwise specifically excluded. Bidder confirms to	



Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
	perform for fulfilment of the contract and completeness of the supplies in all respect within the scheduled time frame and quoted price.	
22.	<p>Bidder hereby confirms that they are not on 'Holiday' by GAIL or Public Sector Project Management Consultant (like EIL, Mecon only due to "poor performance" or "corrupt and fraudulent practices") or banned by Government department/ Public Sector on due date of submission of bid.</p> <p>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 GAIL or the Ministry of Petroleum and Natural Gas.</p> <p>Bidder also confirms that they are not under any liquidation, court receivership or similar proceedings or 'bankruptcy'.</p> <p>In case it comes to the notice of GAIL that the bidder has given wrong declaration in this regard, the same shall be dealt as 'fraudulent practices' and action shall be initiated as per the Procedure for action in case of Corrupt/Fraudulent/Collusive/Coercive Practices.</p> <p>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 GAIL by them.</p>	
23.	<p>Bidder confirms that they have read and understood the General Conditions of Contract – Works available on GAIL's Tender website (http://gailtenders.in/Gailtenders/gccs.asp) & no 'exception / deviation' anywhere has been taken in the same and that they shall abide by provisions of relevant GCC.</p>	
24.	<p>Bidder certifies that they would adhere to the Fraud Prevention Policy of GAIL [available on GAIL's website (www.gailonline.com)] and shall not indulge themselves or allow others (working in GAIL) to indulge in fraudulent activities and that they would immediately apprise GAIL 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 GAIL is liable to be treated as crime and dealt with by the procedures of GAIL as applicable from time to time.</p>	
25.	<p>Bidder confirms that (i) any variation in GST at the time of supplies for any reasons, other than statutory, including variations due to turnover, shall be borne by them and (ii) any error of interpretation of applicability of rate of GST (CGST & SGST/ UTGST or IGST) on components of an</p>	



Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
	item and/or various items of tender by them shall be dealt as per clause no. 13.13 of Section-III.	
26.	<p>Bidders confirm to submit signed copy of Integrity Pact (wherever included in tender).</p> <p>If Bidder is a partnership concern or a consortium, this agreement must be signed by all partners or consortium members.</p>	
27.	Bidder confirms that there is no conflict of interest with other bidders, as per clause no.4.2 of Section-III (ITB) of Tender Document.	
28.	Bidder confirms that, in case of contradiction between the confirmations provided in this format and to the 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:



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 to concerned executive in GAIL issued the tender, by filling up the Format)

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

Dear Sir,

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

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

Postal Address with Pin Code:
Telephone Number :
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 :

F-7
BIDDER'S EXPERIENCE

To,

M/s GAIL (INDIA) LIMITED

SUB:

TENDER NO:

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

Place:

Date:

[Signature of Authorized Signatory of Bidder]

Name:

Designation:

Seal:

Note: As per cl.no.D of Section-II, 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.



F-8 (A)
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	REFEREN CE PAGE NO. OF THE BID SUBMITTE D
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		X
i	Covering Letter, Letter of Submission		
ii	EMD / Declaration for Bid Security [as applicable] as per provisions of Tender		
iii	Digitally signed (in case of e-tendering) or 'signed & stamped (in case of Manual tender) tender document along with drawings and addendum (if any)		
iv	Power of Attorney in the name of person signing the bid.		
v	Confirm submission of document alongwith unpriced bid as per bid requirement (including cl.no.11.1.1 of Section-III).		X
3.0	Confirm that all format 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.		X
5.0	Confirm that Undertaking as per <i>Form-2 to Annexure-V to Section-III</i> and Certification from the statutory auditor or cost auditor of the company (in the case of companies) o		X
6.0	Confirm that Undertaking as per Form-1 to Section-II have been submitted by the bidder (Guidelines from Procurement from a Country sharing a Land Border with India)		X



7.0	Confirm submission of Checklist against Bid Evaluation Criteria as per format F-8(B)		
-----	--------------------------------------------------------------------------------------	--	--

Place:
Date:

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

F-8(B)
CHECKLIST FOR BID EVALUATION CRITERIA (BEC) QUALIFYING DOCUMENTS
(refer Section II of Tender document)

SI No.	Description	Documents required for qualification	Documents Submitted by Bidder	Documents attested as per Section-II of Tender	Reference Page No. of the Bid submitted
Technical BEC					
1.	Experience	<p>Clause A</p> <p>(a) Detailed work order along with Schedule of Rates showing details of BOQ/scope of work.</p> <p>(b) Completion certificate issued by end user / Owner (or their consultant who has been duly authorized by owner to issue such certificate) stating that the work has been completed satisfactorily.</p> <p>Note: The completion certificates / execution certificate shall have details like Full Name & Address of client, work order no., actual value of work, date of start, brief scope of work, completion date etc.</p>		Yes/No	
2.	Job executed for Subsidiary / Fellow subsidiary/ Holding company.	Tax paid invoice(s) duly certified by statutory auditor of the bidder towards payment of statutory tax in support of the job executed for Subsidiary / Fellow subsidiary/ Holding company.		Yes/No	



1.	Average Annual Turn Over	Bidder(s) shall submit copy of Audited Annual Financial Statement [Balance Sheet and Profit & Loss Account Statement] along with Audit Report of three (3) immediate preceding Financial Year(s) along with un-price bid. Bidder may submit format F-10 accordingly.	Submitted <i>(Mention specific year.....)</i>	Yes/No	
2.	Net Worth	Bidder(s) shall submit copy of Audited Annual Financial Statement [Balance Sheet and Profit & Loss Account Statement] along with Audit Report of last Financial Year along with un-price bid.	Submitted <i>(Mention specific year.....)</i>	Yes/No	
3.	Working Capital	Bidder(s) shall submit copy of Audited Annual Financial Statement [Balance Sheet and Profit & Loss Account Statement] along with Audit Report for the last audited Financial Year along with un-price bid. If the bidder's working capital is negative or inadequate, the bidder shall submit a letter from their bank [as per Format] having net worth not less than Rs 100 Crore (or equivalent USD), confirming the availability of the line of credit for the amount as mentioned in BEC, irrespective of overall position of the working capital. Such letter shall be from single bank only. However, banking syndicate will also be acceptable wherein a group of bank can jointly provide line of credit to the bidder.	Submitted <i>(Mention specific year.....)</i> Submitted/ Applicable <i>(Bidder to tick appropriate option)</i>	Yes/No	
4.	Format for Details of financial capability of Bidder	Bidder shall submit "Details of financial capability of Bidder" in prescribed format duly signed and stamped by a chartered accountant / Certified Public Accountant (CPA).	Submitted		



Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal

F-9
FORMAT FOR CERTIFICATE FROM BANK IF BIDDER'S WORKING CAPITAL IS
INADEQUATE/NEGATIVE

(TO BE SUBMITTED IN ORIGINAL)

(To be provided on Bank's letter head)

Date:

To,
M/s. GAIL (India) Limited

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 GAIL'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. Letters 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.



F-10

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

(BIDDER TO SUBMIT BOTH PAGES OF THIS FORM)

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

A. AUDITED ANNUAL TURNOVER* OF LAST 3 YEARS:

Year	Amount (Currency)
Year 1:	
Year 2:	
Year 3:	
Total (A)	
Average Annual Financial Turnover during the last three financial years (A/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:

- 1.0 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]
- 2.0 We confirm that above figures are after referring instructions at page 2 of 2 of F-10.
- 3.0 Practicing Chartered Accountants shall generate Unique Document Identification Number (UDIN) for all certificates issued by them

Name of Audit Firm:
Chartered Accountant/CPA
Date:

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

(Page 1 of 2)

Instructions:

1. The Separate Pro-forma shall be used for each member in case of JV/ Consortium.
2. The financial year would be the same as one normally followed by the bidder for its Annual Report.
3. The bidder shall provide the audited annual financial statements as required for this Tender document. Failure to do so would result in the Proposal being considered as non-responsive.
4. For the purpose of this Tender document:
 - (i) **Annual Turnover** shall be “Revenue from Operations” as per Profit & Loss account of audited annual financial statements
 - (ii) **Working Capital** shall be “Current Assets less Current liabilities” and
 - (iii) **Net Worth** shall be Aggregate value of the paid-upshare capital and all reserves created out of the profits and securities premium account, after deducting the aggregate value of the accumulated losses, deferred expenditure and miscellaneous expenditure not written off, if any, but does not include reserves created out of revaluation of assets, writeback of depreciation and amalgamation.

In case the date of constitution/incorporation of the bidder is less than 3 years old, the average turnover in respect of the completed financial years after the date of constitution/incorporation shall be taken into account for minimum Average Annual Financial Turnover criteria.

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)



F-11
FORMAT FOR CONSORTIUM AGREEMENT
(ON NON- JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

(DELETED)

F-12 BIDDER'S QUERIES FOR PRE BID MEETING

To,

M/s GAIL (INDIA) LIMITED

Sub :

Tender No :

SL. NO.	REFERENCE OF BIDDING DOCUMENT				BIDDER'S QUERY	GAIL'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 : _____

F-13

E-Banking Mandate Form

(To be issued on vendors letter head)

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

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

(Signature of vendor/customer)

BANK CERTIFICATE

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

Bank stamp

Date

(Signature of authorized officer of bank)

F-14

INTEGRITY PACT

(ATTACHED SEPARATELY)

**INDEMNITY BOND**

WHEREAS GAIL (India) Ltd. (hereinafter referred to as “GAIL”) which expression shall, unless repugnant to the context include its successors and assigns, having its registered office at 16, Bhikaiji, Cama Place, R.K. Puram, New Delhi 110066 has entered into a contract with M/s*..... (hereinafter referred to as the “Contractor”) which expression shall unless repugnant to the context include its representatives, successors and assigns, having its registered office at *..... and on the terms and conditions as set out, inter-alia in the [mention the work order/LOA/Tender No.]and various documents forming part thereof, hereinafter collectively referred to as the ‘CONTRACT’ which expression shall include all amendments, modifications and / or variations thereto.

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

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

AND THE CONTRACTOR hereby further agrees with GAIL that:

- (i) This Indemnity shall remain valid and irrevocable for all claims of GAIL and/or any of its employees and Directors including Independent Directors arising out of said contract with respect to any such litigation / court case for which GAIL and/or its employees and Directors including Independent Directors has been made party until now or here-in-after.
- (ii) This Indemnity shall not be discharged/revoked by any change/ modification/amendment/assignment of the contract or any merger of the Contractor with other entity or any change in the constitution/structure of the Contractor’s firm/Company or any conditions thereof including insolvency etc. of the Contractor, but shall be in all respects and for all purposes binding and operative until any/all claims for payment of GAIL are settled by the Contractor and/or GAIL discharges the Contractor in writing from this Indemnity.

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

SIGNED BY :

For [Contractor]

Authorised Representative

Place:

Dated:

Witnesses:

1.

2

F-16

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.	Refer FAQs as available on Govt. e-Procurement System of National Informatics Center (NIC) https://etenders.gov.in/e procure/app
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 are any benefits available to Startups?	Refer Clause No. 49 of Instructions to Bidders of Tender Document.

All the terms and conditions of Tender remain unaltered.



F-17

**UNDERTAKING REGARDING SUBMISSION OF ELECTRONIC INVOICE (E-
INVOICE AS PER GST LAWS)**

(to be submitted on letter head along with documents for release of payment)

To,
M/s GAIL (INDIA) LIMITED

.....

SUB:

PO NO:

Dear Sir,

We _____ (Name of the Supplier) hereby confirm that E-Invoice provision as per the GST Law is

(i) Applicable to us []

(ii) Not Applicable to us []

(Supplier is to tick appropriate option [✓]above).

In case, same is applicable to us, we confirm that we will submit E-Invoice after complying with all the requirements of GST Laws. If the invoice issued without following this process, such invoice can-not be processed for payment by GAIL as no ITC is allowed on such invoices. We also confirm that If input tax credit is not available to GAIL for any reason attributable to Supplier (both for E-invoicing cases and non-E-invoicing cases), then GAIL shall not be obligated or liable to pay or reimburse GST (CGST & SGST/UTGST or IGST) claimed in the invoice(s) and shall be entitled to deduct / setoff / recover such GST amount (CGST & SGST/UTGST or IGST) or Input Tax Credit amount together with penalties and interest, if any, by adjusting against any amounts paid or becomes payable in future to the Supplier under this contract or under any other contract.

Place: [Signature of Authorized Signatory of Bidder]

Date: Name:

Designation:

Seal:



F-18

**NO CLAIM CERTIFICATE
(TO BE SUBMITTED BEFORE RELEASE OF CPS/SECURITY DEPOSIT)**

[On the Letter-head of Supplier/Vendor]

We, _____, a company incorporated under the laws of India/ a Consortium between *___ and *___ (*name of Consortium partners to be inserted*)/ a Partnership Firm consisting of *___ and *___ (*name of Partners to be inserted*)/ a Sole Proprietorship (as the case may be), having its registered office at _____ and carrying on business under the name and style M/s. _____ were awarded the contract by GAIL (India) Ltd. in reference to Tender No. _____ dated _____ (“Order/Contract”).

After completion of the above-said items/job under the Order/Contract, we have scrutinized all our claims, contentions, disputes, issues and we hereby confirm that after adjusting all payments received by us against our R.A. Bills and final bill, we have no claims, dues, issues and contentions from GAIL (India) Ltd.

We further absolve GAIL (India) Ltd. from all liabilities present or future arising directly or indirectly out of the Contract.

There is no economic duress or any other compulsion on us for submission of this no claim certificate.

Signature with Seal of Supplier/Vendor

Dated:

SECTION IV

GENERAL CONDITIONS OF CONTRACT (GCC)

*General Conditions of Contract - Works
is available on GAIL's Tender website
(<http://gailtenders.in/Gailtenders/gccs.asp>).*





SCOPE OF WORK – Ranchi Office Building Interior package

Name of Work: Interior, MEP and related works for Office Building at Ranchi, Jharkhand

The Scope of Work comprises execution of Civil interior, furnishing, Internal Electrification, Plumbing, Fire Fighting, High Side Electrical works including CSS, LT and other Panels, DG, UPS, HVAC (High & Low) work, Water supply, Sewerage System, Storm water Drainage System, Furniture, Solar system installation, Water fountain, LAN, CCTV, Access control system(ACS), Fire alarm system, Public address(PA) system, Audio visual(AV) system, DATA & Telephone Network, Building Management System(BMS) etc. and any other services required to make the office building operational.

The scope of work has been detailed in the item rate Schedule of rates (SOR).

Scope shall also include the provision for barricading (if required), site approaches, godown, site office etc., stability, safety of neighbors' property during entire construction period and getting completion certificate and other clearances from local authority if required. The requisite statutory fees if required for such permission shall be paid by the Contractor and will be reimbursed subsequently to him upon submission of Receipt from the Authorities. Engineer-in-charge will provide all assistance in getting the completion certificate. Further, GAIL has kept statutory permission items in the BOQ and shall be paid to the contractor on completion of each stage of permission/ certification.

Works shown upon the drawing but not mentioned in the specifications or described in the specifications without being shown on the drawings shall nevertheless be held to be included in the same manner as if they had been specifically shown upon the drawings and described in the specifications.

In these contract documents unless otherwise stated specifically, the singular shall include the plural and vice versa wherever the context so requires

Wherever it is mentioned in the Specifications that the Contractor shall perform certain work or provide certain facilities, it is understood that the contractor shall do so at his cost.



Further, contractor shall make their own arrangements for making a temporary site office, store, godown on their own cost and nothing extra shall be paid for the same and decision of the EIC shall be final and binding in this regard.

The materials, design and workmanship shall satisfy the relevant Indian Standard, CPWD specification, MOST specifications and the Specifications contained herein and codes referred to. Where the Specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall be approved by the Engineer – in – charge / Consultant. In case of any ambiguity, sound engineering practices shall prevail and the decision of engineer in charge in such matters shall be final.



SPECIAL CONDITIONS OF THE CONTRACT (SCC)



1.0 GENERAL

- 1.1. Special Conditions of Contract shall be read in Conjunction with the General Conditions of Contract, specification of work, Drawings and any other documents forming part of this Contract wherever the context so requires.
- 1.2 Notwithstanding the sub-division of the documents into these separate sections and volumes, every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the Contract so far as it may be practicable to do so.
- 1.3 Where any portion of the General Condition of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears, the provisions of the special Conditions of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract and shall to the extent of such repugnancy, or variations, prevail.
- 1.4 Wherever it is mentioned in the specifications that the Contractor shall perform certain work or provide certain facilities, it is understood that the Contractor shall do so at his cost and the value of contract shall be deemed to have included cost of such performance and provisions, so mentioned.
- 1.5 The materials, design, and workmanship shall confirm CPWD specifications and the relevant Indian Standards and, the Job Specifications contained herein, and Codes referred to. Where the job specification stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.
- 1.6 It will be the Contractor's responsibility to bring to the notice of Engineer-in-Charge any irreconcilable conflict in the contract documents before starting the work (s) or making the supply with reference which the conflict exists.
- 1.7 In the absence of any Specifications covering any material, design of work (s) the same shall be performed / supplies / executed in accordance with Standard Engineering Practice as per the instructions / directions of the Engineer-in-Charge, which will be binding on the Contractor.
- 1.8 GAIL has engaged **M/s CP & DS Associates Pvt. Ltd.** as their Architect and Project Management Consultant. They shall be responsible for Project Monitoring, Periodic Supervision of Construction Activities at site, Quality Control, Checking & Certification of Contractors Bill and recommending to GAIL, conducting Project Review meeting, Closure of contract and all other related activities as required during construction.

2.0 OWNERS OBLIGATIONS:

The owner's obligations are limited to the following:

- a) Handing over the site.
- b) Supply of construction drawings.
- c) Payment to the contractor for performance of work under the contract as per the terms and conditions specified therein.
- d) A piece of land for setting up temporary office, godown, etc. if required.

3.0 POWER & WATER FOR CONSTRUCTION AND OTHER PURPOSES



Water may not be available at the site. In the absence of the same, the contractor shall require to, at his own expense (if not covered in BOQ), dig a bore well and shall make arrangements for pump/ motor and piping etc. for drawing and distributing water.

Power- is not available on site and the contractor may take temporary connection from state electricity authorities and make all arrangements for meter, MCB, cable and all accessories required for drawing construction power. Alternatively, the contractor can also make alternative provisions for power like DG set etc. at his own cost.

4.0 TERMS OF PAYMENT

4.1 Based on checked measurements, the contractor should prepare a running account bill.

4.2 Contractor shall submit the measurement sheet along with the bill to the Project Manager of the Consultants for scrutiny and passing.

4.3 The Project Manager of the Consultant or his authorized representative at site shall scrutinize and check the measurements recorded on the sheets shall certify correctness of the same on the measurement sheets and in the bill.

4.4 The Project Manager of the Consultant shall certify the bills after carrying out the comprehensive checks in accordance with the terms and conditions of the Contract, within 05 days of submission of the bills, complete in all respects and send the same to the EIC to effect payment to the Contractor.

4.5 Engineer-in-Charge shall make all endeavors to make payments of undisputed amount of the bills submitted based on the joint measurements within 10 days from the date of certification by the Project Manager of the Consultant.

4.6 Measurements shall be recorded as per the methods of measurement spelt out in Specifications/Contract Document. Engineer-in-Charge shall be fully responsible for checking the measurements quantitatively and qualitatively as recorded in the Measurement Sheets /Bills.

4.7 While preparing the final bills overall measurements will not be taken again. Only the volume of Work executed since the last measured bill along with summary of final measurements will be considered for the final bill. However, a detailed check shall be made as to missing measurements and in case there are any missing items on measurements the same shall be recorded.

4.8 The bill shall be raised on progress basis i.e. either fortnightly/monthly/as required, for the work done on site during that period.

4.9 The invoices shall be raised to GAIL (India) Limited, Bengaluru, Karnataka .The tax invoices shall be raised to (further bill to and ship to address shall be same as per invoice address)

GAIL (India) Limited,
Ranchi,
Jharkhand

Payment shall be made on submission of Tax Invoice on VIM portal and on certification of mile stones by Engineer-in-charge.

95% amount of bill shall be paid against each RA bill and remaining 05% amount shall be released after completion of work along with final bill.



Note: EIC reserves the right to make part payments of high value items as deemed fit in the interest of the work.

4.10 Dispute in Mode of Measurement

Where Works have to be measured for any purpose whatsoever, it shall be in accordance with item specifications as per relevant Indian Standards unless otherwise specifically indicated in the Contract Specifications. All measurements will be recorded in metric units only. In case of absence of mode of measurement of any item not covered by both the methods mentioned above, the Engineer in- Charge's decision shall be final and binding. The required number of bills, registers, bill forms, level/ field books, materials/ account registers, testing registers, site order books and any other stationary item pertaining to this contract shall be printed and provided for by the contractor, at his own cost in the format prescribed and approved by the Engineer-in-Charge in writing. The Measurement Sheet will have three copies in different color pages and will be printed so that proper referring and record of complete measurement is maintained. Original sheet will be retained in the book and will be returned to Owner on completion of Work.

5.0 TIME FOR COMPLETION

Time for completion for all the works shall be **“TWELVE MONTHS FOR ALL WORKS”** (Including 15 days for Mobilization) from the date of **Handing over of site.**

The letter of Intimation regarding handing over of site shall be issued within 03 months from the date of issuance of FOA

5.1 The work shall be executed strictly as per the Time Schedule, working drawings and specification of the items included in the schedule of items. The period of work given includes the time required for mobilization and completion in all respects to the entire satisfaction of the Engineer-in-Charge and the Owner.

The time for completion is the time for overall completion of all works. The whole work will be awarded to a single Tenderer hence the Contractor shall plan and make schedule accordingly such that all Works can be completed within stipulated time limit and will constantly keep the Engineer In-Charge- aware of the Work schedule.

5.2 During this period of 12 months, GAIL may engage other agencies to work to complete the building in all respects. The Civil Contractor shall be required to coordinate with all such agencies & plan the work in such a way so that the work of his own & those other agencies don't hamper. The Contractor shall plan and make schedule accordingly such that all Works can be completed within stipulated time limit and will constantly keep the Engineer In-Charge- aware of the Work schedule.

5.3 Weekly programs of work will be drawn up by the Contractor to be approved by the Engineer In-Charge. The Contractor shall scrupulously adhere to these schedules by deploying adequate personnel and construction tools and tackles. In all matters concerning the extent of targets set out for weekly programs and degree of achievements, the decision of Engineer In-Charge- shall be final and binding.

5.4 The time for completion mentioned above shall be inclusive of any monsoon following within the aforesaid time for completion. Contract period of 12 months envisages monsoon season/ untimely occasional rainfall etc. Contractor has to make complete arrangement for dewatering, keeping the site free from water logging etc. during monsoon season or at any point of time as per the situation & site condition. The contractor's quoted rates shall be deemed to have included the same. Delay/ held up of work on account of monsoon/ rain will not be considered for granting of additional time to complete the work.



6.0 DEFECT LIABILITY PERIOD (DLP):

The defect liability period shall be **Twelve months** from the date issue of work completion certificate. Any defect arising out due to any reason, which in the opinion of the Engineer-In-Charge resulting due to above during this period shall be rectified by the contractor at his own risk and cost.

7.0 SECURITY DEPOSIT:

They shall be payable as per clause no. 38 of ITB. The bank guarantee shall remain valid for a period of **27 months (12months + DLP + 3 months)**, from the date of start of job to be reckoned from the date of issue of fax of intent/ work order.

The Security Deposit shall be released after successful completion of the defect liability period.

8.0 ESCALATION

NOT APPLICABLE

9.0 MOBILIZATION ADVANCE

NOT APPLICABLE

10.0 LABOUR AT SITE

The contractor shall arrange the accommodation of labour by own. The contractor shall build and maintain the labour colony at his own expense. Contractor will arrange for electricity and water Supply to them. Electricity and Water, if provided by the owner shall be recoverable from the Contractor.

11.0 LAND FOR CONTRACTOR'S FIELD OFFICE, GODOWN & WORKSHOP

If required, the contractor shall provide a fully furnished site office for the owner/ Architect/ PMC for an area of at least 15 Sqm area and, 15 Sqm for conference/ meeting room for conducting project review meetings with a pantry and toilet facility at his own expense.

The Owner at his own discretion and convenience and for the duration of the execution of the Work shall make available at the site, land for construction of Contractor's temporary field office, Godowns, workshops and assembly areas required for the execution of the Contract. The Contractor shall at his own cost construct all these temporary buildings and provide suitable water supply, sanitary arrangement and electrical connection/arrangement and get the same approved by the Owner.

On completion of the Works undertaken by the Contractor, he shall remove all temporary works erected by him and have the site cleaned immediately as directed by the Engineer-in-Charge. If the Contractor shall fail to comply with these requirements, the Owner may at the expenses of Contractor remove such surplus and rubbish materials and dispose of the same as he deems fit and get the site cleared as aforesaid; and Contractor shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such surplus materials disposed off as aforesaid. However, the Owner reserves the right to ask the Contractor at any time during the pendency of the Contractor to vacate the land by giving 7 (seven) days' notice on security reasons or on national interest or otherwise occupied.

The Contractor shall put up temporary structures as required by them for their office, fabrication shop and construction stores only in the area allocated to them on the project site by the Owner or his authorized representative. No tea stalls/ canteens should be put up or allowed to be put up by any Contractor in the allotted land or complex area without written permission of the Owner.



No unauthorized buildings, constructions or structures should be put up by the Contractor anywhere on the project site.

For uninterrupted fabrication work during all seasons, the Contractor shall put up temporary covered structures at his cost within the area in the location allocated to them in the project site by the Owner or his authorized representative.

No person except for authorized watchman shall be allowed to stay in the plant area/ contractor's area after completion of the day's job without prior written permission from the Owner.

12.0 EXTRA ITEMS/ SUBSTITUTED ITEMS

In respect of any Extra/ Substituted /Deleted items ordered to be executed, the rates payable shall be derived.

- a) The rates can be derived on the basis of similar items for which he has quoted rate in schedule of rates (SOR); the quote rate will be applicable.
- b) If the rates for the additional, altered or substituted work are not specifically provided in the schedule of rates quoted by contractor in SOR the rate will be derived from a similar item of work, if available, as appearing in SOR.
- c) If the rate for the item of work does not appear in the agreed schedule of work quoted by contractor in SOR, nor can the rate for such item be derived from similar item of work appearing there in, the rate payable for such item shall be derived / as per rate for such item/similar item, if available in Delhi Schedule of rates 2023 or latest DSR Published during execution of work, on basis of Delhi schedule of rates 2023 or latest DSR as published by CPWD during execution of work.
- d) If the rates for altered, additional or substituted work which cannot be determined in the manner specified in the sub-clause (a) to (c) above, in that case the rate of such items shall be derived from cost of material and labour plus 15% to cover contractors profit, overheads and other expenses. For the calculation of cost of materials and labour, the basic rates as given in Delhi schedule of rates **2023 or latest** DSR published by CPWD during execution of work shall be taken.
- e) The rates for those items of work which cannot be derived from schedule of rates (SOR) quoted by contractor, or schedule of items, basic rates of material labour as given in Delhi schedule of rates 2023 or latest DSR, the same will be derived from cost of material as per prevailing market rates (against which tax paid invoices will have to be submitted), and labour cost as per the basic rate given in DSR 2023 or latest DSR, plus 15% towards contractors overheads & profits. The opinion of the engineer in charge as to the current market rates for material and quantum of labour & material involved permit shall be final & binding on contractor. For this purpose, & for the purpose of sub clause (d) & (e) above, the coefficient of labour, material, & wastage shall be adopted from the latest Published CPWD analysis of rates / National building code / Standard Schedule of rates as decided by Engineer in charge during execution of work.

13.0 WARRANTIES AND GUARANTEES

All manufacturers' warranties & guaranties for the equipments supplied by the contractor shall be passed on to the owner.



14.0 ALTERATIONS, ADDITIONS AND OMISSIONS

The architect can make a variation of the form, quality or quantity of the works or any part there of that may in his opinion, be necessary and for that purpose or if for any other reasons it shall, in his opinion be desirable he shall have power to under in writing to the contractor to do and the contractor shall do any of the following:

-
- (A) Increase or decrease in quantity of any work included in the contract within limits and as per terms given in GCC.
- (B) Omit any such work
- (C) Change the levels, lines, position and dimension of any part of the works and
- (D) Execute additional work of any kind necessary for completion of works & no such variation shall in any way vitiate or invalidate the contract. But the value, if any of all such variation, shall be taken into account in ascertaining the amount of the contract price.

15.0 APPROVALS

All Statutory approvals wherever required such as approval & NOC from local authorities for building plans, water supply & sewer connection, electricity connection, lifts, tree cutting, shifting and re-routing of services, etc. are the responsibility of the contractor. However, any statutory payment/ licensing fees etc. to be made to local bodies etc. shall be reimbursed at actual to the contractor on submission of documents.

16.0 SELECTION OF SUB CONTRACTORS

The contractor shall employ only approved Sub-contractor for specialized items of work like STP, Waterproofing works, anti-termite, Structural Glazing, External Painting, Lifts etc. in case, in Owner/ Architect opinion, the main contractor is himself not licensed/ adequately experienced to carry out such works. For this purpose, the Contractor shall submit the complete profile of at least two Sub Contractors in each such specialized trade adequately experienced in their respective trades for approval of Owner/ Architect. In case the Contractor fails to submit necessary data or if the agencies as proposed by the Owner/ Architect (who shall not be required to give any reason thereof), such trades of work shall be got executed through agencies to be nominated by Owner/ Architect, with all cost implications & liabilities remaining the responsibility of the Contractor. In case the Contractor does not accept the decision of the Owner/ Architect on this account, this work shall be withdrawn from his contract & got executed at his risk & cost.

17.0 MEASUREMENTS

The Engineer-in-Charge shall, except as otherwise stated ascertain and determine by measurement the value of Work done, in accordance with the Contract and as per actual Work done. The Engineer-in-Charge shall, when he requires any part or parts of the Works to be measured, give notices to the Contractor's authorized agent or representative who shall forthwith attend or send a qualified agent to assist the Engineer-in-Charge in making such measurement and shall furnish all particulars required by either of them. Should the Contractor not attend or neglect or omit to send such representative then the measurement made by the Engineer –In-Charge shall be taken to be the correct measurement of the Work. For all measurements, figured dimensions given in the drawings shall be followed. Measurement of all hidden items shall be carried out by the Engineer-in-Charge. The Contractor or his representative who attends may at the time of measurement take such notes and measurements as he may desire.

Where Works have to be measured for any purpose whatsoever, it shall be in accordance with item specifications as per relevant Indian Standards unless otherwise specifically indicated in the Contract Specifications. All measurements will be recorded in metric units only. In case of absence of mode of



measurement of any item not covered by both the methods mentioned above, the Engineer in Charge's decision shall be final and binding. The required number of bills, registers, bill forms, level/field books, materials/ account registers, testing registers, site order books and any other stationary item pertaining to this contract shall be printed and provided for by the contractor, at his own cost as directed by Engineer-in-Charge.

18.0 ABNORMALLY HIGH-RATE ITEMS (A.H.R.)

In item rate contract/ item rate portion of contract where the tenderer's quoted for the items exceeds 50% of the owner's estimated rate such rates shall be considered as abnormally high rates (A.H.R.) and payments of A.H.R. items beyond the

B.O.Q. stipulated quantity shall be made at the lesser of the following rates

- i) As per the quoted rate for the quantities mentioned in the tender.
- ii) Payments of A.H.R. items beyond the BOQ quantity shall be made at the least of the following rates:
 - a) Rate as per Bill of Quantities.
 - b) Rate for such item, if available in Delhi Schedule of rates 2023, on basis of Delhi schedule of rates 2023 or latest DSR published by CPWD.
 - c) Market rates (if not covered in DSR 2023) of the item which shall be derived based on actual market rate of materials against which tax paid invoice will have to be submitted & labour cost.(as per DSR 2023 or latest DSR) + 15% to cover Contractors profit overheads and other expenses
 - d) The opinion of engineer in charge as to the current market rates for material and quantum of labour & material involved permit shall final & binding on contractor. For this purpose & for the purpose of sub clause (c), the coefficient of labour, material, & wastage shall be adopted from the CPWD analysis of rates / National building code / Standard Schedule of rates as decided by Engineer in charge.

19.0 TESTING LABORATORY SET UP

DELETED

20.0 INCOMING MATERIAL REPORT

1. All material entering the site shall be properly recorded by contractor's representative with detail of challan, bill and quantity.
2. All equipment shall be inspected and tested as per an agreed quality Assurance Plan before the same is packed and dispatched from the Contractor's Works. The Contractor shall carry out tests as specified/ directed by Engineer.
3. Contractor shall perform all such tests as may be necessary to meet requirements of Local Authorities, Municipal or other statutory laws/ byelaws in force. No extra shall be paid for these.
4. The Engineer may, at his sole discretion, carry out inspection at different stages during manufacturing and final testing after manufacturing.



5. Approvals or passing of any inspection by the engineer or his authorized representative shall not however, prejudice the right of the Engineer to reject the plan if it does not comply with the specification when erected or give complete satisfaction in service.
6. All materials and equipment found defective shall be replaced and the whole work again tested to meet the requirements of the specifications, at the cost of the contractor. Contractor has to obtain a performance certificate/approval for the complete layout of piping/equipment erected.
7. For all materials of approved make, contractor shall submit the MTC (Manufacturers Test Certificate) and no further lab testing may be required for same. However, EIC at his sole discretion may ask to test certain samples of approved make and contractor shall abide by same.

21.0 QUALITY ASSURANCE PLAN

It is envisaged by the Owner that the contractor(s)/ sub-contractor(s) shall adopt appropriate Quality Assurance Program designed to generate adequate confidence in the Owner and in themselves so that the work is completed within the cost and time schedule with post execution rejections/modifications of work tending towards zero.

21.1 With the above in view, it is also contemplated that Quality Assurance Program shall be followed by the Contractor(s)/ sub-contractor(s) right from design stage to completion of the work in all the stages as per agreed Quality Assurance Program.

The detailed Quality Assurance Program for the Contract shall be mutually agreed and finalized with the successful tenderer after the award.

21.2 A Quality Assurance Program of Contractor shall generally cover but is not restricted to the following:

1. Organization structure for the management and procedure for implementation of the Quality Assurance Program.
2. Documentation to be maintained should clearly indicate details- of routine and periodical inspections and test reports including reporting frequencies, procedure, feedback data and any compliance required by technical consultant/ Project-in-charge or his representative.
3. Inspection and test procedure for site, activities including list of minimum testing facilities to be created at site by the Contractor.
4. Procedure of review and appraisal of inspection status/test results and compliance reports thereon, where so required.
5. Systems for maintenance of records and submission of relevant copies/originals to technical consultant/ Project-in-charge as required.
6. System for handling, storage and delivery of equipment and construction materials for use on works under the Contract.
7. A quality plan (QP) details out quality test/checks for all materials, the process inspection, final inspection and testing envisaged during the execution of the Contract.



8. The QP should also indicate briefly the test procedure frequency of various tests, applicable code/standard, tolerance limits/acceptance levels etc. for all type of works and for all stages of processing, under the scope of this Contract. These shall include but not be limited to the following:

- 1) All materials to be supplied and/or used on works under the Contract.
- 2) In process inspection stages of construction work.

The Quality Assurance Program including the inspection quality plans shall be mutually discussed and finalized with the successful Contractor. On such finalized document, Owner will indicate the customer inspection points/ stages beyond which work shall not proceed without the Owner's consent.

21.3 QUALITY ASSURANCE DOCUMENTS

21.3.1 The Contractor shall submit the following Quality Assurance Documents at prescribed stages during stage checks and/or completion of final inspection.

- (i) Record of the inspection and various tests with checks and verifications of all customer inspection points, approved sketches, if used, as well as final inspection and test reports and records.
- (ii) All inspection and test procedures and other examinations, procedures actually adopted during fabrication.
- (iii) All deviations / rectifications formats and reports are used to remove/make good deficiencies in respect of various non-conformities observed and recorded during execution.
- (iv) The Owner or his authorized representative reserves the right to carryout quality surveillance of the systems and procedures of the Contractor / sub-Contractors quality management system at "prior to", during and post execution stages of the works.

24.0 SECURITIES OF MATERIALS / EQUIPMENTS ON RENT

Contractor shall be solely responsible for the security of the material at site and GAIL shall not be responsible for any loss/ theft of the materials.

- a) Materials required for the works, whether brought by the Contractor shall be stored by the Contractor only at places approved by the technical consultant/Project-in-charge, as storage and safe custody of material shall be responsibility of the Contractor.
- b) GAIL officials concerned with the Contract shall be entitled at any time to inspect and examine any materials intended to be used in or on the works, either on the site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or at any place(s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be required for such inspection and examination.
- c) All materials brought to the site shall become and remains the property of the GAIL and shall not be removed off the site without the prior written approval of the technical consultant/Project-in-charge. But whenever the works are finally completed and advance, if any, in respect of any such material is fully recovered, the Contractor shall at his own expenses forthwith remove from the site all/surplus material originally supplied by him and upon such removal, the same shall become the property of the Contractor.

25.0 CONTRACTOR PERSONNEL AT SITE:



List of persons employed by Contractor for the subject work mentioning their residential address shall be submitted to GAIL. In case of any revision, the same shall be informed to GAIL from time-to-time. If required, the necessary verification from Police / Gram Pradhan shall have to be submitted by the contractor.

The Contractor shall be directly responsible for any/all disputes arising between him and his personnel and keep indemnified against all losses, damage and claims arising thereof.

Within the GAIL's premises, the Contractor's personnel shall not do any private work other than their normal duties.

The personnel engaged by the Contractor shall be subject to a security check by the GAIL's security staff while entering/leaving the premises. The contractor & his personnel shall be required to follow the rules and regulations of GAIL in force from time to time. The contractor may also be required to provide photo passes to the personnel required by him, for security and safety reasons and furnish the details of the same when asked for.

No other person except Contractor's authorized representative shall be allowed to enter GAIL premises Contractor shall also not entertain any outsider or extend any service beyond GAIL's premises. Entry of Contractor's persons shall be regulated with proper identity/gate pass.

The contractor shall be fully responsible for theft, burglary, fire or any mischievous deeds by his staff and any loss to GAIL shall be recovered from the immediate bill of the Contractor.

Contractor shall provide all necessary tools and tackles, equipments, safety belt, wheel burrow, scaffolding, ladders, drilling m/c & safety equipment etc. required to carry out job at his cost and material used by Contractor shall be of standard make and approval of Engineer-In-Charge shall be taken for the same.

GAIL also reserves the right to ask the Contractor to remove particular person(s) from site with immediate effect if in the opinion of GAIL, his behavior/performance is not up to the mark and/or found indulging in unlawful activities, Contractor shall immediately comply with such instructions.

It will be the responsibility of the contractor's engineer to ensure that their personnel behave in a proper manners and behavior and not to undergo the argument with the employees. It will be the responsibility of the Contractor's Engineer to deal with such complaints or co-ordinate with the GAIL Engineer.

26.0 SETTING OUT THE WORKS

The Technical consultant/ Project-in-charge shall supply dimensioned drawings, levels and other information necessary to enable the Contractor to set out the works and the Contractor shall set out the works and be responsible for the accuracy of the same. He shall rectify at his own cost and to the satisfaction of the Technical consultant/Project-in-charge any error found at any stage which may arise through in accurate setting out unless such error is based on incorrect data furnished in writing by the Technical consultant/Project-in-charge, in which case the cost of rectification shall be borne by the GAIL. The Contractor shall protect and preserve all benchmarks used in setting out the works till end of the Defects Liability Period unless the technical consultant/Project-in-charge direct their earlier removal.

27.0 SITE DRAINAGE



All water, which may accumulate on the site during the progress of the works or in trenches and excavations, shall be removed and drained out from the site to the satisfaction of the technical consultant/Project-in-charge by the Contractor at his expense.

28.0 CONTRACTOR'S SUPERVISION

The Contractor shall either himself supervise the execution of the works or shall appoint a competent representative approved by the technical consultant/Project-in-charge. If the Contractor has himself not sufficient knowledge and experience to be capable of receiving instructions or cannot give his full attention to the works, the Contractor, shall at his own expense, employ as his accredited representative an engineer approved by the technical consultant/Project-in-charge. Orders given to the contractor's representative shall be deemed to have the same force if these had been given to the Contractor himself. If the Contractor fails to appoint a suitable representative as directed by the Technical consultant/Project-in-charge, the Technical consultant/Project-in-charge shall have full power to suspend the execution of the works until such date as a suitable representative is appointed and the Contractor shall be held responsible for the delay so caused to the works.

29.0 INSPECTION AND APPROVAL

29.1 All works embracing more than one process shall be subject to examination and approval at each stage thereof or one stage as per instruction of technical consultant/ Project-in-charge. The Contractor shall give due notice to the technical consultant/ Project-in-charge or his authorized representative when each stage is ready. In default of such a notice, the technical consultant/ Project-in-charge shall be entitled to appraise the quality by such measures as considered appropriate, at the cost of the Contractor.

29.2 No work shall be covered up or put out of view without the approval of the Technical consultant/ Project-in-charge or his authorized representative and the Contractor shall afford full opportunity and facility for examination and measurement of any work which is about to be covered up or put out of view, this applies to examination of foundation also before permanent work is placed thereon. The Contractor shall give due notice in writing to the Technical consultant/ Project-in-charge or his authorized representative whenever any such work or stage of work including foundation work is ready for examination prior of start of concreting or covering up of the foundation and the Technical consultant/ Project-in-charge or his representative shall without reasonable delay, unless he considers it unnecessary and advises the Contractor in writing accordingly, attend for the purpose of examining and measuring such work or of examining such foundations. In the event of the failure of the Contractor to give such notice in writing he shall, if required by the technical consultant/ Project-in-charge, uncover and dismantle such work at the Contractor's expense.

29.3 The Technical consultant/ Project-in-charge or his representative shall have powers at any time to inspect and examine any part of the works and the Contractor shall give such facilities as may be required for such inspection and examination.

30.0 CONTRACTOR'S LIABILITY AND INSURANCE

After award of work, the contractor is required to take Workmen compensation policy and Comprehensive all risk policy for the works for the full duration of the contract and for periods when the contract is extended for any reason at his own expenses.

Labour Cess of 1% (or as per prevailing rate, if applicable) under BOCW Act to be deposited by contractor to concerned authority, and proof to be submitted along with RA/Final bills.



31.0 SAFETY REGULATIONS

The contractor shall abide by all safety regulations and ensure that safety equipment, PPE's for specific job is issued to the employee during the execution of work, failing which all the works at site will be suspended. No work shall be allowed unless proper working condition and required PPE's are made available by the contractor to ensure safe performance of the work in the working area.

32.0 PHOTOGRAPHS/ LABOUR PERMISSION/ VEHICLE PERMISSION

The contractor shall arrange to make photo gate passes /labour permissions/ vehicle passes etc. for his persons/ labours/ vehicles for working in site plant premises at his own cost as rules of the company.

33.0 SECURITY

The contractor shall have total responsibility for all equipment and materials in his custody stores loose, semi-assembled and/or erected by him at site. All materials in the contract shall enter or leave the site only with the written permission of the Engineer-in-Charge.

34.0 COMPENSATION FOR EXTENDED STAY

NOT APPLICABLE.

35.0 SPECIAL NOTE TO TENDERERS

While quoting the rates in the tender by the tenderer they should consider all the provisions of the tender including statutory requirement prevailing during the course of the contract.

The special conditions of contract supersede the relevant clauses of General Conditions of Contract.

36.0 PRICE REDUCTION SCHEDULE (PRS)

Price Reduction Schedule shall be applicable as per the provisions of ITB and General Conditions of Contract of tender. Total contract value excluding taxes and duties shall be considered for PRS.

37.0 CONSTRUCTION MATERIAL AND EQUIPMENT:

The contractor shall ensure all equipment and material to be available on site required for execution of works as per tender specifications and to the satisfaction of the EIC.

The material and equipment shall not be demobilized or removed from the site without prior written approval of the Superintending Engineer/Consultant, GAIL.

In case of any default on the above provisions after the award of contract, the bidder shall be liable for penal action including cancellation of contract and forfeiture of security deposit and further legal action.

The Engineer in Charge may direct the contractor for additional machines and equipments as per the need of the work whenever it is felt necessary by him.



38.0 CONDITIONS

The tenderer / contractor must visit the premises and ascertain the type and nature of work before quoting the rates. It is understood that the tenderer / contractor has satisfied himself with the information and knowledge required before bidding and as quoted rates shall remain firm during the currency of the contract.

The quoted rates shall include all costs for transportation of material to and from the premises as and when required. Nothing extra is payable on this account. Transportation of any wastage, exchange of rejected or defective material, surplus material etc. shall have to be arranged by the tenderer/contractor at his own risk and costs. Also, any material brought inside or taken out of the premises shall have the necessary prior permission to do so.

The rates shall also be deemed to cover working under any adverse conditions that may be required at the convenience of the occupants and under the supervision of the contractor. The rates shall also be deemed to include cost towards all essential/contingent works, tools and tackles and any other material that may have to be taken up for the effective completion of this contract.

For the execution of this Contract Agreement, Engineer-in-charge (EIC) would mean the person nominated by GAIL (India) Limited for this purpose or person(s) duly authorized by EIC.

All serviceable old material generated during the execution of the subject work shall be stacked and taken out of the GAIL premises by the contractor for their own use and GAIL shall not charge any cost for the same. Accordingly, the tenderer shall quote the rates after considering the salvage cost of the above serviceable material.

Material not found conforming to tender requirement, shall have to be unconditionally replaced by the tenderer/contractor and any damage caused by its use be made good by him.

The tenderer should take into consideration while quoting, the necessary expenses to be born by the contractor on account of testing of material to be conducted as per the frequency prescribed by Latest Published CPWD specifications.

The contract shall be carried out in a workman like manner and the workers will abide by all GAIL rule and norms while inside the premises. They shall also restrict movement to their place of work only. The workman shall work in close co-ordination of any other agencies working at site. This shall be adhered to at no extra cost.

The tenderer/ contractor shall be responsible for any injury caused to persons, animals or things (fittings/ fixtures/ furnishings etc.) any damage caused to any property of GAIL etc., which may arise from the operations or neglect of any person of the tenderer/ contractor's team, or any person engaged by him for any purpose related to the execution of this contract. This clause shall include inter alias, any damage to buildings, roads, streets, footpaths etc. adjacent to or otherwise to the premises. The tenderer/contractor shall indemnify GAIL of all liabilities arising out of his operations in any way under any acts of the Government and in award of any compensation or damaged consequent upon any claim arising out of the above. The tenderer/contractor shall further make good all damage caused thus either to GAIL or any third party.

The tenderer shall indemnify GAIL under Workmen's Compensation Act, Fatal Accident Act, Personal Injuries Act, Insurance Act etc. and or their Industrial Legislation in force from time to time. The contractor / tenderer shall indemnify GAIL for compliance with the labour laws.



In the event of any accident occurring during work, which may result in any injury to a person, the responsibility of their medical treatment will fully rest with the tenderer/contractor and expenditure incurred thereon will be borne entirely by the tenderer/contractor. GAIL shall be totally indemnified from any liability whatsoever.

Compliances under various Labour Laws

The Contractor has to fully comply with all applicable Labour Laws and Regulations passed, modified and notified from time to time by the Central, State and Local Government agencies/authorities. Specific attention of the Contractor is drawn to the following obligations amongst others:

1. The Minimum Wages Act, 1948, Payment of Wages Act, 1936 and Payment of Bonus Act 1965 or The Code on Wages, 2019 (after it comes into force)

1.1. Minimum Wages:

- a. During the tenure of the contract, the Contractor must ensure the payment of minimum wages, as notified by the Central Government or State Government whichever is higher, as per the provisions of the Minimum Wages Act, 1948 / Code on Wages, 2019 (after it comes into force).
- b. **Wage period and monthly wages:** Wage period shall be monthly and wages for a month shall be calculated by multiplying daily rate of Minimum Wages by 26. The monthly wages include the wages of the weekly days of rest as applicable to the office/establishment of GAIL.

Deduction in case of any days of absence other than weekly days of rest shall be calculated using the following formula:

$$\text{Deduction for absence} = \text{days of absence} \times \text{applicable wage rate}$$

1.2. Payment of Wages:

- a. The Contractor shall disburse monthly wages **through e-banking / digital mode through cashless transaction only**, and avoid illegitimate deductions and maintain records /returns as prescribed. The Contractor shall be solely responsible for the payment of wages and other dues to the resources, if any, deployed by him latest by 7th day of the subsequent month as per the provisions of the Payment of Wages Act, 1936 / as applicable under Code on Wages, 2019 (after it comes into force) in the presence of Engineer In-charge (EIC) or authorized representative of GAIL. After disbursement of wages, the representative of the Contractor and EIC/ authorised representative of GAIL have to certify the payment of wages to the resources and sign the Wage Register - Form B (under The Ease of Compliance to Maintain Registers under various Labour Laws Rules, 2017) / FORM-I of Code on Wages, 2019 (after it comes into force) with specific seal detailing name/designation/Company.

1.3. Payment of Bonus:

Contractor shall ensure payment of bonus as per the provisions of the Payment of Bonus Act, 1965 / Code on Wages, 2019 (after it comes into force). Present minimum rate of payment of Bonus as per the Payment of Bonus Act, 1965 is 8.33% of minimum wages per month or 8.33% of Rs.7,000/- per month whichever is higher. The rate shall be subject to amendments made from time to time to the legislation.

Payment of Bonus / ex-gratia shall be made preferably before Deepawali festival falling after the end of relevant financial year(s) and the balance payment at the time of closure of contract.

For service contracts, the payment towards the bonus/ex-gratia (**made on yearly basis**) shall be released / reimbursed to the contractor, after submission of proof of payment. No reimbursement shall however be applicable in works contract.

2. Leaves/ Leave with wages/ Holiday:

The Contractor shall comply with all the applicable leave Rules including leave with wages in terms of applicable labour legislations i.e. Factories Act, 1948 / Shops & Establishment Act/ Industrial Establishment (national & festival holidays, casual & sick leave) Act, 1965.

The Contractor shall extend the leave with wages and maintain the Register of Leave pertaining to the resource deployed. The payment towards un-availed leave, as per the Factories Act, 1948 / Shops & Establishment Act, shall be settled with the resource at the time of closure of the contract or separation of resource from the contract by the contractor.

- i. As per the **Factories Act, 1948 (if applicable)**:-Annual Leave with Wages @ 01 day for every 20 days of work performed by him in the previous calendar year becomes due.
- ii. As per the **Shops & Establishment Act (if applicable)** : Privilege Leave not less than 15 days and Sickness/Casual Leave not less than 12 days (this provision may vary from state to state).
- iii. As per the **Industrial Establishment (National & Festival Holidays, Casual & Sick Leave) Act, 1965 / Negotiable Instrument Act 1881 / Shops & Establishment Act (as applicable)**: (a) three national holidays of one whole day each on the 26th January, 15th August and 2nd October (b) five other holidays on any of the festivals specified in the - Schedule appended to this Act. (c) Every worker shall in each calendar year, be allowed by the employer 07 casual leave and 14 sick leave in such manner and on such conditions as may be prescribed (This provision may vary from state to state).

3. The Employees' Provident Fund & Miscellaneous Provisions Act 1952

- a) The Contractor shall have independent PF code no. with the RPFC as required under the Employees' PF & Misc. Provisions Act, 1952.
- b) The Contractor has to ensure compliance (as per prevailing rates) and extend benefits under the Employees' Provident Fund Scheme 1952, the Employees' Pension Scheme 1995 & the Employees' Deposit Linked Insurance Scheme, 1976 to the resources deployed by him.
- c) The Contractor is required to submit copies of *separate e-Challans / ECR alongwith proof of payment/receipt* in respect of resources engaged through this contract only, on monthly basis. **Common challans would not be acceptable in GAIL.** The Contractor should submit copies of previous months EPF e-Challans / ECR alongwith current month's bill. The TRRN. No. of the ECR would be verified online from EPFO portal by the Engineer-in-charge to confirm the status of payment and names of the resources deployed.
- d) **PF is mandatory irrespective of the number of resources deployed** by the Contractor under this contract. **PF membership and deposit of PF contribution is also mandatory even if the wage payment to the resource is exceeding the prescribed monthly wage ceiling (i.e. Rs. 15,000/-)**

under the Employees' PF & Misc. Provisions Act, 1952 and in such case the liability of the Contractor towards PF contribution shall be limited to the prescribed monthly wage ceiling notified from time to time (i.e. Rs. 15,000/- currently).

- e) In case, the Contractor deploys any “**International Worker**”, the Contractor should also make compliance under para 83 of EPF Scheme, 1952 i.r.o the “International Workers” and must register on the *International Worker Portal of EPFO*.

4. The Employees' State Insurance Act, 1948 (If applicable and as per prevailing rates)

- a) The Contractor shall have his own ESI code No. allotted by Employees' State Insurance Corporation (ESIC) as required under the Employees' State Insurance Act, 1948.
- b) The Contractor has to arrange **Smart Cards (i.e. ESI Identity Card) /e-Pehchan Card** for the resource(s) engaged by him from the Corporation.

5. The Employees' Compensation Act 1923 (wherever applicable)

In case, the work place is out of the notified coverage area under ESIC i.e. ESIC is not implemented in the area or in case of excluded employees under ESIC, the Contractor is required to take Employee Compensation / Workmen Compensation Policy from IRDAI approved Insurance Company taking into consideration the **maximum compensation liability** as per provisions of Employees' Compensation Act, 1923. It must be ensured that the contractor/contracting firm should extend coverage to the contract workers through Employee Compensation Policy, to meet the **Compensation Liability under Employee's Compensation Act, 1923** along with **Medi-claim Floater Policy with a coverage of Rs. 3 Lakhs per resource covering his/her spouse and two children.**

6. Group Personal Accident Insurance Policy

The Contractor is required to take a Group Personal Accident Insurance Policy with coverage of **Rs. 5 Lakhs** (covering death, permanent disability + partial disability) per resource for the entire period of contract covering all resources deployed under the contract.

7. The Payment of Gratuity Act, 1972

In case of Death or permanent disablement of a resource during execution of work under the contract, the Contractor has to pay the Gratuity as per the provision under the Payment of Gratuity Act, 1972 to the nominee(s) of the resource as per the details maintained in the duly signed Nomination Form maintained by the Contractor. The proof of disbursement may be submitted to the EIC for claiming reimbursement of amount paid towards death Gratuity from GAIL.

8. The Contract Labour (R&A) Act, 1970

- a) The Contractor is required to obtain Labour license under the provisions of the Contract Labour (R&A) Act, 1970 from the office of Licensing Officer, Central Labour Authority, Ministry of Labour and Employment, Govt. of India having jurisdiction of the Region.
- b) The Contractor shall discharge obligations as provided under the Contract Labour (R&A) Act, 1970 rules and regulations framed under the same and enforced from time to time.

- c) The Contractor shall ensure regular and effective supervision and control over the resources deployed for which a supervisor / representative of the Contractor should be available at all the times for giving suitable direction for undertaking the Contractual Obligations.
 - d) The Contractor is solely responsible for payment of wages to each resource deployed by him and such wages shall be paid before the expiry of such period as may be prescribed.
 - e) It shall be the duty of the Contractor to ensure the disbursement of wages to resource(s) through e-banking/digital mode. In case the resource does not have a bank account, the disbursement of wages may be made in cash in the presence of the Engineer-in-charge / authorized representative of GAIL initially and Contractor shall simultaneously arrange for opening the bank account of each contract labour deployed by him.
 - f) In case, the Contractor fails to make payment of wages and deposit of PF contribution within the prescribed period or makes short payment of wages / short deposit of PF contribution, **it shall be treated as FAILURE and action as per the provisions of General Conditions of Contract shall be taken. Further, GAIL as Principal Employer, will make payment of wages in full or the unpaid balance due, as the case may be, to the resource(s) deployed by the Contractor and deposit the PF contribution with PF authorities. Such amounts will be recovered from the Contractor either by deduction from any amount payable to the Contractor under any contract or as a debt payable by the Contractor.**
9. The contractor is required to comply with all applicable labour laws and regulations including, but not limited to the following:
- a) The Factories Act, 1948 / The Shops & Establishment Act, 1948 (which ever applicable)
 - b) The Maternity Benefit Act, 1961
 - c) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1979 & Building and Other Construction Workers Welfare Cess Act, 1996
 - d) The Inter State Migrant Workmen (RECS) Act 1979 (if applicable)
 - e) Contract Labour (R&A) Act-1970
 - f) Employees' Provident Fund & Misc. Provisions Act- 1952
 - g) Employees' State Insurance Act-1948
 - h) Employees' Compensation Act, 1923
 - i) Payment of Gratuity Act, 1972
 - j) Minimum of Wages Act,1948
 - k) The Payment of Wages Act,1936
 - l) The Payment of Bonus Act,1965

Responsibilities of the Contractor

1. The Contractor shall be solely responsible and indemnify GAIL against all charges, dues, claim etc. arising out of the disputes relating to the dues and employment of resources, if any, deployed by him.
2. The Contractor shall indemnify GAIL against all losses or damages, if any, caused to it on account of acts of the resource(s) deployed by him.
3. The Contractor shall indemnify GAIL from all claims, demands, actions, cost and charges etc. brought by any court, competent authority / statutory authorities against GAIL.
4. The Contractor shall also indemnify GAIL for any action brought against him for violation, non-compliance of any act, rules & regulation of center / state / local statutory authorities.
5. All resources deployed by the Contractor are deemed to be on the rolls of the Contractor.
6. **Age:** No resource below the age of 18 years shall be deployed by the contractor for the execution of the contract. However, maximum age of resources deployed under the contract would be 60 years. (In case of Security and Fire & Safety Services, no resource below the age of 18 years shall be deployed by the contractor for the execution of the contract. However, in view of nature of business operation and nature of duty, for efficacy & efficiency purpose, resources will be deployed up to the age of 58 years. However, the age limit can be relaxed for a further period of two (02) years up to the age of 60 years if the contract worker is competent, efficient and medically fit i.e. physically fit with good health, good eye sight without any disease. The contractor has to produce Medical Fitness Certificate, to this effect, against such contract workers if deployed beyond 58 years.)
7. **Appointment/Nomination of supervisor:**
As a part of the contract, the Contractor is required to appoint/nominate a supervisor (s) who will supervise, control and give directions to the resource(s) for discharging the contractual obligations. Accordingly, the Contractor has to give in writing the name and contact details of the supervisor (s) to the EIC. A copy of the same is also to be sent to HR In-charge and Security In-charge for records.
8. A copy of the Letter of Acceptance (LOA) should be submitted to the Security Department by the Contractor / his representative or supervisor for facilitating the movement of resource(s) including machine & materials involved in the contract.
9. The resources to be deputed/ deployed by the Contractor shall observe all security, fire and safety rules of GAIL while at the site/work. All existing and amended safety / fire rules of GAIL are to be followed at the work site by the Contractor and his deployed resource(s).
10. **Personal Protective Equipment / Safety Kit and Liveries:** Contractor shall ensure adequate supply of personal protective equipment / Safety Kit and Liveries as mentioned in the Scope of Work to all such resources deployed.

- 11. In case of accident, injury or death caused to the resource(s) while executing the Work under the contract, the Contractor shall be solely responsible for payment of adequate compensation, insurance money etc. to the next kith & kin of injured / diseased. Contractor shall indemnify GAIL from such liabilities.
- 12. The Contractor shall not deploy any resource suffering from any contagious or infectious disease. The Contractor shall get the deployed resource(s) examined from a civil Govt. Doctor / GAIL's Doctor.
- 13. No resource(s) or representatives of Contractor (including Contractor) be allowed to consume alcoholic drinks or any narcotics within the premises of GAIL (including Plant, Office and Residential etc.). If found under the influence of above, the Contractor shall immediately replace that resource(s) with intimation to the EIC.
- 14. While engaging / deploying the resources, the Contractor is required to make efforts to provide opportunity of employment to resources belonging to **Schedule Caste, Schedule Tribe and Other Backward Class** in order to have a fair representation of these sections of the society.
- 15. While engaging the resources, the Contractor is required to make efforts to provide an **opportunity** to candidates with experience of **apprentice training in GAIL** under the provisions of the Apprentices Act, 1961.
- 16. The Contractor is required to maintain all Registers and other records in an **office** within the premises of GAIL or at a place **within a radius of three kilometers**.
- 17. Contractor shall provide proper **Employment cards (FORM XII)** for the resource to be deployed by him, duly signed by the Contractor or authorized person on behalf of Contractor.
- 18. **Gate/ Entry Pass or Authorization:**
Entry to the premises of GAIL is restricted and is subject to appropriate entry authorization in the prescribed format of a Gate Pass or any other entry authorization w.r.t police verification as per instruction of Security department from time to time. Similarly, entry for material/ equipment's/ tools/ tackles etc. is restricted & subject to entry authorization by security department.
- 19. The Contractor shall issue **Identity cards** in his firm's name to the resource deployed.
- 20. Discipline of the resource(s) during discharge of duties must be regulated by the Contractor himself or by his representative.
- 21. **Police verification**
 - a) The Contractor (including his sub-Contractors/Petty Contractors etc, if allowed) will undertake police verification in respect of the resource(s) engaged by him in GAIL's premises. Such verification will have to be carried out from concerned police station of their permanent place of residence/present place of residence.
 - b) Further, the Contractor is advised not to deploy any resource having past criminal record in the establishment/premises of GAIL under this contract awarded to him.
 - c) In the event of violation of above clauses at (a) and (b), the Contractor will be solely responsible for the same.

- d) If any such resource(s) having criminal record is deployed by the Contractor in the premises of GAIL and has come to the notice of GAIL at any point of time, the Contractor shall immediately replace that resource(s), failing which that particular resource(s) of the Contractor will not be allowed to enter into the premises of GAIL.
- 22. While confirming to any of these conditions, the Contractor must ensure that all applicable Laws of State regarding labour, their welfare, conduct etc. are complied.
- 23. *The contractor shall ensure the KYC of contract workers in EPFO portal at all time during the period of contract and submit a proof of the same to the Engineer-in-charge.*
- 24. *The contractor shall ensure that the nomination of contract workers deployed by him under the said contract is duly updated in the EPFO Portal.*

Compliance of Government of India Directives

1. Pradhan Mantri Suraksha Bima Yojna (PMSBY) and Pradhan Mantri Jeevan Jyoti Bima Yojna (PMJJBY)

Contractor shall, ensure that all its resources deployed under this contract have obtained additional insurance coverage under the Pradhan Mantri Suraksha Bima Yojana (PMSBY) and Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) through the participating banks and submit the proof of such insurance coverage to the satisfaction of GAIL. The Contractor shall submit evidence / proof to GAIL in this respect. Both the schemes are to be regulated continuously on yearly basis and the same should be renewed on each successive relevant date in subsequent years during the period of the contract.

2. Labour Identification Number (i.e. LIN) Registration (Mandatory)

The Unified Shram Suvidha Portal, developed by Government of India, facilitates reporting of Inspections & submission of Returns and has also been envisaged as a single point of contact between employer, resources and enforcement agencies bringing in transparency in their day-to-day interactions. For integration of data among various enforcement Agencies, the Contractor, as an inspectable unit, is required to register and obtain Labour Identification Number (i.e. LIN) from Shram Suvidha Portal and submit the same in GAIL.

3. Pradhan Mantri Rojgar Protsahan Yojna (PMRPY) / Aatmanirbhar Bharat Rozgar Yojana (ABRY)/ Pradhan Mantri Garib Kalyan Yojana– if applicable

In order to support the Govt. of India's Initiative on Employment Generation, the Contractor must register for Pradhan Mantri Rojgar Protsahan Yojna (PMRPY) Scheme / Aatmanirbhar Bharat Rozgar Yojana (ABRY) /Pradhan Mantri Garib Kalyan Yojana (as applicable). In service contracts, the Contractor shall inform GAIL/Engineer in Charge about the benefit availed, if any, against the scheme for adjustment against the invoice(s) / bill(s).

Records and Registers

1. Maintenance of records and registers

The Contractor is required to maintain statutory records and registers for applicable labour laws as prescribed under the following rules:

- a) Ease of Compliance to Maintain Registers under the various Labour Laws, 2017
- b) Rationalization of Forms and Reports under Certain Labour Laws Rules, 2017
- c) Labour Codes (after they are made effective by Government of India)

2. The Contractor has to maintain the following (but not limited to) Registers/ Forms/ Reports / Returns at all times:

- a) Employee Register in FORM A (to be replaced by FORM – IV of Code on Wages-2019 after it comes into force)
- b) Wage Register in FORM B (to be replaced by Register of Wages, Overtime, Fine, Deduction for damage and Loss in FORM – I of Code on Wages-2019 after it comes into force)
- c) Register of Loan / Recoveries in FORM C
- d) Attendance Register in FORM D
- e) Register of rest/leave/leave wages in FORM E
- f) Copies of Wage Slips in FORM XIX (to be replaced by FORM – V of Code on Wages-2019, after it comes into force)
- g) Copies of Employment Card in FORM XII

3. Documents to be submitted by the Contractor to EIC at various stages during the currency of the contract

a) Immediately after issuance/receiving of Letter of Acceptance (LOA)

- i. Details as required for issuance of **FORM - VII (Notice of Commencement of Work)**
- ii. Application for issuance of **FORM –III (Form of Certificate by Principal Employer)** for obtaining Labour License from Licensing Authority for engaging 20 or more resources.
- iii. Copy of **FORM - VI (License)** before commencement of work if 20 or more resources are engaged.
- iv. Copy of **Provident Fund Registration Certificate** issued by concerned Regional Provident Fund Commissioner.
- v. Copy of **ESI Registration Certificate** issued by concerned ESIC.
- vi. Copies **Insurance Policy(ies)** as mentioned at *Annexure-iv*
- vii. Copy of **Labour Identification Number (i.e. LIN) Registration** done in **Shram Suvidha Portal** of Govt. of India.
- viii. Copy of registration under the Building and Other Construction Workers (RE&CS) Act, 1996 in case he employs ten or more building workers in any building or other construction work.

b) At the time of submission of monthly bills

- i. Copy of **Employee Register in FORM – A** under The Ease of Compliance to Maintain Registers under various Labour Laws Rules, 2017 (to be replaced by FORM – IV (of Code on Wages-2019, after it comes into force).
- ii. Copy of **Wage Register in FORM – B** under The Ease of Compliance to Maintain Registers under various Labour Laws Rules, 2017 (to be replaced by Register of Wages, Overtime, Fine, Deduction for damage and Loss in FORM – I of Code on Wages-2019, after it comes

into force) duly certified by **authorized representative** of the Contractor and **authorised person** in GAIL certifying as “*Certified that the amount shown in the column No. ---- has been paid to the workman concerned in my presence on----- (date) at ----- (place)*” along with **copy of bank statement** duly certified by bank and *copy of online transaction statement against each resource with details of name, account number, amount paid & date of payment* as proof of **Cashless Transaction / Payment of wages through e-banking/digital mode.**

- iii. As a part of compliance and proof of depositing Provident Fund, EDLI and ESI contributions the Contractor shall submit copies of the **Separate eChallans / ECR**, bank receipts/bank statement in respect of resources deployed in GAIL in the previous month in this contract. The documents should also contain details of resources, PF account No., ESI No., contributions of resources and employer etc.
- iv. Dully filled in statement as per **Annexure- i.**
- v. Copy of Wage Slips in FORM XIX
- vi. *Proof of deposit of Cess under The Building and Other Construction Workers' Welfare Cess Act, 1996, (if applicable)*

c) **At the time of closure of contract**

- i. **Indemnity Bond** of Rs. 100/- duly notarized from Notary indemnifying GAIL from all liabilities w.r.t. the resource engaged by the Contractor regarding payment of wages, Provident Fund/ESI contributions, Insurance and other statutory payments. Format for Indemnity Bond is enclosed at **Annexure- ii.**
- ii. Copy of the **Wage Register** in **FORM – B** (to be replaced by FORM-I of Code on Wages-2019 after it comes into force) for the last month.
- iii. Copies of **Service Certificates** issue to resource in **FORM VIII**
- iv. Copy of the ECR related to EPF and ESIC Compliance in respect of Resource.
- v. Details as required for issuance of **FORM - VII (Notice of Completion of Work)**
- vi. Copies of FORM-C & FORM –D under the Payment of Bonus Act 1965 as proof of payment towards Bonus.
- vii. Copy of proof towards release of Leave Encashment
- viii. Copies of No Dues Certificate from contract workers stating they have received all statutory payments and social benefits.
- ix. *Proof towards PF KYC compliance of contract workers*
- x. *Proof of deposit of total Cess under The Building and Other Construction Workers' Welfare Cess Act, 1996, (if applicable) with final assessment from respective Cess Collector(s).*

4. **Verifications of bills and documents submitted by the Contractor**

Before certifying/verifying the running/ final bill/invoice of the Contractor, the designated EIC of the respective contract of GAIL, shall verify from the ECRs of PF/ESI, through respective web portals, the detail/status of the payment made by the Contractor. In case the information furnished by the Contractor is found to be incorrect, GAIL shall take appropriate action against the Contractor under relevant conditions as available in the tender document.

Statement in support of RA Bill for the Month of _____, 20__

- (1) Name of the Firm/Agency/Contractor _____
- (2) Nature of Contract: Job/ Service _____
- (3) Period of Contract: From _____ to _____
 (a) Extension Period of Contract, if any from _____ to _____
 (b) Place where contract workmen are working _____
- (4) Postal address of the Contractor: _____
- (5) Phone No. of the Contractor: _____
- (6) Fax No. and Email of the Contractor: _____
- (7) Name and Address of PF office from where EPF Code No. has been allotted: _____
- (8) EPF Code No. allotted by PF office: _____
- (9) Name and Address of ESIC office from where ESI Code No. has been allotted: _____
- (10) ESI Code No. allotted by ESIC office: _____
- (11) Labour License No. _____ dated _____
- (12) Validity period of Labour License from _____ to _____
- (13) Detail of Resource engaged by the Contractor:

Category	No. of Resources		Prevailing Minimum Wages
	Male	Female	
Unskilled			
Semi-skilled			
Skilled			
Highly skilled			
Total			

- (14) Copy of Wage Register in FORM – B (to be replaced by FORM-I as per Code on Wages-2019, after it comes into force)
- (15) Details of deposit of contribution towards EPF:
 a) EPF Challan No. _____ Amount _____ Date _____
- (16) Details of Deposition of contribution towards ESI
 a) ESI Challan No. _____ Amount _____ Date _____
- (17) Whether any arrangement / agreement has been entered with any resource for extending benefits under Inter-state Migrant Workmen (RE&CS) Act, 1979: ____ (Yes / No)
 If Yes, No. of such Inter-state Migrant Workers: _____

SIGNATURE OF CONTRACTOR/AUTHORIZED REPRESENTATIVE

Place:

Date:

INDEMNITY BOND

WHEREAS GAIL(India) Limited (hereinafter referred to as GAIL) which expression shall, unless repugnant to the context include their legal representatives, successors and assigns, having their Registered Office at 16, Bhikaiji, Cama Place, R.K. Puram, New Delhi has entered into a CONTRACT with <name of the Contractor> Incorporated (hereinafter referred to as the ('CONTRACTOR') which expression shall unless repugnant to the context include their legal representatives, successors and assigns, having their Registered Office ----- for Rs. -----for <NAME OF THE CONTRACT> ---- for a period of-----” and on the terms and conditions as set out, inter-alia in the Letter of Acceptance No. -----and various documents forming part thereof hereinafter collectively referred to as the ‘CONTRACT’ which expression shall include all amendments, modifications and / or variations thereto.

GAIL has also requested the CONTRACTOR to execute an Indemnity Bond in favour of GAIL indemnifying it from all consequences which may arise out of any Case filed by any Resources/ vendors/ sub- Contractors /partner etc. who may have been engaged by the CONTRACTOR directly or indirectly with or without consent of GAIL for above works , which may be pending before any court of Law including Quasi-Judicial Authority , Competent Authority, Labour Court , Arbitrator , Tribunal etc. and the Contractor has readily agreed for the same.

NOW, THEREFORE, in consideration of the promises aforesaid; the CONTRACTOR hereby irrevocably and unconditionally undertakes to indemnify and keep indemnified GAIL from any loss, which may arise out of any such contract/Case. The CONTRACTOR undertakes to compensate to GAIL forthwith, on demand, without protest the loss suffered by GAIL together direct / indirect expenses.

AND THE CONTRACTOR hereby agrees with GAIL that:

- (i) This Indemnity Bond shall remain valid and irrevocable for all claims of GAIL arising from any such contract/case for which GAIL has been made party until now or here-in- after.
- (ii) This Indemnity Bond shall not be discharged / revoked by any change / modification / amendment / deletion in the constitution of the firm / Contractor or any conditions thereof including insolvency etc. of the CONTRACTOR but shall be in all respects and for all purposes binding and operative until any claims for payment are settled by the Contractor.

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

SIGNATURE OF CONTRACTOR/AUTHORIZED REPRESENTATIVE

Place:

Date:

UNDERTAKING

(To be submitted along with un-priced bid)

I/We hereby undertake that I/We have completely understood the statutory & non-statutory components, minimum resources required to be deployed and the cost involved thereof in deployment of resources as per the tender conditions.

I/We further undertake to ensure all compliances of the tender conditions. Any non-compliance may be construed as deficiency in the performance of the contract. If such non-compliance is noticed GAIL/owner is at liberty to take action in line with the tender conditions including termination of the contract.

Signature of Bidder.....
Name of Bidder.....

Summary of Insurance Policies

Contractor is required to cover all resources deployed by him with the following insurances / schemes:

Sl. No.	SCHEME	APPLICABILITY	PREMIUM/ CONTRIBUTION	SUM ASSURED/ BENEFITS	REMARKS
1	The Employees' State Insurance Act, 1948	Applicable to all resources of the Contractor (within ESI wage limit) working in notified area.	3.25% of wages by employer 0.75% of wages by employees	Benefits under the Employees' State Insurance Act, 1948.	
2	The Employees' Compensation Act, 1923 (in lieu of ESI - mentioned at Sl. 1)	Applicable to excluded employees under ESI and those who are working in non-notified area to extend similar benefits as available under ESI Act, 1948	Premium to be calculated considering wage limit under EC Act, 1923 (i.e. Rs. 15,000/- p.m. currently)	Maximum Compensation Liability under Employee's Compensation Act, 1923 along with a Medi-claim Floater Policy with a coverage of Rs. 3 Lakhs per resource covering his/her spouse and two children	Provides compensation and medical facility to resources.
3	Group personal Accident Insurance	Applicable to all resources of the Contractor	Based on the coverage	Insured value: Rs. 5 Lakh to cover expenses associated with any accident.	Death, permanent disablement, temporary total disability or any other medical expenses related to accident.
4	Pradhan Matri Suraksha Bima Yojana (PMSBY)	Eligibility - age group 18 to 70 years	Rs. 12/- per annum	Accidental death and permanent disability: (i) Permanent total disability - Rs. 2 lakhs. (ii) Permanent partial disability - Rs. 1 Lakh.	
5	Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)	Eligibility - age group 18 to 50 years. (can continue upto 55 years)	Rs. 330/- per annum.	Risk coverage - Rs. 2 Lakhs- in case of death due to any reason	

INTEGRITY PACT

INTRODUCTION:

GAIL as one of its endeavour to maintain and foster most ethical and corruption free business environment, have decided to adopt the Integrity Pact, a tool developed by the Transparency International, to ensure that all activities and transactions between the Company (GAIL) and its Counterparties (Bidders, Contractors, Vendors, Suppliers, Service Providers/Consultants etc.) are handled in a fair and transparent manner, completely free of corruption. Accordingly, an MOU on Integrity Pact has been signed on 23.07.2007 by GAIL with Transparency International India.

Considering the above, the details mentioned at attached Annexure-1 are applicable as stated in Instruction to Bidders of Bid Document in addition to the existing stipulation regarding Corrupt and Fraudulent Practices.

The attached copy of the Integrity Pact at Annexure- 2 shall be included in the Bid submitted by the bidder (to be executed by the bidder for all tenders of value Rs. 1 (One) crore and above). In case a bidder does not sign the Integrity Pact, his bid shall be liable for rejection.

Bidder is required to sign the Integrity Pact with GAIL as per format & terms and conditions enclosed with tender. In case a bidder does not sign the Integrity Pact, his bid shall be liable for rejection.

I COMMITMENTS AND OBLIGATIONS OF THE “COUNTERPARTY”

- a) The Counterparty, directly or indirectly (through agent, consultant, advisor, etc.), shall not pay any bribe/ influence or give undue/ unlawful benefit to anyone to gain undue advantage in dealing with GAIL.
- b) The Counterparty will not engage in collusion of any kind including price fixation etc. with other Counterparts.
- c) The counterparty will not pass GAIL’s confidential information to any third party unless specifically authorized by GAIL in writing.
- d) The Counterparties shall promote and observe best ethical practices within their respective organizations.
- e) The Counterparty shall inform the Independent External Monitor.
 - i) If it received any demand, directly or indirectly, for a bribe/ favour or any illegal gratification/ payment / benefit;
 - ii) If it comes to know of any unethical or illegal payment / benefit;
 - iii) If it makes any payment to any GAIL associate.
- f) The Counterparty shall not make any false or misleading allegations against GAIL or its associates.

II VIOLATIONS & CONSEQUENCES:

- a) If a Counterparty commits a violation of its Commitments and Obligations under the Integrity Pact Programme during bidding process, their entire Earnest Money Deposit/ Bid Security, would be forfeited and in addition, action shall be taken as per **“Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices”**
- b) In case of violation of the Integrity pact by Counterparty after award of the Contract, GAIL shall be entitled to terminate the Contract. Further, GAIL would forfeit the security deposits/ Contract Performance Bank Guarantee and in addition, action shall be taken as per **“Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices”**

INDEPENDENT EXTERNAL MONITORS (IEMS)

Presently the panel consisting of the following Independent External Monitors (IEMs) has been appointed by GAIL, in terms of Integrity Pact(IP) which forms part of GAIL Tenders / Contracts.

- i) Shri Deepak Kashyap, (email id : deepakkashyapnd02@gmail.com)
- ii) Shri Yogendra Tripathi (email id : yogendratripathi@yahoo.com)
- iii) Shri Amrit Lugun (email id : asha74lugun@gmail.com)

This panel is authorised to examine / consider all references made to it under this tender/ contract. "The bidder(s), in case of any dispute(s) / complaint(s) pertaining to this tender falling under provisions of Integrity Pact may raise the same either directly with the IEMs on the panel viz Shri Deepak Kashyap, Email : deepakkashyapnd02@gmail.com , Shri Yogendra Tripathi , Email id : yogendratripathi@yahoo.com & Shri Amrit Lugun , Email id : asha74lugun@gmail.com or with CC to them through their Nodal Officer- Sh. T Xalxo, GM (C&P)- Email txalxo@gail.co.in, GAIL (India) Limited, GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi – 110066. On receipt of such complaints/representations, Nodal Officer shall coordinate with IEM Panel and GAIL authorities concerned for their disposal as per extant guidelines."

INTEGRITY PACT

(To be executed on plain paper)

Between GAIL (India) Limited, a Government of India Public Sector, (here-in-after referred to as “Principal”).

AND

_____ (here-in-after referred to as “The Bidder/ Contractor”).

(Principal and the Bidder / Contractor are here-in-after are referred to individually as “Party” or collectively as “Parties”).

PREAMBLE

The Principal intends to award under laid down organizational procedures, contract/s for _____. The Principal values full compliance with all relevant laws of land rules, regulations, and economic use of resources and of fairness /transparency in its relations with its Bidder (s) and/or Contractor (s).

In order to achieve these goals, the Principal will appoint Independent External Monitors (IEMs) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following Principles:-
 - i) No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or for a third person, any material or immaterial benefit which the person is not legally entitled to.
 - ii) The Principal will, during the tender process treat all Bidder(s) with equity and reasons. The Principal will in particular, before and during the tender process , provide to all Bidder (s) the same information and will not provide to any Bidder (s) confidential / additional information through which the Bidder (s) could obtain an advantage in relation to the tender process or the contract execution.
 - iii) The Principal will exclude from the process all known prejudiced persons.

2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal Code (IPC)/ Prevention of Corruption Act (PC Act), or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officers and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder (s)/Contractor (s)

1. The Bidder (s) / Contractor (s) commits themselves to take all measures necessary to prevent corruption. The Bidder (s)/ Contractor (s) commits themselves to observe the following principles during participation in the tender process and during the contract execution:
- i) The Bidder (s) / Contractor (s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
 - ii) The Bidder (s) / Contractor (s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other action to restrict competitiveness or to introduce cartelisation in the bidding process.
 - iii) The Bidder (s) / Contractor (s) will not commit any offence under the relevant IPC/PC Act; further, the Bidder (s) / Contractor (s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - iv) The Bidder (s)/ Contractor (s) of foreign origin shall disclose the name and address of the Agents/ representatives in India, if any. Similarly, the Bidder (s)/ Contractor (s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further, all the payments made to the Indian agent/ representative have to be in India Rupees only.
 - v) The Bidder (s) / Contractor (s) will, when presenting their bid, disclose any and all payments made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.




- vi) Bidder(s) / Contractor(s) who have signed the Integrity Pact shall not approach the Courts while representing the matter to IEMs and shall wait for their decision in the matter.
2. The Bidder(s)/ Contractor(s) shall not instigate third person to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder (s) / Contractor (s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put their reliability or credibility in question, the Principal is entitled to disqualify the Bidder (s) / Contractor (s) from the tender process or take action as per provisions of “**Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices**”.

Section 4 – Compensation for Damages

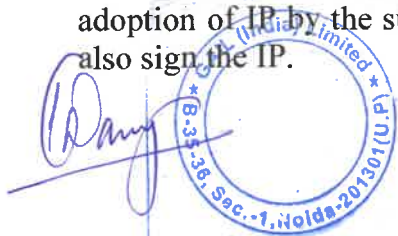
1. If the Principal has disqualified the Bidder (s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit / Bid Security .
2. If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equal to the Contract Value or the amount equivalent to Performance Bank Guarantee.

Section 5 – Previous transgression

1. The Bidder declares that no previous transgression occurred in the last three years, with any other Company in any country conforming to the anti-corruption approach or with any Public Sector Enterprise in India that could justify his exclusion from the tender process.
2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or actions can be taken as per provisions of “**Procedure for action in case Corrupt /Fraudulent/ Collusive/Coercive Practices**”

Section 6 – Equal treatment to all Bidders / Contractors / Subcontractors

1. In case of sub-contracting, the Principal contractor shall take the responsibility of the adoption of IP by the sub-contractor. It is to be ensured by him that all sub-contractors also sign the IP.



The image shows a handwritten signature in blue ink over a circular blue stamp. The stamp contains the text: "G.P. (India) Limited", "B-36", "Sec.-1, Noida-201301 (U.P.)".

2. The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 – Criminal charges against violating Bidder (s) / Contractor (s) / Sub-contractor (s)

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Section 8 –Independent External Monitor / Monitors

1. The Principal appoints competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
2. The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all documents/records pertaining to the contract for which a complaint or issue is raised before them, as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed. It will be obligatory for him/ her to treat the information and documents of the Bidders/ Contractors as confidential. He/she reports to the C&MD, GAIL.
3. The Bidder (s)/ Contractor (s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his/her request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same is applicable to Sub-contractors.
5. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

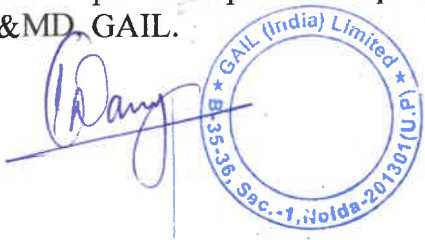


6. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he/she will so inform the Management of the Principal and request the Management to discontinue or to take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
7. The Monitor will submit a written report to the C&MD, GAIL within 30 days from the date of reference or intimation to him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.
8. If the Monitor has reported to the C&MD, GAIL, a substantiated suspicion of an offence under relevant IPC/PC Act, and the C&MD, GAIL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, then only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Central Vigilance Commission.
9. The word 'Monitor' would include both singular and plural.
10. In case of any complaints referred under IP Program, the role of IEMs is advisory and would not be legally binding and it is restricted to resolving the issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidder.
11. After award of contract, the IEMs shall look into any issue relating to execution of contract, if specifically raised before them. As an illustrative example, if a contractor who has been awarded the contract, during the execution of contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs.

Section 9 – Pact Duration

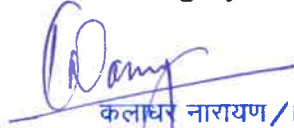
This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded. Any violation to the same would entail disqualification of the bidders and exclusion from future business dealing.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by the C&MD, GAIL.



Section 10 – Miscellaneous provisions

1. This agreement is subject to Indian Law. Place of performance and exclusive jurisdiction is the Registered Office of the Principal, i.e. New Delhi.
2. Changes and supplements as well as termination notices, if any, need to be made in writing. Side agreements have not been made.
3. If the Contractor / Bidder is a Joint Venture or a partnership concern or a consortium, this agreement must be signed by all partners or consortium members.
4. Should one or several of the provisions of this agreement turn out to be invalid, the remainder of this agreement shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions in such a case.
5. Issues like warranty / guarantee, etc. shall be outside the purview of IEMs.
6. In the event of any contradiction between the Integrity Pact and its Annexure, the Clause in Integrity Pact will prevail.



कलाधर नारायण / KALADHAR NARAYAN
 उप महाप्रबंधक (संविदा एवं क्रय-परियोजना) / DGM (C & P-Projects)
 गेल (इंडिया) लिमिटेड / GAIL (India) Limited
 जूबिली टावर / JUBILEE TOWER
 B-35 & 36, Sector-1, Noida - 201 301 (U.P.)

(For & on Behalf of Principal)

(Office Seal)

(For & on Behalf of Bidder/Contractor)

(Office Seal)

Place -----

Date -----

Witness 1:

(Name & Address)

.....

Witness 2:

(Name & Address)

.....

LIST OF APPROVED MAKES

PLEASE NOTE THAT BELOW MENTIONED ACCEPTED MAKES ARE ONLY FOR ITEMS WHERE SPECIFIC MAKES HAS NOT BEEN MENTIONED IN THE DETAILED SCHEDULE OF RATES-SOR OR ANY REASON THE SPECIFIED MAKE AS MENTIONED IN SOR IS NOT AVAILABLE OR SUITABLE AS PER SITE CONDITIONS

NOTE:

- 1. THE BELOW LIST IS INDICATIVE ONLY.*
- 2. WHEREVER MAKES ARE NOT AVAILABLE, OR EQUIVALENT MAKES ARE NOT MENTIONED; THE CONTRACTOR CAN SUBMIT ALTERNATIVE MAKES TO THE ENGINEER- IN-CHARGE/ CONSULTANT ALONGWITH PAST TRACK RECORD FOR APPROVAL.*
- 3. THE CONTRACTOR SHALL BE REQUIRED TO GET THE FINISHING ITEMS/ PRODUCTS APPROVED IN RESPECT OF THEIR MAKE, FINISH, TEXTURE, COLOUR & SUCH PARAMETERS, WHICH ARE ESSENTIAL.*

CIVIL AND OTHER RELATED WORKS

S.N.	ITEMS	APPROVED MAKE
1	GREY CEMENT	ACC, J.K, ULTRATECH, BIRLA, SHREE, LAFARGE, PRISM, JAYPEE, DALMIA, AMBUJA
2	WHITE CEMENT	JK, BIRLA WHITE OR EQUIVALENT AS APPROVED
3	WALL PUTTY	BIRLA, J.K, DALMIA SKIM COAT, SAINT GOBAIN, BERGER
4	AAC BLOCKS	MAGICRETE, KANNAV, ECO GREEN, CONECC, MEGHALITE, MAXLITE
5	PLASTER OF PARIS (POP)	JK, BIRLA WHITE, GYPROC, SRIRAM, TRIMURTI, SAKARNI
6	REINFORCEMENT/ STRUCTURAL STEEL	TATA, SAIL, RINL(VIZAG), VEDENTA ELECTROSTEEL - V-XEGA, SRMB, JINDAL PANTHER, SHYAM STEEL
7	ANTI-TERMITE TREATMENT	PEST CONTROL INDIA LTD, PEST CON INDIA, PEST CONTROL INCORPORATED, INDO GULF PEST CONTROL, MONTARI INDUSTRIES
8	CONCRETE ADDITIVE/ ADMIXTURES	CICO, PIDILITE, FOSROC, BASF, STP, BERGER, SIKA
9	PRELAMINATED FLUSH DOORS/ SHUTTERS	GREENPLY, KITPLY, AMULYA, ARCHIDPLY, DURO, GREENLAM, MERINO
10	WOODEN FLUSH DOORS / SHUTTERS	GREENPLY, KITPLY, AMULYA, ARCHIDPLY, DURO, GREENLAM, MERINO
11	METAL FLUSH DOORS/ SHUTTERS	SHAKTI HORMANN, OZONE, SIGNAM
12	PLYWOOD / BLOCK BOARD / SOFT BOARD	GREENPLY, KITPLY, MERINO, ARCHIDPLY, GREENLAM
13	PRELAMINATED MDF BOARD	GREENPLY, MERINO, ARCHIDPLY, KITPLY, GREENLAM
14	LAMINATES/ VENNER	GREENLAM, MERINO, ARCHIDPLY, KITPLY, GREENPLY, VIRGO
15	MDF BOARD	GREENPLY, DURO, MERINO, GREENLAM, CENTURY
16	ADHESIVE FOR WOODWORK	DUNLOP, FEVICOL, PIDILITE
17	POLYURETHANE SEALANT	KRYTON, PIDLITE, FAREMATE, BERGER
18	POLYETHELENE BOARD/ BACKER ROD	SUPREME INDUSTRIES, FOSROC, SIKA
19	ALUMINIUM SECTIONS	JINDAL, HINDALCO, NALCO

20	STAINLESS STEEL	SALEM STEEL, JINDAL STAINLESS, TATA STEEL
21	STAINLESS STEEL RAILING	OZONE, DORMA, KITCH, VISTA
22	EXPANSION/ FASTNERS	FISHER, HILTI, ANCHOR
23	FLOAT GLASS / TOUGHENED GLASS/ DGU/ LAQUERED GLASS/ PERFORMACE GLASS/ MIRROR	SAINT GOBAIN, ASAHI (AIS), MODIGUARD
24	CERAMIC TILES	KAJARIA, HR JOHNSON, ORIENT BELL, SOMANY, HINDWARE
25	VITRIFIED TILES	KAJARIA, ORIENT BELL, SOMANY, HR JOHNSON, HINDWARE
26	EXTERIOR WALL TILES	ORIENT BELL, UNISTONE, HR JOHNSON, DALAL TILES
27	SYNTHETIC ENAMEL PAINTS	BERGER (LUXOL GOLD), ASIAN (APCOLITE), ICI DULUX (GLOSS), SHALIMAR, NEROLAC
28	OIL BOUND DISTEMPER	ASIAN PAINT, BERGER, NEROLAC, ICI DULUX, ULTRATECH PAINTS
29	CEMENT BASED PAINT	SNOWCEM PLUS, BERGER, ASIAN, SHALIMAR, ULTRATECH PAINTS
30	PLASTIC EMULSION PAINT/ INTERIOR PAINT	OIKOS, ASIAN, BERGER, ICI, NEROLAC
31	OTHER PAINTS / PRIMERS	ICI DULUX, ASIAN, BERGER, NEROLAC, ULTRATECH PAINTS
32	EXTERIOR PAINTS	BERGER, ASIAN PAINTS, ICI, NEROLAC, ULTRATECH PAINTS
33	SURFACE TEXTURE PAINT(EXTERIOR)	OIKOS, SKK, ULTRATECH, ASIAN, BERGER, ULTRATECH PAINTS
34	SURFACE TEXTURE PAINT(INTERIOR)	OIKOS, SKK, ULTRATECH, ASIAN, BERGER, ULTRATECH PAINTS
35	DOOR / WINDOWS PATCH FITTINGS	DORMA, HETTICH, DORSET, HAFAL, OZONE, EBCO
36	LOCKS	DORSET, DORMA, HETTICH, HAFAL, GODREJ, OZONE
37	WARDROBE/ CUPBOARDS HANDLES	HETTICH, DORMA, HAFAL, DORSET, OZONE, GODREJ
38	M.S. PIPE/TUBES	JINDAL (HISAR), TATA, SAIL
39	S.S. HINGES	DORMA, HETTICH, HAFAL, OZONE, DORSET
40	M.S. HINGES	GARG, ISI MARK ANY APPROVED MAKE.
41	DOOR CLOSER	DORMA, DORSET, HAFAL, HETTICH, OZONE, DORSET

42	TOWER BOLTS (CONCEALED/ SURFACE MOUNTED)	DORMA, DOORSET, HAFALE, HETTICH, OZONE, DORSET
43	METAL FALSE CEILING (ANTIBACTERIAL / ANTI FUNGAL)	ARMSTONG, HUNTERDOUGLAS, METACIL, ANAKON, NEWAGE, ANUTONE, LINDNER, PROMINANCE
44	SILICON SEALANT	DOW CORNING, GE BAYER, WACKER, BERGER, SIKA, ALSTONE
45	PAD LOCKS	HARRISON, LINK, DORSET
46	FIRE DOORS	GODREJ, GLOBEL FIRE PROTECTION COMPANY, RADIANT STAFF FIRE DOORS, NAVAIR, PACIFIC
47	FIRE DOOR HARDWARES	HORMANN, DORMA, ASSA ABLOY, HAFELE, BECKER, PACIFIC
48	FIRE RATED GLAZING	SAINT GOBAIN, SCHOTT, PYROGUARD, GUARDIAN
49	POLYCARBONATE ROOF SHEETING	GE PLASTIC, DANPALON, POLYGAL, SABIC, LEXAN COVESTRO INDIA PVT., TUFLITE POLYMER LIMITED
50	FLOOR SPRING	DORMA, HAFALE, HETTICH, OZONE, DORSET
51	ROLLING SHUTTERS	HORMANN, AMBIENCE, OR EQUIVALENT AS APPROVED
52	AUTOMATION OF DOOR/ ROLLING SHUTTER	PRAKASH, GANDHI, VIJAY IRON WORKS
53	ALUMINIUM COMPOSITE PANEL / HPL	ALUTECH, ALSTONE, ALSTRONG, FUNDERMAX, ARCHIDPLY, GREENLAM, VIRGO, REYNOARCH
54	ASPHALT EMULSION	STP, KARNAK, CHEMICAL CORPORATION
55	TILE JOINT FILLER	DURACREATE, ROFF RAINBOW TILE MATE, WINSIL 20 / SILICON SEALANT OF GE BAYER SILICON, BERGER
56	RUBBER GASKET	BIS APPROVED QUALITY
57	POLYURETHANE PAINT	MRF, BERGER, ASIAN PAINTS, ICI, NEROLAC
58	WAX POLISH	MANSION (RECKITT & COLMAN) OR EQUIVALENT AS APPROVED
59	MELAMINE	ICI DULUX, ASIAN, MRF, BERGER
60	SILICON WATER REPELLENT SOLUTION	GE BAYER, REMMERS, DUPONT, DOW CORNING
61	GYPSUM BOARD FALSE CEILING	INDIA GYPSUM, GYPROC, USG BORAL, AEROLITE, ANAKON

62	MINERAL FIBRE TILES CEILING/ CEILING	METAL FALSE	ARMSTRONG, HUNTER DOUGLAS, AEROLITE, ANAKON, NEWAGE , ANUTONE, LINDNER, PROMINANCE
63	BAFFLE FALSE CEILING		HUNTER DOUGLAS, HIGH STEEL, ANUTONE, ARMSTRONG, PROMINANCE
64	LAMINATED FLOORING	WOODEN	GREENPANEL, PERGO, HOLZ PARKETT, ARMSTRONG, LEVO, VITO FLOOR
65	BLINDS		VISTA LEVELLOR, HUNTER DOUGLUS, MAC, DYNA, INDO GERMAN
66	PVC FLOORING		ARMSTRONG, HOLZ PARKET, FORBO
67	GLASS MOSAIC TILES		CORAL, BISAZZA, PAVIT
68	GRC/GFRC PRODUCTS		BIRLA, SENEISHA, EVEREST, UNISTONE, DALAL, ECOVISION
69	WOODEN PANELLING/ ACOUSTIC PANELLING		ARMSTRONG, TRANQUIL, HUNTER DOUGLAS, ANAKON
70	MODULAR FURNITURE		GODREJ, HNI, SPACEWOOD OFFICE SOLUTION (SOS), HERMAN MILLER, GEEKEN
71	STEEL DOORS		KUTTY'S, GMP TECHNICAL SOLUTIONS, TIRUPATI, VIJAY SYSTEM ENGINEER, GODREJ
72	WALLPAPER		NILAYA, ULGADOR, OR EQUIVALENT AS APPROVED
73	ACRYLIC SOLID SURFACE		TRISTONE, MERINO, DU POINT, STARON, LG HAUS, REHAU
74	UPVC WINDOWS/ DOORS		KOMMERLING, FENESTA, VEKA INDIA, ASAHI (AIS), PROMINANCE, LESSO, DECEUNINCK
75	CARPET FLOORING		LEVO, SHAW, INTERFACE, MILLIKEN, WELSPUN, TUNTEX, VITO, HARRINGTON
76	SELF DRILLING SCREWS		LANDMARK CRAFT, OMNI, SUMMER
77	WELDING ROD		ADOR WELDING, ESAB, MODI HITECH
78	GLASS RAILING		UNISTONE AGRS, OZONE, DORMA
79	STAINLESS HARDWARE, HARDWARE	STEEL BRASS	GODREJ, KICH, OZONE, EVERITE, DORMA, HAFELE, HETTICH, DORSET
80	TWO POINT LOCKING SYSTEM FOR OPENABLE WINDOW INCLUDING HANDLES		DORSET, GODREJ, EVERITE, DORMA, HAFELE, HETTICH
81	JOINT FILLER/ ADHESIVES		LATICRETE, ARALDITE, REYNO, WEBER, UTRATECH

82	PLASTICIZER	CICO, PIDILITE, FOSROC, STP, DR. FIXIT, BERGER
83	WATER PROOFING COMPOUNDS, SEALANTS, ADMIXTURES	PIDILITE, CICO, FOSROC, SIKA, STP, BASF, BERGER
84	CONCRETE PAVERS	CECO, VYARA PAVERS, KK MANHOLE, ECOVISION, SOBHA, SILICON PAVERS
85	CONCRETE GRASS PAVERS	CECO, VYARA PAVERS, ECOVISION, SOBHA, SILICON PAVERS
86	PRECAST CEMENT CONCRETE KERB STONE	TUFTECH, KK MANHOLE, NIMCO, UNISTONE, ECOVISION, SOBHA, SILICON PAVERS, VYARA
87	PRE-CAST EDGING	TUFTECH, KK MANHOLE, NIMCO, UNISTONE, ECOVISION, SOBHA, SILICON PAVERS, VYARA
88	PRECAST SURFACE/ SAUCER DRAIN	TUFTECH, KK MANHOLE, NIMCO, UNISTONE, ECOVISION, SOBHA, SILICON PAVERS, VYARA
89	CALCIUM SILICATE BOARD	HILUX BOARDS, SAINT GOBAIN, ANAKON
90	ALLUMINIUM LOUVERS	HUNTER DOUGLAS, GLASSCON, COLT, RENSION, C-SGROUP, GMBH
91	ALUMINIUM HARDWARE	EVERITE, EBCO, DORSET, HEFELE, HETTICH, DORMA, HARDWYN
92	CEMENT CONCRETE TILES (CHEQUERED PRECAST CC TILES COMMERCIAL TILES)	PAVIT TILES, SUPER PRECAST AND INFRASTRUCTURES, ULTRA, DUROCRETE, EUROCON, KK MANHOLES, ECOVISION, VYARA
93	DOOR SEAL - WOOL PILE WEATHER STRIP	HAFALE, RAVEN OR EQUIVALENT AS APPROVED
94	TELESCOPIC SLIDING DRAWER CHANNELS	HETTICH, EARL BIHARI, GODREJ, OZONE OR EQUIVALENT AS APPROVED
95	GLASS FILM	3M, GARWARE, LLUMAR
96	VINYL FLOORING	SQUARE FOOT, EBACO OR EQUIVALENT AS APPROVED
97	CLOUD/ SOUNDSCAPE	DECOSONIC, USG BORAL, ARMSTRONG, UBP, SAINT GOBAIN
98	MODULAR TOILETS (TOILET CUBICLES)	GREENLAM, MERINO BESCO, CUBICLE INDIA
99	KITCHEN EQUIPMENTS	CONTINENTAL EQUIPMENT INDIA PVT. LTD., RELIEF KITCHEN EQUIPMENTS OR EQUIVALENT AS APPROVED
100	BUTT HINGES FOR OPENABLE WINDOW SHUTTERS	DORSET, GODREJ, EVERITE, DORMA, HAFELE, HETTICH

101	PRELAMINATED PARTICLE BOARD	GREENLAM, MERINO, ARCHIDPLY, NOVAPAN
102	GLASS PARTITIONS	HAFALE, JEB, DORMA OR EQUIVALENT AS APPROVED
103	FALSE CEILING MEMBERS	GYP. STEEL OF INDIA, GYSUM LTD., UNIVERSAL BUILDING PRODUCTS, SAINT GOBAIN, GYPROC
104	PVC CONTINUOUS FILLET FOR PERIPHERY PACKING OF GLAZING/ CURTAIN WALL	ROOP, ANAND, FOREX PLASTIC OR EQUIVALENT AS APPROVED
105	SIGNAGE/ ARTWORK/ ARTEFACTS	VDIS, SUPERTECH SIGNS, CLASSIC SIGN AND DISPLAY, METAL CRAFE
106	ACRYLIC MODIFIED CEMENTITIOUS WATERPROOFING COMPOUND	CICO TEC. LTD., SHALIMAR, FOSROC, BERGER, BASF
107	RUBBER SEALS	ENVIROSEALS OR EQUIVALENT AS APPROVED
108	BRUSH STRIPS	ENVIROSEALS OR EQUIVALENT AS APPROVED
109	EXPANSION JOINT FILLER	GE SILICON, FORSOC, SUPREME, SHALIMAR, STP, BERGER
110	WATER STOP	FIXOPAN OR EQUIVALENT AS APPROVED
111	P V C DIVIDING STRIPS	FIXOPAN OR EQUIVALENT AS APPROVED
112	ALUMINIUM/ IRON STANDING SEAM ROOFING / ZINC ROOFING	KALZIP, SANCO-JAPAN, TATA BLUESCOPE, JINDAL, HINDALCO
113	GRC JALI / SCREENING /GRC WALL PANEL / GRC WALL/ /GRC VENEER	DALAL TILES INDUSTRIES, UNISTONE, BIRLA GRC, ULTRATECH, ECOVISION
114	CC INTERLOCKING PAVER/ GRASS PAVER/ CURVE STONE/ CHEQUERED TILES/ TERRAZZO FLOORING TILES	DALAL TILES INDUSTRIES, UNISTONE, ULTRATECH
115	HEAT RESISTANT TILES	DALAL TILES INDUSTRIES, THERMATECH, BIRLA, SOMANY, KAJARIA
116	SPACE FRAME STRUCTURE	HINDUSTAN ALCOX LTD, TATA BLUESCOPE, ALUMAX GROUP PVT. LTD., MEKARK STRUCTURES INDIA PVT LTD, TRIOCON SPACE FRAME TECHNOLOGIES PVT. LTD., CCS GROUP, ZAMIL STEEL BUILDING INDIA PVT. LTD.
117	SIGNAGE WORKS/ LOGO	POSH-DECOR, PIONEER ALUMINIUM, CLIQUE SIGNS

118	AAC BLOCK ADHESIVE MORTAR	FERROUS CRETE (FERRO-1188), ARDEX ENDURA (WHITE STAR), ULTRA TECH, SIKA, MAGICRETE
119	STONE ADHESIVE	FERROUS CRETE-(FERRO-1133), ARDEX, PIDILITE ENDURA (DIAMOND STAR), ULTRA TECH, SIKA, MAGICRETE
120	EPOXY GROUT	FERROUS CRETE, ARDEX ENDURA, PIDILITE ULTRA TECH, ACRO PAINTS, SOPREMA, SIKA
121	GYPSUM/ READY MIX PLASTER	FERROUS CRETE- (FERRO-500), GYPROC (ELITE 90), ULTRA TECH
122	HIGH MAST LIGHT	PHILIPS, BAJAJ, CROMPTON GREAVES
123	ENTERANCE MATT SYSTEMS	MIGUA, WORLDWIDE ASP, MCGILL
124	WATERPROOFING COMPOUND/ ADMIXTURE	PIDILITE, SIKA, CHOKSEY
125	PU INJECTION GROUTING	PIDILITE, BASF, CICO, CHOKSEY
126	HDPE MEMBRANE	PIDILITE, SIKA, BASF, CHOKSEY
127	SBS MEMBRANE	PIDILITE, BASF, SIKA
128	POLYURETHANE/ POLYUREA /CRYSTALLINE WATERPROOFING COATING	PIDILITE, SIKA, CICO, BASF, CHOKSEY
129	PU FOAM INSULATION (TERRACE)	PIDILITE, SIKA, CICO, BASF
130	WALL INSULATION	PIDILITE, DRYVIT, GRUPO PUMA
131	EPOXY/ PU/ EPU/ TERRAZO FLOORING	PIDILITE, SIKA, CICO, BASF, CHOKSEY
132	FLOOR HARDENER	PIDILITE, CHOKSEY, MAPEI
133	SWELLABE WATER BAR	PIDILITE, SIKA, CICO, BASF, CHOKSEY
134	STONE SEALER	ROFF, ARDEX ENDURA, PIDILITE, KERAKOLL
135	ADHESIVE FOR INSULATION BONDING(HVAC)	PIDILITE, FOSTER, CHILDER
136	INSULATION PROTECTION COATINGS(HVAC)	PIDILITE, FOSTER, CHILDER
137	RAFT/RETAINING WALL/ PODIUM/TERRACE WATERPROOFING	SOPREMA, ISOLTEMA, SINTEC
138	GREEN WALL / VERTICAL GARDEN	AVANA GREENS, HYPER BOLES, GREEN ART LANDSCAPE PVT LTD, THE LEAF LANDSCAPE
139	DECORATIVE GLASS GRAPHIC / FILM	3M, LUMAR, GARWARE

140	CARPET FLOORING	INTERFACE, MILLIKEN, ATLAS, SHAW, MOHAWK, TUNTEX
141	SHINGLES ON ROOF	IKO (CAMBRIDGE/ DYNASTY), ATLAS, CERTAINTEED
142	SS SHEET CLADDING	SALEM STEEL, JINDAL STAINLESS, TATA
143	FACADE ACCESS SYSTEM	INNOMAC, NAW INFRATECH, ADVANCETECH
144	WPC (WOOD POLYMER COMPOSITE) JALI	ALSTONE, ECOSTE, ARCHID, FLORESTA, BLACK COBRA
145	HT FASTNERS	UNBRAKO, TVS, FISHER, HILTI
146	ANY OTHER ITEMS	ON APPROVAL OF ARCHITECT / CONSULTANT

PLUMBING, FIRE FIGHTING, WTP AND STP WORKS

S.N.	ITEMS	APPROVED MAKE
1	5 LAYER PERT WATER SUPPLY PIPE	POLO FIT, POLOPLAST, GEORGE FISCHER
2	PP-R PE 80 GLASS FIBRE COMPOUND WATER SUPPLY PIPE	POLY-MUTANE ML5 POLOPLAST, GEORGE FISCHER
3	NOISE INSULATED DRAINAGE PIPES	POLOPLAST , HULIOT, WAVIN
4	PRESSURE REDUCING VALVE	HONEYWELL, ZOLOTO, DEEPAK
5	AIR ADMITTANCE VALVES	STUDOR, MCALPINE, AIP
6	TRAPS, WASTES, SHOWER TRAPS	MCALPINE, CHILLY, CAMRY
7	PAN CONNECTORS	MCALPINE, CHILLY, CAMRY
8	CONCEALED CISTERN	TECE, VIEGA, GEBERIT, SCHELL
9	DRAIN CHANNELS AND TILE INSERTS	MCALPINE, CHILLY, CAMRY
10	SS JAALI/ FLOOR DRAIN	CHILLY, CAMRY, KOHLER, RUHE, PLANTEX
11	SHOWER DRAINS (TRAPPED/ UNTRAPPED)	MCALPINE, CHILLY, CAMRY
12	TILE GRATING WITH BLUE SILICON NRV	MCALPINE, CHILLY, CAMRY
13	CPVC PIPES/ FITTINGS AND VALVES	ASTRAL, SUPREME, PRINCE, FINOLEX
14	G.I. PIPES / M.S. PIPES IS 1239/ 3589	JINDAL-HISSAR, PRAKASH, SURYA, TATA, APL APOLLO, SAIL, ATUL
15	UPVC/SWR/PVC PIPES AND FITTINGS	ASTRAL, SUPREME, PRINCE, FINOLEX, SUDHAKAR
16	SPUN CAST IRON PIPES &	SRIF, SKF, NECO

	FITTINGS IS 3989	
17	SAND CAST IRON PIPE AND FITTINGS IS 1729	SRIF, SKF, NECO
18	G.I. FITTINGS (MALLEABLE CAST IRON)	ZOLOTO, SANT, UNIK, DRP-M
19	CHECK VALVES (DUAL SLIM TYPE)	SANT, ZOLOTO, ADVANCE, AIP
20	BUTTERFLY VALVE	SANT, ZOLOTO, ADVANCE, AIP, SKS, CIM
21	GATE/BALL VALVES	SANT, ZOLOTO, ADVANCE, AIP, SKS
22	STONEWARE PIPES & GULLY – IS 651	ANAND, PRAGATI, TRIMURTI, OR ISI MARKED EQUIVALENT AS APPROVED
23	RCC PIPES IS 458	PRAGATI, SUPER WIRE, KK MANHOLE, INDIAN HUME PIPE
24	C.I. / D.I. MANHOLE COVER & FRAME IS 1726	NECO, SRIF, SKF, RIF, KARTAR, HEPCO
25	F.R.P. MANHOLE COVER, GRATING, CATCH BASIN COVER	PRODUCTS UNLIMITED, KK MANHOLE OR EQUIVALENT AS APPROVED
26	SFRC MANHOLE COVER AND GRATING/ TURF PAVERS/ SFRC COVERS	KK MANHOLES OR EQUIVALENT AS APPROVED
27	HOT WATER INSULATION	SUPERLON, A-FLEX, ARMAFLEX, AEROFLEX, THERMAFLEX
28	ANTI-CORROSIVE TAPE FOR PIPE PROTECTION	PYPKOTE, MAKPOLYKOTE OR EQUIVALENT AS APPROVED
29	GARDEN IRRIGATION SYSTEM	JAIN, HARVEL OR EQUIVALENT AS APPROVED
30	ANTICORROSIVE BITUMASTIC PAINT	BERGER, ASIAN PAINTS, ICI, NEROLAC, ULTRATECH PAINTS
31	EPOXY PAINT	BERGER, ASIAN PAINTS, ICI, NEROLAC, ULTRATECH PAINTS
32	PUMPS	KIRLOSKAR, WILO, PENTAIR, GRUNDFOS, EBARA
33	PLC	AS PER MANUFACTURERS SPEC'S
34	PRESSURE VESSEL	AS PER MANUFACTURERS SPEC'S
35	PRESSURE SENSOR	AS PER MANUFACTURERS SPEC'S
36	CLEAR WATER PUMPS	KIRLOSKAR, WILLO, PENTAIR, GRUNDFOS, EBARA
37	FRP/ GRP VESSELS / FILTER/ SOFTENER	APEX, THERMAX, ION EXCHANGE, PENTAIR
38	SUCTION STRAINER/ POT	VENUS, LEADER, EMERALD, ZOLOTO

	STRAINER	
39	Y STRAINER	NVR, ADVANCE, ZOLOTO
40	PYP COAT FOR BURIED PIPING	IWL, COALTEK, POLYCAM
41	METERS, INDICATION LAMP	ENERCON OR EQUIVALENT
42	PRESSURE GAUGE	FIEBIG, GURU, EMERALD
43	WELDING RODS	ADOR WELDING, ESAB, MODI HITECH
44	STAINLESS STEEL KITCHEN SINK	NIRALI, MITALI, NEELKANTH, JAYNA
45	CP SANITARYWARE	KOHLER, ROCA, JAQUAR, TOTO, HINDWARE, PARRYWARE, EURONICS
46	CP SANITARY FIXTURE/ FITTING	KOHLER, ROCA, JAQUAR, TOTO, EURONICS
47	SENSOR BATHROOM ACCESSORIES	EURONICS, SCHELL, UTEC, JAQUAR, KOHLER, ROCA, TOTO
48	AIR PURIFIER / AEROSOL DISPENSER	EURONICS, KOHLER OR EQUIVALENT AS APPROVED
49	MULTI-PAN WC CONNECTOR	ROCA, MCALPINE, VIEGA
50	HEALTH FAUCET	JAQUAR, KOHLER, ROCA, TOTO
51	ELECTRICAL WATER HEATER / GEYSER	VENUS, BAJAJ, AO SMITH, RACOLD
52	WATER COOLER / DISPENSERS	EUREKA FORBES, VOLTAS, BLUE STAR, BAJAJ
53	CP / SS FORGE FOR FLOOR TRAP & FLOOR DRAIN	CHILLY, ACO, NEER
54	G.I./ M.S FORGED STEEL PIPES & FITTINGS I.S:1239 (PART-II)	VS, DRP, TRUE FORGE, SAINT
55	GUNMETAL FULLWAY VALVE	ZOLOTO, CIM, SKS
56	SOLENOID VALVE	DANFOSS, HONEYWELL, AIP
57	WATER METERS	KENT, MARSHALL OR EQUIVALENT AS APPROVED
58	PP PIPE	ASTRAL, WAVIN, POLOPLAST
59	DWC PIPE	ASTRAL, SUPREME, ASHIRWAD, FINOLEX
60	C.I. HUBLESS PIPE AND FITTINGS	SKF, NECO, ELECTROSTEEL
61	PIPE INSULATION	ARMACELL, CANI, AEROCELL
62	FLOW REGULATOR DEVICE	AQUAPLUS, CON-SERV, JAQUAR
63	AIR RELEASE VALVE	SKS, AIP, ZOLOTO, ADVANCE, NVR
64	SLUICE VALVE	ZOLOTO, ADVANCE, NVR
65	FLOAT VALVE (GUNMETAL) UPTO 40MM	SKS, CIM, ZOLOTO
66	ALTITUDE FLOAT VALVE	SKS, CIM, ZOLOTO
67	MH/ WATER TANK PLASTIC STEPS	NECO, RIF, KARTAR, KGM
68	P.V.C WATER STORAGE TANK	SINTEX, SHEETAL, LOTUS

69	CLEAR WATER PUMPS	KIRLOSKAR, WILLO, PENTAIR, GRUNDFOS, EBARA
70	HYDRO-PNEUMATIC PUMPING SYSTEMS	KIRLOSKAR, WILLO, PENTAIR, GRUNDFOS, EBARA
71	SUBMERSIBLE SUMP PUMPS FOR DRAINAGE & SEWERAGE	KIRLOSKAR, WILLO, PENTAIR, GRUNDFOS, EBARA
72	WATER LEVEL CONTROL & INDICATION SYSTEM INTEGRATORS	TECNIKA, TECHROL, AUTO PUMP
73	DOSING SYSTEM	TOSCHON, PENTAIR, GRUNDFOS
74	PUMP VIBRATION PADS & PIPE FLEXIBLE CONNECTORS	DUNLOP, KANWAL INDUSTRIAL CORPORATION, RESISTOFLEX
75	REVERSE OSMOSIS WATER TREATMENT SYSTEMS	ALFA UV, EUREKA FORBES, KENT, ION EXCHANGE
76	ULTRAVIOLET WATER PURIFIER	ALFA UV, EUREKA FORBES, KENT, ION EXCHANGE
77	FIRE ACCESSORIES/ FIRE CABINET	SAFEGUARD, LIFEGUARD, NEWAGE, MINIMAX
78	SPRINKLERS	HD, TYCO, VIKING
79	ALARM VALVE	HD, SPRAYSAFE, AIP
80	FIRE-PUMPS	MATHER PLATT, WILO, KBL, KIRLOSKAR, GRUNDFOS
81	HOT WATER GENERATOR	THERMAX, RADIP CONTROL OR EQUIVALENT AS APPROVED
82	SOLAR HEATER	SOLARHART, TATABP, RITEEKA
83	HOT WATER BOILER	RAPID CONTROL, OLYMPIA OR EQUIVALENT AS APPROVED
84	FIRE EXTINGUISHER	SAFEGUARD, LIFEGUARD, NEWAGE, MINIMAX
85	FIRE SURVIVAL CABLES	BATRA HENLAY, FINOLEX, POLYCAB, KEI
86	PUMP MOTOR	CROMPTON GREAVES, ABB, KIRLOSKAR, HAVELLS, SIEMENS
87	CONTROL PANEL	SPC, SHIVALIK, ADVANCE
88	FIRE BRIGADE CONNECTION	LIFEGUARD, SAFEGUARD, NEWAGE
89	PIPE COAT	PYPKOTE, MAKPHALT, MLOTE
90	FIRST-AID HOSE REEL DRUM	LIFEGUARD, SAFEGUARD, RAPIDROP, MINIMAX, NEWAGE
91	THERMO PLASTIC HOSE REELS FOR DRUMS	LIFEGUARD, SAFEGUARD, RAPIDROP, MINIMAX, NEWAGE
92	R.R.L. HOSE & C.P. HOSE	LIFEGUARD, SAFEGUARD, MITRAS, MINIMAX, NEWAGE

93	BRANCH PIPE, NOZZLE, COUPLING ETC.	LIFEGUARD, SAFEGUARD, NEWAGE, MINIMAX
94	HYDRANT/LANDING VALVES	LIFEGUARD, SAFEGUARD, NEWAGE, MINIMAX
96	PIPE CLAMP & SUPPORTS	CHILLY, MORPHO, RIPPLE, FIXOTECH, UBB
97	NON-RETURN VALVES	ZOLOTO, AIP, SKS, ADVANCE, KSB, NVR
98	DUAL PLATE/ WATER TYPE NON-RETURN VALVE	ZOLOTO, ADVANCE, NVR
99	INSTALLATION CONTROL VALVE	HD, TYCO, VIKING
100	SPRINKLER HEAD	HD, TYCO, RAPIDROP
101	FLEXIBLE HOSE	HD, TYCO, RAPIDROP
102	WATER FLOW SWITCH	HONEYWELL, RAPID CONTROL, SYSTEM SENSOR
103	PRESSURE SWITCH	INDFOSS, SWITZER, EMERALD
104	FIREMAN AXE	LIFEGUARD, SAFEGUARD, NEWAGE, MINIMAX
105	FIRE SEALENT	BIRLA 3M, HILTI, FISCHER
106	GROOVED PIPE FITTINGS	RAPIDROP, JAINSONS OR EQUIVALENT AS APPROVED
107	SUPPRESSION SYSTEM	LIFEGUARD, SAFEGUARD, MINIMAX
108	BAR SCREEN	JASH / ECOLOGIX / HUBER / JHONSON
109	AIR BLOWER	EVEREST / AKASH / ROOTECH
110	AIR DISPERSION SYSTEM	REHAUE / ECOLOGIX / OTT
111	SUBMERSIBLE MIXER	AQUA ITALY / TORO / ATE / TOSHIO
112	TUBE SETTLER, TUBE DECK MEDIA, MBBR MEDIA	COOLDECK, MM AQUA OR EQUIVALENT AS APPROVED
113	ANY OTHER ITEM NOT COVERED IN THE LIST OF MAKES BUT IS REQUIRED TO EXECUTE THE JOB IN TOTALITY	AS APPROVED BY THE EIC/ ARCHITECT/ CONSULTANT

ELECTRICAL & HVAC WORKS

S.N.	ITEMS	APPROVED MAKE
1	CABLE	RR KABEL, POLYCAB, BATRA HENLAY, KEI, FINOLEX, HAVELLS
2	CABLE TRAYS	SMC, RMCON, OBO, SLOTCO, PILCO, RICCO, BEC
3	MOULDED CASE CIRCUIT BREAKER (MCCB)/ RESIDUAL CURRENT CIRCUIT BREAKER(RCCB)	SCHNEIDER, LEGRAND, L&T, EATON, ABB, C&S, HAGER

4	MINIATURE CIRCUIT BREAKERS (MCB)	SCHNEIDER, LEGRAND, L&T, EATON, ABB, C&S, HAGER
5	POWER/ AUX. CONTACTOR	SCHNEIDER, LEGRAND, L&T, ABB
6	PROTECTION RELAY	ABB, L&T, AREVA
7	INDICATING LAMPS LED TYPE AND PUSH BUTTON	SCHNEIDER, LEGRAND, L&T, SIEMENS, ABB
8	OVERLOAD RELAYS WITH BUILT-IN SINGLE-PHASE PREVENTER	SCHNEIDER, ABB, L&T
9	ELECTRONIC DIGITAL METERS WITH LED DISPLAY	SCHNEIDER, ABB, L&T
10	CABLE GLANDS DOUBLE COMPRESSION WITH EARTHING LINKS	COMET, DOWELL'S, HAX BRASS
11	BIMETALLIC CABLE LUG	COMET, DOWELL'S, HAX BRASS
12	SELECTOR SWITCH, TOGGLE SWITCH	SCHNEIDER, SALZER (L&T), KAYCEE
13	PVC INSULATED COPPER CONDUCTOR STRANDED FLEXIBLE WIRES (FRLS)	RR KABEL, POLYCAB, BATRA HENLAY, KEI, FINOLEX, HAVELLS
14	METAL CONDUIT AND ACCESSORIES	BEC, NIC, RMCON, STEELKRAFT
15	ACCESSORIES FOR SUPPORTING SYSTEM	HILTI, FISHER, SHAKTI
16	TERMINAL BLOCKS	CONNECT WELL, ELMEX, WAGO, PHOENIX
17	INDUSTRIAL SOCKET OUTLETS	SIEMENS, SCHNEIDER, LEGRAND, HAGER, CAPE ELECTRIC, MENNEKES
18	BACK OF HOUSE SWITCH & SOCKETS	CRABTREE – ATHENA, NORTHWEST – CONVEX, SCHNEIDER – OPALE, HONEYWELL – WRAPAROUND, LEGRAND – MYLINC
19	PVC PIPES/ CONDUITS AND ACCESSORIES	BEC, AKG, ATUL, POLYPACK, PRECISION
20	COPPER CONDUCTOR PVC INSULATED	RR KABEL, POLYCAB, BATRA HENLAY, KEI, FINOLEX, HAVELLS
21	PVC INSULATED WIRES	RR KABEL, POLYCAB, BATRA HENLAY, KEI, FINOLEX, HAVELLS
22	EARTH LEAKAGE CIRCUIT BREAKERS	LEGRAND, SIEMENS, HAGER, C&S, ABB, L&T
23	MCB DISTRIBUTION BOARDS	SCHNEIDER, EATON, LEGRAND, ABB, C&S, HAGER, GREATWHITE
24	HRC FUSES	L&T, SIEMENS, LEGRAND, C&S, ABB

25	AIR CIRCUIT BREAKERS	L&T (U –POWER), SIEMENS ELECTRIC (MASTERPACT NW), ABB (E MAX), LEGRAND (DMX3), C&S, ABB
26	PROTECTIVE RELAYS/ IDMT RELAYS	ALSTOM, ABB, SIEMEN, C&S
27	ON – LOAD SWITCH ISOLATOR	ABB, L&T, SIEMENS
28	APFCRELAYS (MICROPROCESSOR)	L&T, SCHNEIDER, SIEMENS, NEPTUNE-DUCATI,
29	ELECTRICAL PANELS (HT/ LT)	TRICOLITE, PRECISION SYSTEM CONTROL, L.S POWER CONTROL, OR ANY CHANNEL PARTNER OF ABB, SIEMENS, SCHNEIDER, L&T, C&S
30	MV CONTACTORS, TIMER (SOLID STAT)	L&T, SIEMENS, ABB, C&S
31	1100 VOLTS GRADE CABLES/ XLPE CABLE	RR KABEL, POLYCAB, BATRA HENLAY, KEI, FINOLEX, HAVELLS
32	1100 VOLTS GRADE PVC CONTROL CABLES/ XLPE CABLE	RR KABEL, POLYCAB, BATRA HENLAY, KEI, FINOLEX, HAVELLS
33	CABLE LUGS (TINNED COPPER)	DOWELLS, JAINSON, RALLISON, BATRA HENLAY, POLYCAB
34	CABLE COMPRESSION GLANDS	PEECO, COMET, TRINITY TOUCH
35	11KV XLPE CABLES	RR KABEL, POLYCAB, BATRA HENLAY, KEI, FINOLEX, HAVELLS
36	11 KV CABLE JOINTS (HEAT SHRINKABLE)	DENSON, RAYCHEM OR EQUIVALENT AS APPROVED
37	11 KV VACUUM CIRCUIT BREAKERS	SIEMENS, L&T, SCHINDER, ABB
38	HT RELAYS	SIEMENS, ALSTOM, L&T, ABB
39	11 KV RING MAIN UNIT	SIEMENS, SCHINDER, L&T, ABB
40	CAPACITOR	L&T, SIEMENS, SCHNEIDER, ABB
41	CAST RESIN CURRENT TRANSFORMER	AE, KAPPA, GILBERT, MAXWELL, C&S, VOLTAMP
42	METERS DIGITAL	L&T RISHAB, SIEMENS, AE, C&S, HPL, ABB
43	TRIVECTOR METER	SIEMENS, SCHINDER, C&S, HPL
44	HT-CT, PT, METER	AE, KAPPA, SIEMENS, C&S, HPL
45	SELECTOR SWITCHES	KAYCEE, L&T SAZLER, C&S, ABB, SCHNEIDER
46	INDICATION LAMP (LED TYPE)	L&T, SIEMENS, C&S
47	GANG OPERATED AIR BREAKER SWITCH UNIT	PACTIL, MEI OR EQUIVALENT AS APPROVED

48	SINGLE POLE DROP OUT FUSES	PACTIL, MEI OR EQUIVALENT AS APPROVED
49	11 KV PALLET TYPE LIGHTING ACCESSORIES	WSI, OVALUM, ELPRO, BHEL
50	11 KV INSULATOR	WSI, OVALUM, ELPRO, BHEL
51	TIME SWITCHES	L&T, SIEMENS, ABB, C&S
52	CABLE JOINT	RAYCHEM, DENSON OR EQUIVALENT AS APPROVED
53	INDOOR TYPE ON LOAD AIR BRAKE SWITCH	MEI, ISOTECH INDIA PVT LTD, HPL
54	RUBBER FLOOR MAT 11 KV (ISI) (ELASTOMETRIC)	SUNTAX, TYCOON OR EQUIVALENT AS APPROVED
55	CHANGEOVER SWITCH	L&T, SCHNEIDER C&S, ABB
56	AUTO TRANSFER SWITCH	GE, EMERSON C&S, ABB, L&T, SCHNEIDER
57	SANDWITCH BUS DUCT	L&T, ZUCCHINI (LEGRAND), CONTROL & SWITCHGEAR, PRECISION SYSTEM CONTROLS
58	AIR INSULATED BUS DUCT	SIEMENS, ABB, C&S, SCHNEIDER, PRECISION SYSTEM CONTROLS
59	EXTERNAL LIGHTING POLES	BAJAJ, HI-LITE, WIPRO, MAYFAIR
60	EXTERNAL LIGHTING FIXTURE	WIPRO, PHILIPS, BAJAJ, CROMPTON
61	MS BLACK ENAMELED/ GALVANIZED ERW CONDUITS	AKG, ATUL PIPE, RAMCON
62	M.S. CONDUIT & ACCESSORIES	BEC, ATUL PIPE, AKG
63	PVC CONDUIT & ACCESSORIES	BEC, AKG, ATUL PIPES
64	MODULAR SWITCHES, SOCKET OUTLETS & WIRING ACCESSORIES WITH MOULDED COVER PLATE	NORTHWEST (NOVA), MK (WRAPAROUND), SCHNEIDER (OPALE), GREATWHITE, ABB, NORISYS
65	HEAVY DUTY METAL CLAD SOCKET OUTLETS WITH MCB IN MS HOUSING	LEGRAND, SIEMENS, HAGER, C&S, ABB
66	WEATHERPROOF SOCKET OUTLETS WITH MCB	HAGER, LEGRAND, SIEMENS, C&S, ABB
67	KWH METERS (ELECTRONIC DIGITAL TYPE)	TRINITY, L&T, SECURE, HPL, ABB
68	SAND WITCH RISING MAIN	ZUKINI – LEGRAND, SIEMENS – SIVACON, SCHNEIDER
69	SINGLE PHASE PREVENTER	L&T, MINILEC, LEGRAND.
70	MOTOR PROTECTION CIRCUIT BREAKERS	LEGRAND, SIEMENS, L&T, C&S, ABB

71	TELEPHONE WIRES	LAPP, FINOLEX, BELDEN, POLYCAB, BATRA HENLEY
72	TELEPHONE TAG BLOCK	KRONE, POUYET OR EQUIVALENT AS APPROVED
73	TV CO-AXIAL CABLE	LAPP, RPG, SKYSTONE, POLYCAB, BATRA HENLEY
74	CAT 6 CABLE	BELDEN, PANDUIT, SCHENIEDER, POLYCAB, BATRA HENLEY
75	CABLE LUGS	DOWELLS, JAINSON OR EQUIVALENT AS APPROVED
76	SELECTOR SWITCHES	L&T SALZER, KAYCEE, C&S, ABB
77	ENERGY MONITOR/ TRIVECTOR METER	NEPTUNE-DUCATI, L&T, TRINITY, C&S
78	VOLTMETER, AMMETER	L&T RISHAB, SIEMENS, AE, C&S, ABB
79	INVERTOR	SU-KAM, LUMINOUS, POWER TRON, BPE, MICROTEK
80	CEILING FANS	CROMPTON, HAVELLS, ORIENT
81	EXHAUST FAN	ALSTOM, CROMPTON GREAVES, HAVELLS, POLYCAB
82	FLUORESCENT LAMP	WIPRO, PHILIPS, REGENT
83	COMPACT FLUORESCENT LAMPS	REGENT, WIPRO, PHILIPS
84	LAMINATED SHEET	HYLAM, FORMIER OR EQUIVALENT AS APPROVED
85	SPLITTERS FOR SMART TV SYSTEM	NETGEAR, CATVISION OR EQUIVALENT AS APPROVED
86	LIGHT FIXTURES	PHILIPS, WIPRO, REGENT, DMAP, CROMPTON, BAJAJ, HAVELLS
87	UPS	NUMERIC, VERTIV, APC, ABB
88	CVT	LOGICSTAT, BLUEBIRD, SELVON, MAX POWER
89	AVIATION OBSTRUCTION LIGHT (LED TYPE)	PHILIPS, WIPRO, BAJAJ
90	EXCHANGE/ CONSOLE PANEL	TATA TELECOM, PANASONIC, MATRIX
91	HANDSET	TATA PHONE, BEETEL, PANASONIC, SIEMENS
92	RUBBER MATS	SYNTAX, TYCOON(ISI), ELASTOMERIC OR EQUIVALENT
93	TAPE OFF	CAT VISION, SHYAM OR EQUIVALENT AS APPROVED

94	CHANGEOVER SWITCH	L&T, SCHNEIDER, ABB
95	LIFT	SCHINDLER, MITSUBISHI, THYSSENKRUPP, KINETIC HYUNDAI
96	DG SETS	CUMMINS, KIRLOSKAR (KOEL) OR EQUIVALENT AS APPROVED
97	PACKAGE TYPE SUBSTATION(PSS)	ABB, SCHNEIDER, C&S, SIEMENS
98	HI WALL SPLIT AC UNITS	OG, MITSUBISHI, DAIKIN, CARRIER, BLUESTAR
99	TRANSFORMER	SCHNEIDER ELECTRIC, CROMPTON GREAVES, SIEMENS, KIRLOSKAR, VOLTAMP, ABC TRANSFORMER
100	VRF SYSTEM (INDOOR & OUTDOOR)	MITSUBISHI-ELECTRIC, CARRIER, TRANE, YORK
101	FAN / BLOWER/AXIAL FAN	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
102	AIR FILTER	THERMODYNE, PUROLATOR OR EQUIVALENT AS APPROVED
103	HIWALL DX UNIT (INDOOR & OUTDOOR)	MITSUBISHI-ELECTRIC/ VOLTAS/ DAIKIN/ TRANE
104	I)AIR WASHER	AIRFLOW ZECO BRIGHTFLOW
105	II) AIR WASHER FAN	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
106	III) AIR WASHER PUMP	KIRLOSKAR BEACON WILLO
107	I) AIR SCRUBBER	AIRFLOW ZECO BRIGHTFLOW
108	II) AIR SCRUBBER FAN	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
109	III) AIR SCRUBBER PUMP	KIRLOSKAR BEACON WILLO
110	VENTILATION FANS:	
111	INLINE FAN	CARRIER KINAL FLAKT OSTBERG

112	PROPELLER FAN	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
113	PAC SYSTEM	VETRIV / BLACK BOX CORPORATION / SCHNEIDER ELECTRIC SE
114	FACTORY FABRICATED BOX TYPE DUCT (PIR)	ZECO, ROLASTAR, PIE-PAL, DUCTOFAB, WAVE
115	G.I SHEET FOR DUCT	TATA SAIL JINDAL
116	ACOUSTIC LINING OF DUCT	AFLEX KFLEX APL ARMACELL
117	THERMAL INSULATION NITRILE RUBBER (CLASS 'Ó')/ ANY OTHER THERMAL INSULATION	AFLEX KFLEX APL ARMACELL PARAMOUNT
118	SUPPLY / RETURN AIR GRILLS	CARYAIRE, SYSTEM AIR, RAVISTAR, CYNOR
119	VOLUME CONTROL DUCT DAMPER	CARYAIRE, SYSTEM AIR, RAVISTAR, CYNOR
120	SUPPLY / RETURN AIR DIFFUSERS	CARYAIRE, SYSTEM AIR, RAVISTAR, CYNOR
121	THERMOSTAT SENSOR	JOHNSOSN HONEYWELL SIEMENS
122	ANCHOR FASTNERS	HILTI, FICHER OR EQUIVALENT AS APPROVED
123	COPPER REFRIGERANT PIPE	MAXFLOW DIAMOND RAJKO
124	HUMIDISTAT	HONEYWELL JOHNSON CONTROL SIEMENS
125	MODULATING MOTORS	BELINO, RAPID CONTROL OR EQUIVALENT AS APPROVED
126	FLEXIBLE INSULATED DUCT- UL LISTED	CARYAIREB, SYSTEM AIRC, ATCO OR EQUIVALENT AS APPROVED

127	FIBRE GLASS INSULATION	OWEVES CORNING UP TAWEGA EURO THERM
128	NITRILE TAPE FOR NITRILE INSULATION	K-FLEX A-FLEX APL
129	TF QUALITY EXPENDED POLYSTYRENE INSULATION	BEARD SELL ARKC LLOYDS
130	EXTRUDED POLYSTYRENE INSULATION	BEARD SELL ARKC LLOYDS
131	ALUMINIUM PERFORATED SHEET FOR ACOUSTIC LINING	AIKC, LLOYDS OR EQUIVALENT AS APPROVED
132	WELDING RODS	ADOR WELDING, ESAB, MODI HITECH
133	FAN COIL UNITS	SINKO TRANE ZECO
134	WATER CHILLING MACHINE (SCREW TYPE)	TRANE/ YORK/ DAIKIN/CARRIER
135	PUMPS:	
136	I) CONDENSER WATER	KIRLOSKAR/ MATHER & PLATT/ GRUNDFOSS/ESPA
137	II) PRIMARY CHILLED WATER	KIRLOSKAR/ MATHER & PLATT/ GRUNDFOSS/ESPA
138	III) SECONDARY CHILLED WATER WITH VFD	GRUNDFOSS / BELL & GOSSETTE/ESPA/WILLO
139	IV) SUCTION GUIDE VANES	ANERGY / ARMSTRONG/ ITT-XYLEM
140	V) VFD	SIEMENS / ABB / HONEYWELL
141	AIR HANDLING UNITS:	
142	I) AIR HANDLING UNITS	YORK/CARRIER/ZECO
143	II) COOLING COIL	COIL COMPANY/ CARYAIRE/ZECO
144	III) FAN	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
145	AIR WASHERS:	
146	I) AIR WASHER	BRIGHTFLOW/AIRFLOW/ZECO
147	II) AIR WASHER FAN	KRUGER, NICOTRA, HUMIDIN, FANAIR,

		GREENHECK
148	III) AIR WASHER PUMP	KIRLOSKAR/ BEACON/WILLO
149	IV) FILTERS	AS PER MANUFACTURER'S STANDARD
150	V) AIR SCRUBBER	AIRFLOW/ZECO/BRIGHT FLOW
151	VENTILATION FANS:	
152	I) CENTRIFUGAL	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
153	II) AXIAL	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
154	III) PROPELLER	GE/ ALSTOM/ AIRFLOW/ HUMIDIN
155	IV) INLINE	KRUGER, NICOTRA, HUMIDIN, FANAIR, GREENHECK
156	COOLING TOWERS	BELL/PAHARPUR /ADVANCE/CASE
157	M.S. PIPES:	
158	I) UPTO 150MM DIA	TATA/ JINDAL HISSAR/SAIL
159	II) ABOVE 150MM DIA	JINDAL HISSAR/ SAIL/TATA
160	HEAT RECOVERY WHEEL	FLAKTWOODS/ARCTIC /ZECO
161	BUTTERFLY VALVES	AUDCO/ZOLOTO/C&R/AIP
162	CHECK VALVES	ADVANCE/ ZOLOTO/C&R/AIP
163	BALANCING VALVES	AUDCO/ ADVANCE/C&R/AIP
164	GATE VALVES	LEADER/ ZOLOTO/ C&R/AIP
165	EXPANSION BELLOWS	RESISTOFLEX/ CORI /KANWAL
166	POT/Y-STRAINERS	SANDHU/ RAPID COOL/ SANT/ EMERALD
167	PRESSURE GAUGE	FEIBIG/ H. GURU/ EMERALD
168	THERMOMETERS	FEIBIG/ H. GURU/ EMERALD
169	AUTO AIR VENT	ANERGY/ OVENTROP/ RAPID COOL
170	G.I. SHEETS	SAIL/ TATA/ JINDAL
171	AL. SHEETS	HINDALCO, BALCO OR EQUIVALENT AS APPROVED
172	FIRE DAMPERS	CARYAIRE/PRECISE/SYSTEM AIR
173	GRILLS/DIFFUSERS	CARYAIRE, SYSTEM AIR, RAVISTAR, CYNOR , DYNACRAFT
174	FRESH AIR LOUVERS	CARYAIRE, SYSTEM AIR, RAVISTAR, CYNOR , DYNACRAFT
175	NITRILE INSULATION	ARMACELL/ AFLEX /KFLEX
176	FILTERS (IN AIR-CONDITIONING SYSTEM)	THERMODYNE/ PUROLATOR/ ANFILCO



177	FAN COIL UNITS	SINKO/TRANE/ ZECO
178	SPLIT TYPE AC UNITS	DAIKIN/ HITACHI/ TOSHIBA/ VOLTAS/CARRIER
179	TEMPERATURE SENSOR	SONTAY/ KELE/ MAMAC
180	BIRD SCREEN	CARYAIRE, SYSTEM AIR, RAVISTAR, CYNOR , DYNACRAFT
181	SOLAR PV SYSTEM	USHA SRIRAM, WAAREE, SURYA ROSHNI, JAKSON
182	CHILLED / HOT WATER CLOSED TYPE PRESSURIZED EXPANSION TANK WITH AIRSEPERATOR	ANERGY, ITT-XYLEM, GRUNDFOSS
183	SUCTION GUIDES	ANERGY, ARMSTRONG, ITT-XYLEM
184	CHILLED WATER CASSETTE UNIT	BRIA, CARRIER, TRANE
185	DRY SCRUBBER	FANAIR, HUMIDIN, TRION, ZECO
186	ADVANCE OXIDATION PLASMA CELL (AOP)	ULTRAPURE, HONEYWELL, TRINNED, ACUAIR
187	FACTORY MADE SPIRAL DUCT	ATCO, GP SPIRA, DUCTOFAB
188	ACTUATORS FOR DAMPERS	BELIMO, HONEYWELL, SIEMENS, TROX
189	SOUND ATTENUATOR	CARYAIRE, HUMIDIN, PINEAIRE, SYSTEMAIR, FANAIR
190	FLOWSWITCH/ AIRSTAT	DANFOSS, RAPID CONTROL
191	FLOW METER & BTU METER	DANFOSS, SIEMENS, FEEDREL
192	CONSTANT VOLUME FLOW LIMITERS	PINEAIR, TROX OR EQUIVALENT AS APPROVED
193	ELECTRO CHEMICAL TREATMENT SYSTEM (ECTS) FOR COOLING TOWERS	DECAION, CET-ENVIRO, ENERGEO
194	ANY OTHER ITEM NOT COVERED IN THE LIST OF MAKES BUT IS REQUIRED TO EXECUTE THE JOB IN TOTALITY	AS APPROVED BY THE EIC/ ARCHITECT/ CONSULTANT


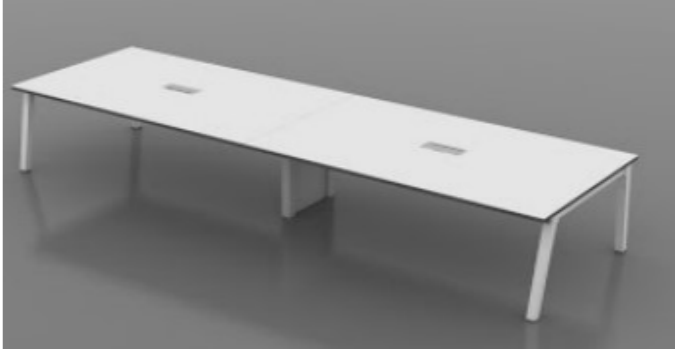


LV WORKS




S. N.	ITEM NAME	APPROVED MAKE
<u>CCTV</u>		
1	CAMERA	AMERICAN DYNAMICS/PELCO/ BOSCH / TYCO- ILLUSTRRA
2	NVR	AMERICAN DYNAMICS/PELCO/ BOSCH / TYCO- ILLUSTRRA




3	HARD DISK	WD/ SEAGATE / TOSHIBA
4	LED DISPLAY	SONY / LG / SAMSUNG
5	VIDEO MANAGEMENT SYSTEM (VMS)	GENETEC/GEUTEBRUCK/ BOSCH/MILESTONE
6	NETWORK RACK	APW/ VALRACK/ AMP
7	SWITCHES	JUNIPER/CISCO/NETGEAR
8	PATCH PANEL, CAT6 I/O, PATCH CORD, FACEPLATE, CAT6 CABLE, CAT6 MODULAR JACK	DER WISER/SIEMON/PANDUIT/BELDEN
9	HDMI CABLE	CRESTRON/EXTRON/KRAMER
10	WORKSTATION	HP/DELL/LENOVO
<u>DATA AND NETWORKING</u>		
11	SWITCHES	JUNIPER/CISCO/NETGEAR
12	PATCH PANEL, CAT6 I/O, PATCH CORD, FACEPLATE, CAT6 CABLE, CAT6 MODULAR JACK	DER WISER/SIEMON/PANDUIT/BELDEN
13	NETWORK RACK	APW/ VALRACK/ AMP
<u>FIRE ALARM SYSTEM</u>		
14	FIRE ALARM PANEL, DETECTOR, ISOLATOR MODULE, I/O MODULE, BREAK GLASS, SOUNDER CUM STROBE, RESPONSE INDICATOR	HONEYWELL/ NOTIFIER/ EDWARDS
<u>PUBLIC ADDRESS SYSTEM</u>		
15	PA CONTROLLER	HONEYWELL/BOSCH/JBL
16	PA SPEAKER	HONEYWELL/BOSCH/JBL
17	PA SPEAKER CABLE	POLYCAB/BELDON/KEI
18	NETWORK RACK	APW/ VALRACK/ AMP
<u>IPABX</u>		
19	IPABX SERVER, TELEPHONE'S	SIEMENS/CISCO /ALCATEL
20	ANALOG PHONE	SIEMENS/CISCO /ALCATEL
21	PATCH CORD CAT6	DER WISER/SIEMON/PANDUIT/BELDEN
22	50 PAIR ANEALED COPPER TELEPHONE CABLE	FINOLEX, DELTON OR EQUIVALENT AS APPROVED
<u>AV</u>		
23	IP CONFERENCE PHONE	SIEMENS/CISCO /ALCATEL
24	LED TV	SONY / LG / SAMSUNG
25	SWITCHES, SFP MODULE	JUNIPER/CISCO/NETGEAR
26	NETWORK RACK	APW/ VALRACK/ AMP
27	MOTORIZED FLOOR BOX	BESTNET/ LEGRAND/ MK





28	VIDEO CONFERENCING SYSTEM	LOGITECH/ POLYCOM/ CISCO
29	HDMI CABLE	CRESTRON/EXTRON/KRAMER
30	AUDIO CABLES	KRAMER/POLYCAB/BELDON
31	POWER CABLES	KRAMER/POLYCAB/KEI




S.No.	DESCRIPTION	Total Qty.	UNIT	Reference Image
10	FURNITURE WORKS			
ZV	Furniture works 1. The furniture product should be from the manufacture which have BIFMA Certification, GREENGUARD/ GREENPRO, AIOTA Certification. 2. The dimensions of the furniture as given in the respective items as below are indicative and there shall be no deviation of cost on account of this. However, the dimensions mentioned below may vary in between ± 10% during execution as directed by Engineer-In-Charge.			
	All images mentioned below are reference images only.			
ZV.3	Linear Workstation for Security Staff room/Working Hall/Technical room	22.00	NUM	
	Dimension: 1200mm(L) x 600mm(D) x 1200mm(H)			
	<p>Supplying and placing in position of sliding tile base modular Workstation as per photograph/drawing. Free standing partition height 1200mm and should be minimum of 65-67mm thick. Partition inner frame is 1.1-1.2 mm thick mild steel. Horizontal and vertical trims are made out of extruded aluminum of 1.mm thick. All Panels/trims shall be powder coated with 50 microns. Aluminum trims are elegantly fixed with special fixtures in the partition. The frame work shall be fitted with 9mm thick pre laminated Particle tiles of approved shade. Partition shall have provision for pin up board with fabric/ white marker/ laminated of approved shade. Partition framework shall have adequate provisions for the movement of electric data cables at desired 2 levels; one at skirting and another above / below the table top. The complete partitioning work shall be carried out as per the approved drawing. Tabletop for workstation made up of 25mm thick pre laminated Particle board of approved shade. The worktop shall be supported on minimum 2mm thick powder coated CRCA brackets and side panels. Side's panels should be made from 18mm thick pre laminated Particle board of approved shade. All working or non working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. . Provision of one PVC keyboard tray and Metal CPU trolley with lockable castors for each seating. Also a provision of Mobile Pedestal Unit (size:- L-400mm x D-450mm x H-600mm) with a combination of 2 drawer & one filing drawer. The pedestal storage unit shall be made of 18 mm thick prelaminated Particle board with provision of handles & central Locking arrangement. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.4	L-Shape Workstation for Security Staff room/ Working hall/ PS with Steno	125.00	NUM	
	Dimension: 1500mm(L) x 1350mm(L) x 600mm(D) x 1200mm(H)			
	<p>Supplying and placing in position of sliding tile base modular Workstation as per photograph. Free standing partition height 1200mm and should be minimum of 65-67mm thick. Partition inner frame is 1.2-1.5mm thick mild steel. Horizontal and vertical trims are made out of extruded aluminum of 1.2-1.5mm thick. All Panels/trims shall be powder coated with 50 micron. Aluminum trims are elegantly fixed with hidden connectors on the partition. The frame work shall be fitted with 8mm thick pre laminated Particle tiles of approved shade. Partition shall have provision for pin up board with fabric/ white marker/ laminated of approved shade. Partition framework shall have adequate provisions for the movement of electric data cables at desired 2 levels; one at skirting and another above / below the table top. The complete partitioning work shall be carried out as per the approved drawing. Tabletop for workstation made up of 25mm thick pre laminated Particle board of approved shade. The worktop shall be supported on minimum 2mm thick powder coated CRCA brackets and side panels. Side's panels should be made from 18mm thick pre laminated Particle board of approved shade. All working or non working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of one PVC keyboard tray and CPU trolley for each seating. Also a provision of Pedestal Unit (size:- L-400mm x D-450mm x H-600mm) with a combination of 2 drawer & one filing drawer. The pedestal storage unit shall be made of 18 mm thick prelaminated Particle board with provision of handles & Locking arrangement. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.5	Medium height Storage for Security Staff room/Technical Room			
ZV.5.1	Dimension: 2700mm(L) x 450mm(D) x 1200mm(H)	1.00	NUM	
ZV.5.2	Dimension: 1300mm(L) x 450mm(D) x 1200mm(H)	8.00	NUM	
ZV.5.3	Dimension: 1400mm(L) x 450mm(D) x 1200mm(H)	16.00	NUM	
ZV.5.4	Dimension: 6000mm(L) x 450mm(D) x 1200mm(H)	2.00	NUM	
ZV.5.5	Dimension: 2000mm(L) x 450mm(D) x 1200mm(H)	20.00	NUM	
ZV.5.6	Dimension: 950mm(L) x 450mm(D) x 1200mm(H)	16.00	NUM	
ZV.5.7	Dimension: 2480mm(L) x 450mm(D) x 1200mm(H)	12.00	NUM	
ZV.5.8	Dimension: 2970mm(L) x 450mm(D) x 1200mm(H)	3.00	NUM	

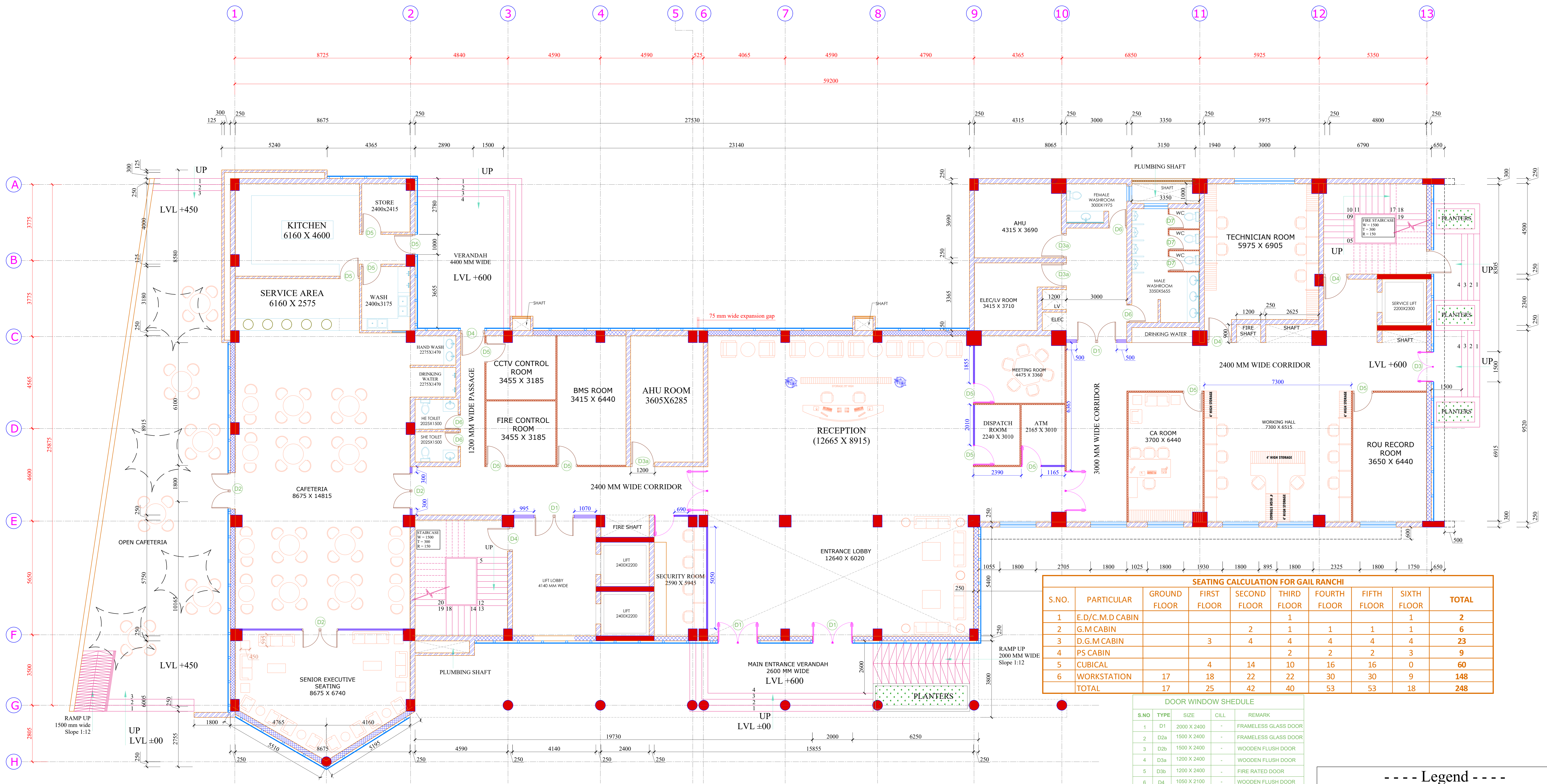
ZV.5.9	Dimension: 1850mm(L) x 450mm(D) x 1200mm(H)	16.00	NUM	
ZV.5.10	Dimension: 1600mm(L) x 450mm(D) x 1200mm(H)	17.00	NUM	
	Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing . storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)			
ZV.6	Emergency Response Table	1.00	NUM	
	Dimension: 4450mm(L) x 1500mm(D) x 750mm(H)			
	Supplying and placing in position of meeting table as per drawing. Table top made out of 25mm Thk Prelam particle board Table Top with 2mm PVC Edge Banding on all Exposed edges. The table top supported on Mild Steel 50mm x50mm Slanted Leg and 50mm x 25mm Horizontal connectors with Powder coating of 50 Micron.Wire Management : 220/350mm Flip Up with soft closure and on Metal Cable Tray, Vertical wire entry cover considered for Power and data Management. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)			
ZV.7	Main Table for DGM Cabin/ CA room/Doctors Room	24.00	NUM	
	Main Table Dimesnion: (L)2100mm X (D)900mm X (H)750mm All over Side Runner Dimension: (L)1900mm X (D)450mm X (H)650mm			
	Supplying, and placing in position of a straight line table with wire manager as per photograph/drawing. The main desk of size 2100mm (L) X 900mm (D) X 750mm (H) shall be made out of 42mm thick pre laminated particle board with the approved shade. Table top supported with side panels and modesty panel. The side panels made out of 42mm thick pre laminated Particle board & modesty panel made out of 36mm thk pre laminated Particle board of approved shade. All working or non working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of Pop-up - cable manager box in the table .The Fixed Side Runner attached to the table of all over size 1900mm (L) x 450mm (D) x 650mm (H) has a provision for three drawer with locking facility , two openable shutters with locking arrangement , open storage with shelf & one open storage for cpu.The another side panel of table top having a provision of two attached drawer as per photograph. The table top rest on SS studs for design purpose same as per image.The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)			
ZV.8	Back Storage for DGM Cabin/ CA room	24.00	NUM	
	Dimension: (L)3000mm X (D)450mm X (H)750mm			
	Supplying , and placing in position of back storage as per photograph/drawing. The complete storage unit shall be made up of 18 mm thick prelam particle board with 2mm thk pvc edge banding . The storage shall be provisioned with one shelf and 2 nos compartments .The storage shall have openable shutters with handles and locking arrangements.All working or non working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature.The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)			

ZV.9	Main Table for Ex. Cubicle	60.00	NUM	
	Main Table Dimension : 1650mm(L) X 750mm(d) x 750mm(h) Side Runner Dimension: 900mm(L) X 450mm(d) x 750mm(h)			
	<p>Supplying, and placing in position of main Table as per drawing. Modular tables size 1650mm(L) x 750mm(D) x 750mm(H).The Table top made out of 25mm thk prelam particle board with 2mm thk pvc edge banding & side panel & modesty panel made up of 18mm thick pre-laminated particle board .The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. The table have a provision of free standing Side Storage of size 900mm L x 450mm D x 750mm Ht., Storage Top made out of 25mm thick pre laminated particle board and rest all storage to be made out of 18 mm thick prelaminated particle board . All exposed edges shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. Storage having provision of 3 drawer unit, one openable shutter, one open storage with handle & central locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.10	Back Storage for Ex. Cubicle	60.00	NUM	
	Dimension: (L)2100mm X (D)450mm X (H)750mm			
	<p>Supplying , and placing in position of back storage as per photograph/drawing. The complete storage unit shall be made up of 18 mm thick prelam particle board with 2mm thk pvc edge banding . The storage shall be provisioned with one shelf and 2 nos compartments .The storage shall have openable shutters with handles and locking arrangements.All working or non working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.11	Medium height Storage for Ex. Cubicle room			
ZV.11.1	Dimension: (L)1725mm X (D)450mm X (H)1200mm	30.00	NUM	
ZV.11.2	Dimension: (L)1920mm X (D)450mm X (H)1200mm	8.00	NUM	
	<p>Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing . storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision.The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.12	Medium height Storage for Passage area			
ZV.12.1	Dimension: (L)2400mm X (D)450mm X (H)1200mm	3.00	NUM	
ZV.12.2	Dimension: (L)1725mm X (D)450mm X (H)1200mm	2.00	NUM	
ZV.12.3	Dimension: (L)1350mm X (D)450mm X (H)1200mm	1.00	NUM	

	<p>Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing . storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.13	<p>Conference / Meeting table- : Diamond Shaped : providing and fixing of the following as per design, Using Action Tesa High Gloss 18mm Pre Laminated Board, Fixed on 25 mm pre laminated MDF base TOP, with support structure of BSL MDF of matching design, Complete with SS T strip on the edge, Additional structure for the Cable Cubbies, VC connectivity's etc. The finishes to be of the highest quality standard conforming to the best of world class workmanship.</p>			
ZV.13.1	TABLE-1 4600 X 1500	1.00	NUM	
ZV.13.2	TABLE-2 6000 X 1500	1.00	NUM	
ZV.13.3	TABLE-3 7000 X 1500	1.00	NUM	
ZV.13.4	TABLE-4 6000 X 1500	1.00	NUM	
ZV.13.5	TABLE-5 6000 X 1500	1.00	NUM	
ZV.13.6	TABLE-6 11000 X 2000	1.00	NUM	
ZV.14	<p>Back storage for GM Cabin-01,02/ CGM Cabin</p> <p>Dimension:(L)3800mm X (D)450mm X (H)750mm</p>	7.00	NUM	
	<p>Supplying and placing in position of 18mm thick plywood with laminate finish back storage as per image. A well-built bookcase with the looks this is the complete package. A compartmentalized shelving system with adequate space ensures any book will fit in the shelf. This Bookshelf is built using plywood with laminate with 2mm thick PVC edges.. The lower cabinets provide an alcoved space to ensure your books dont yellow with age.The lower area to be provisioned with openable shutters with handles and locking arrangements. The upper area to have open shelves for display. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.15	<p>Main Table for PS to GM Cabin/ PS with Steno</p> <p>Main Table Dimension: 1650mm(L) X 750mm(d) x 750mm(h) Side Runner Dimension: 900mm(L) X 450mm(d) x 750mm(h)</p>	6.00	NUM	
	<p>Providing and placing of table as per drawing. Modular tables size 1650mm(L) x 750mm(D) x 750mm(H). Table top made up of 25mm thick pre-laminated particle board and understructure shall be made of 18mm thick pre-laminated particle board gable ends and modesty panels. The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of 3 drawer mobile pedestal, one CPU trolley and PVC keyboard tray attached to the table top. The table shall be provisioned with free standing Side Storage of size 900mm L x 400mm D x 750mm Ht., Storage Top made out of 25mm thick pre laminated particle board and rest all storage to be made out of 18 mm thick pre-laminated particle board . Storage having a openable shutter with handles and central locking arrangement. All exposed edges shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.16	<p>Back Storage for PS to GM Cabin/ PS with Steno/ CGM Cabin/ED Cabin-01</p> <p>Dimension: 2480mm(L) X 450mm(d) x 750mm(h)</p>	6.00	NUM	

	<p>Supplying, and placing in position of medium height storage @ 750mm height as per photograph/drawing . storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.18	<p>Back Storage for INCHARGE</p>	4.00	NUM	
	<p>Dimension:(L)3500mm X (D)450mm X (H)750mm</p>			
	<p>Supplying and placing in position of 18mm thick plywood with laminate finish back storage as per image. A well-built bookcase with the looks this is the complete package. A compartmentalized shelving system with adequate space ensures any book will fit in the shelf. This Bookshelf is built using plywood with laminate with 2mm thick PVC edges.. The lower cabinets provide an alcoved space to ensure your books dont yellow with age.The lower area to be provisioned with openable shutters with handles and locking arrangements. The upper area to have open shelves for display. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.19	<p>Main table for BMS room/Fire control room/ CCTV Control room/ Dispatch room/RGMC/CGD Control room</p>	8.00	NUM	
	<p>Dimension: 1200mm(L) X 600mm(D) X 750mm(H)</p>			
	<p>Supplying, and placing in position of Free standing table as per Image/drawing. The table top are made up of 25mm thick pre-laminated particle board with 2mm thk pvc edge banding . The Table supported with 18mm thk Prelam Particle board side panel & Modesty panel. The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of one fixed Pedestal storage unit (combination of two drawers and one filing drawer) . Pedstal Unit made of 18mm thk prelaminated particle board with 2mm thk pvc edge banding. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			
ZV.20	<p>Medium Height storage for Dispatch room</p>	1.00	NUM	
	<p>Dimension: 1800mm(L) X 450mm(D) x 1200mm(H)</p>			
	<p>Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing . The storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. The storage unit having openable shutters withD shape handles & locking arrangement. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge.Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)</p>			

ZV.21	Full Height storage fort Record room	12.00	NUM	
	Dimension : 900mm(L) X 450mm(D) X 1800mm(H)			
	Supplying, and placing in position of full height storage @ 1800mm height as per photograph/drawing. The storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. The modukar storage have openable shutters with Dshape handles and locking arrangement. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)			
ZV.22	Medium height partition	460.00	M2	
	Supplying and placing in position of sliding tile base medium ht partition as per photograph/drawing. Free standing partition height 1200mm and should be minimum of 65-67mm thick. Partition inner frame is 1.1-1.2 mm thick mild steel. Horizontal and vertical trims are made out of extruded aluminum of 1.mm thick. All Panels/trims shall be powder coated with 50 microns. Aluminum trims are elegantly fixed with special fixtures in the partition. The frame work shall be fitted with 9mm thick pre laminated Particle tiles of approved shade. Partition shall have provision for pin up board with fabric/ white marker/ laminated of approved shade. Partition framework shall have adequate provisions for the movement of electric data cables at desired 2 levels; one at skirting and another above / below the table top. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)			
ZV.23	Main Table for GM Cabin-01,02/ CGM Cabin	7.00	NUM	
	Main Table Dimension:(L)2400mm X (D)1130mm X (H)770mm Side Runner Dimension: :(L)1200mm X (D)600mm X (H)770mm			
	Supplying, and placing in position of table as per photograph. This precise Durian Boss's Desk is designed with superb qualityFinish made of engineered wood-medium density fibre board & veneer glossy finish on the same. Functional and stately, with a sturdy design style, this L shape desk is sure to make a dramatic statement in the office. Featuring a cherry finish, with delicate panel moulding and a fantastic size.The modesty frame of the table gives the great look with panel upholstered wth PVC material which gives the leatherette look.Main Table top thkness 80mm , side panel/gable end in 70mm thk mdf with venner glossy finish. Main table and side runner having a skirting @120mm thk with gives a rich look. The office desk comes with the side runner having enough storage space.The side runner top with a thickness of 80mm thk that gives the great look . Side table, side panel, shelves,drawers made up of 18mm thk mdf with venner finish. Table having a provision of Pedestal of size: 400(L) X 500(D) X 660(H) having three drawers to store essential & undestructure made out of 18mm thk mdf with venner finish .Drawers have the stylish handle which enhance the look. Material & Subtype:Engineered Wood - Medium Density Fibre Board, Colour & Colour Family:Red - Cherry.side storage unit having a side panel, one drawer , one shutter & one shelf of 18mm thk mdf with venner finish. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make : Harmony, Geeken, HNI, Spacewood Solutions (SOS)			



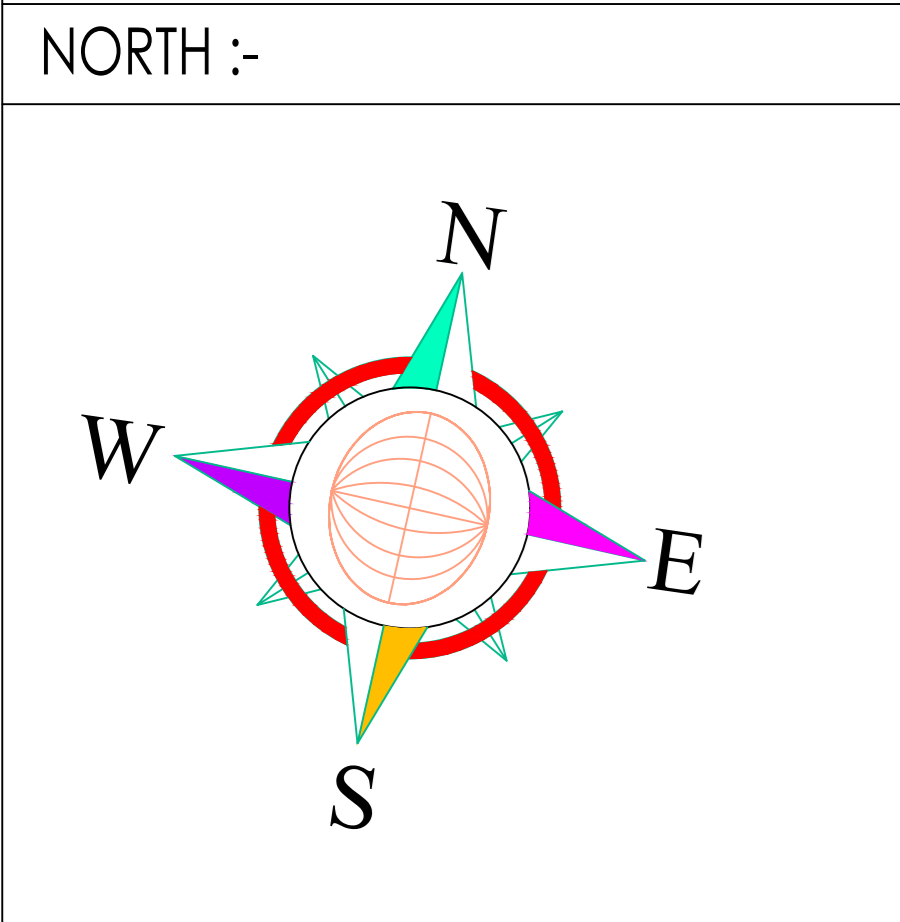
GROUND FLOOR

S.NO.	PARTICULAR	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR	FIFTH FLOOR	SIXTH FLOOR	TOTAL
1	E.D./C.M.D CABIN				1			1	2
2	G.M CABIN			2	1	1	1	1	6
3	D.G.M CABIN		3	4	4	4	4	4	23
4	PS CABIN				2	2	2	3	9
5	CUBICAL	4	14	10	16	16	0	0	60
6	WORKSTATION	17	18	22	22	30	30	9	148
TOTAL		17	25	42	40	53	53	18	248

S.NO	TYPE	SIZE	CILL	REMARK
1	D1	2000 X 2400	-	FRAMELESS GLASS DOOR
2	D2a	1500 X 2400	-	FRAMELESS GLASS DOOR
3	D2b	1500 X 2400	-	WOODEN FLUSH DOOR
4	D3a	1200 X 2400	-	WOODEN FLUSH DOOR
5	D3b	1200 X 2400	-	FIRE RATED DOOR
6	D4	1050 X 2100	-	WOODEN FLUSH DOOR
7	D5	1000 X 2100	-	WOODEN FLUSH DOOR
8	D6	900 X 2100	-	WOODEN FLUSH DOOR
9	D7	750 X 2100	-	WOODEN FLUSH DOOR
10	W1	3000 X 1500	900	ALUMINUM WINDOW
11	W2	1800 X 1500	900	ALUMINUM WINDOW
12	V1	1200 X 900	1500	ALUMINUM WINDOW
13	V1	750 X 900	1500	ALUMINUM VENTILATOR
SGL		AS/PLAN		STRUCTURAL GLAZING

---- Legend ----

Symbol	Description
	Brick Wall (BW)
	Wooden Partition (WP)- Ht. 3600
	Glass Partition (GP)- Ht. 3600



NOTES:-

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- FOLLOW WRITTEN DIMENSIONS ONLY AND DO NOT SCALE THE DRG.
- ANY DISCREPANCY FOUND IN THE DRG. SHALL BE BROUGHT TO THE NOTICE OF ARCHITECT IMMEDIATELY.
- READ THIS DRG WITH ALL RELEVANT STR/ ELEC/PLUMBING DWGS. AND SPECIFICATIONS OF THE CONTRACT.
- BOB:- BOTTOM OF BEAM
- FFL:- FLOOR FINISH LEVEL
- TOS:- TOP OF THE SLAB
- ALL HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR LEVEL

PROJECT TITLE :-
CONSTRUCTION OF EASTER REGION HEADQUARTER AT, RANCHI, JHARKHAND

OWNER :-
GAIL (INDIA) LIMITED
A GOVT. OF INDIA UNDERTAKING
B-35 & 36, 17th FLOOR,
JUBILEE TOWER, SEC-1, NOIDA(U.P.)

BUILDING TITLE :-
OFFICE BUILDING

DRAWING TITLE :-
GROUND FLOOR PLAN

DR. TYPE. :-
CONCEPT DRAWING

DR. NO. :-
CPDS/GAIL/RANCHI/AR/01

DELT. BY :- SHRUTI

APPD. BY :- A. NIGAM

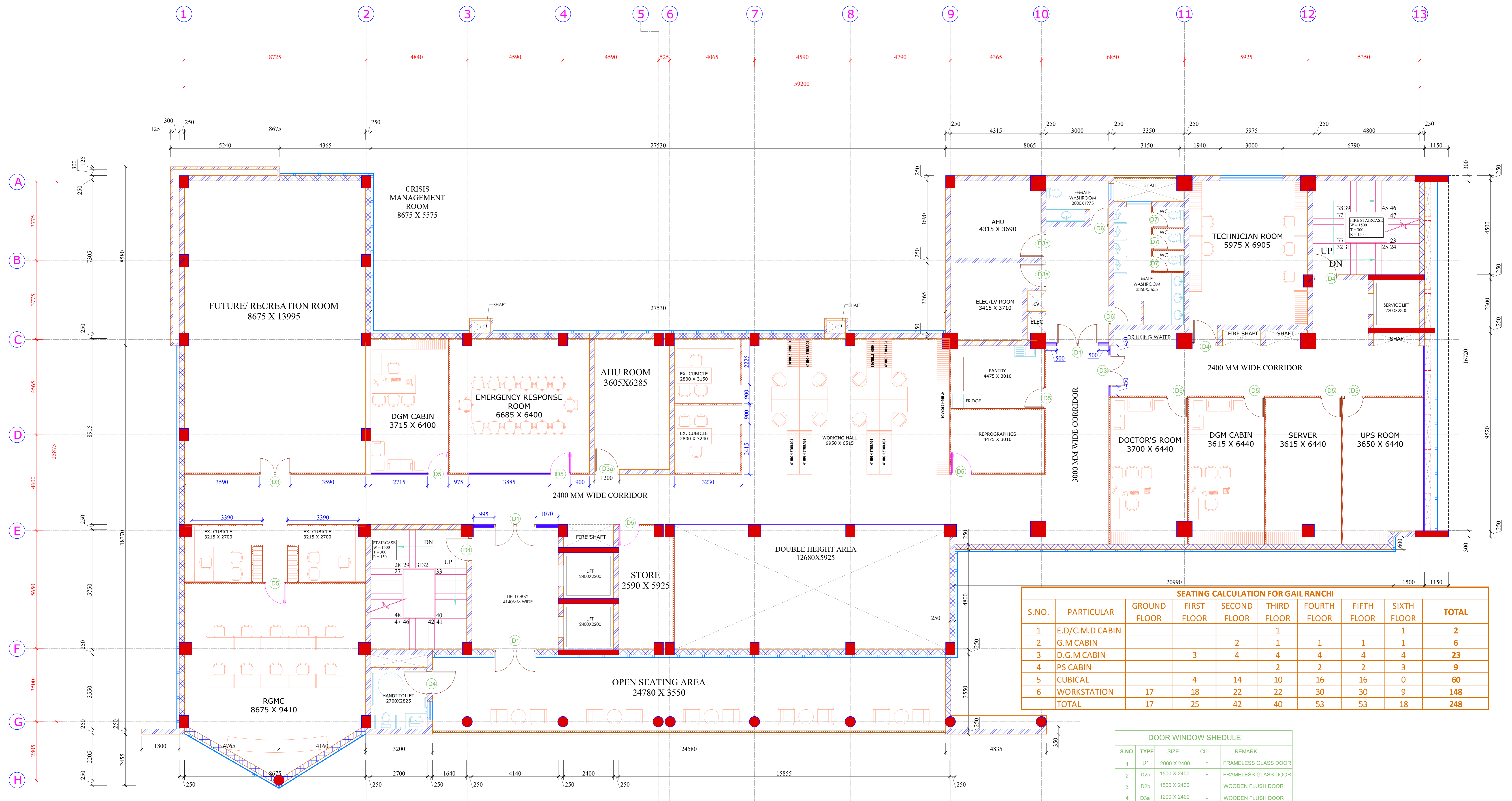
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DATE :- JULY-2021

REV. NO :- 01

ARCHITECTS:

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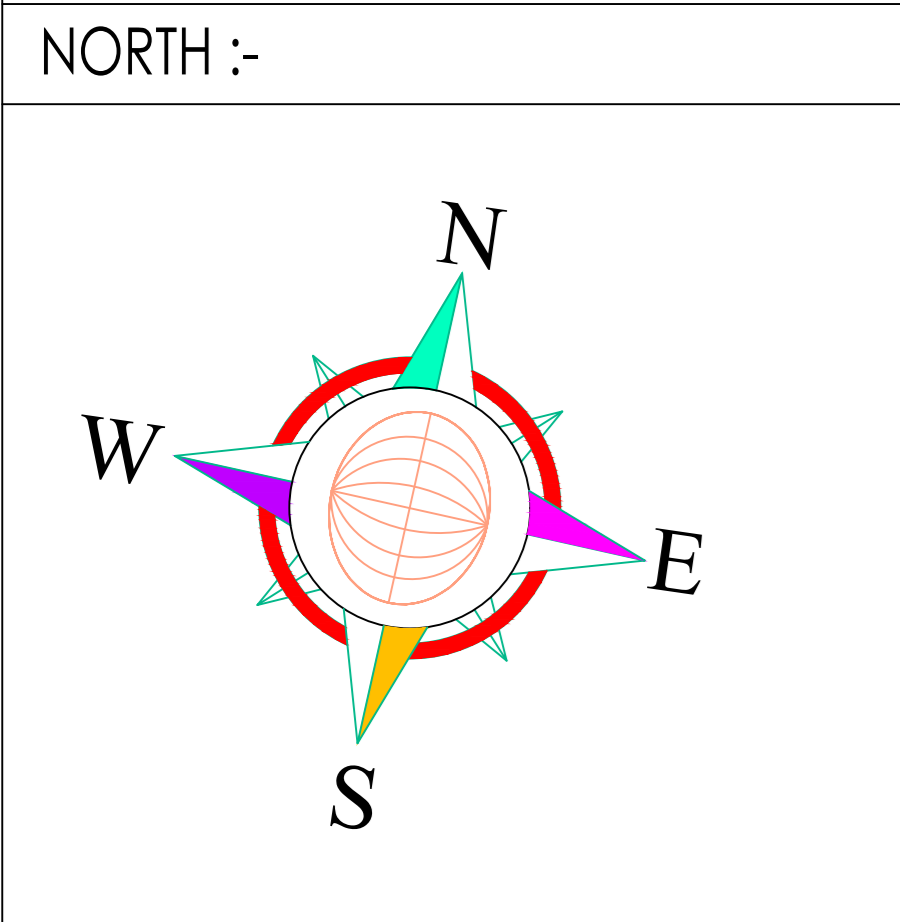
FIRST FLOOR

S.NO.	PARTICULAR	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR	FIFTH FLOOR	SIXTH FLOOR	TOTAL
1	E.D/C.M.D CABIN				1			1	2
2	G.M CABIN			2	1	1	1	1	6
3	D.G.M CABIN		3	4	4	4	4	4	23
4	PS CABIN				2	2	2	3	9
5	CUBICAL		4	14	10	16	16	0	60
6	WORKSTATION	17	18	22	22	30	30	9	148
	TOTAL	17	25	42	40	53	53	18	248

S.NO.	TYPE	SIZE	CILL	REMARK
1	D1	2000 X 2400	-	FRAMELESS GLASS DOOR
2	D2a	1500 X 2400	-	FRAMELESS GLASS DOOR
3	D2b	1500 X 2400	-	WOODEN FLUSH DOOR
4	D3a	1200 X 2400	-	WOODEN FLUSH DOOR
5	D3b	1200 X 2400	-	FIRE RATED DOOR
6	D4	1050 X 2100	-	WOODEN FLUSH DOOR
7	D5	1000 X 2100	-	WOODEN FLUSH DOOR
8	D6	900 X 2100	-	WOODEN FLUSH DOOR
9	D7	750 X 2100	-	WOODEN FLUSH DOOR
10	W1	3000 X 1500	900	ALUMINUM WINDOW
11	W2	1800 X 1500	900	ALUMINUM WINDOW
12	V1	1200 X 900	1500	ALUMINUM WINDOW
13	V1	750 X 900	1500	ALUMINUM VENTILATOR
	SGL			ASIPLAN STRUCTURAL GLAZING

---- Legend ----

Symbol	Description
	Brick Wall (BW)
	Wooden Partition (WP)- Ht. 3600
	Glass Partition (GP)- Ht. 3600



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- BOB:- BOTTOM OF BEAM
- FFL:- FLOOR FINISH LEVEL
- TOS:- TOP OF THE SLAB
- ALL HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR LEVEL

PROJECT TITLE :-
CONSTRUCTION OF EASTER REGION HEADQUARTER AT, RANCHI, JHARKHAND

OWNER :-
GAIL (INDIA) LIMITED
A GOVT. OF INDIA UNDERTAKING
B-35 & 36, 17th FLOOR,
JUBILEE TOWER, SEC-1, NOIDA(U.P.)

BUILDING TITLE :-
OFFICE BUILDING

DRAWING TITLE :-
FIRST FLOOR PLAN

DR. TYPE. :-
CONCEPT DRAWING

DR. NO. :-
CPDS/GAIL/RANCHI/AR/02

DELT. BY :- SHRUTI

APPD. BY :- A. NIGAM

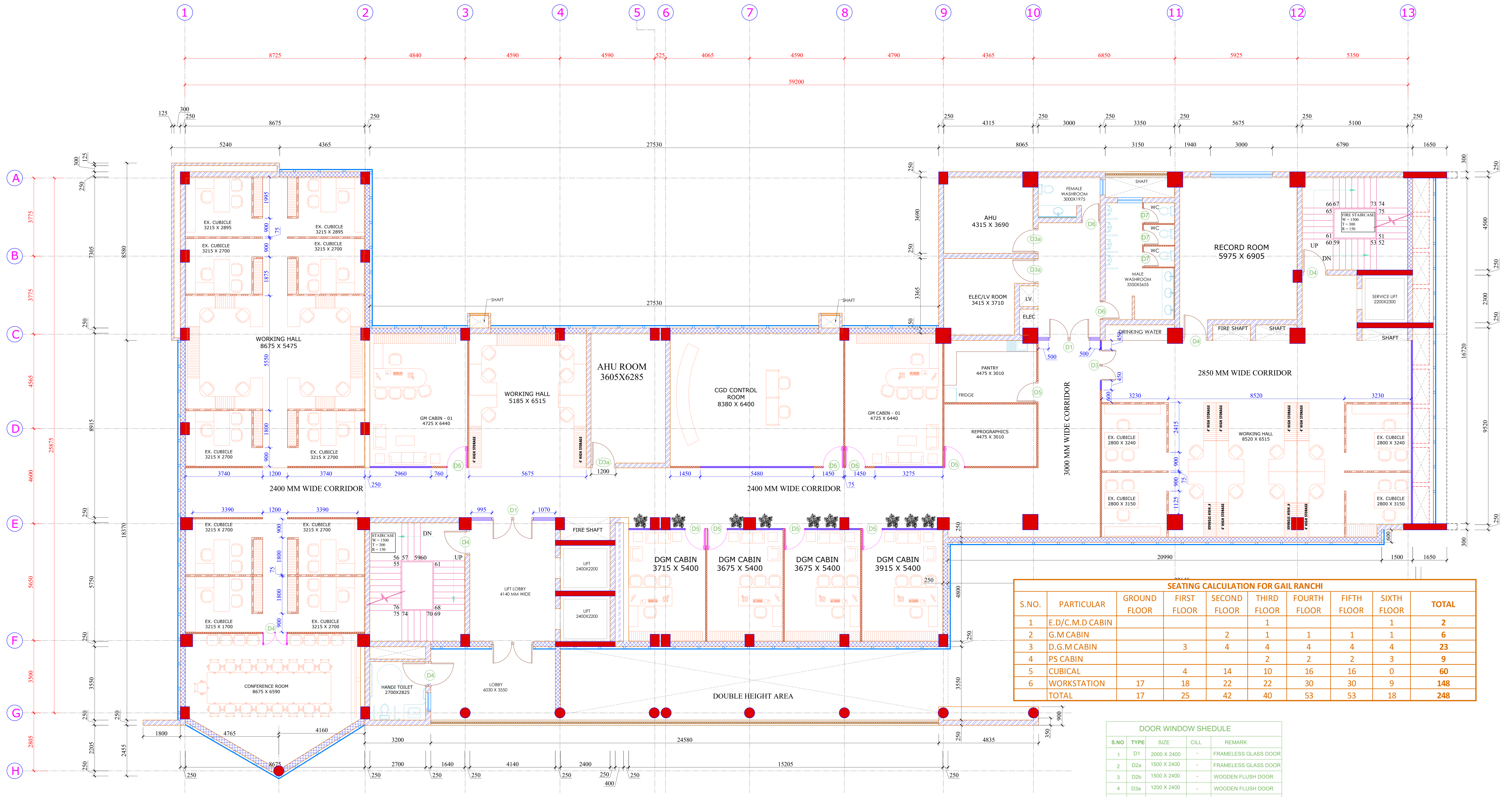
SCALE :- 1:100 (A1)

DATE :- 08-05-2021

REV. NO :- 01

ARCHITECTS:

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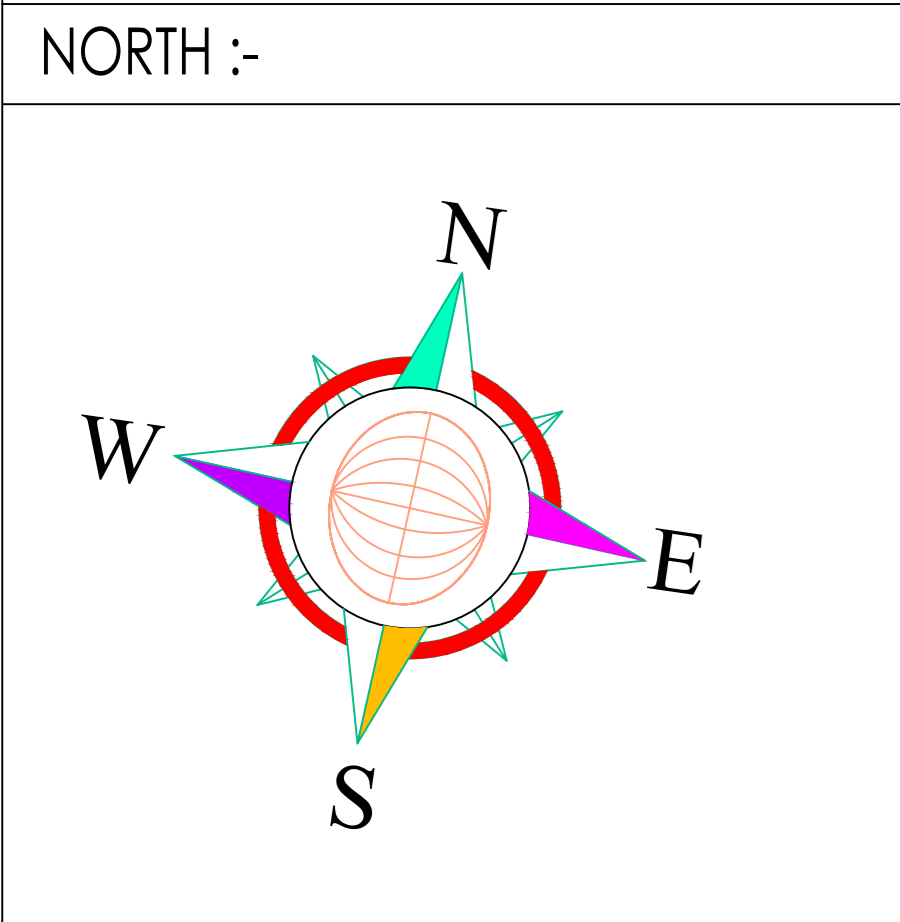
SECOND FLOOR

S.NO.	PARTICULAR	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR	FIFTH FLOOR	SIXTH FLOOR	TOTAL
1	E.D./C.M.D CABIN				1			1	2
2	G.M CABIN			2	1	1	1	1	6
3	D.G.M CABIN		3	4	4	4	4	4	23
4	PS CABIN				2	2	2	3	9
5	CUBICAL		4	14	10	16	16	0	60
6	WORKSTATION	17	18	22	22	30	30	9	148
	TOTAL	17	25	42	40	53	53	18	248

S.NO.	TYPE	SIZE	CILL	REMARK
1	D1	2000 X 2400	-	FRAMELESS GLASS DOOR
2	D2a	1500 X 2400	-	FRAMELESS GLASS DOOR
3	D2b	1500 X 2400	-	WOODEN FLUSH DOOR
4	D3a	1200 X 2400	-	WOODEN FLUSH DOOR
5	D3b	1200 X 2400	-	FIRE RATED DOOR
6	D4	1050 X 2100	-	WOODEN FLUSH DOOR
7	D5	1000 X 2100	-	WOODEN FLUSH DOOR
8	D6	900 X 2100	-	WOODEN FLUSH DOOR
9	D7	750 X 2100	-	WOODEN FLUSH DOOR
10	W1	3000 X 1500	900	ALUMINUM WINDOW
11	W2	1800 X 1500	900	ALUMINUM WINDOW
12	V1	1200 X 900	1500	ALUMINUM WINDOW
13	V1	750 X 900	1500	ALUMINUM VENTILATOR
	SGL	AS/PLAN		STRUCTURAL GLAZING

---- Legend ----

Symbol	Description
	Brick Wall (BW)
	Wooden Partition (WP)- Ht. 3600
	Glass Partition (GP)- Ht. 3600



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- BOB:- BOTTOM OF BEAM
- FFL:- FLOOR FINISH LEVEL
- TOS:- TOP OF THE SLAB
- ALL HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR LEVEL

PROJECT TITLE :-
CONSTRUCTION OF EASTER REGION HEADQUARTER AT, RANCHI, JHARKHAND

OWNER :-
GAIL (INDIA) LIMITED
A GOVT. OF INDIA UNDERTAKING
B-35 & 36, 17th FLOOR,
JUBILEE TOWER, SEC-1, NOIDA(U.P.)

BUILDING TITLE :-
OFFICE BUILDING

DRAWING TITLE :-
SECOND FLOOR PLAN

DR. TYPE. :-
CONCEPT DRAWING

DR. NO. :-
CPDS/GAIL/RANCHI/AR/03

DELT. BY :- SHRUTI

APPD. BY :- A. NIGAM

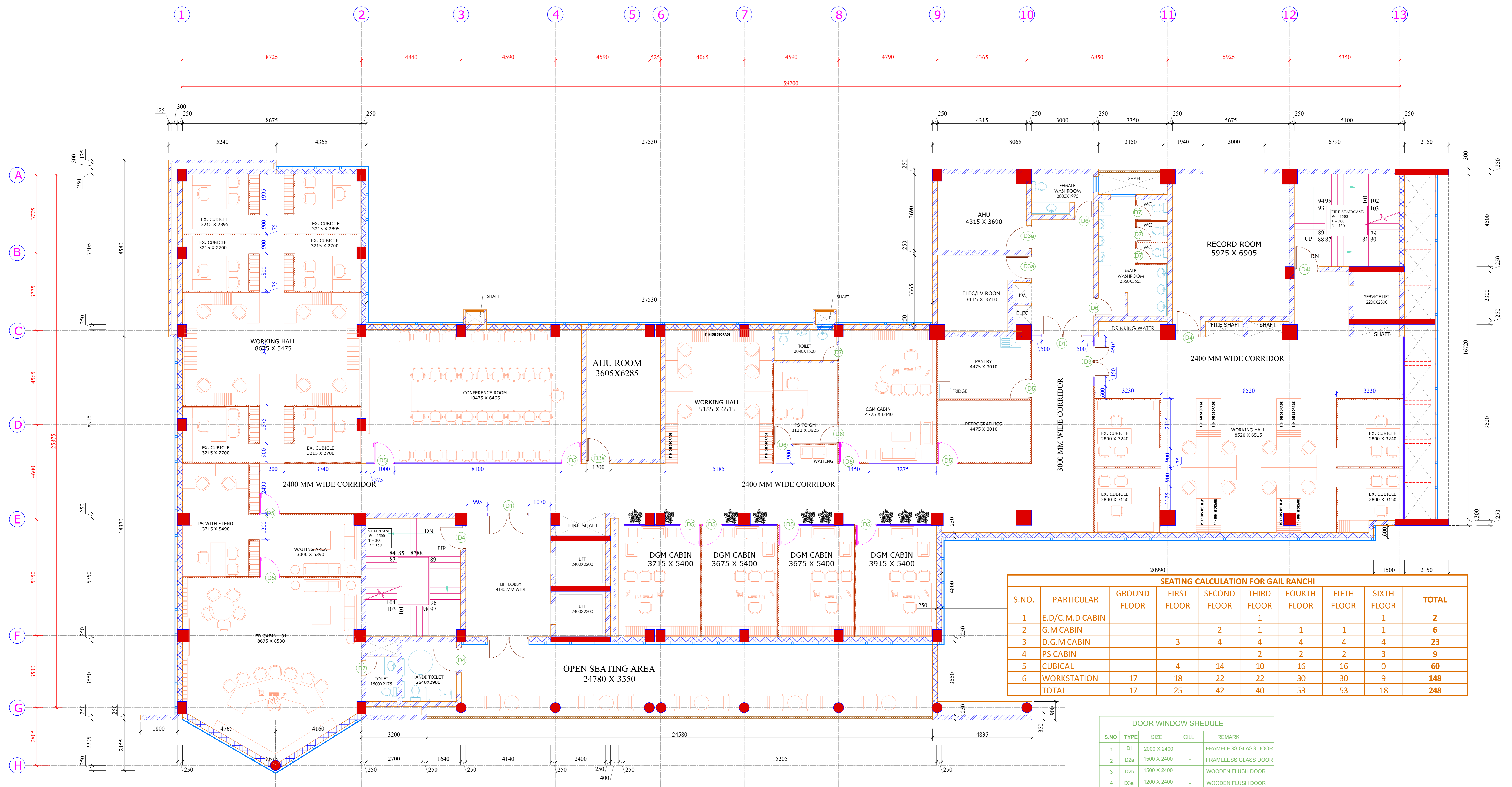
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DATE :- 08-05-2021

REV. NO :- 01

ARCHITECTS:

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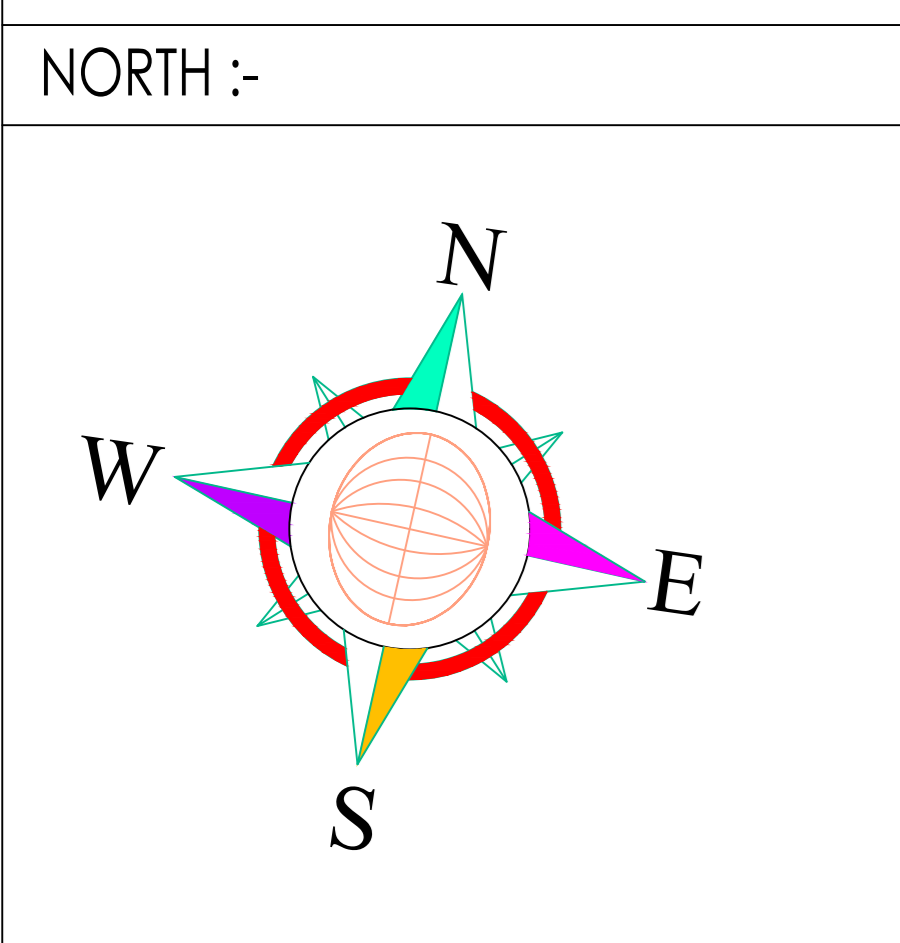
THIRD FLOOR

S.NO.	PARTICULAR	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR	FIFTH FLOOR	SIXTH FLOOR	TOTAL
1	E,D/C,M,D CABIN				1			1	2
2	G,M CABIN			2	1	1	1	1	6
3	D,G,M CABIN		3	4	4	4	4	4	23
4	PS CABIN				2	2	2	3	9
5	CUBICAL		4	14	10	16	16	0	60
6	WORKSTATION	17	18	22	22	30	30	9	148
	TOTAL	17	25	42	40	53	53	18	248

S.NO.	TYPE	SIZE	CILL	REMARK
1	D1	2000 X 2400	-	FRAMELESS GLASS DOOR
2	D2a	1500 X 2400	-	FRAMELESS GLASS DOOR
3	D2b	1500 X 2400	-	WOODEN FLUSH DOOR
4	D3a	1200 X 2400	-	WOODEN FLUSH DOOR
5	D3b	1200 X 2400	-	FIRE RATED DOOR
6	D4	1050 X 2100	-	WOODEN FLUSH DOOR
7	D5	1000 X 2100	-	WOODEN FLUSH DOOR
8	D6	900 X 2100	-	WOODEN FLUSH DOOR
9	D7	750 X 2100	-	WOODEN FLUSH DOOR
10	W1	3000 X 1500	900	ALUMINUM WINDOW
11	W2	1800 X 1500	900	ALUMINUM WINDOW
12	V1	1200 X 900	1500	ALUMINUM WINDOW
13	V1	750 X 900	1500	ALUMINUM VENTILATOR
	SGL	AS/PLAN		STRUCTURAL GLAZING

---- Legend ----

Symbol	Description
	Brick Wall (BW)
	Wooden Partition (WP)- Ht. 3600
	Glass Partition (GP)- Ht. 3600



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- BOB:- BOTTOM OF BEAM
- FFL:- FLOOR FINISH LEVEL
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PROJECT TITLE :-
CONSTRUCTION OF EASTER REGION HEADQUARTER AT, RANCHI, JHARKHAND

OWNER :-
GAIL (INDIA) LIMITED
A GOVT. OF INDIA UNDERTAKING
B-35 & 36, 17th FLOOR,
JUBILEE TOWER, SEC-1, NOIDA(U.P.)

BUILDING TITLE :-
OFFICE BUILDING

DRAWING TITLE :-
THIRD FLOOR PLAN

DR. TYPE. :-
CONCEPT DRAWING

DR. NO. :-
CPDS/GAIL/RANCHI/AR/04

DELT. BY :- SHRUTI

APPD. BY :- A. NIGAM

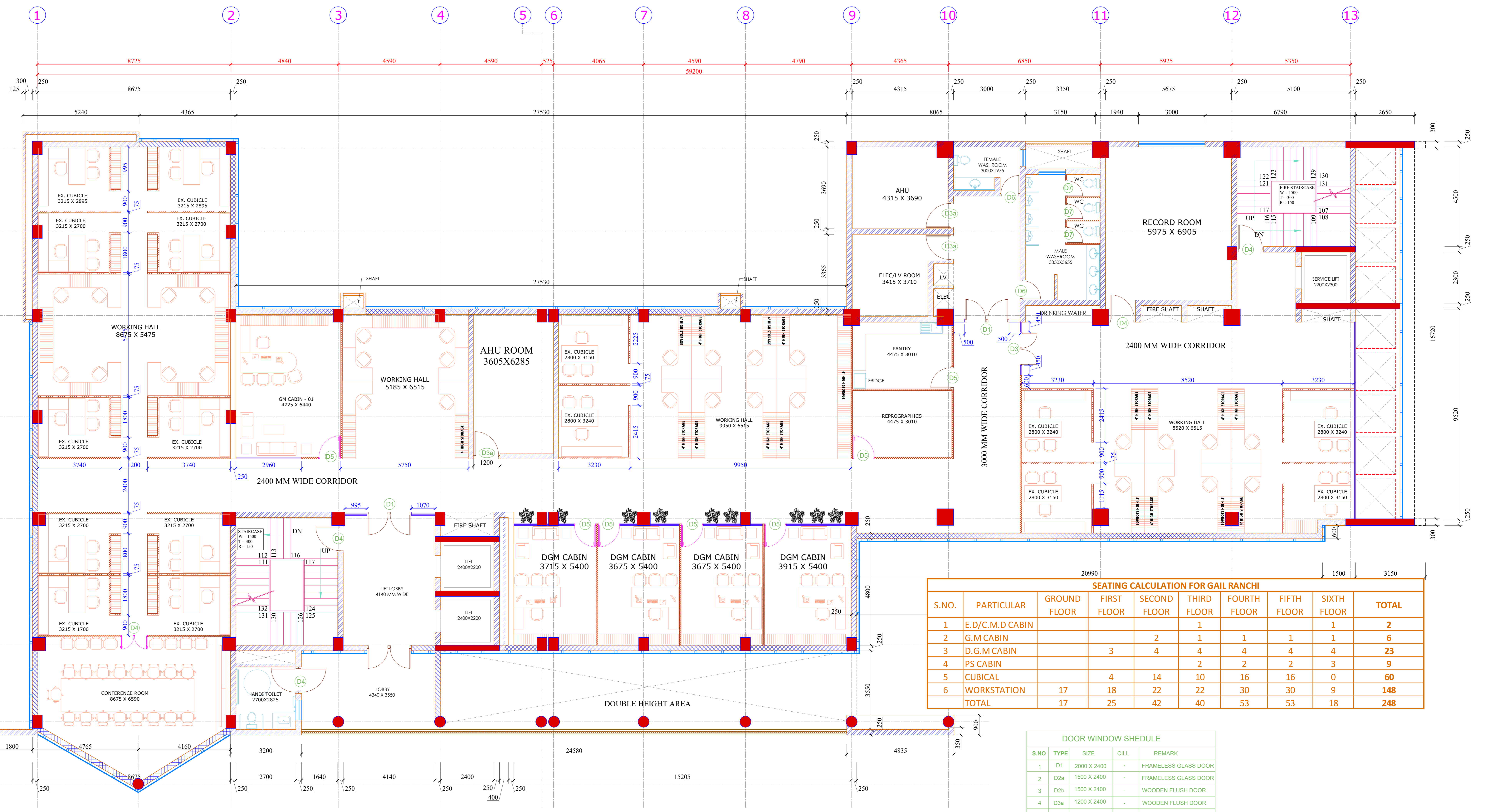
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DATE :- 08-05-2021

REV. NO :- 01

ARCHITECTS:

C.P. & D.S. ASSOCIATES,
 (An ISO 9001-2008 Certified Company)
A R C H I T E C T S
ENGINEERS, INTERIORS, P. M. C.
 B-32B, 3rd Floor, Pacific Business Park, Plot no 37/1
 Site IV, Sahibabad Industrial Area
 GHAZIABAD-201010, UTTAR-PRADESH, INDIA.
 TELEFAX: + 91-120-4136547/48
 email: designsolutions.cpds@gmail.com



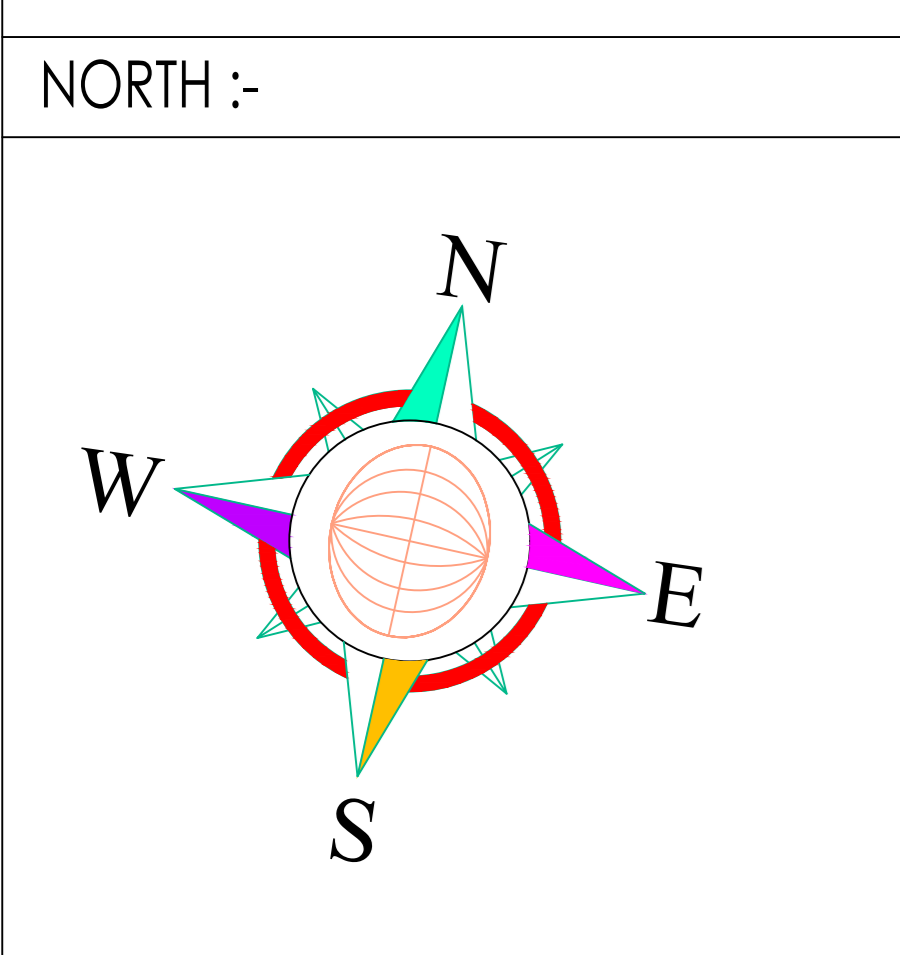
FOURTH FLOOR

S.NO.	PARTICULAR	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR	FIFTH FLOOR	SIXTH FLOOR	TOTAL
1	E.D./C.M.D CABIN				1			1	2
2	G.M CABIN			2	1	1	1	1	6
3	D.G.M CABIN		3	4	4	4	4	4	23
4	PS CABIN				2	2	2	3	9
5	CUBICAL		4	14	10	16	16	0	60
6	WORKSTATION	17	18	22	22	30	30	9	148
	TOTAL	17	25	42	40	53	53	18	248

S.NO.	TYPE	SIZE	CILL	REMARK
1	D1	2000 X 2400	-	FRAMELESS GLASS DOOR
2	D2a	1500 X 2400	-	FRAMELESS GLASS DOOR
3	D2b	1500 X 2400	-	WOODEN FLUSH DOOR
4	D3a	1200 X 2400	-	WOODEN FLUSH DOOR
5	D3b	1200 X 2400	-	FIRE RATED DOOR
6	D4	1050 X 2100	-	WOODEN FLUSH DOOR
7	D5	1000 X 2100	-	WOODEN FLUSH DOOR
8	D6	900 X 2100	-	WOODEN FLUSH DOOR
9	D7	750 X 2100	-	WOODEN FLUSH DOOR
10	W1	3000 X 1500	900	ALUMINUM WINDOW
11	W2	1800 X 1500	900	ALUMINUM WINDOW
12	V1	1200 X 900	1500	ALUMINUM WINDOW
13	V1	750 X 900	1500	ALUMINUM VENTILATOR
	SGL	AS/PLAN		STRUCTURAL GLAZING

---- Legend ----

Symbol	Description
	Brick Wall (BW)
	Wooden Partition (WP)- Ht. 3600
	Glass Partition (GP)- Ht. 3600



NOTES:-

- ALL THE DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
- FOLLOW WRITTEN DIMENSIONS ONLY AND DO NOT SCALE THE DRG.
- ANY DISCREPANCY FOUND IN THE DRG. SHALL BE BROUGHT TO THE NOTICE OF ARCHITECT IMMEDIATELY.
- READ THIS DRG WITH ALL RELEVANT STR/ ELEC/PLUMBING DWGS. AND SPECIFICATIONS OF THE CONTRACT.
- BOB:- BOTTOM OF BEAM
- FFL:- FLOOR FINISH LEVEL
- TOS:- TOP OF THE SLAB
- ALL HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR LEVEL

PROJECT TITLE :-
CONSTRUCTION OF EASTER REGION HEADQUARTER AT, RANCHI, JHARKHAND

OWNER :-
GAIL (INDIA) LIMITED
A GOVT. OF INDIA UNDERTAKING
B-35 & 36, 17th FLOOR,
JUBILEE TOWER, SEC-1, NOIDA(U.P.)

BUILDING TITLE :-
OFFICE BUILDING

DRAWING TITLE :-
FOURTH FLOOR PLAN

DR. TYPE. :-
CONCEPT DRAWING

DR. NO. :-
CPDS/GAIL/RANCHI/AR/05

DELT. BY :- SHRUTI

APPD. BY :- A. NIGAM

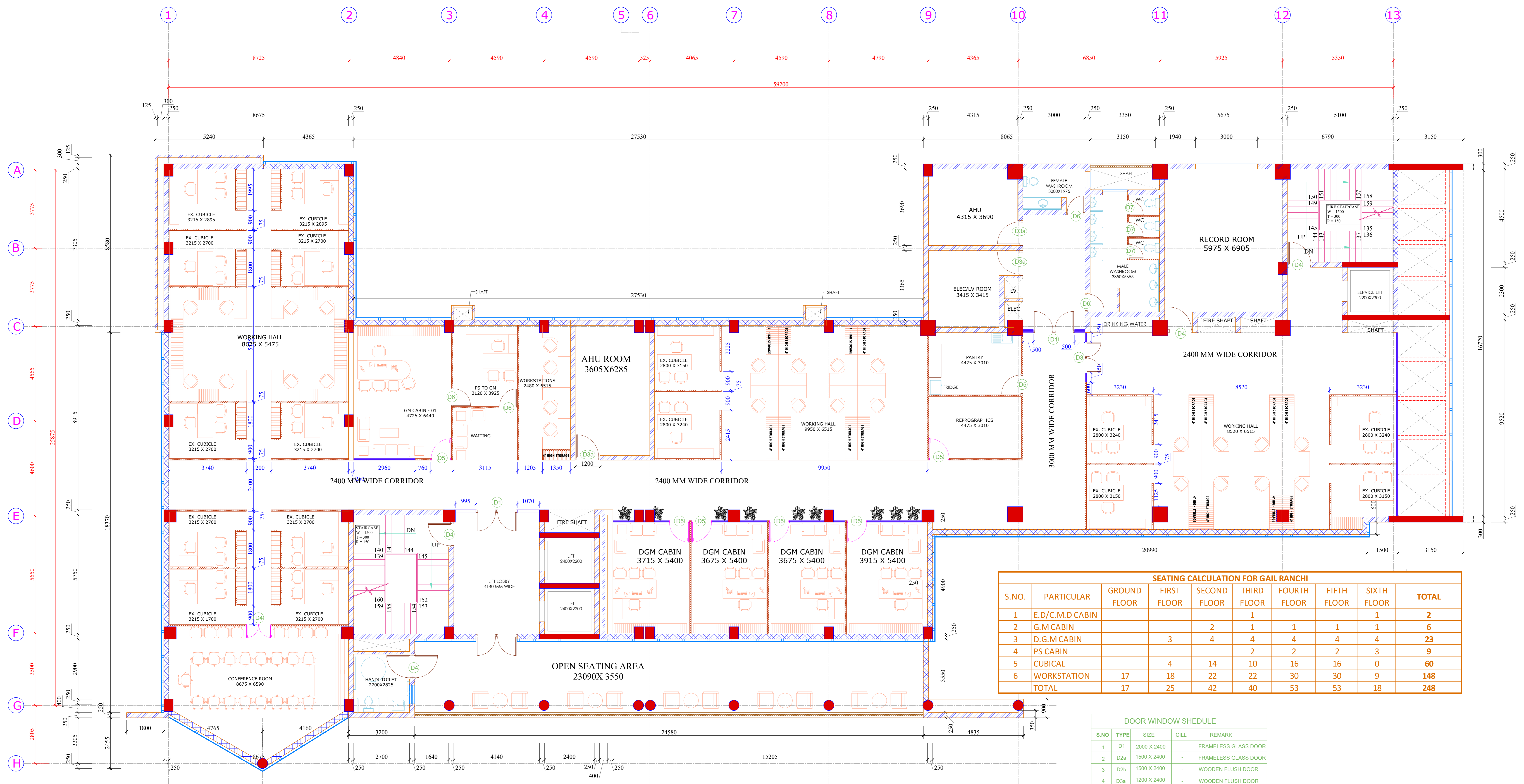
SCALE :- 1:100 (A1)

DATE :- 08-05-2021

REV. NO :- 01

ARCHITECTS:

C.P. & D.S. ASSOCIATES,
 (An ISO 9001-2008 Certified Company)
A R C H I T E C T S
ENGINEERS, INTERIORS, P. M. C.
 B-328, 3rd Floor, Pacific Business Park, Plot no 37/1
 Site IV, Sahibabad Industrial Area
 GHAZIABAD-201010, UTTAR-PRADESH, INDIA.
 TELEFAX: + 91-120-4136547/48
 email: designsolutions.cpds@gmail.com

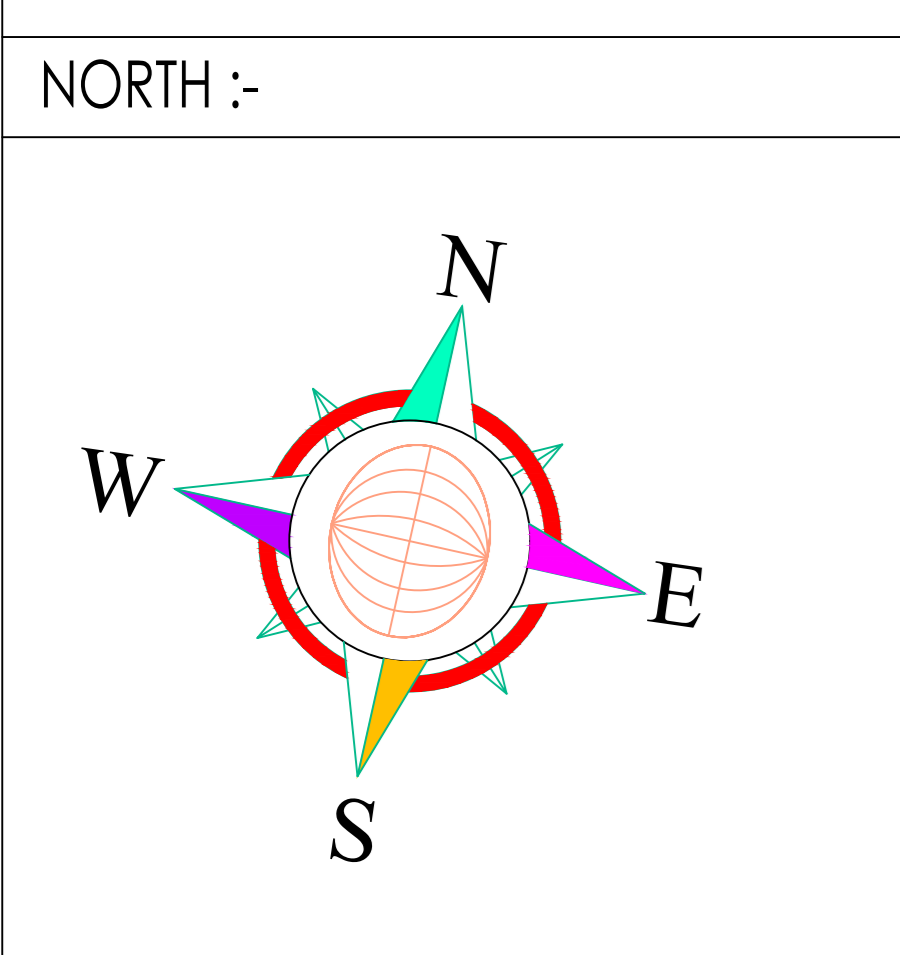


FIFTH FLOOR

S.NO.	PARTICULAR	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR	FIFTH FLOOR	SIXTH FLOOR	TOTAL
1	E.D./C.M.D CABIN				1			1	2
2	G.M CABIN			2	1	1	1	1	6
3	D.G.M CABIN		3	4	4	4	4	4	23
4	PS CABIN				2	2	2	3	9
5	CUBICAL		4	14	10	16	16	0	60
6	WORKSTATION	17	18	22	22	30	30	9	148
	TOTAL	17	25	42	40	53	53	18	248

S.NO	TYPE	SIZE	CILL	REMARK
1	D1	2000 X 2400	-	FRAMELESS GLASS DOOR
2	D2a	1500 X 2400	-	FRAMELESS GLASS DOOR
3	D2b	1500 X 2400	-	WOODEN FLUSH DOOR
4	D3a	1200 X 2400	-	WOODEN FLUSH DOOR
5	D3b	1200 X 2400	-	FIRE RATED DOOR
6	D4	1050 X 2100	-	WOODEN FLUSH DOOR
7	D5	1000 X 2100	-	WOODEN FLUSH DOOR
8	D6	900 X 2100	-	WOODEN FLUSH DOOR
9	D7	750 X 2100	-	WOODEN FLUSH DOOR
10	W1	3000 X 1500	900	ALUMINUM WINDOW
11	W2	1800 X 1500	900	ALUMINUM WINDOW
12	V1	1200 X 900	1500	ALUMINUM WINDOW
13	V1	750 X 900	1500	ALUMINUM VENTILATOR
	SGL	AS/PLAN		STRUCTURAL GLAZING

Symbol	Description
	Brick Wall (BW)
	Wooden Partition (WP)- Ht. 3600
	Glass Partition (GP)- Ht. 3600



NOTES:-

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- FFL:- FLOOR FINISH LEVEL
- TOS:- TOP OF THE SLAB
- ALL HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR LEVEL

PROJECT TITLE :-
CONSTRUCTION OF EASTER REGION HEADQUARTER AT, RANCHI, JHARKHAND

OWNER :-
GAIL (INDIA) LIMITED
A GOVT. OF INDIA UNDERTAKING
B-35 & 36, 17th FLOOR,
JUBILEE TOWER, SEC-1, NOIDA(U.P.)

BUILDING TITLE :-
OFFICE BUILDING

DRAWING TITLE :-
FIFTH FLOOR PLAN

DR. TYPE. :-
CONCEPT DRAWING

DR. NO. :-
CPDS/GAIL/RANCHI/AR/06

DELT. BY :- SHRUTI

APPD. BY :- A. NIGAM

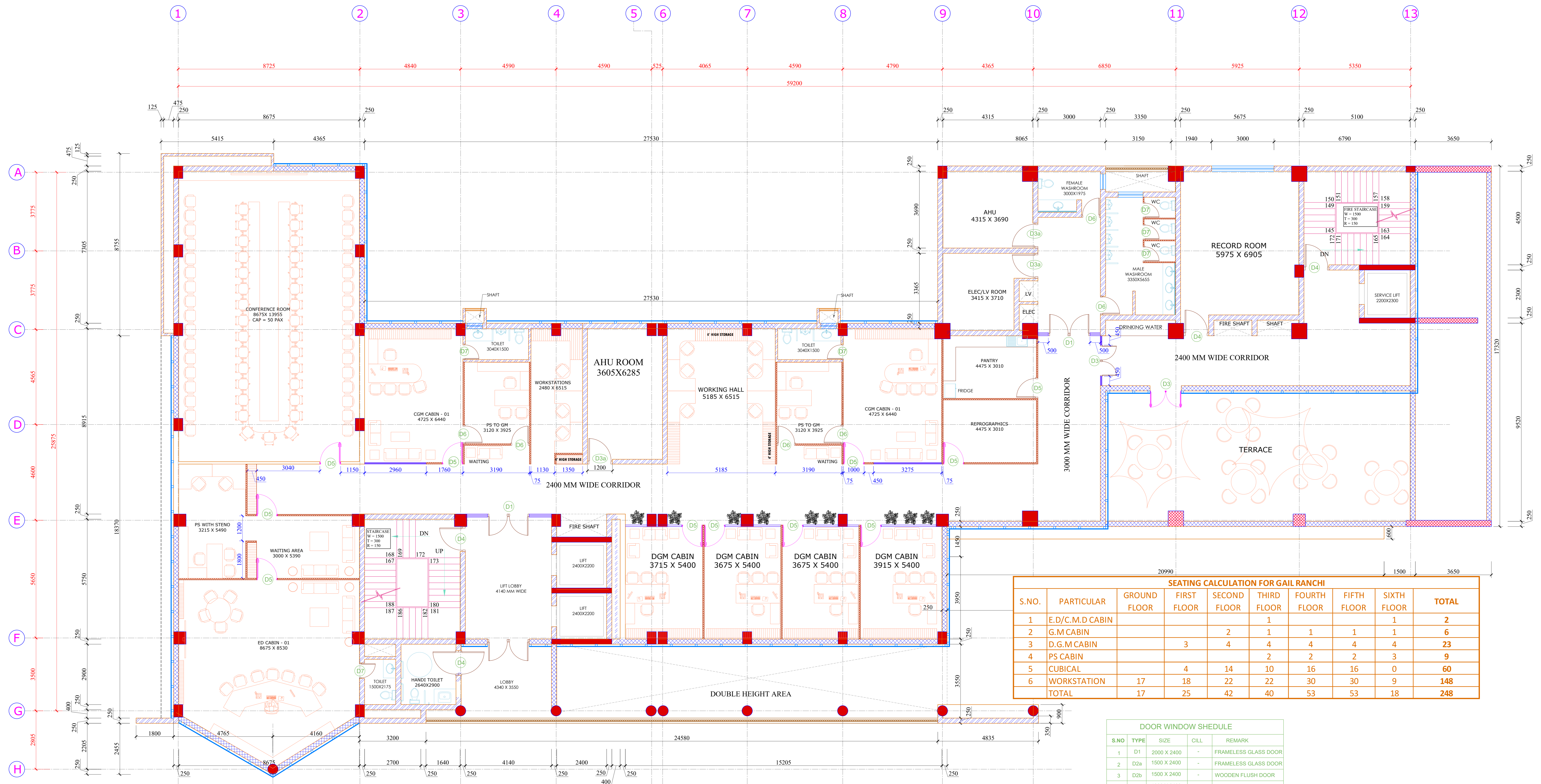
SCALE :- 1:100 (A1)

DATE :- 08-05-2021

REV. NO :- 01

ARCHITECTS:

C.P. & D.S. ASSOCIATES,
 (An ISO 9001-2008 Certified Company)
A R C H I T E C T S
ENGINEERS, INTERIORS, P. M. C.
 B-328, 3rd Floor, Pacific Business Park, Plot no 37/1
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 GHAZIABAD-201010, UTTAR-PRADESH, INDIA.
 TELEFAX: + 91-120-4136547/48
 email: designsolutions.cps@gmail.com



SIXTH FLOOR

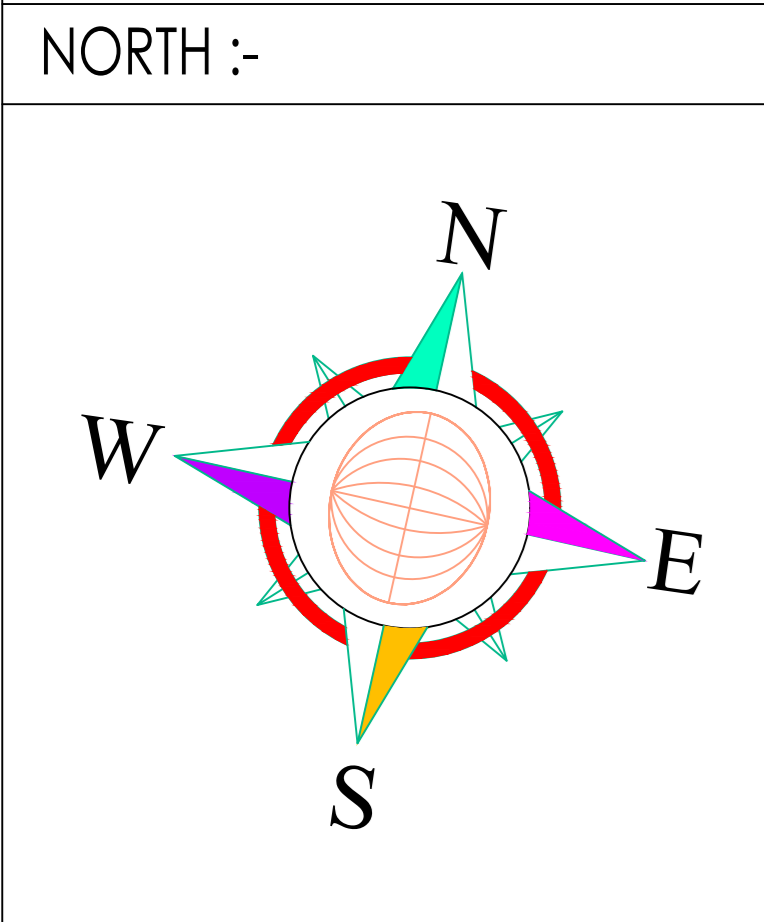
S.NO.	PARTICULAR	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR	FIFTH FLOOR	SIXTH FLOOR	TOTAL
1	E.D./C.M.D CABIN				1			1	2
2	G.M CABIN			2	1	1	1	1	6
3	D.G.M CABIN		3	4	4	4	4	4	23
4	PS CABIN				2	2	2	3	9
5	CUBICAL		4	14	10	16	16	0	60
6	WORKSTATION	17	18	22	22	30	30	9	148
	TOTAL	17	25	42	40	53	53	18	248

S.NO.	TYPE	SIZE	CILL	REMARK
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7	D5	1000 X 2100	-	WOODEN FLUSH DOOR
8	D6	900 X 2100	-	WOODEN FLUSH DOOR
9	D7	750 X 2100	-	WOODEN FLUSH DOOR
10	W1	3000 X 1500	900	ALUMINUM WINDOW
11	W2	1800 X 1500	900	ALUMINUM WINDOW
12	V1	1200 X 900	1500	ALUMINUM WINDOW
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	SGL	AS/PLAN		STRUCTURAL GLAZING

---- Legend ----

Symbol	Description
	Brick Wall (BW)
	Wooden Partition (WP)- Ht. 3600
	Glass Partition (GP)- Ht. 3600

FOR APPROVAL



NOTES:-

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CONSTRUCTION OF EASTER REGION HEADQUARTER AT, RANCHI, JHARKHAND

OWNER :-
GAIL (INDIA) LIMITED
A GOVT. OF INDIA UNDERTAKING
B-35 & 36, 17th FLOOR,
JUBILEE TOWER, SEC-1, NOIDA(U.P.)

BUILDING TITLE :-
OFFICE BUILDING

DRAWING TITLE :-
SIXTH FLOOR PLAN

DR. TYPE. :-
CONCEPT DRAWING

DR. NO. :-
CPDS/GAIL/RANCHI/AR/07

DELT. BY :- SHRUTI

APPD. BY :- A. NIGAM

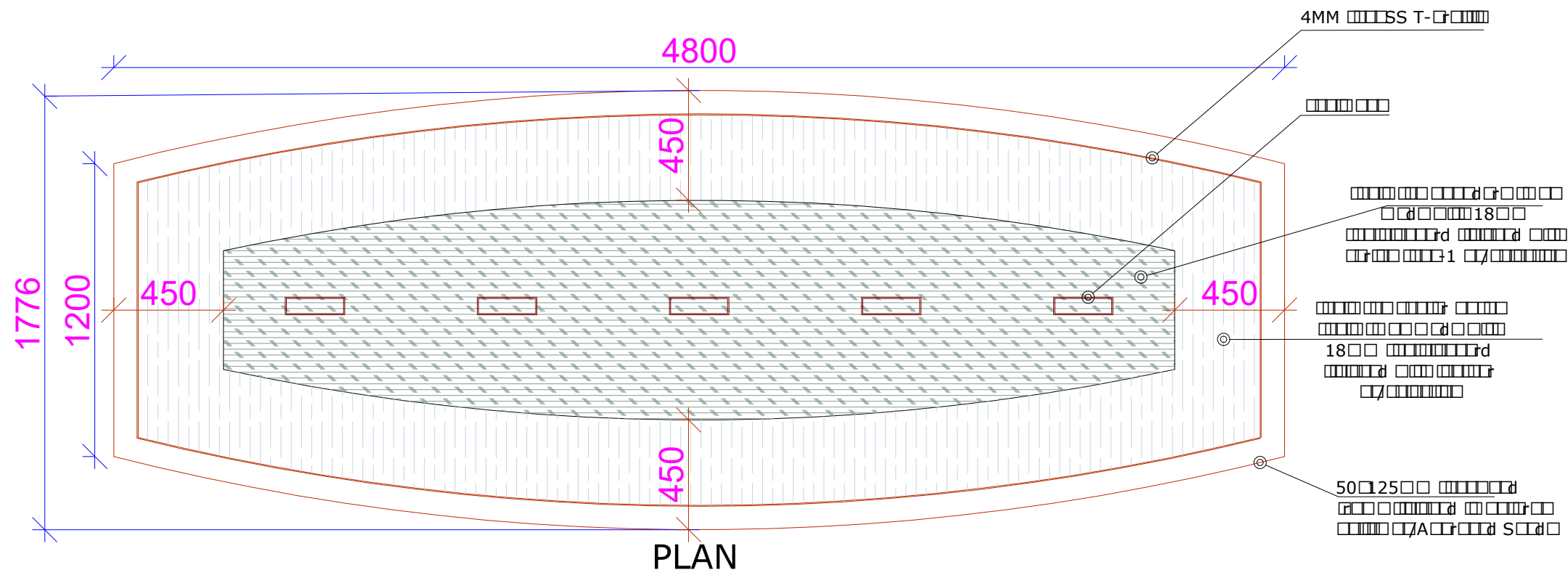
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DATE :- 08-05-2021

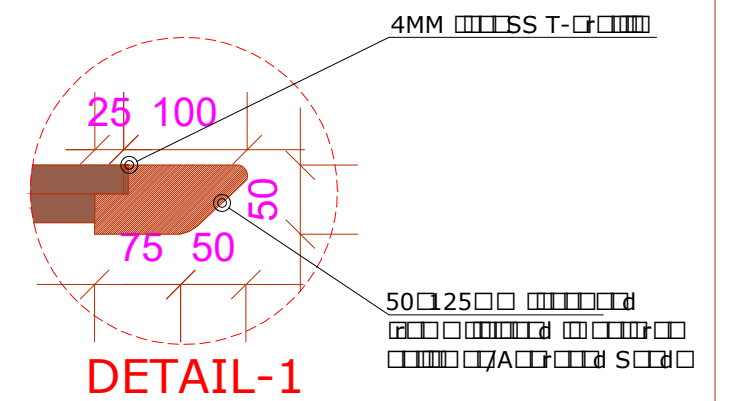
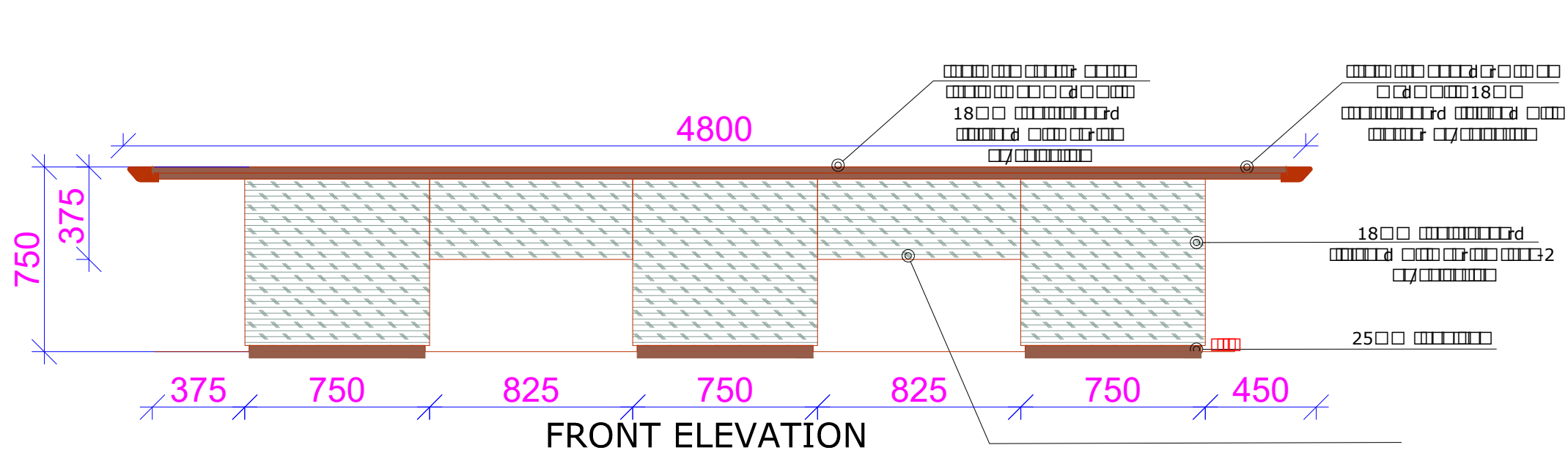
REV. NO :- 01

ARCHITECTS:

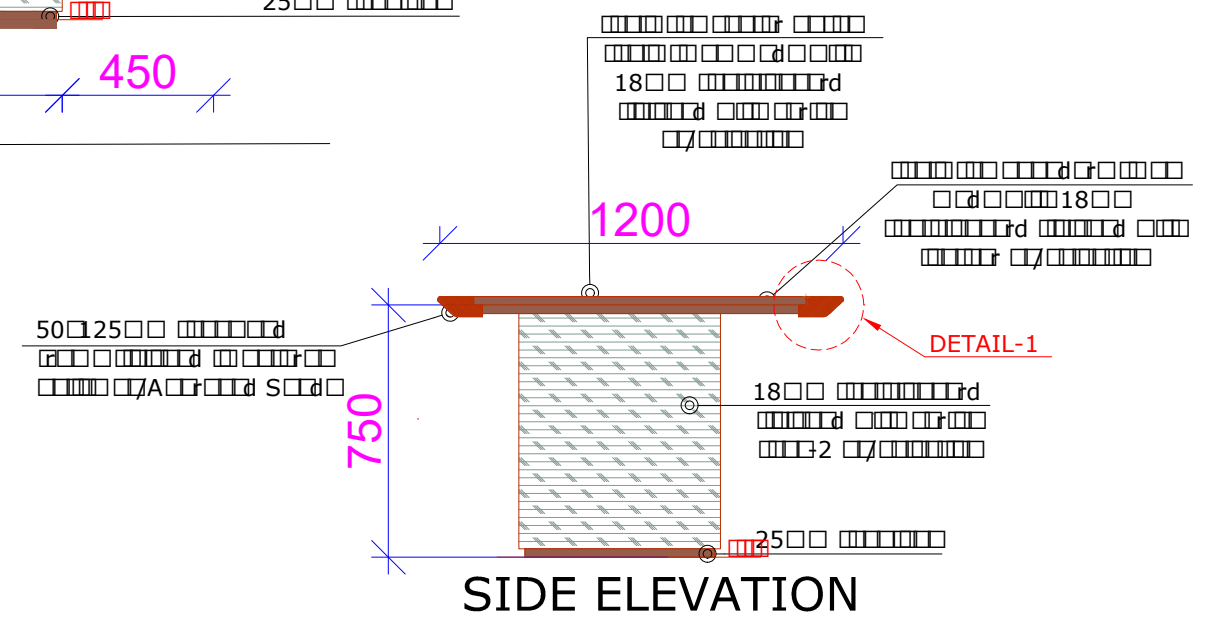
C.P. & D.S. ASSOCIATES,
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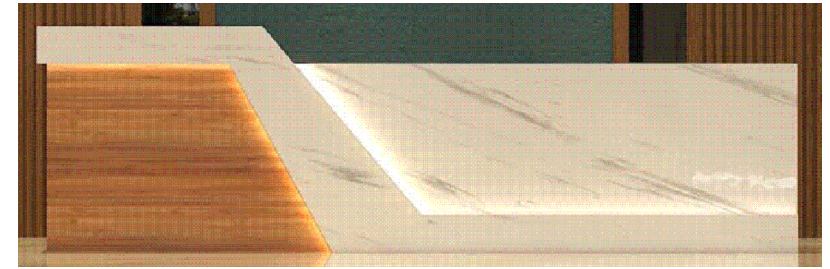
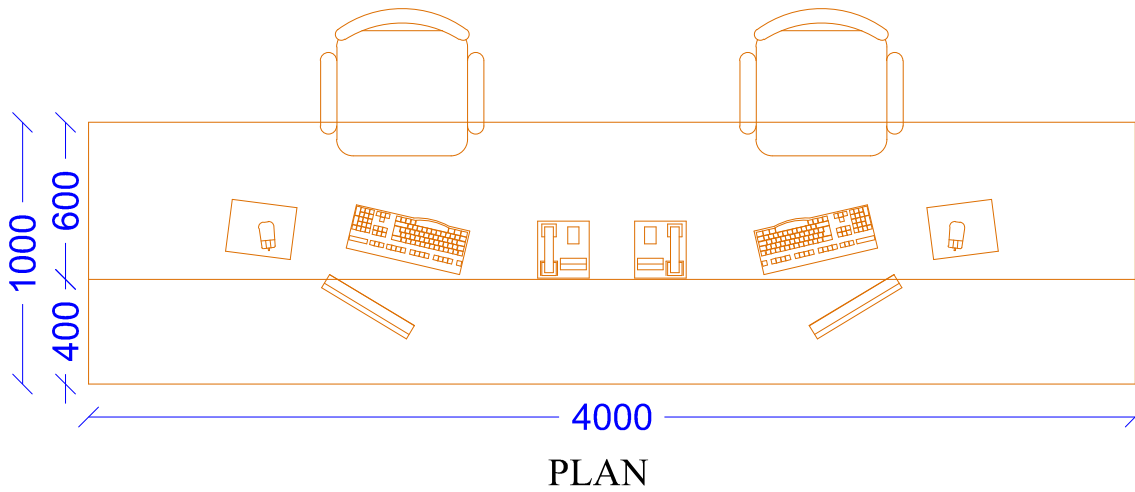


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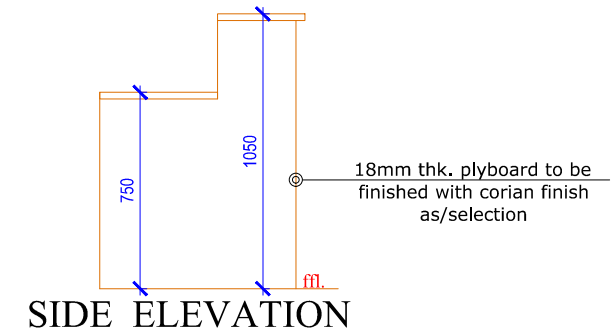
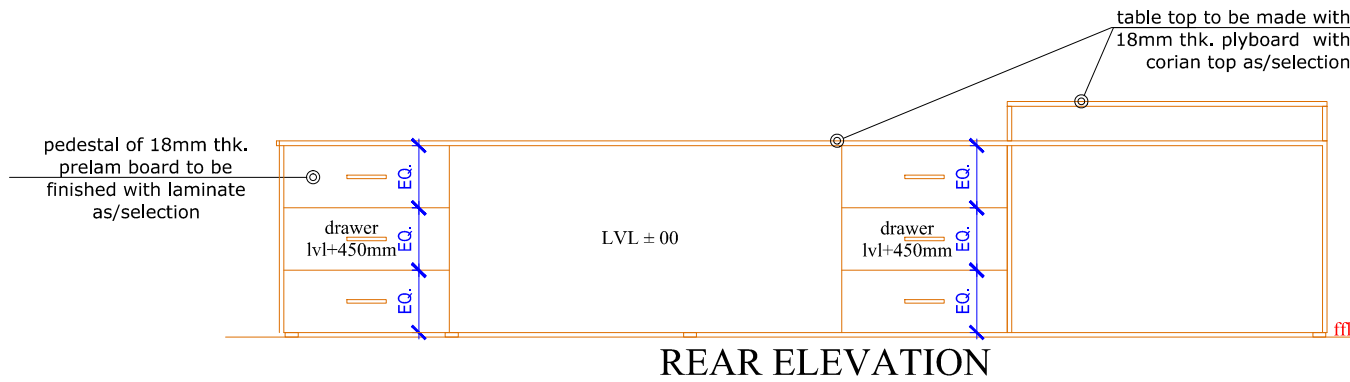


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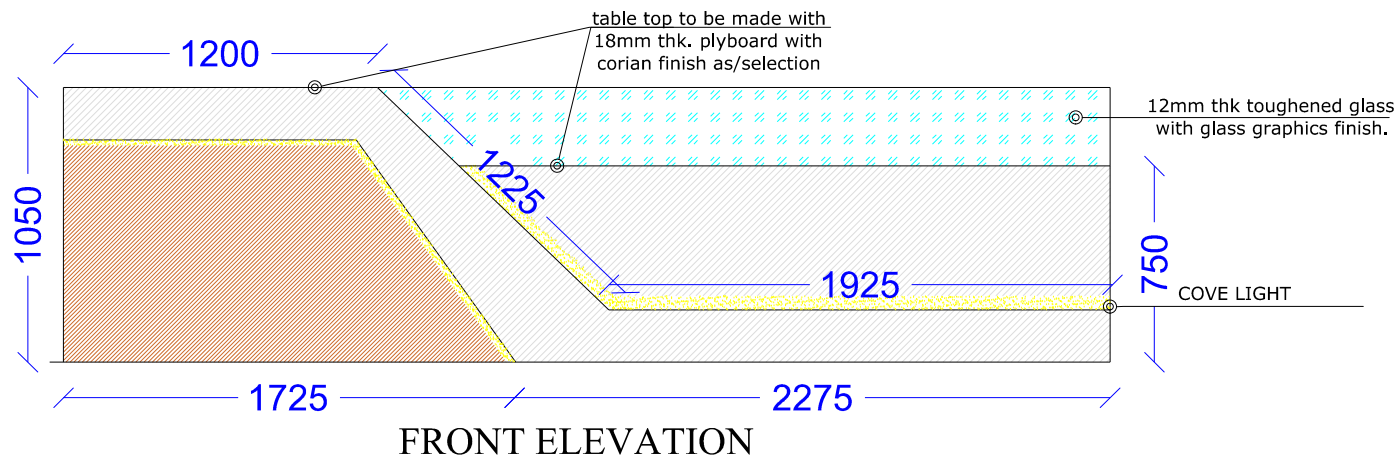




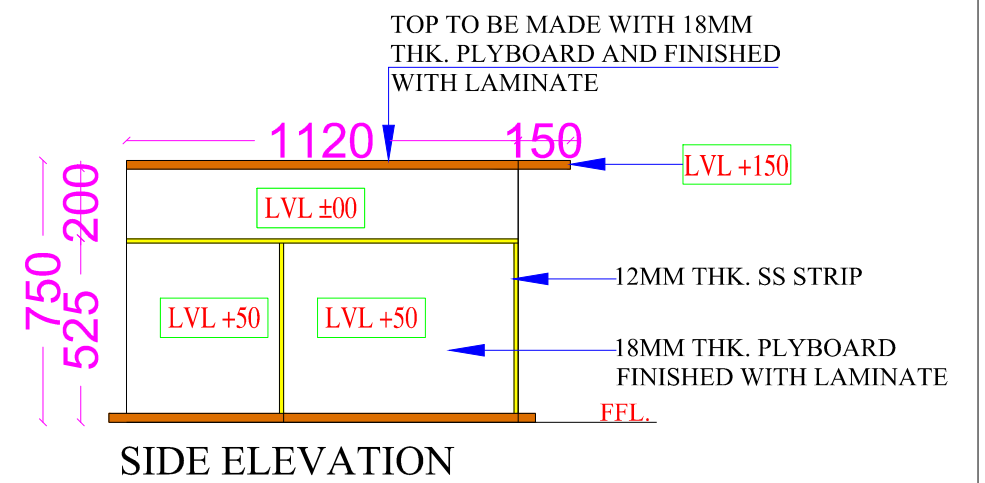
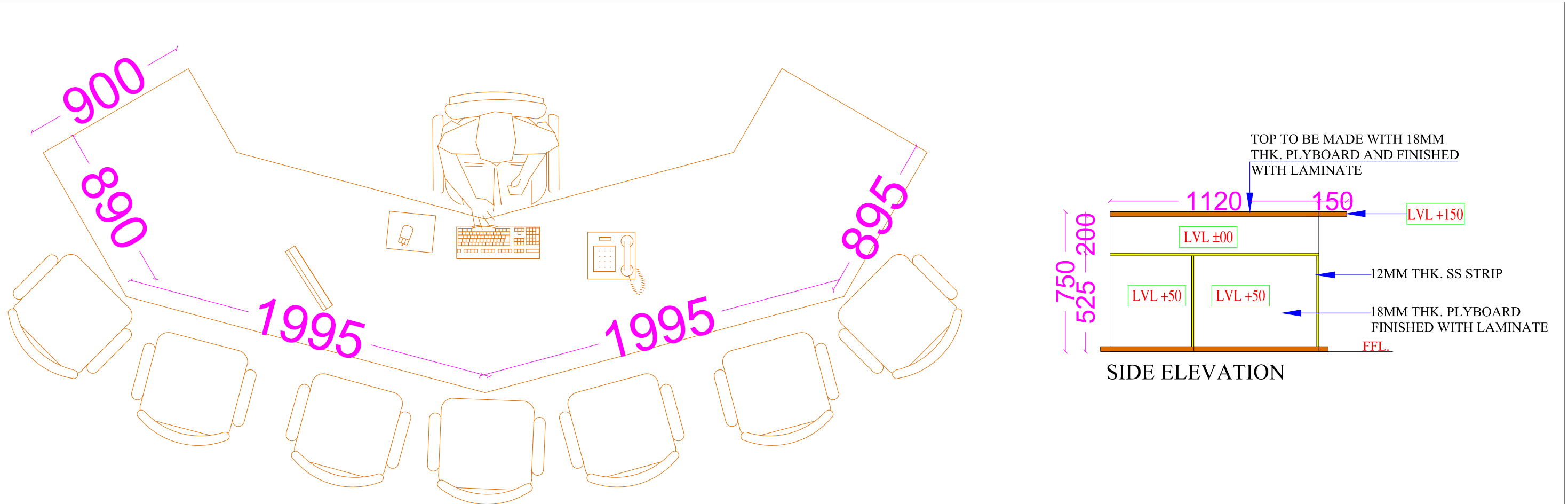
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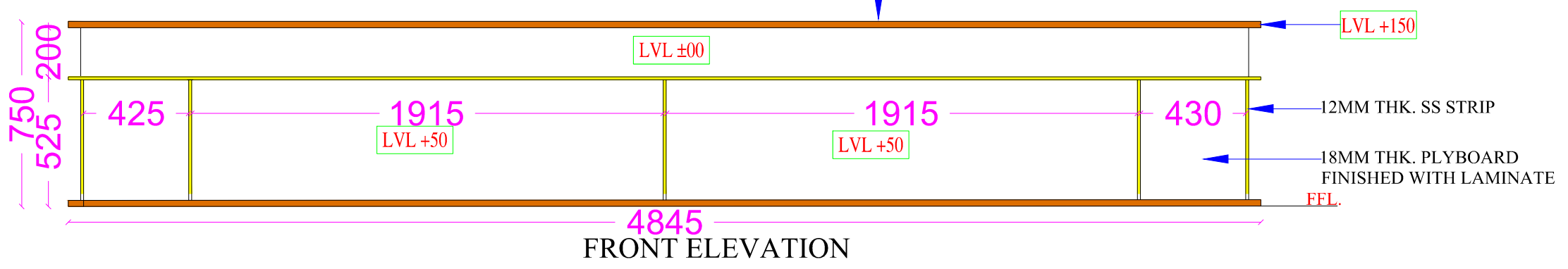
SIDE ELEVATION



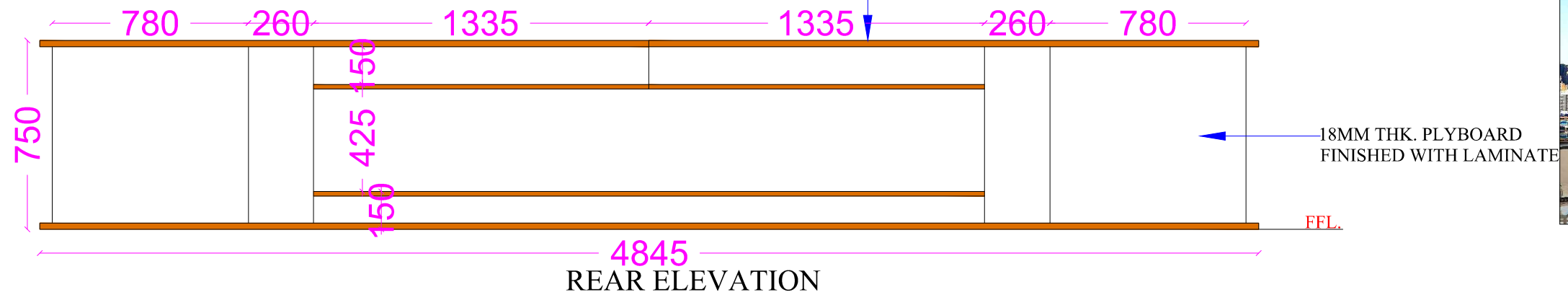
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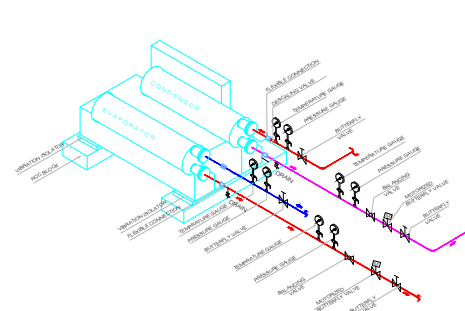
TOP TO BE MADE WITH 18MM THK. PLYBOARD AND FINISHED WITH LAMINATE



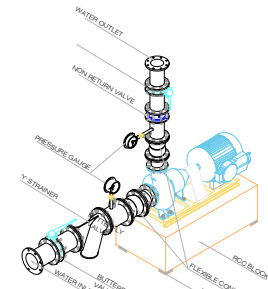
TOP TO BE MADE WITH 18MM THK. PLYBOARD AND FINISHED WITH LAMINATE



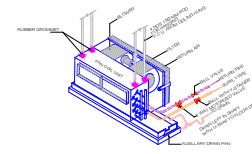
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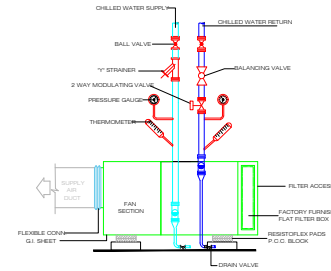
TYPICAL CONNECTION DETAILS FOR CONDENSER & EVAPORATOR



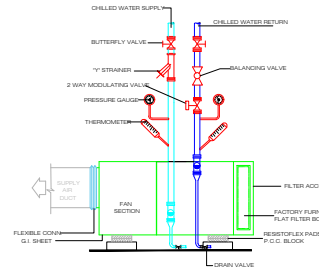
TYPICAL CONNECTION DETAILS FOR PUMPS



TYPICAL PIPING DETAIL FOR RISER AND RETURN LINES FOR CHILLED WATER

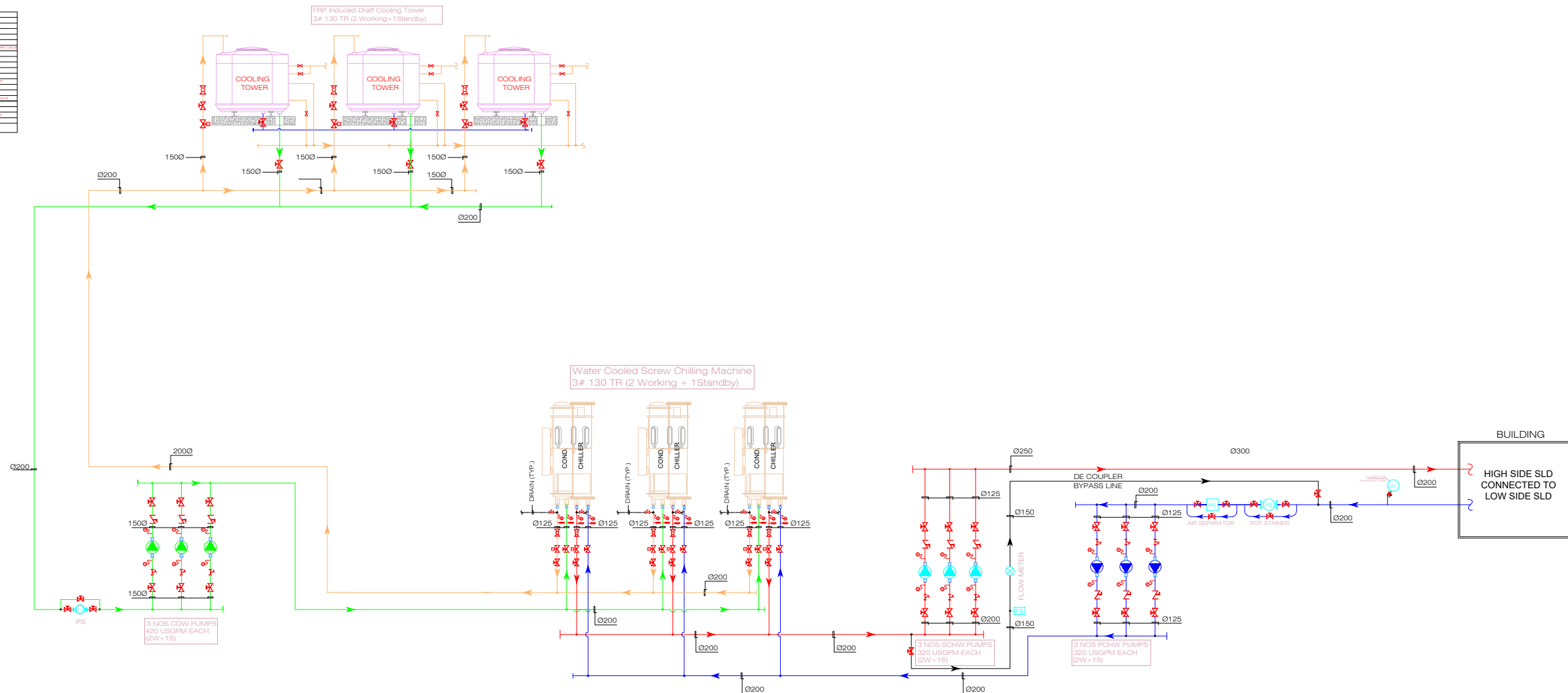


TYPICAL AIR HANDLING UNIT PIPING CONNECTIONS DETAIL FOR CHILLED WATER 40mm DIA & BELOW



TYPICAL AIR HANDLING UNIT PIPING CONNECTIONS DETAIL FOR CHILLED WATER 50mm DIA & ABOVE

NO.	DESCRIPTION	DATE
1	ISSUED FOR APPROVAL	04.10.2023



NO. OF PRINTS	ISSUED TO	DATE
00	---	00/00/00

S.N.	DATE	DETAILS
REVISIONS		

OWNER :-
GAIL (INDIA) LIMITED
 A GOVT. OF INDIA UNDERTAKING
 B-35 & 36, JUBILEE TOWER,
 SEC-1, NOIDA (U.P.)

PROJECT:-
**CONSTRUCTION OF EASTER
 REGION HEADQUARTER AT
 RANCHI, JHARKHAND**


ARCHITECT:

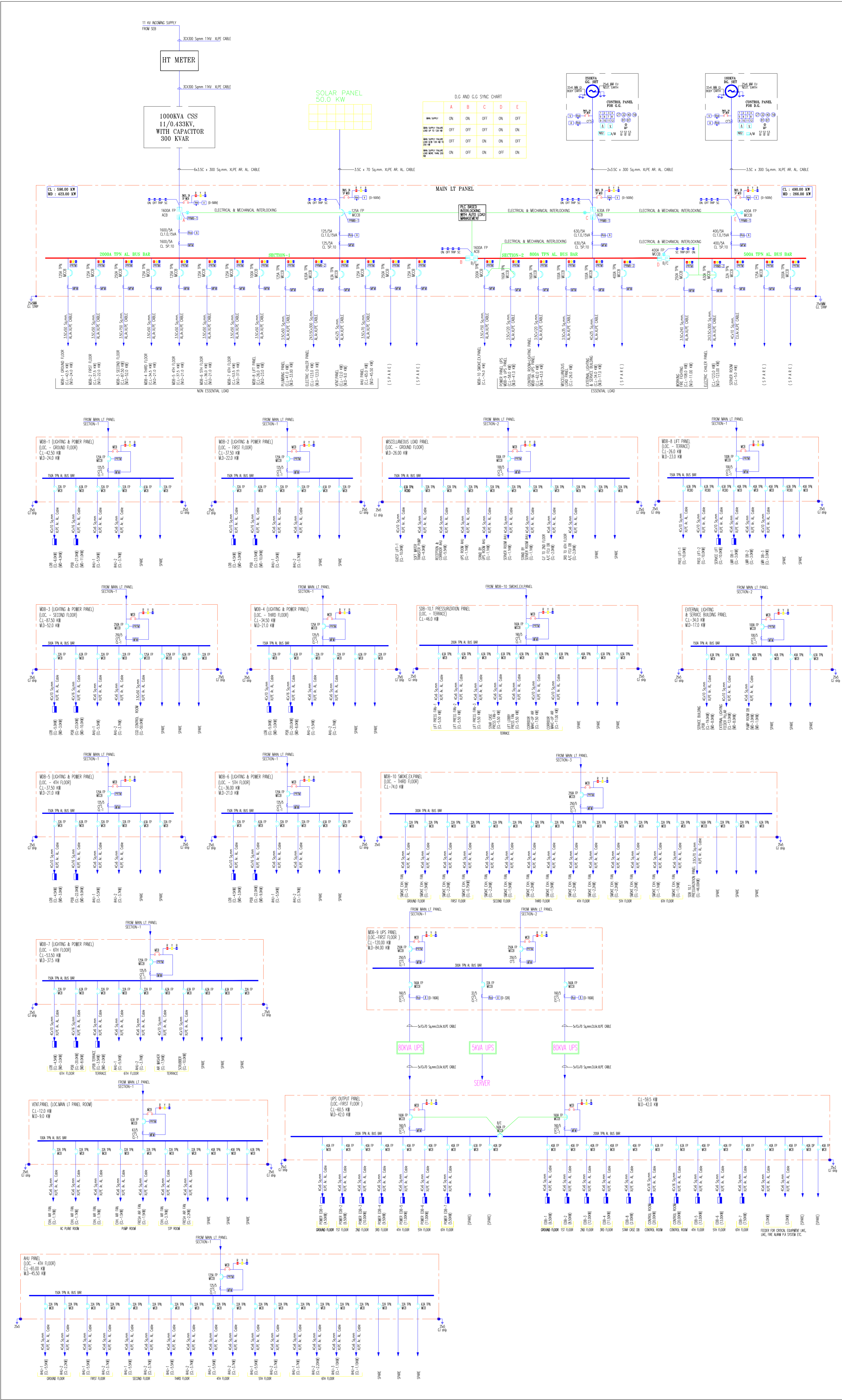
**CP & DS ASSOCIATES
 ARCHITECTS**
 PLANNERS PROJECT MANAGEMENT
 B-328, 3rd Floor, Pacific Business Park
 Plot No - 37/1, Site - IV, Sahibabad,
 Industrial Area, Ghaziabad - 201010
 Tel: 0120-4136547-48, 9311282552, 9811282552
 Email :- design@cpds@gmail.com

STAGE
 FOR APPROVAL

DRAWING TITLE
 HIGH SIDE SCHEMATIC LAYOUT

Designed	Checked	Approved
P.A	SHIVA	SHIVA
Scale	Date	Rev. No.
1:100 @A3	04.10.2023	R-0

Drawing No. CTOC.- GR-HVAC-01
 ORIENTATION: 



Note

- ALL ALUMINIUM BUS BARS SHALL HAVE A SIZE OF MAXIMUM OF OTHER CURRENT CARRYING OF 1 AMP PER SQMM OR TO WITH STANDARDS OF INDICATED FAULT LEVEL WHICHEVER IS HIGHER
- ALL 415 VOLT PANELS SHALL HAVE EXTENDED BUSBARS/CONTROL WIRING TERMINAL BLOCK TO FACILITATE EXTENSION WITH OUT SHUTTING DOWN PANEL
- ALL ACBS AND BUSBAR ON 415 VOLT PANELS SHALL HAVE AT LEAST VALUE OF 50 KA
- MICROPROCESSOR RELEASES FOR ACBS ALL RELEASES SHALL BE SITE SETABLE WITHIN RANGE STIPULATED
- ELECTRICAL INTERLOCKING TO ENSURE D.O. SUPPLY IS NOT PARALLELED WITH GRID
- ALL ACBS/MCB FEEDER RATINGS SHALL BE "N" PANEL RATING & APPROPRIATE FRAME SIZE SELECTED BY MANUFACTURER
- MCB SHALL BE THERMAL MAGNETIC RELAYS UP TO 200A AND ABOVE 200A SHALL BE MICROPROCESSOR BASED RELEASES
- PROTECTION RELAY RELEASES (PANEL) SHALL BE AS FOLLOWS:
 - OVER CURRENT RANGE 100A-120A - WITH TIME SETTING
 - SELECTIVE SHORT CIRCUIT 100A-1000A - WITH TIME SETTING
 - INSTANTANEOUS SHORT CIRCUIT 200A-1000A
 - EARTH FAULT WITH ADJUSTABLE RELAY 20A-100A
 - UNDER VOLTAGE 60A-90A TIME SETTING
 - OVER VOLTAGE 100A-120A TIME SETTING
 - REVERSE POWER
 - CURRENT UNBALANCE
 - PHASE SEQUENCE
- MEASUREMENTS:
 - CURRENT - PHASES, NEUTRAL
 - VOLTAGE - PHASE-NEUTRAL
 - POWER - ACTIVE/REACTIVE
 - ENERGY - ACTIVE/REACTIVE
 - POWER FACTOR
 - FREQUENCY
- CONNECT:
 - MCB'S CONNECTIVITY FOR ACB ON/OFF STATUS/PROTECTION PARAMETERS SET/FULL TRIP SIGNALS

LEGEND:

	MINIATURE CIRCUIT BREAKER
	MOULDED CASE CIRCUIT BREAKER
	MOTORISED MOULDED CASE CIRCUIT BREAKER
	AIR CIRCUIT BREAKER (D.O.)
	MOTORISED AIR CIRCUIT BREAKER (D.O.)
	VACUUM CIRCUIT BREAKER (D.O.)
	FUSE
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	AMMETER
	VOLTMETER
	AMMETER SELECTOR SWITCH
	VOLTMETER SELECTOR SWITCH
	POWER FACTOR METER
	ENERGY METER
	INDICATING LAMP
	ON/OFF TRIP SC
	FREQUENCY METER
	D/C & EARTH FAULT RELAY
	OVER CURRENT & E/F RELAY
	UNDER VOLTAGE RELAY
	LOCK OUT RELAY
	AUXILIARY RELAY
	WINDING TEMP. ALARM/TRIP
	TRIP CIRCUIT SUPERV. RELAY
	ACTIVE & REACTIVE ENERGY METER
	MULTI-FUNCTION METER
	DC VOLT METER
	DC AMMETER
	ON/OFF REMOTE SWITCH
	STAR DELTA/DIRECT ON LINE STARTER
	EMERGENCY STOP (PUSH BUTTON)
	TEST (PUSH BUTTON)
	ACCEPT (PUSH BUTTON)
	PROTECTION RELAYAS MICROPROCESSOR BASED

00	---	00/00/00
NO. OF PRINTS	ISSUED TO	DATE
R4	13.06.2022	REVISED AHU VENT & SMOKE PANEL
R3	27.05.2022	REVISED AS PER COMMENT
R2	25.03.2022	REVISED AS PER COMMENT
R1	29.01.2022	REVISED AS PER COMMENT
S.N.	DATE	DETAILS
REVISIONS		
OWNER		
GAIL (INDIA) LIMITED A GOVT. OF INDIA UNDERTAKING B-35 & 36, JUBILEE TOWER, SEC-1, NOIDA (U.P.)		
PROJECT		
CONSTRUCTION OF EASTER REGION HEADQUARTER AT RANCHI, JHARKHAND		
ARCHITECT		
CP & DS ASSOCIATES A R C H I T E C T S PLANNERS PROJECT MANAGEMENT B-328, 3rd Floor, Pacific Business Park Plot No-3771, Site-IV, Sahibabad, Industrial Area, Ghaziabad - 201010 Toll-free: 01204136547/8, 91128252, 981128252 Email: - ds@cpdsonline.com		
MEP CONSULTANTS		
C T O C Consulting Engineers Pvt. Ltd. E-28, - (Basement) East of Kailash, New Delhi-110065 (INDIA) Tel.: 011-43942523, 43952523		
STAGE		
TENDER DRAWING		
DRAWING TITLE		
MAIN SINGLE LINE DIAGRAM		
Designed	Checked	Approved
BANSHI	BUBU	CHAWLA
Scale	Date	Rev. No.
NTS	20/08/2021	R04
Drawing No.	ORIENTATION:	
CTOC/EL-SLD-01		



TECHNICAL SPECIFICATIONS



CIVIL WORKS

The work to be performed under this specification includes providing all labour, supervision including Contractor's and specialized supervision, all materials (including cement, structural steel, reinforcement steel) and consumables, temporary storage sheds, temporary site office, construction equipment, scaffolding, fuel supply, tools and plant, transportation, technical personnel, all sampling and testing, providing necessary facilities and equipment to Engineer-in-charge for carrying out the inspection and quality check, recording before start of construction activities, setting out layout and levels, carrying out construction and erection in a mechanized manner, making all safety arrangements, storage, repair/rectification / maintenance until handing over and all incidental items not shown or specified but reasonably implied or necessary for the successful completion and proper functioning of the building and other services all in strict accordance with the Schedule of Items and quantities, Technical Specification and Drawings complete, as per the Direction of and to the satisfaction of the engineer-in-Charge.

General

The materials, design and workmanship shall satisfy the relevant Indian Standard, CPWD specification, most specifications and the Specifications contained herein and codes referred to. Where the Specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall be approved by the Engineer-in-charge. In case of any ambiguity, sound engineering practices shall prevail and the decision of engineer in charge in such matters shall be final.

The tenderer /contractor shall arrange the necessary quality tests from the reputed laboratory for items which are not ISI marked and for any new make which is not approved as per SOR and specification and /or if there is any doubt on the quality of ISI marked material/ approved make as per SOR. The decision of engineer in charge in this matter shall be final and binding. Material not found conforming to any of such tests shall have to be unconditionally replaced by the tenderer/contractor and any damage caused by its use be made good by him. Accordingly, the tenderer should take in to consideration while quoting, the necessary expenses to be borne by the contractor on account of testing of material to be conducted as per the frequency prescribed by CPWD specifications for non-ISI brands and for any make not approved as per SOR and specifications, including the providing of the samples for testing.

The detailed specifications given hereinafter are for the items of works described in the schedule of quantities attached herein and shall be guidance for proper execution of work to the required standards. It may also be noted that the specifications are of generalized nature, and these shall be read in conjunction with the description of item in schedule of quantities and drawings.

The work also includes all minor details of construction which are obviously and fairly intended, and which may not have been referred to in these documents but are essential for the entire occupation in accordance with standard Engineering practice.

Unless specifically otherwise mentioned, all the applicable codes and standards published by the Indian Standard Institution and all other standards which may be published by them before the date of receipt of tenders, shall govern in all respects of design, workmanship, quality and properties of materials and methods



of testing, methods of measurements etc.

Wherever any reference to any Indian Standard Specification occurs in the documents relating to this contract the same shall be inclusive of all amendments issued there to or revisions thereof, if any, up to the date of receipt of tenders. In case there is no I.S.I. specification for the particular work, such work shall be carried out in accordance with the instructions in all respects, and requirements of the Engineer-in-Charge. The work shall be carried out in a manner complying in all respects with the requirements of relevant bye-laws of the Municipal Committee/Municipal Corporation/Development Authority / Improvement Trust under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-Charge and, unless otherwise mentioned, nothing extra shall be paid on this account.

Samples of various materials, fittings, etc. proposed to be incorporated in the work shall be submitted by the contractor for approval of the Engineer-in-charge before order for bulk supply is placed.

The contractor shall take instructions from the Engineer-in-charge regarding collection and stacking of materials in any place. No unserviceable materials / malba shall be stacked such that it does not hamper the day-to-day movement of people/office staff/ visitors etc.

The contractor shall maintain in perfect condition all works executed till the completion of the entire work allotted to him. Where phased delivery is contemplated, this provision shall apply to each phase.

The contractor shall give a performance/ test certificate of the entire installation(s) as per standard specifications before the work is executed and no extra payment would be made to the contractor for the same.

The contractor shall clear the site thoroughly of all scaffolding materials and rubbish etc. left out of his work and dress the site in & around the premises up to the satisfaction of the Engineer-in-charge before the work is considered as complete.

All works shall comply with relevant IS codes and CPWD standards and specifications.

Notes:

1. Work shall be carried out as per latest CPWD specifications and GAIL guidelines.
2. Skirting is 10 cm high.
3. Green Building Compliance shall be implemented strictly as per the guidelines of **GRIHA manual**. The bidder shall refer the manual for maintaining all the standards and mandatory compliances with regard to this before quoting and shall be assumed to be fully aware of the guidelines. Nothing extra shall be paid on this account.

1. GREEN BUILDING REQUIREMENTS

1.1. SUSTAINABLE CONSTRUCTION MANAGEMENT

The project is targeting to achieve green building ratings.



Contractor is expected to comply, at respective stages of construction, with all the construction related requirements of above Green Building rating system including but not limited to top soil preservation, dust emission control, stormwater management during construction, construction waste management, health/safety and sanitation facilities to construction workforce, Indoor air quality management during construction, material procurement, tree preservation and/or transplantation.

Key requirements are indicated below:

1.2. EROSION & SEDIMENTATION CONTROL

It is required to prevent soil erosion through storm water and wind, both during construction and post-development. Measures to be adopted include temporary landscaping, permanent seeding, mulching etc. The plan shall meet the following objectives:

- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil (fertile soil) by stockpiling for reuse. Contractor should take steps to protect the top soil during construction, by way of storing and reusing it within the site.
- Temporary landscaping, if required, to prevent the top soil erosion can be done by planting fast growing plants.
- Prevent existing trees at site
- Undeveloped areas within the site should not be disturbed and be protected with permanent landscaping before the start of construction, wherever possible.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.
- During excavation or site filling activities, Top soil should be stripped to a depth of 200mm from areas occupied by buildings, roads and external services. Top soil is rich in nutrient so it shall be stockpiled to a height of 400mm at the designated area. Protect the topsoil either by mulching, temporary landscaping or covering it with some plastic cover. The same soil shall be applied during plantation of vegetation and can also be used as a finished grade for planting areas.

1.3. DUST EMISSIONS CONTROL

The following methods shall be used by Contractor to prevent conditions conducive to dust generation and suppress dust should it occur.

- Adjacent paved areas and roads used for construction traffic shall be maintained free of tracked soil or fill materials. At minimum, paved traffic areas, driveways, sidewalks, and streets shall be cleaned on a daily basis by wet sweeping and/or washing. More frequent cleaning shall be provided as necessary. Adjacent paved areas and roads shall be left clean at the end of each day.
- Exposed excavations, disturbed ground surfaces, and unpaved traffic areas shall be maintained in a moist condition.
- During non-working hours, the Site should be left in a condition that will prevent dust from being generated. At the end of each work day, disturbed areas shall be wetted down and security fencing shall be installed and or inspected to prevent access and additional disturbance.



- Provide temporary cover and daily maintenance for soil or fill stockpiles and keep active surfaces moist.
- A temporary decontamination pad and/or a stabilized construction entrance shall be provided at active site entrance/egress locations to keep adjacent paved areas clean.
- Wheel Washing facility shall be provided at the exit gate of the site.
- Soil loaded into transport vehicles for offsite disposal will be covered with continuous heavy duty plastic or other covering to minimize emissions to the atmosphere. The covering will be in good condition, joined at the seams, and securely anchored to minimize headspace where vapors may accumulate.
- **Roads** — All onsite traffic shall be restricted to specific designated roads. Off-road travel shall only be authorized on a case-by-case basis. Traffic speed shall also be restricted to an appropriate level on all designated roads. All designated roads shall be considered as high potential dust source areas, and as such, will be a priority for dust controls utilizing water and/or gravel.

1.4. SPILL PREVENTION

- Develop and implement a spill prevention plan (to control effects of spill from hazardous materials like bitumen, diesel etc.) on site

1.5. PRESERVE AND PROTECT LANDSCAPE DURING CONSTRUCTION

- Preserve or transplant at least 75% of existing fully-grown trees within the project site / campus.

1.6. TEMPORARY STORM WATER TRENCH AND SEDIMENTATION TANK

- Construct temporary drainage channels. Its main purpose is settling of sediment, filtering of water and to minimize the soil erosion within the site
- General practice - temporary storm water trench is constructed at the periphery of the site
- The basement water can be pumped out to a temporary trench or through water pipe which is further connected to the main storm water trench
- During rain water should get stagnated within the site and the same should be dewatered using pump with screening filter which aids in retaining the soil.

1.7. BASIC FACILITIES FOR CONSTRUCTION WORKFORCE

Provide basic facilities for construction workforce to exceed the guidelines of 'The Building and other Construction Workers Act, 1996 & Rules, 1998'.

- Adequate housing to meet or exceed local / labour byelaw requirement.



- Sanitary facilities: Provide at least 3 toilet seats & 3 urinals for the first 100 workers and one additional toilet seat & urinal for every 100 workers thereafter (or) as defined by local / labour byelaw. (The sanitary measures should be provided separately for men and women).
- First-aid and emergency facilities.
- Adequate drinking water facilities.
- Personal protective equipment (by owner / contractor).
- Dust suppression measures.
- Adequate illumination levels in construction work areas.
- Site emergency alarm.
- Day care/ crèche facility for workers' children.
- (Only if, more than 50 female building workers are employed full time)

The projects shall comply with NBC (2005) safety norms for providing the necessary safety equipment and measures for construction workers.

Contractor is expected to keep a record of the implemented measures in the form of drawings, photographs, documents etc. and provide it to Green Building Consultant.

1.8. WATER USE REDUCTION – DURING CONSTRUCTION

Demonstrate that the project has reduced at least 10% of the potable water required for construction activities (concrete mixing, plastering works and curing), as compared to national and international practices, for the building type being designed, with the use of:

- Treated waste water
- Admixtures & curing compounds
- Any other innovative measures

Ensure that the quality of construction is not compromised by reducing potable water requirement or by reusing treated wastewater.

1.9. CONSTRUCTION WASTE MANAGEMENT

Applicable Stage: Excavation Works to End of Construction

Develop and implement Construction Waste Management Plan that should include the list of various items that can either be reused during construction or recycled. Typical items may include steel, bricks, Fly Ash bricks/ AAC blocks, concrete blocks, pavers, ductwork, Glass, Aluminium, False roof materials, wood, jute bags, empty containers, paperboard & plastic used in packing, etc. The plan should also include where these materials will be sent to and the mode of transportation.

By documenting measures implemented at site, the project will qualify for two points.

Actions required by the contractor:

The contractor has to ensure that more than 95% by weight or volume of the construction debris is recycled or reused and ultimately diverted from the landfill.



- i. Tabulate the total waste material, quantities diverted and the means by which diverted in the template attached.
- ii. Earmark dedicated place within the site for storing & sorting construction wastes.
- iii. Provide separate waste skips for
 - a. INERT WASTE (Concrete waste, debris etc.)
 - b. WOOD WASTE
 - c. PAPER/ PLASTICS/GLASS WASTE
 - d. METAL WASTE
 - e. HAZARDOUS WASTE
- iv. Receipts of sale, and donation should be collected and submitted to Green Building Consultant.
- v. Gate passes with the weight noted should be provided to the haulers and later on submitted to Green Building Consultant.
- vi. Photographs of the material being reused on site and the waste materials being managed on the site should be taken and submitted.
- vii. The unit for calculations should remain consistent throughout the documentation i.e. the percentages are calculated either by weight or by volume. Quantity of waste diverted in tons or cubic yards.
- viii. The contractor has to ensure that 95% by weight or volume of the construction debris is recycled or reused and ultimately diverted from the landfill.

1.10. CONSTRUCTION IAQ MANAGEMENT, During Construction

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3.
- Protect stored onsite or installed absorptive materials from moisture damage.
- If air handlers must be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-2004.

Actions required by the contractor:

- Develop Construction IAQ Management plan to include the following areas as per SMACNA guidelines:
 - a. Source Control
 - b. Scheduling
 - c. Pathway Interruption
 - d. Housekeeping
 - e. HVAC Protection
- Ensure implementation of IAQ measures on site during construction.
- Take photographs of the implemented measures
- Provide required documentation to Green building Consultant

1.11. CONSTRUCTION IAQ MANAGEMENT, BEFORE OCCUPANCY



Applicable Stage: After completion of Interior Works and before occupancy
 After construction and prior to occupancy, conduct baseline IAQ testing using testing protocols consistent with the ISO method (listed below in Table 12) and demonstrate that the maximum concentration levels of contaminants are not exceeded, as listed below in Table, in all regularly occupied areas and common areas.

Contaminant	Maximum Concentration	ISO Method
Formaldehyde	27 parts per billion	ISO 16000-3
Particulates (PM10)	50 micrograms per cubic meter	ISO 7708
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter	ISO 16000-6
4-Phenylcyclohexene (4-PCH)*	6.5 micrograms per cubic meter	ISO 16000-6
Carbon monoxide (CO)	9 parts per million and no greater than 2 parts per million above outdoor levels	ISO 4224
* This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing are installed as part of the base building systems.		

For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to comply with the requirement. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test. The air sample testing shall be conducted as follows:

- All air sample testing measurements to be conducted before occupancy and during normal occupied hours. The ventilation system should be operational starting at the normal start time operated at minimum outside air flow rate under the occupied mode.
- Prior to testing the building shall have all interior finishes installed.
- The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points shall not be less than one per 2,500 sqm (or) For each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.
- Air samples shall be collected between 1 meter and 2 meters from the floor, to represent the breathing zone of occupants, and over a minimum 4-hour period.



1.12. GENERAL RESPONSIBILITIES OF CONTRACTOR

- Contractor is expected to implement the recommendations provided by Green Building Consultant and provide support during the site inspections.
- Contractor will also have to prepare and provide respective documentation including but not limited to plans, checklists, calculations, photographs, challans, receipts, manufacturer certificates etc as required for achieving Green Building Rating.
- It is desirable that Contractor designates an individual in their existing team who will be responsible for day-to-day coordination with respective site people to ensure implementation of green building measures and ultimately provide the required documentation for aspired Green Building Ratings.
- In case of any deviations in implementing recommended measures and/or using specified material, contractor will have to immediately inform Owners, Green Building Consultant, Architect, Structural Engineer as applicable.
- In case of any additional requirement to comply with Green Building ratings as identified during construction based on the actual site conditions/construction activities, shall have to be implemented by the Contract

1.13. BUILDING MATERIALS

Hereunder are the GREEN BUILDING CRITERIAS related to the building materials (civil and interiors):

- i. Materials with Recycled Content
- ii. Regional/ Local Materials
- iii. Low Emitting Materials
- iv. Energy Efficiency
- v. Third Party Certified Materials
- vi. Building Product Disclosure & Optimization
- vii. Utilization of BIS recommended waste materials in building structure

1.13.1. MATERIALS WITH RECYCLED CONTENT, 20%

Use materials with recycled content such that recycled content constitute minimum 20% of the total value of the building materials in the project.

Typical materials with High Recycled Content available in the market are

Materials	% Recycled content
Fly ash blocks	30-40
Glass	10-15



Ceramic Tiles	20-30
MDF wood	15
Steel	20-25
Gypsum	25-30

Actions required by the contractor:

- Use building materials (Civil & interior), which have high degree of recycled content.
- Collect certificates from vendors/manufacturers for recycled content.

1.13.2. REGIONAL/ LOCAL MATERIALS

Use materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impact resulting from transportation. Ensure 30% of the total building materials (by cost) used in the building (as per owner / developer’s scope) are manufactured locally within a distance of 400 km.

Actions required by the contractor:

- As mentioned above, procure building materials (Civil & interior) that are manufactured, extracted, harvested regionally within 400 kms (radial distance) from the project site.
- Collect certificate/letter from the vendors indicating the distance of manufacturing unit from the project site.

1.13.3. LOW EMITTING MATERIALS, ADHESIVE, SEALANTS, PAINTS AND COATINGS

All adhesives, sealants, paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the requirements as mentioned in the tables below.

VOC LIMITS FOR PAINTS & COATINGS

Type of Paints & Coatings	VOC Limit (g/L less water)
Non-flat (Glossy)	150
Flat (Mat)	50
Anti-corrosive/ Anti-rust	250
Clear Wood Finish: Varnish	350
Clear Wood Finish: Lacquer	550
Floor Coatings	100

VOC LIMITS FOR ADHESIVES



Type of Adhesives	VOC Limit (g/L less water)
Glazing adhesives	100
Ceramic tile adhesives	65
Drywall and panel adhesives	50
Wood substrata adhesives	30
Wood flooring adhesives	100
HVAC duct insulation	850
Indoor Carpet adhesives	50
Multipurpose construction adhesives	70

1.13.4. LOW EMITTING MATERIALS, COMPOSITE WOOD AND AGRI FIBER PRODUCTS

Composite wood and agrifiber products used in the interiors of the building must not contain added urea formaldehyde resins.

Composite wood and Agrifiber products are defined as: particle board, medium density fibreboard (MDF), plywood, wheat board, strawboard, panel substrates and door cores.

Actions required:

- Ensure that the specified materials are used in the building.
- Collect certificate/letter from the vendors indicating materials are free from added urea formaldehyde.

1.13.5. BUILDING ENVELOPE PARAMETERS

Materials used for building envelope must comply with the following recommendations:

Insulated Roof “4-inch-thick Overdeck XPS/PUF insulation over Roof deck”, Roof Assembly U factor:	0.050 Btu/hr. sqft deg. F
Insulated Spandrel Panel (Spandrels Panels with Insulated Panels of 5-inch-thick XPS Insulation), Maximum U factor:	0.043 Btu/hr. sqft deg. F
Exterior Wall Assembly Maximum U factor (AAC Block work + 1-inch thick XPS Insulation)	0.085 Btu/hr. sqft deg. F
Vertical Fenestration Assembly Maximum U-factor	0.264 Btu/hr. sqft deg. F
Vertical Fenestration Maximum Effective SHGC	0.22
Window to Wall Ratio	40% to 60%

Actions required:

- Ensure building materials used for building façade are in lines with the green building requirements
- Documentation must be provided to Green Building Consultant submission as required.



1.13.6. THIRD PARTY CERTIFIED MATERIALS

Ensure that the project uses at least five passive or active green building materials, products, and equipment that are certified by CII under Green Product Certification Programme (GreenPro) or by a third-party agency approved by GRIHA/GRIHA/IGBC.

- Passive Products & Materials include glazing, insulation, paints & coatings, adhesives & sealants, fly ash blocks, cement, concrete, composite wood, certified new wood, housekeeping chemicals, false ceiling materials, flooring materials, furniture, gypsum-based products, high reflective materials & coatings, etc.,
- Active Products include Electrical systems (Lighting Systems & Controls, Pumps & Motors, etc.), Mechanical systems (unitary air conditioners, etc.), Plumbing Fixtures (faucets, showers, etc.)
- The materials, products and equipment (e.g. high reflective materials, water fixtures, lighting fixtures, carpets, etc.) certified by CII under Green Product Certification Programmed (GreenPro) or any third-party agency will be accepted to show credit compliance

Actions required:

- Ensure at least 5 building materials that are certified (as explained above) are used in the project
- Manufacturer Certificate/ Test Report/ Any other relevant Documentation must be provided to Green Building Consultant for GRIHA/GRIHA/IGBC submission as required.

1.13.7. UTILIZATION OF BIS RECOMMENDED WASTE MATERIALS IN BUILDING STRUCTURE

- Minimum 25% replacement of OPC with fly ash or any BIS recommended waste by weight of cement used in structural concrete
- Minimum 40% of materials (by volume) in building blocks/bricks should be fly ash or any BIS recommended waste, for 100% load bearing and non-load bearing walls
- Minimum than 25% replacement of OPC with fly ash or any BIS recommended waste in plaster/masonry

Actions required:

- Ensure building materials that meet above requirements are used in the project
- Manufacturer Certificate/ Test Report/ Any other relevant Documentation must be provided to Green Building Consultant for GRIHA/IGBC submission as required.

2. GENERAL

2.1.General

For all items of work described in the Bill of quantities, the work shall be carried out strictly in accordance with description in General Specifications, particular specifications and drawings. The description, drawings and specifications shall be taken complementary to each other and shall form part of this contract.

The general specifications of CPWD in respect of material & workmanship shall be followed for which nothing extra shall be paid. All works shall comply with relevant IS Codes and CPWD Standards and Specifications as per the direction of Engineer-In-Charge.



The quoted rates shall be deemed to include all necessary hardware, tools & plants, props, material, labor, duties, taxes, insurance premia etc., all needed to make the individual item functional, to the complete satisfaction of the Engineer-in-charge, whether specifically mentioned in the individual item or not.

2.2.Scope of Work:

The Scope of Work for buildings under this contract includes for full and final and entire completion of all works including all internal services in all respects described in General Specifications, particular specifications and as shown on drawings forming part of the contract.

Although all the details of construction have been by and large covered in these documents, any item or detail of construction not specifically covered but obviously implied and essential to consider Civil works and all internal services complete and functional, shall be deemed to have been covered in the item rate quoted. The Tendered may however, consider a minimum level of specifications conforming to IS Code or National Building Codes to cover these missing details.

2.3.Samples of Materials:

The contractor shall produce samples of all materials at least four weeks before incorporation in the work and shall obtain approval of these in writing from the Engineer-in-charge, before he places bulk order for the materials. Materials to be incorporated in the work shall conform to latest relevant ISI specifications, ISI marked goods where manufactured shall be used. (This will apply to the materials where specific brand, names of manufacturer not stipulated) where brand, names are given then the material should be out of the brands, names as specified.

2.4.Slopes:

Adequate slope shall be provided in areas where there is likelihood of ingress of water such as toilets, balconies veranda, terraces, top of chajjas, window cills, plinth protections etc. though these may not be expressly shown in drawings.

2.5.Curing:

Exposed surfaces of all cement works viz. cement concrete, brick work, flooring, plastering, pointing and the like shall be cured by keeping surface adequately and continuously wet as directed by the Engineer-in-charge for at least seven days. Cost for this shall be deemed to be included in the percentage quoted against the respective schedule.

Bar Chart:

Contractor shall submit Bar Chart to the Engineer-in-charge and Project Manager, GAIL (INDIA) LIMITED for the entire work in the contract. The above bar chart shall be submitted by contractor within one week of acceptance of contract. Bar chart as submitted shall be scrutinized by the Engineer-in-charge and Project Manager. Mutually agreed Bar chart shall be finalized within 7 days of submission by the contractor. The contractor shall carry out the changes as suggested by Architect and Project Manager. The mutually agreed Bar chart shall be signed by contractor, Engineer-in-charge and Project Manager. This shall be binding on contractor for progressing the work for completion by due date.

2.6.Standard of Work:

To determine the acceptable standard of workmanship and also to decide if any variations are required in the layout of internal services or finishes, the contractor shall execute on sample room for each area. The sample room shall be put up for inspection and approval and specific dates put up in the bar-chart mentioned above for each of the following

Structure including location of doors / windows, fixing of door / window frames and internal plaster location of electric light, fan, socket outlets, switch positions, False ceiling, telephone and water trap positions, wash hand, Basins, geyser positions. Complete sample room with all finished as per specifications



All materials fittings / fixtures to be incorporated in the sample rooms conforming to specifications makes and brands as given in the Contract Agreement shall be got approved at least one week before they are required at site for incorporation. The order should be placed by the contractor in such a way that they can be procured in time and incorporated in the sample room. All stages of the sample shall be jointly approved by Project Manager, Architect and Engineer-in-charge and record of approval stage wise duly signed and dated shall be kept by the Engineer-in-charge.

Completion of Sample Room: Immediately after completion of sample room the contractor shall give notice thereof to the Engineer-in-charge with a copy to the Project Manager. The sample room shall be completed to the entire satisfaction of the Engineer-in-charge, Architect and Project Manager. If satisfied, the Engineer-in-charge & Architect shall issue a certificate indicating the dates on which the specific sample room has been completed. The certificate shall be countersigned by the Project Manager.

The Project manager, wherever mentioned shall be the project manager appointed by the client, who would be in charge of the project.

The contractor must clearly understand that this project involves additions and alterations of an old structure, with variation in technologies of the existing building to the new structure. Immaculate planning and co-ordination with the Engineer-in-charge shall be needed and the contractor must ensure that his team consists of qualified and compatible engineers. Certain decisions may be taken on the site and shall need to be documented and dealt with accordingly.

EXTERIOR TEXTURE PAINT

General Description

STONY COAT (NSC series) is a texture coating that incorporates high-tech acrylic

resin with natural granite and ceramic chips. It creates a natural and marvelous effect, which is ideal for commercial, residential, and various designs of building's exterior.

Area of Application

Suitable for surface of concrete, mortar, masonry, wood, gypsum plastered board, asbestos board, and etc.

Note: different surfaces would need to apply with different primers.

Feature

Appearance and Effect

- Marble or granite effect as authentic as real marble and granite
- Excellent color retention
- Marvelous effect of color and pattern
- Various choices of color to fit your stylish design '

Quality and Benefit

- Economical price compared to real granite
- Surface with excellent dust, dirt, and stain resistance.
- Outstanding Temperature-Variation Endurance.
- Superb durability providing long-term protection for building.
- High-tech resin that provides excellent adhesion and washability.
- Top water and chemical resistance.
- Excellent Impact and abrasion resistant.
- Non hazardous, non toxic and friendly to both the user and the environment.



Color Availability

- Standard colors as shown in catalogue.
- Variation of colors is available to gratify various needs as well.

Specification Data

Item	Description
Drying Time (at 30 °C)	Surface Dry: 6 Hours (Depend on the weather) Hard Dry : 24 Hours
Shelf Life	Up to 6 months if stored in tightly sealed containers.
Film Thickness	Dry Film 1.25 - 1.50 mm
Solid Content	80 ± 1 %

Preparation of Building Surface (Outline)

The plastering to wall and column must be free of line, smooth sponge or brush finish for external and steel trowel finish for internal.

2. The plastering should allow to cures for at least 21 days before coating.
3. All cracks or defective substrate shall be repaired / replaced by the main contractor to the architect’s approval.
4. Ensure that the water retention in the surface should be less than 10%, and the surface intensity over 5 kgf/cm².
5. Remove impurities, such as dirt, oil, grease and rust on the surface.
6. Unfavorable problems of substrate, such as surface flaky, peeling, water leaking, and etc, should be treated with respective method before application.

DESIGNER FALSE CEILING

(i) HASHTAG BAFFLE CEILING

Technical Data sheet

Description.

RhythmScapes™ HashTag Baffle Ceiling is a Pre-finished ceiling designed to create a contemporary interior and naturally open the realms of design flexibility in any interior environment. Semi-ridged in nature that will create a soothing vibrant interior while helping to access the services above and create an open transparent look.

Application.



RhythmScapes™ HashTag Baffle Ceiling is ideally suited for commercial offices, retail, hospitality and corporate environments.

Composition.

RhythmScapes™ HashTag Baffle Ceiling is manufactured from polyethylene terephthalate light in weight and noncorrosive in nature.

- Made from Formaldehyde Free material.
- Minimum of 12mm thickness required.
- Excellent performance, Resistant to fading. Non toxic, non-allergenic and non-irritant.
- Highly durable providing long term stability and performance.
- Easy Connectors and easy to install
- Modular design for easy installation and demountable allowing your design to evolve with

Technical Specification

Technical Rating: 12mm polyethylene terephthalate is Fire retardant & Acoustic in nature.

Product Style: Random

Pattern Thickness: 12mm

Tile Dimensions: 150mm x 2400mm

Pack Size: 10 modules per box.

Colours: (others colours to order)

(ii) FABRIC WOOD PANEL

(1800mm x 600mm) Approx or as per the drawing made of 12mm real walnut wood species with Custom wooden stain finish with an Organic base and a trimer of cyanamide with 1-3-5 Triazine with custom machine coat finish as approved to be installed using z profile system as per the manufacturer specification. All material should be of approved make & complete as per the drawing, specification, and approval of the architect.

(iii) RIPPLE LIGHT CEILING

Description.

The ultimate renewable material for architecture is also one of the oldest, and most attractive. Wood is solid, can be bent and shaped, is easily machined, and with the used of computer-aided-design and CNC milling, timber is also continuously contemporary. These benefits make wood preferred material to use for rich ambience. RhythmScapes™ Ripple Light is a pre-finished Light Ceiling designed to create a contemporary interior and naturally open the realms of design flexibility in any interior environment. Smooth & Modular in nature that will create a soothing vibrant interior while helping to glow the surrounding.

Application.

RhythmScapes™ Ripple Light Ceiling being versatile is ideally suited for Bungalows, commercial offices, retail, hospitality and corporate environments.

Composition.



RhythmScapes™ Ripple Light Ceiling is manufactured from 3 materials namely Russian Birch, Air-Ply & Polymer.

- Polymer Finish.
- Veneer Finish Of your choice.
- Gold/Rose Gold/Bronze.

Key Benefits

- Light weight and easy to install
- Choice of Russian Birch as a sustainable option
- High durability
- Limitless finish options
- Many customisation options
- Options for curved surfaces

Technical Data sheet

Specification checklist	
Demountable ceilings	Aircraft Suspension
Standard width	150mm
Standard plank length	2400mm
Max plank length	3000mm (extra cost)
In-built shadow gaps	3000mm (extra cost)
Can be applied to curved surfaces	Yes
Polymer & Veneer finishes	Yes
Rapid installation	Yes
Clear lacquer sheen levels	10-50%
Ancillary trims and finishing details available	Yes

(iv) ACOUSTIC TRAPEZIUM PANELS

Technical Data Sheet

Description

Rhythmscapes™ Acoustic Trapezium Pebbles Is A Pre- Finished Panel Designed To Create A Contemporary Interior And Naturally Open The Realms Of Design Flexibility In Any Interior Environment. Inspiring In Nature That Will Create A Soothing Vibrant Interior While Helping To Reduce All The Carpentry Work Without Any Hassles.

Application

Rhythmscapes™ Acoustic Trapezium Pebbles Is Ideally Suited For Commercial Offices, Shopping Malls, Lobbies, Hospitality & Corporate Environments.

Composition



Rhythmscapes™ Acoustic Trapezium Pebbles Is Manufactured From 100% Wood Fibre And Is Water Resistant.

- Made From 100% Wood Fibre.
- Thickness 8mm-50mm.
- Excellent Performance, Resistant To Fading. Non Toxic, Non-Allergenic And Non-Irritant.
- Highly Durable Providing Long Term Stability And Performance.
- Acoustic Thermally Bonded Polyester Fibre.
- Light Weight And Easy To Install
- Modular Design For Easy Installation And Demountable Allowing Your Design To Evolve With You.

Technical Specification

Sound Absorption Rating: 25mm with AAB backing— α_w 0.6 (MH); NRC 0.85 per ASTM C423, ISO 354

size	Hz	125	250	500	1000	2000	4000
40mm	α_p	0.25	0.60	0.85	1.00	0.95	0.80

(v) ACOUSTIC PETAL CEILING

Technical Data sheet

Description

RhythmScapes™ Petals is a pre-finished acoustic ceiling designed to create a contemporary interior and naturally open the realms of design flexibility in any interior environment. Semi-ridged in nature that will create a soothing vibrant interior while helping to reduce reverberation sound & assist in controlling background noise.

Application

RhythmScapes™ Petals is ideally suited for commercial offices, retail, hospitality and corporate environments.

Composition

RhythmScapes™ Petals is manufactured from polyester (which is recyclable) and contains a minimum of 60% post-consumer recycled material PET bottle-flake).

- Made form acoustic polyester fibre without chemical binders or retardants.
- Minimum of 60% already recycled polyester fibre; made from post production waste.
- Excellent acoustic performance, Resistant to fading. Non toxic, non-allergenic and non-irritant.
- Highly durable providing long term stability and performance.
- Light weight and easy to install
- Modular design for easy installation and demountable allowing your design to evolve with you.



Technical Specification

Product Style: Rhombus

Pattern Thickness: 12mm

Tile Dimensions: Standard 212mm x 300mm

Pack Size: 2 modules per box.

Colours: (others colours to order)

Sound Absorption Rating: 50mm with AAB backing— α_w 0.6 (MH);
NRC 0.85 per ASTM C423, ISO 354

size	Hz	125	250	500	1000	2000	4000
40mm	α_p	0.25	0.60	0.85	1.00	0.95	0.80

(vi) ALUMINIUM, UN-PERFORATED, MULTI B CEILING SYSTEM WITH V CLOSED GROOVE

Fixing of Luxalon 80B / 130B / 180 B un-perforated Aluminium panel ceiling 0.5mm, 6 mm thick with square edges, panel length upto 6mtrs, Coil Coated on a Continuous Paint Line, Double baked and roll formed from enamelled corrosion resistance Aluminium Alloy AA5050 (Al.Mg) for higher strength and good roll forming characteristics. The ceiling panel shall be manufactured on high speed, high precision roll forming machinewith ARKUSIX Hi configuration roller levelling process to ensure the flatness and to avoid the failure of metal at corners which may occur normally on press brake machine. Panel shall be clipped to baked enamelled Aluminium panel carrier of 62mm wide x 29mm deep made of 0.95mm thick in standard length of 5mtrs made of double Baked enamelled Aluminium alloy AA5050 (Al.Mg.) black with cutouts to hold the panels in a module of 50mm (width of gap 20mm open) The Carrier shall be suspended by means of G.I. suspensi on rod 4mm diameter and a Galvanised suspension spring clip at a distance of 1.7mtrs c/c. Paint finish: Aluminium panels shall be chromatised for maximum bond between metal and paint enamelled twice under high temperature, one side with full primer and finish coat the other side (innerside) with a primer coating and Skin Coat on a Continuous Paint Line.

The ceiling system should meet the required standards for GreenPro certification and should qualify as green product as per CII green products and services council. The manufacturer should be ISO 9001:2015 Quality Management System Certification compliant with in house testing facility and should have their own manufacturing plant in India.

Mode of Measurements: Measurements shall be wall to wall without any deductions for lights, diffusers, columns etc. All ceiling shall be Green pro Certified: For LEED certification by Indian Green Building council (IGBC). Ceiling manufacturer should have local manufacturing unit in India. Manufacturer should have Roll-forming machine to produce Baffle panels & in-house testing lab in India & having more than 20 years of existence in India.

PLUMBING WORKS

TECHNICAL SPECIFICATIONS – PLUMBING INSTALLATIONS

SECTION - I SANITARY FIXTURES



1. SCOPE OF WORK

1.1 Work under this section shall consist of furnishing all Material and labor as necessary and required to completely install all Sanitary Fixtures, brass and chromium plated fittings and accessories as required by the drawings and specified hereinafter or given in the Schedule of Quantities.

1.2 Without restricting to the generally of the foregoing the Sanitary Fixtures shall include all Sanitary Fixtures, C.P. fittings and Accessories etc. necessary and required for the Building.

1.3 Whether specifically mentioned or not all Fixtures and appliances shall be provided with all fixing devices, nuts, bolts, screws, hangers as required.

2. GENERAL REQUIREMENTS

2.1 All Fixtures and fittings shall be provided with all such accessories as are required to complete the item in working condition whether specifically mentioned or not in the Schedule of Quantities, Specifications and Drawings.

2.2 All Fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per Architectural/ Interior designer's requirements. Wherever necessary the fittings shall be centered to dimensions and pattern desired.

2.3 Fixing screws shall be half round head Chromium Plated brass with C.P. washers wherever required as per directions of Engineer-in-Charge / Owner /Owner.

2.4 All Fittings and Fixtures shall be fixed in a neat workmanlike manner true to Levels and Heights shows on the drawings and in accordance with the manufacturer's recommendations. Care shall be taken to fix all Inlet and Outlet Pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, tiling or terrace shall be made good at Contractors cost.

2.5 When directed, Contractor shall install Fixtures and accessories in a mock-up room for the approval of the Engineer-in-Charge/Owner. Sample room Fixtures may be reused on the works if undamaged, but no additional payment for fixing or dismantling shall be admissible.

SECTION - II PUMPS AND EQUIPMENTS

1.1 Work under this sub-head consists of furnishing all labour, with appropriate T&P scaffolding & staging as required to completely install pumping system for various water supply services and water treatment as per drawings, specified hereinafter and given in the Bill of Quantities.

1.2 Without restricting to the generality of the foregoing, the work of pumps and water treatment equipment shall include the followings:

- a) Hydro pneumatic booster pump (For Domestic water supply).
- b) Water treatment units consisting of filters and chlorination etc.
- c) Level Control & indication System
- d) Inbuilt Motor control panels with pumps, power and control cabling and allied electrical works.
- e) Pipes, valves, accessories, hangers, supports, delivery and suction feeders and connection to proposed pipe work.

2. **HYDRO PNEUMATIC SYSTEMS**

2.1 The scope of this section covers supply, installation, testing and commissioning of compact packaged type skid mounted, self-contained hydro pneumatic system. The skid mounted, factory assembled hydro-pneumatic system shall be provided with pressure switches. Control panel should consist of short



circuit safety, earthing, over current, under voltage protection. The system shall comprise of multiple pumps working and one stand-by to meet the system discharge requirements.

2.2 It shall confirm the all those specifications specified above with the following:

- a) Panel mounted microprocessor multi pump controller with large graphical display, pressure switches, indications to indicate pump ready, pump running and fault and capable to communicate with other controllers following open protocol through RS485 port. All alarms should be displayed in the controller. The panel should also have provision for manual / automatic alternate (cyclic) operation of pumps, ON/OFF switch, complete.
- b) Pressure switches bellow type fitted with micro switch and having maximum pressure and differential scale should confirming BS-6134 standards and IP55 protection class, inter connecting power and control cabling etc.

2.3 Control Panel (for Hydro-pneumatic Systems without VFD)

The control panel shall have terminals for:

- a) Remote monitoring.
- b) Pump fault
- c) Analog output signal for frequency convertor (In case of VFD operated Hydro pneumatic systems).
- d) Pressure sensor / Pressure switches as per system requirement.

2.4 General

The hydro pneumatic system shall be capable of maintaining a constant pressure at varied consumption. The hydro pneumatic system shall be complete with pressure sensor and microprocessor based controller for flow control by means of frequency variation (in case of VFD operated system). The controller should have time control switch to adapt pump operation to actual requirement in peak load situation. The control panel should also have manual operation.

- The pumping system shall perform the following functions:
- Shut off the pump at zero demand.
- Shut off the pump at zero suction(Dry Run protection)
- Protect the pump from overvoltage, under voltage, overload & earth fault.
- Vary the time of pump speed acceleration and deceleration (For VFD operated Hydro pneumatic system).
- Compensate for higher friction losses at high flow rates.
- Send out a signal for remote monitoring of flow as well as pressure.
- Conduct automatic test run of pumps at set times.
- Keep track of run time for pumps.
- Perform run time equalization of all pumps in system.

2.5 Installation

Hydro pneumatic systems shall be mounted on a common base frame & installed as per manufacturer's recommendations. Pump sets shall be mounted on machinery isolation cork or any other equivalent vibration isolation fitting. The vibration isolation pads, foundation bolts etc. shall be supplied by the Contractor. Contractor shall ensure that the foundation bolts are correctly embedded.



Pump-sets shall preferably be factory aligned, wherever necessary, site alignment shall be done by competent persons. The entire system along with pumps & control panel must be sourced from single manufacturer only for unit responsibility.

2.6 Testing

Contractor shall submit all the performance curves of the pumps supplied by them. They shall also check the capacity and total head requirements of each pump to match their own piping and equipment layout. On completion of the entire installation, pumps shall be tested, wherever possible, for their discharge, head, flow rate, B.H.P. Where it is not possible at least the discharge, head and B.H.P. (as measured on the input side) shall be field tested. Test results shall correspond to the performance curves.

3. RAINWATER FILTER

3.1 Rainwater filter shall be of dual media pressure filter (comprising of minimum 300mm bed depth of Anthracite and support media and minimum Height on Straight 1500mm) of downward or upward flow type suitable for a rate of filtration given in Schedule of quantities.

3.2 Filter shall be vertical type of required diameter. The shell shall be fabricated from M.S. plate suitable to withstand a working pressure of 4 Kg/cm². The minimum thickness of shell will be 10mm and dished ends shall be 12mm. The quality of Steel shall be as per IS: 2062 Grade B, thickness as per ASME Section 8. The filter shall have at least one pressure tight manhole cover.

Filter shall be provided with screwed or flanged connections for inlet, outlet, individual drain connections and all other connections necessary as required. Filter shall be painted inside with two or more coats of coal tar epoxy paint, one coat of red oxide primer outside with two or more coats of synthetic enamel paint of approved shade.

The Filter media shall comprise of 0.5 to 1.00 mm fine filtering silica sand for removal of turbidity and suspended matter.

The initial charge of filter media as specified in above para's shall be the responsibility of contractor.

The pressure filter shall be complete with cleaning cycle controller adjustable to meet application requirement, actuating control valves in required sequence for back wash.

4.3 Under Drain System

Filter shall be provided with an efficient under drain system comprising of collecting pipes, gunmetal/polypropylene nozzles of manufacturer's design. The entire under drain system be provided on M.S. Plate or cement concrete supports.

4.4 Face Piping

Filter shall be provided with interconnecting face piping comprising of inlet, outlet, and backwash pipe complete with pipes, valves and accessories, as per requirement. Piping shall be G.I. piping, heavy duty, as per I.S: 1239 and valves shall be cast iron double flanged sluice valves with C.I. body and Neoprene rubber diaphragm.

4.5 Accessories

Each filter shall be provided with following accessories:-

- a) Air release valve with connecting piping.
- b) 150mm dia dial bourden type gunmetal pressure gauges with gunmetal isolation cock and connecting piping on inlet and outlet.
- c) SS Sampling cocks on raw water inlet and filtered water outlet.
- d) Individual drain connection with gunmetal fullway valve should be piped through a properly sized G.I. pipe to nearest drain point.

5. ELECTRICAL CONTROL PANEL

5.1 Motor Control System



The main switch board shall be floor mounted, free standing, cubical type, compartmentalized and shall be factory built fabricated by CPRI approved fabricators. The board shall be fabricated from 2mm thick CRCA sheet and powder coated after seven tank process. The board shall be fabricated with IP 54 degree of protection suitable for operation of 415 volt \pm 10%, 3 phase, 4 wire, 50Hz, AC supply. The switch board shall have provision for termination of cables from top as well as bottom with suitable knockouts. The layout shall be designed for convenient connections and inter-connections with various switchgears. Connections from individual compartments to cable alleys shall be such as not to shut down healthy circuits in the event of maintenance work becoming necessary on a defective circuit. A base channel of 75mm x 5mm thick shall be provided at the bottom. A maximum of 200mm space between the floor and bottom most panel of unit shall be provided. The bus bar shall be of aluminium complete with heat shrinkable PVC sleeves. The fabrication of switch board shall be taken up only after the drawings for the fabrication of the same are approved by the Engineer-in-charge.

Control panel shall contain starters and safety protection for different types of pump motors & various feeders along with its controls. It shall also house the switchgears for incoming as well for outgoing supply. Provision of voltmeter (for incomer) & ammeter for incomer as well as for other feeders with selector switch, a set of LED indicating light for incoming phases as well as status indication of each equipment. The voltmeter & indication lamps shall be protected by MCBs.

The feeders for all those motors having more than 7.5 HP capacity shall be provided with fully automatic Star Delta starters with motor duty MCCBs for short circuit protection only (ICS = 100% ICU)& Overload Relays with contactors of suitable range & ratings, for overload protection, while less than or equal to 7.5 HP motor shall have Motor protection circuit breaker(MPCB) with suitable rating contactor. Single phase preventers shall be provided for all 3 phase motors. Single phase preventer shall be in conformity with relevant ISI standards. Single phase preventers shall act when the supply voltage drops down to 90 % of the rated voltage or failure of one or more phases. Single phase preventer shall be voltage operated and of approved make.

Other feeders of the panel which don't require starter shall be housed with:

- a) MCCB with Thermal magnetic release & should provide adjustable setting for overload and short circuit protection with ICS = 100% ICU.
- b) MCB used for controlling shall be with tripping characteristics of C curve. The miniature circuit breakers shall be 1/2/3/4 pole as per requirement. The breaking capacity of MCBs shall have minimum 10KA.

ON-OFF switches for each motor / equipment should not be provided on the cover of the control panel. But at the same time interlocking shall be provided between switch and the door in such a way that the door of the panel cannot be opened when the supply is ON.

The panel shall be provided all identification tags, danger board etc as per IS standard.

All control panels shall be provided with detailed control circuit diagram indicating the terminal numbers and color coding of the wires used in the panels. This diagram shall be pasted on the inner side of the cover and protected with PVC transparent lamination.

All MCCBs / MPCB's shall be equipped with extended front operated rotary handles on the doors. Rotary handle should have provision for pad lock.



Outgoing from each of the MCCB shall be extended to the cable alley by providing necessary busbar of suitable rating and supports etc. for terminating the outgoing feeders.

The detailed specification of switch gears and other accessories shall follow as described in electrical package of tender specifications.

All dosing tanks and process tanks/sumps shall be provided with level indicators/switches for low and high level alarm as well as for dry run protection, indications of which shall be provided in the main Electrical Control Panel.

6. PUMP MOTOR CONTROLLER CUM WATER LEVEL INDICATING PANEL & SYSTEM

6.1 Water Level Indicators and Controllers

The hydrostatic pressure sensor (Water level indicator) shall operate on hydrostatic pressure measurement principle. The sensors shall be made of Stainless Steel for installation in storage tanks, and capable of providing 4 to 20 mA analog signal compatible with PLC signal inputs and all control outputs to MCC panel (Plumbing/Water supply), for various water tanks as per the schedule of quantities. The Pressure Transducers shall be used for water level measurement, and it shall be convenient to mount on the water tanks. Hydrostatic pressure level sensors shall be submersible or externally mounted pressure sensors suitable for measuring the level of liquids in deep tanks or water in reservoirs. Level measurement shall be based on the pressure measurement principal, also referred to as hydrostatic tank gauging (HTG). It shall work on the principle that the difference between the two pressures (d/p) is equal to the height of the liquid (h, in inches) multiplied by the specific gravity (SG) of the fluid. Following shall be the formula used for measurements / calibration: $d/p = h (SG)$. These sensors sense increasing pressure with depth and because depth is proportional to Volume for a regular tank, the Volume of Water can be easily calculated using a PLC.

1.2 Level Indicator / Controller Panel

The Centralized PLC control panel shall be front operated, cubicle construction, wall mounted type, fabricated out of 1.6 mm thick CRCA Sheet, with hinged lockable doors, dust and vermin proof, powder coated of approved shade, inter-connections, having, internal wiring, earth terminals, Top / Bottom control cable entry, numberings etc. comprises of touch-screen display board (Minimum Diagonal size 8") along with all accessories for complete Programmable logical controls & indications, having necessary interlocks, Inputs/Outputs, required number of repeater amplifiers, all audio-visual alarms as per the requirements listed below i/c emergency stop push button on the panel etc. The panel shall have BMS compatible with open protocol.

FIRE-FIGHTING WORKS

A) **TECHNICAL SPECIFICATIONS:**

1. **SCOPE OF WORK:**

Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install electrically operated and diesel driven fire pumps, wet



riser, fire hydrant system/fire extinguishing as required by the drawings and specified hereinafter or given in the Bill of Quantities.

Without restricting to the generality of the foregoing, the work shall include but not limited to the following:-

Fire Pumps, Motor, Engine and Accessories:

- a) Fire Fighting shall be connected from proposed plant room.
- b) Pressure gauge with isolation valves.
- c) Mild Steel / Galvanized Pipes, fittings, valves, suction strainers, suction & delivery headers & accessories.

Fire Hydrant System:

- a) M.S. / G.I. Piping for wet riser/hydrant systems.
- b) Fire Hydrant valves, RRL hose pipes, hose reels, hose cabinets, and connections to fire mains.
- c) Isolation & non-return valves, pipe supports/welding/Fire Brigade inlet, and accessories.

Fire Sprinkler System :

- a) M.S. / G.I. Piping for sprinkler systems.
- b) Fire Alarm control valves/Installation Control.
- c) Sprinkler heads, Spare Sprinkler.
- d) Inspection & Testing assemblies.

Hand Appliances / Fire Extinguishers :

Supply and installation of fully charged and tested fire extinguishers hand appliances Clean Agent type, water CO₂, foam, dry chemical powder type, ABC stored pressure type, CO₂ gas cartridge type as required by these specification and drawings.

Hydraulic Calculations :

The tenderer shall be responsible for providing fully detailed hydraulic calculations of sprinkler and hydrant system to comply with IS 15105 : 2021 and NBC-2016 to the requirements of Fire Services.

HYDRANT SYSTEM DESCRIPTION:

- d) The Hydrants System shall from proposed plant room .
- e) The Hydrant system shall be kept pressurized all the times.



- c) In the event of fire when any of the hydrant valves in the network is opened, the resultant fall in the pressure shall start the jockey pump first through pressure switch automatically. In case jockey pump fails to maintain the pressure common hydrant pump shall start at the preset pressure. In case of further drop in pressure the diesel standby pump shall start.
- d) The hydrant risers shall be terminated with air release valve at the highest points to release the trapped air in the pipe work.
- e) To provide for an air cushion for counteracting pressure surges / water hammer, an air vessel shall be furnished in the pump room near the fire pumps. The air vessel shall normally be kept partly full of water.
- f) External fire hydrant will be provided on the ring main. Hydrant shall be located at least 2M away from the building.
- g) Hydrant stations and cabinet shall be provided at all designated location inside and along with external hydrants. The hydrant stations shall be located in M.S steel fire cabinet as per drawing and will contain all items described in BOQ.

SPRINKLER SYSTEM DESCRIPTION:

- h) The automatic sprinkler system will be installed to protect the entire building with permitted exception e.g. electrical switch room, power transformer and DG room as identified. Sprinkler system shall be feed from proposed plant room.
- i) Installation control valve shall be provided for alarming in case of fire. Installation control valve comprising of main stop valve, alarm valve with accessories, strainer and water motor gong.
- j) For the sprinkler system the building shall have a riser of 150 mm dia, tapped on each floor to feed the sprinkler system. On each floor, at the tapping from the sprinkler riser, there shall be butterfly valve of suitable diameter and flow switch or Zone control valve with test drain assembly. The Zone control valve/flow switch shall be connected to the Annunciation Panel through electrical cables.

Jointing

Welded Joints :

- k) Before welding, the ends shall be cleaned by wire brushing, filing or grinding. Each weld-run shall be cleaned of slag before the next run is deposited.
- l) Welding shall be done by certified welders only.
- m) Welding at any joint shall be completed uninterrupted. If this cannot be followed for some reasons, the weld shall be insulated for slow and uniform cooling.



- n) Welding shall be done by manual oxy-acetylene or manual shielded metal arc process. Automatic or semi-automatic welding processes may be done only with the specific approval of purchaser.
- o) Socket weld joint shall be done with low hydrogen type covered electrodes with manual shielded metal arc process.
- p) Joints between M.S./ G.I. Pipes and fittings shall be made with the pipes and fittings having “V” groove and welded with electrical resistance welding in an approved manner.
- g) Weld Electrodes shall be of one of the approved makes, of grade and type as suitable for the job and meeting the approval of the engineer.
- h) As far as possible welding shall be carried out in flat position. If not possible, welding shall be done in a position as close to flat position as possible.
- i) Joints shall be given a first weld in full width without burrs on the full dia of the pipe. Welding shall be carried out vertically from the surface to be welded. Weld fluxes shall not be so plastic such as to fall or drip down.
- j) The root of butt joints shall be such as to achieve full penetration with the complete fusion of root edges. The weld projection shall not exceed 3 mm inside the pipe.
- k) After application of first coat the weld shall be ground and then another layer of welding shall take place. The weld shall also be cleaned by grinding.
- l) For pipes with wall thickness less than 3 mm, oxy-acetylene welding is recommended.
- m) All pipe cutting shall be by oxy acetylene gas cutting only. The cut surface shall be cleaned and ground by an electric grinder before further welding.
- n) Pipe cutting or welding in inaccessible areas shall be avoided. Pipes shall not be welded in trenches unless the bottom edge of the pipe does not have clear space for working with electrode.
- o) Fillet welds shall be made by shielded metal arc process regardless of thickness and class of piping. Electrode size shall not exceed 10 SWG (3.25 mm). At least two runs shall be made on socket weld joints.
- p) For supports, angle pieces shall be cut by oxy acetylene gas and cleaned by electric grinder. All cutting for bolt inserts shall be by electric drill.

Flanged joints (65 mm dia and above)

Flanged joints with flanges conforming to IS: 6392 shall be provided on



- Straight runs at intervals not exceeding 25-30m on pipe lines of 50 mm dia and above and as directed by the Project Manager.
- For jointing all types of valves, appurtenances, pumps, connections with other type of pipes, to water tanks and other places necessary and as required for good engineering practice and as shown/noted on the drawings.
- Flanges shall be with GI bolts and nuts and 3mm insertion gasket of natural rubber conforming to IS: 11149.

Unions (up to 50 mm dia)

Approved type of dismountable unions shall be provided on pipe lines of 40 mm dia and smaller dia, in locations similar to those specified for flanges.

Hose Reel:

q) Wall mounting the swinging type first aid hose reel with drum shall conform to IS : 884-1985.

r) The rubber tubing shall be 20 mm dia thermoplastic hose 30.0 m long as per IS : 12585 with SS / Gum Metal shut off nozzle having 6.5 mm dia orifice and control

valve, shut off valve of approved make. The wall mounted bracket shall be fixed by means of fasteners. The hose reel shall have a stainless steel nozzle.

s) The hose reel shall be connected directly to the riser by means of 25 mm dia MS / G.I. pipe with threaded bends, union & one no. ball valve.

t) The drum can swing up to 170 degree.

Hose Cabinets:

u) Hose cabinet shall be fabricated from 16 gauge MS powder coated sheet of fully welded construction with hinged single / double door partially glazed door with suitable locking arrangement, stove enameled fire red paint with 'Fire Hose' written on it prominently. Glass panels shall be 4 mm thick. The words 'Fire Service Inlet' should be written in letters at least 75 mm in height and 12 mm in width in fluorescent fire red color (see IS 5 : 1978)

v) The hydrant cabinet shall hold double headed hydrant, 2 nos. Hoses and 1 no. branch pipe.

w) The cabinet shall have two pipe studs of 200 mm dia in MS with base which shall be fixed to the back of the cabinet and shall be used to hold the RRL hose.

RRL Hoses :

x) 6.1 The hoses for the internal and external hydrant system should be rubber impregnated



woven jacketed type conforming to IS:636 Type - A. Each fire hose shall be provided with quick coupling, branch pipes, nozzles, spanners etc.

- y) 6.2 Hose pipes of all types shall be capable of withstanding an internal water pressure of not less than 3.5 Kg/Sq.cm without bursting. It must also withstand a pressure of 21 Kg/Sq.cm without undue leakage or sweating.
- z) 6.3 Each hose shall be fitted with instantaneous spring lock type couplings at both ends. Hose shall be fixed to the coupling ends by copper rivets and the joint shall be reinforced by 1.5 mm galvanized mild steel wires and leather bands.

Branch Pipes and Nozzle :

Gun Metal / Stainless steel Standard Branch Pipe shall be used conforming to IS : 903 with Stainless steel nozzle of 16 mm dia to fit standard instantaneous type 63 mm dia hose coupling. Suitable spanners of approved design shall be provided in adequate numbers for easy assembly and dismantling of various components like branch pipes, nozzles, quick coupling ends.

Hydrant Valve :

Gun Metal / Stainless steel Hydrant valve shall be of oblique pattern provided as per IS: 5290 complete with hand wheel, quick coupling connection, spring and blank cap and chain.

The hydrant shall have flanged inlet of 100 mm dia and 63 mm female instantaneous type outlet. The hydrant shall have a rubber plug with chain fixed to the main body of the Hydrant.

Pressure Switch:

The pressure switches shall be employed for starting and shutting down operation of pumps automatically, dictated by lines pressure. The Pressure switch shall be diaphragm type, it shall be suitable for line pressures upto 15 kg / cm².

The switch shall be suitable for consistent and repeated operations without change in values.

The enclosure shall be of aluminum and pressure element and wetted parts shall be of stainless steel. The switch shall be snap acting type with 1 no. NO / NC contact.

Air Vessel:

Provide an air vessel for counter acting pressure surges whenever the pumping set comes into operation. It shall be normally partly full of water, the remaining being filled with air, which will be under compression when the system is in normal operation.

Air vessel shall be fabricated from MS plate conforming to IS : 2002 grade 2A having 10 mm thickness shell with 10 mm thick dished ends and suitable supporting legs. It shall be provided with a 80 mm dia / 100 mm dia flanged connections from pump, one 25 mm drain with ball valve and



15 mm sockets for pressure gauge and pressure switches. The air vessel shall be hydraulically tested to 20 kg/cm² pressure for 30 minutes.

The pressure vessel shall be provided for hydrant and sprinkler system. The pressure switches shall be mounted on the drain end of each air vessel. The air vessel shall also be provided with safety valve mounted at the top.

Valves:

aa) **Sluice Valves:**

Sluice valve of 50 NB and above shall be flanged/grooved end valve with Ductile iron body. The spindle, wall seat, and wedge nuts shall be of bronze / ductile iron. They shall generally have rising stem and shall be of the particular duty and design called for. All sluice valves will be provided with a supervisory switch.

The valves shall be supplied with suitable flanges, non-corrosive bolts and asbestos fiber gasket. Sluice valves shall conform to Indian Standard IS: 14846: 2000 and IS: 2906. Sluice valves for water works purposes suitable for seat test pressure of 16 Kg/Sq.cm.

Butterfly Valve :

The butterfly valve shall be suitable for water works and tested to a minimum of 16 Kg / Sq.cm pressure.

The body shall be of Ductile iron to IS : 210 in circular shape and of high strength to take the water pressure of 20 Kg/Sq.cm. The disc shall be heavy duty ductile iron with anti-corrosive epoxy or nickel coating.

The valve seat shall be of high grade elastomeric or nitrile rubber. The valve in its closed position shall have complete contact between the seat and disc throughout the perimeter. The elastomeric rubber shall have a long life and shall not give away on continuous applied water pressure. The shaft shall be EN 8 grade carbon steel.

UL / FM Global approved, 285 psi (1965 kPa), grooved ends, polyphenylene sulfide (PPS) coated ductile iron body (ASTM A-536, Grade 65-45-12). Ductile iron disc, synthetic rubber encapsulated suited for the intended service, with integrally cast stem. Complete with weatherproof actuator and pre-wired supervisory switches.

The valves shall be supplied with manual gear operated opening/closing by lever. The valves shall be supplied with supervisory switch.

Gun Metal Valves:

Gun metal valves shall be used for smaller dia pipes, and for threaded connection. The valves shall bear certification as per IS: 778-1984 and shall be rated to 16 Kg/Sq.cm pressure.



The body and bonnet shall be of gun metal to IS : 318. The steam gland and gland nut shall be forged brass to IS: 319. The hand wheel shall be of cast iron to IS: 210.

The hand wheel shall be of high quality finish to avoid hand abrasions. Movement shall also be easy. The spindle shall non rising type.

All valves shall be approved by the Authority Representative before they are allowed to be used on the work.

Non-Return Valve :

Non-return valves shall be ductile iron grooved end type. An arrow mark in the direction of flow shall be marked on the body of the valve. The valve shall bear IS : 5312 certification.

The valve shall be of ductile iron body and cover. The internal flap in the direction of water shall be of cast iron and hinged by a hinge pin of high tensile brass or stainless steel. Cast iron part shall be as per IS : 210.

The gasket shall be of high quality rubber and flap seat ring of leaded gunmetal. At high pressure of water flow the flapper shall sit tightly to the seat. The valve shall be capable of handling pressure up to 16 Kg/Sq.cm.

Air Valves :

Provide 25 mm dia screwed inlet cast iron single acting air valves, on all high points in the system as shown on the drawing.

Drain Valve :

Provide 50 mm dia between steel pipe to IS : 1239 (heavy class) with 50 mm gunmetal full way valve for draining any water in the system in low pockets. Drain valves shall be provided at low points of all water riser and mains to ensure that all sections of pipe works and plant can be drained.

Pressure Relief Valves

Each pressure relief valve shall be of the fully enclosed type and fitted with hand easing gear. Each pressure relief valve in a pressure reducing station shall have a flow capacity equal to that of the pressure reducing valve. Pressure relief valves in locations other than reducing stations shall have flow capacities equal to that of the associated equipment.

Pressure Gauge:

Pressure gauge shall be provided near all connections to hydrant system and isolation valves of sprinkler system and where required. Pressure gauge shall be stainless steel 100 mm dia gunmetal Burden type with a scale range from 0 to 15 Kg/cm² and shall be constructed as per IS 3624. Each pressure gauge shall have a siphon tube connection with ball valve, tapping and connecting pipe and nipple. The gauge shall be installed at appropriate level and height for easy readability



Branch Pipe:

Gun Metal Standard Branch Pipe shall be used conforming to IS : 903 with gun metal nozzle of 16mm dia to fit standard instantaneous type 63mm dia hose coupling.

Pendent / Upright Type Sprinkler Head:

Sprinkler heads shall be of quartzoid bulb type with bulb, valve assembly, yoke and deflector. The sprinkler shall be of approved make and type with 15 mm nominal dia outlets. The bulb shall be made corrosion-free material strong enough to withstand any water pressure likely to occur in the system. The bulb shall shatter when the temperature of the surrounding air reaches at 68. The nominal bore shall be 15 mm dia and color of liquid shall be Red. The Sprinkler head shall bear approval of FOC/UL/FM.

Installation Control Valve For Sprinkler:

Black enamel coated ductile iron body conforming to ASTM A-536, grade 65-45-12, aluminum bronze clapper, stainless steel spring and shaft, EPDM seal, and Nitrile seat O-rings. Valve internal parts shall be replaceable without removing the valve from the installed position. Water working pressure is 300 psi. Suitable for constant and variable pressure systems with optional Series 752 retard chamber. It shall be vertically mounted and the direction of water travel shall be indicated on the surface. It shall be rated to 12 kg/cm² and tested to 25 kg/cm² pressure.

A by-pass check valve shall be fitted to adjust minor and slow variations in water pressure for balancing so as to avoid any false alarm.

The valve shall also be provided with a test control box. The box shall house a lever to test and operate the ICV. A brass strainer shall also be provided at the point of water supply to the alarm gong. A retarding chamber shall also be provided. The chamber shall be able to balance the water pressure in case of water line surges.

Each installation control valve shall have two sets of pressure gauges with brass ball valve type shut off.

A water motor Alarm shall also be provided. This shall be mechanically operated by discharge of water through an impeller. The drive bearing shall be weather resistant. A strainer shall be provided on line before the nozzle. A brass automatic ball drop valve with the retard chamber shall also be provided.

Flow Switch:

Flow switch shall have a paddle made of flexible material of the width to fit within the pipe bore. The terminal box shall be mounted over the paddle/pipe through a connecting socket. The switch shall be potential free in either N O or N C operation of a single sprinkler head. The terminal box shall have connections for wiring to the Annunciation panel. The seat shall be of stainless steel. The



flow switch shall have IP : 55 Protection. It should operate even with the flow of one Sprinkler bursting.

Fire Lock Commercial Zone Control Riser Module

Zone control valve with drain assembly shall be of commercial class of grooved or flanged type including the module body integrated with a shut off valve, test and drain valve combination with different orifice sizes, a UL listed and FM approved flow switch, and a pressure gauge of horizontal and vertical type. The terminal box shall be mounted over the paddle/pipe through a connecting socket. The switch shall be potential free in either NO or NC operation of a single sprinkler head. The terminal box shall have connections for wiring to the Annunciation panel. The seat shall be of stainless steel. The flow switch shall have IP:55 Protection. It should operate even with the flow of one Sprinkler bursting.

Fire Man's Axe :

Fire man's axe for firefighting purpose shall be used conforming to IS:926- 1985

Painting:

All hydrant pipes shall be finished with post office red colour paint. All M.S. pipes shall first be cleaned thoroughly before application of primer coat. After application of 2 coats of Red oxide primer, two coats of enamel paint shall be applied. Wherever required all pipe headers shall be worded indicating the direction of the pipe and its purpose such as " TO RISER NO 1" etc.

Testing :

All piping in the system shall be tested to hydrostatic pressure of 13.5 Kg/Sq.cm without drop in pressure for at least 2 hours. Rectify all leakages, make adjustments and retest as required and directed.

General Requirements

All fire pumps are factory assembled and tested and fire pump shall be painted with red paints. Pumps shall be installed true to levels on suitable concrete foundations. Base plate shall be firmly fixed by properly grouted foundation bolts.

Pumps and motors shall be truly aligned by suitably instruments. Record of such alignment shall be furnished to the Project Manager.

All pump connections shall be standard flanged type with number of bolts as per relevant standard requirement for the working pressure. Companion flanges shall be provided with the pumps. Manufacturers' instructions regarding installation, connections and commissioning shall be strictly followed.

Tenderer shall provide necessary test certificates, type test certificates, performance curves and NPSH curves of the pumps from the manufacturer when called for.

The tenderer shall provide facilities to the Project Manager and Consultant for inspection of



equipment during manufacturing and also to witness various tests at the manufacturer's works without any cost to the Project Manager or Consultant.

Seismic isolation and clamping for each pump and flexible connection on the suction as well as the discharge side shall be provided.

TECHNICAL SPECIFICATIONS

CONTRACTORS ARE ADVISED TO VISIT THE SITE BEFORE QUOTING THE RATES. OTHERWISE IT WILL BE ASSUMED THAT THE PARTY HAS ALREADY VISITED THE SITE BEFORE QUOTING THE TENDER. AN UNDERTAKING SHOULD BE FURNISHED IN ACCORDANCE WITH ANNEXURE ENCLOSED.

GENERAL DESCRIPTION

The solar water heating system shall be designed according to the following design Criterion and shall conform to the following technical specifications.

1. Design criterion:-
 - a. Capacity: 300 LPD x 1 No.
 - b. Output water temperature: 60 deg C
 - c. Collector Type: Evacuated tube collector
 - d. System Type: Non-Pressurized
 - e. Application: Cooking/washing
 - f. Circulation: Thermosyphon
2. Conforming Standards

The details of the standard, which contain minimum performance requirement along With the test method are as follows.

Only Collectors with MNRE approval shall be used. Test procedure for Thermo-syphonic solar water heating systems are available on MNRE web site www.mnre.gov.in should be followed.

3. Evacuated Tube Collector System

Evacuated Tube shall meet the following specifications

Diameter of Tube: 58mm (OD)

Length of the tube: 1800mm

Thickness of glass tube: 1.6mm

Glass material: Borosilicate



No: of tubes: 100

Absorber coating: 3 layer selective coating

Absorption efficiency: >90%

Emittance: <8%

Vacuum: $P < 3 \times 10^{-3}$ Pa

4. Collector Support frame:

The structure shall be in a position to withstand wind velocity of 100 Km/hr. The structure shall be made with angle iron stronger than 35mm X 35mm X 3mm and shall have the vertical support at top and bottom edge of the inclined plane of the collector at a distance of 2.5 m or less. The vertical support shall be firmly grouted to the roof or in the ground in case of ground mounted system. The grouting blocks shall be minimum 25cm X 25cm X 15cm and finished properly. In case of grouting is carried out on a roof already water proofed with asphalt , the back support of the collector may be anchored to the parapet or the size of the grouting block shall be increased to provide for a dead load weight anchoring of 75 Kg per leg of the vertical stand.

The collector support frame shall be rectangular shape i.e having all four sides touching the collector edge. The cement pedestals should be made after chipping of the existing rooftop to provide proper gripping and strength. Structure should be such that collector's bottom side is at least 30 cm above the ground/roof level. In case of inclined roof, the collector housing frame along with the vertical angle shall be mounted & fixed using suitable necessary structure keeping in view the load bearing capacity of the roof top ensure the stability against storm. The collector should be properly clamped and tightened with frame and supporting structure at both the ends by 20mmX 2mm size MS strip consisting rubber packing to avoid chemical reaction between the collector bodies and clamp. Last row of collector supporting structure



should be grouted throughout its length opposite to collector facing with c.c work ratio 1:2:4 of size 25cm X 30cm (d x h i.e height X width) and then plaster with cement.

Painting of stand: Proper cleaning and degreasing of the surface should be done before painting. Two coats of zinc chromate red oxide primer shall be applied followed by one coat of enamel paint. Suitable anticorrosion paint should be applied after proper treatment.

5. Storage tank

Materials: The storage tank (vertical/horizontal) should be stainless steel SS304.

Thickness: Minimum thickness according to tank capacity shall be as follows

22 guage for 100 lpd

20 guage (0.91mm) for 200 lpd

20 guage (0.91 mm) for 500 lpd

18 guage (1.2 mm) for 1000 lpd

18 guage (1.2 mm) for 1500 lpd

18 guage (1.2 mm) for 2000 lpd

16 guage (1.6 mm) for 3000 lpd

16 guage (1.6 mm) for 4000 lpd

16 guage (1.6 mm) for 5000 lpd

The tank shall be non pressure type and made of stainless steel of grade X04Cr19Ni9 or X07Cr18Ni9 of IS 1570 part 5 – 1985, TIG welded. All sockets and internal fittings of the tanks should of stainless steel. The tank shall be insulated with Polyurethane

foam 50 mm thick duly formed with injuction in a machine and cladding of GI precoated sheet. All sockets and internal fittings of the tanks should be of stainless steel. External of the tank should be properly insulated so that hot water temperature does not decrease by more than 5 deg. C in about 16 hrs.

Hot water storage water tank shall be provided with a sacrificial magnesium anode



with steel core. The anode shall be screwed to the tank from outside for easy replacement.

The storage tank shall be properly installed at site using enamelled coat appropriate size angle iron stand, girder cement pedestals of 1:2:4 ratio or any other specific provision suitable to site to ensure the stability against heavy storm etc.

6. Piping:

1/2 inch to 1 inch dia ISI marked GI pipe, medium class of IS 1239 shall be used for taking cold water supply from existing tank. Polyethelene-Aluminium-Polyethelene (PE-AL-PE) Composite pressure pipes conforming to IS-15450-2004 U.V. stabilised with carbon black having thermal stability for hot water supply, capable to withstand temperature upto 100 degree C including special fittings of composite material (engineering plastic blend and brass inserts wherever required) e.g. elbows, tees, reducers, couplers & connectors etc. The pipe line should be properly supported and fixed with clamp with the help of suitable size stand/civil structure (cement concrete ratio 1:4). ISI marked gunmetal strainer of standard make should be fitted in the main cold water supply line before the system. This includes testing of joints complete as per direction of the Engineer in charge.

Collector headers shall be of Copper or PE-AL-PE.

7. Valves/Nipple/tees/bend/taps:

Gunmetal valve as per ISI specification shall be used. Nipple/tees and bends shall be of medium class G I (B-class) /brass or copper. Gunmetal ball/globe valve shall be provided in each collector row and main collector lines. Gunmetal gate valve shall be provided at cold water inlet and hot water outlet. Gunmetal non return valve shall be provided on the cold water inlet. Gun metal drain valve shall be provided at the lowest point of the system for completely draining hot water from the system.

8. Temperature gauge:

One number temperature gauge (ISI mark) for hot water storage tank/outlet – dial



type – duly calibrated and suitable for temperature ranges (0 to 120 ° C) shall be provided.

9. Electrical heaters: Electrical heater shall be ISI marked. Electrical heater backup shall be one no. each of rating 3 KW for 500 LPD, 2 nos. each of rating 3 KW for 1000 LPD.

10. Suppliers shall furnish 2 valves, one for inlet and one for outlet.

11. Other component essential for completeness of the system as per tender specification.

12. Installation, testing and commissioning of the complete system at consignee's end shall be completed within 4 months from the date of confirmation received from consignee that the ground and foundation work has been completed.

13. Supplier shall get General Arrangement (GA) drawings approved from the indenter or consignee before supply of the system above 500 LPD. General arrangement drawing shall clearly show all the parts of the system (such as Evacuated Tube collectors, collectors stand assembly, stainless steel insulated hot water storage tank complete with stainless steel heat exchanger, sacrificial anode, electrical back up, internal and external piping, tank stand assembly, various valves, pressure gauges, temperature gauges, water meter etc) and their fixing arrangements.

14. Suppliers shall supply two sets of instruction manual to the consignee without any extra cost. Instruction manual shall contain the following details:

- (a) Schematic diagram of the solar collector and a domestic hot water system.
- (b) Instructions for installation (including mounting details) and use and safety precautions.
- (c) Instructions for repair and maintenance including causes for common failures, such as, dust ingress on glass cover, peeling of paint, scaling, damaged sealant, gasket and grommets and their remedies.



(d) List of service outlets.

15. The firms shall furnish complete and satisfactory type test reports for each size / type of solar Evacuated Tube collector as per contract specification from any govt. laboratory to the concerned Director (QA). Type test reports shall be complete with authenticated drawing giving complete details of the various component used in the ETC collector. Type test reports shall include all the tests listed in IS

16. The supplier shall get themselves registered for all the items as per these specifications.

Maintenance during the warranty period of 5 years shall be done by the bidder as per the schedule of maintenance attached as Annexure “A”. Nothing extra will be paid for the same. The bidder has to include the amount in the rates of items mentioned in the BOQ. The security deposit will be refunded only after the completion of 5 year warranty.

APPROVED MAKE LIST

1. The equipment and materials to be used in the execution of this contract shall be selected from the following list unless otherwise specifically agreed by Engineer-in-charge.

Sr. No.	Item Description	Manufacturer
1.	ETC Solar Water Heater	Raccold/Bosch/ V-Guard
2.	Storage tank 3 layer	Sintex/Hi-tech/ Kaveri/Ganga
3.	Valves	Zoloto/ Leader/ Intervalve/ Audco
4.	GI/PE-Al-PE Pipes & Fittings	Tata/ Jindal/Astral/ Ashirvad
5.	Electrical equipment's	L&T/ Siemens/ GE
6.	Hot Water Insulation	Spintex 300 rock wool / 100 mm Rockwool
7.	Armoured PVC Insulated Cable and Wires	Havells/ Gloster/ Polycab
8.	Cable fittings, Glands & Lugs, Cable Glands	Dowells/ Comet/ Polycab/ Gloster



2. The successful contractor shall prepare a list of equipment and materials selected from the approved list, proposed to be used by him for execution of the contract. Before placing orders on suppliers or delivering the equipment and materials to site, the Contractor shall obtain approval from Engineer-in-charge, whose decision shall be final

Note: For whichever items, makes of materials are not specified, the same shall be decided by the Engineer – in – charge and the decision taken by the Engineer – in – charge shall be final and binding on the contractor.

ELECTRICAL WORK

1.0 GENERAL:

Work shall be carried out in accordance with the specifications of local rules, Indian Electricity Act 1910 as ammended upto date, and rules issued there under, regulations of the Fire Insurance Company and Indian Standard Code of practice No. IS: 732-1963 (revised). Wiring for items of work not covered by any of the above regulations, shall be carried out in accordance with the CPWD specifications.

2.0 MV SWITCHGEAR PANELS & DISTRIBUTION BOARDS:

2.1 This section shall cover supply, assembly, installation, connection, testing and commissioning of medium voltage cubicle type MV Switchgear panels as described in these specifications, drawings and schedule of quantities. The MV Switchgear and Distribution boards are designated as:

Main Distribution Boards
Sub-Distribution Boards
Motor Control Centers

2.2 MEASUREMENT:

The unit rate per item shall include design supply, assembly, installation, connection, testing and commissioning of MV Switchgear and Distribution boards, with all the components in place, internal cabling, as specified in this specification, and shown on the drawing, and load schedule complete with supply and fixing of M.S. channel / angle iron support on wall/floor etc.



In case of MV Switchgear issued by owner for erection, the unit rate shall include inspection, receiving, storage, installation, field testing and commissioning activities including co- ordination with the suppliers of the MV Switchgear. The rate shall be quoted per set of MV Switchgear panel, as identified in the BOQ. The details of design/Constructional features of these MV Switchgear panels are specified here below.

2.3 **GENERAL :**

2.3.1 SYSTEM RATING:

All the Main Panels / MDBs / SMDBs / MCCs / DBs, shall be suitable for operation on three phase/ single phase, 415/240 volts, 50 Hz neutral solidly grounded at transformer and short circuit level not less than 65kA/50kA/35kA (Icu = Ics) at 415 volt as specified in BOQ.

The Main Panels / MDBs / SMDBs / MCCs / DBs shall be designed to withstand heaviest condition at site, with maximum expected ambient temperature of 50°C, 90-95 percent humidity and dusty weather. They shall not de-rate up-to 50°C temperature.

2.3.2 **STANDARDS AND CODES:**

The Panels shall comply with the latest edition of relevant Indian Standards and Indian Electricity Rules and Regulations. The following Indian Standards shall be complied with:

IS 8623-1,2,3	Factory built assemblies of switchgear and control gear for voltages upto and including 1000 V AC & 1200 V DC.
IS 60947-1	L.V. switchgear and control gear - General rules
IS 60947-2	L.V. switchgear and control gear – Circuit Breakers.
IS 60947-3	L.V. switchgear and control gear – Switches, Disconnectors, switch disconnectors and fuse combination units.
IS 60947-4/1	L.V. switchgear and control gear – Contactors and Motor starters (Electromechanical)
IS 60947-4/2	L.V. switchgear and control gear - Contactors and Motor starters (AC semiconductor controllers and starters)
IS 60947-4/3	L.V. switchgear and control gear - AC semiconductor controllers and contactors for Non-Motor Loads.
IS 60947-5/1	L.V. switchgear and control gear – Control Circuit Devices and Switching elements – Electromechanical.



IS 60898-1	Electrical Accessories- Circuit Breakers for overcurrent protection for Household and similar installation – Circuit breakers for AC operation.
IS 60898-2	Electrical Accessories- Circuit Breakers for overcurrent protection for Household and similar installation – Circuit breakers for AC & DC operation.
IS 12640-1	RCCB for Household or similar use
IS 12640-2	RCBO for Household or similar use
IS 11353-85	Guide for uniform system of marking and identification of conductors and apparatus terminals.
IS 60947-1/ IEC-60529	Degree of protection provided by enclosures for low voltage switch gear and control gears.
IS 2675-83	Enclosed distribution fuse boards and cutouts for Voltages not Exceeding 1000 V.
IS 2551-82	Danger notice plates.
IS 9926	Fuse wires used in rewirable type Electric fuses upto 650 Volts.
IS 13703	HRC fuse links for voltage above 650V.
IS 2705	Current Transformers(Part- I,II & III)
IS 3156	Voltage Transformers(Part- I,II & III)
IS 13875	Digital measuring instruments for measurement & control
IS 3231	Relays
IS-5578 & IS 11353	Marking and arrangement for switchgear, busbars, main connection and & auxiliary wiring.

2.3.3 SHOP DRAWINGS:

Prior to fabrication of the MV Switchgear Panels / MDBs / SDBs / MCC, the contractor shall submit following for approval from Engineer / Consultants:

- a. GA drawings with dimension and construction details.
- b. Schematic Drawings.
- c. Control schematic drawings.
- d. Bill of Material with Catalogue No., Model No., Rating etc. of equipment and components.



- e. Bus Bar sizing Calculations for Temperature rise and Short Circuit withstand capacity.
- f. Manufacturer's Catalogue as required by Engineer / Consultant.

2.3.4 **INSPECTION:**

At all reasonable times during production and prior to transport of the distribution boards to site, the contractor shall arrange and provide all the facilities at their plant for inspection by Engineer/Consultant or authorised representative.

2.3.5 **TEST CERTIFICATES:**

Following Type Test reports and certificates are required to be submitted by the contractor / Manufacturer:

- a. Temperature rise Test.
- b. Short Circuit Withstand capacity.
- c. Degree of protection.

Testing of MV Switchgear panels shall be carried out at factory and or at site as specified in Indian Standards in the presence of Engineer/Consultants the test results shall be recorded on prescribed forms. The test certificates for the test carried out at factory or at site shall be submitted in six copies to the Engineer / Consultants for approval.

2.4 **CONSTRUCTION:**

CUBICLE TYPE MV SWITCHGEAR PANELS / MDBs / SMDBs / MCC:

2.4.1 **STRUCTURE:**

The MV Switchgear Panels / MDBs / SDBs / MCCs shall be sheet steel enclosed cubicle pattern, floor mounted free standing, totally enclosed dead front, compartmentalized, multitier, Form 3B design. The panels shall be extensible type with provision for bus bar extensions. Generally all MV Switchgear Panels / MDBs / SDBs / MCCs shall be of front access only & suitable for top & bottom entry of cables unless otherwise specifically specified.

All CRCA sheet steel used in the construction of MV Switchgear Panels / MDBs / SDBs / MCCs shall be 2mm thick and shall be folded and braced as necessary to provide a rigid support for all components. Sheet steel shrouds and partitions shall be of minimum 2 mm thickness. Joints of any kind in sheet steel shall be seam welded, all welding slag grounded off and welding pits wiped smooth with plumber metal. The height of the panels should not be more than 2400 mm. The operating levels of the top most cubicle shall not be more than 1800 mm. The operating level of the lower most cubicle shall not be less than 500 mm.

The MV Switchgear Panels / MDBs / SDBs / MCCs shall be totally enclosed, completely dust and vermin proof. Gaskets between all adjacent units and beneath all covers shall be provided to render the joints dust proof. All doors and covers shall be fully gasketed with foam rubber and/or rubber strips and shall be lockable. Doors shall have concealed hinges.



All panels and covers shall be properly fitted and secured with the frame, and holes in the panel correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with bolt and nuts. Self threading screws shall not be used in the construction of the MV Switchgear Panels / MDBs / SDBs / MCCs etc.

A base channel of 75mm x 40mm x 5mm thick shall be provided at the bottom. A clearance of 300mm between the floor of the MV Switchgear Panels / MDBs / SDBs / MCCs and the bottom of the lower most unit shall be provided.

The MV Switchgear Panels / MDBs / SDBs / MCCs shall be preferably arranged in multitier formation. These shall be of adequate size with a provision of 20 Percent spare space to accommodate possible future additional switch gear. The size of the boards shall be designed in such a way that the internal space is sufficient for hot air movement, and the electrical component do not attain temperature more than 40 degree Celsius above ambient temperature.

Knockout holes of appropriate size and number shall be provided in the MV Switchgear Panels / MDBs/SDBs/MCCs in conformity with the number, and size of incoming and outgoing conduits/cables. Size of the terminal connectors and holes in the bus bars shall be suitable to the numbers and size of external cables.

Alternatively, the MV Switchgear Panels/MDBs/SDBs/MCCs shall be provided with removable undrilled sheet steel gland plates (3mm thick) at top / bottom, to drill holes for cable/ conduit entry, at site.

The switch boards shall be designed to facilitate easy inspection, maintenance and repair.

The MV Switchgear Panels / MDBs / SDBs / MCCs shall be sufficiently rigid to support the equipment without distortion under normal and short circuit condition. They shall be suitably braced for short circuit duty. Provision shall be made for permanently earthing the frames and other non current carrying parts of the switchgear by two independent earth connections.

2.4.2 PROTECTION CLASS:

All indoor MV Switchgear Panels / MDBs / SDBs / MCCs shall have degree of protection conforming to class IP 52. While outdoor panels shall be weather proof dust and water tight IP-55.

2.4.3 METAL TREATMENT & FINISH:

All sheet steel work used in the construction of switchboard shall undergo a 9 tank (min.) process of degreasing, pickling in acid, cold rinsing, phosphating, passivating and then spraying with a high corrosion resistant primer. The primer shall be baked in an oven followed by finishing treatment of two coats of epoxy paint alternatively these shall be powder coated to the specified shade of IS.5 of approved colour and stoved. Inside the doors shall be painted ivory white, matt finished. The total thickness of paint shall not be less than 60 microns.

2.4.4 BUS BARS :



The Bus bars shall be of three phase four wire system with separate neutral and earth bar. The busbars, and interconnection between busbars and various components shall be of high conductivity, high strength aluminium alloy complying with the requirement of grade 63401 (E91E) of IS 5082. The busbar shall be of rectangular cross section designed to withstand full load current for phase busbars and half rated / full rated (as per BOQ) current for neutral busbars and shall be extensible on both sides. The bus bar shall be rated for the frame size of the main incoming breaker, but in any case not less than 200 amp. capacity. The busbar shall have uniform cross section through out the length.

The busbars and interconnections shall be coated with heat resistant sleeves & colour coding. The busbars shall be supported on unbreakable, non hygroscopic insulated supports of FRP SMC supports at sufficiently close intervals to prevent busbar sag and shall effectively withstand without damage electromagnetic stresses in the event of short circuit. The neutral as well as earth bar shall also be capable of withstanding the fault level.

The busbars shall be housed in a separate compartment. The busbar shall be isolated with 3mm thick bakelite sheet to avoid any accidental contact. All busbars connections shall be done by drilling holes in busbars and connecting by chromium plated brass bolts and nuts. Additional cross section of bus bars shall be provided in all Panels/ Distribution boards to cover up the holes drilled in the busbars. Spring and flat washers shall be used for tightening the bolts. Minimum Clearances between Phase –to - Phase and Phase –to – neutral shall be maintained as per relevant IS

All connections between bus-bars and circuit breakers/switches and between circuit breakers/switches and cable terminals shall be through solid copper bus-bars / aluminium bus-bars / cables of proper size to carry rated full load current and fault current, as defined in the BOQ/SLD. These strips / bars shall be insulated with insulating heat resistant paint with colour coding. Current density shall be 0.8Amps/Sq.mm (min.) for aluminium busbars. Contractor to submit Bus Bar sizing calculations for review and approval. Bus-bar temp. shall not exceed beyond 85 deg.C (i.e. 35 deg.C above ambient of 50 deg.C)

2.4.5 **CIRCUIT COMPARTMENTS :**

Each circuit breaker shall be housed in separate compartments and shall be enclosed on all sides. Sheet steel hinged lockable door shall be duly interlocked with the breaker units in "ON" and "OFF" positions. Safety interlocks shall be provided for air circuit breaker to prevent the breaker from being drawn-out when the breaker is in "ON" position.

The door shall not form an integral part of the drawout position of the circuit breaker. All instruments and indicating lamp shall be mounted on the compartment door. Sheet steel barrier shall be provided between the tiers in a vertical section. Humidistat controlled, 240V operated space heaters to be provided in the cable alley.

2.4.6 **INSTRUMENT COMPARTMENT :**



Separate and adequate compartment shall be provided for accommodating instruments, indicating lamps, control contactors/relays, and control fuses etc., These components shall be accessible for testing and maintenance without any danger of accidental contact with live parts of the circuit breaker units, bus bars and connections.

2.4.7 TERMINALS :

The outgoing terminals and neutral link shall be brought out to a cable alley suitably located and accessible from the panel front. The current transformers for instruments metering shall be mounted on the terminal blocks. No direct connection of incoming or outgoing cables to internal components of the MV Switchgear Panels / MDBs / SDBs / MCCs is permitted, only one conductor may be connected in one terminal.

2.4.8 WIREWAYS :

A horizontal PVC wire way with screwed covers shall be provided at the top to take interconnecting control wiring between different vertical sections.

2.4.9 CABLE COMPARTMENTS :

Cable compartments of adequate size shall be provided in the MV Switchgear Panels / MDBs / SDBs / MCCs for easy termination of all incoming and outgoing cables entering from bottom or top. Adequate supports shall be provided in the cable compartments to support cables. All outgoing and incoming feeder terminals shall be brought out to terminal blocks in the cable compartment.

2.4.10 EARTHING :

Aluminium earth bars of suitable size but not less than 25 mm x 6 mm shall be provided in the Panels/Distribution Boards for the entire length of the panel. The frame work of the MV Switchgear Panels / MDBs / SDBs / MCCs shall be connected to this earth bar. Provision shall be made for connection from this earth bar to the main earthing bar coming from the earth pit on both sides of the MV Switchgear Panels / MDBs / SDBs / MCCs and to take tapping to the outgoing earthing strips to connect to the main distribution boards.

The earth continuity conductor of each incoming and outgoing feeder shall be connected to this earth bar. The armour shall be properly connected with earthing clamp, and the clamp shall be ultimately bonded with the earth bar. CT earthing also shall be connected to this earth bar.

2.4.11 LABELS :

Engraved PVC labels shall be provided on all incoming and outgoing feeders. Single line circuit diagram showing the arrangements of circuit inside the MV Switchgear Panels / MDBs / SDBs / MCCs shall be pasted on inside of the panel door and covered with transparent laminated plastic sheet.

2.4.12 INTERNAL COMPONENTS :



The MV Switchgear Panels / MDBs / SDBs / MCCs shall be equipped complete with all type of required number of circuit breakers, contactors, relays, fuses, meters, instruments, indicating lamps, push buttons, equipment, fittings, bus-bars, cable boxes, cable glands etc., and all the necessary internal connections /wiring as required and as indicated on relevant drawings. Components necessary for proper complete functioning of the Panels/Distribution boards, but not indicated on the drawings shall be supplied and installed on the distribution boards. All Control wiring shall be done with 1.5sq.mm FRPVC insulated copper wires and for CT Circuits, it shall be done with 2.5 sq.mm. FRPVC insulated copper wires.

All parts of the MV Switchgear Panels / MDBs / SDBs / MCCs carrying current including the components, connections, joints and instruments shall be capable of carrying their specified rated current continuously, without temperature rise exceeding the permissible values as per the relevant specifications at any part of the MV Switchgear Panels / MDBs / SDBs / MCCs. Panels shall be provided with the Cubicle illumination lamps and 5/15 amp. Socket shall be provided in the Cubicles.

All units of the same rating and specifications shall be fully interchangeable.

2.5 COMPONENTS OF MV SWITCHGEAR PANELS / MDBs / SDBs / MCCs AND DBs:

2.5.1 GENERAL :

The type, size and rating of the components shall be as indicated on the relevant drawings.

While selection of the capacity of the components resulting from the prevailing conditions like room temperature, IP rating etc. should be considered. Thermal and magnetic trip rating shall be compensated for the ambient temperature.

The switchgear ratings indicated on the drawings are anticipated at prevailing site condition.

2.5.2 AIR CIRCUIT BREAKERS:

The air circuit breaker shall comply with the requirements of IS:60947-2 and shall have:

- i) A service short circuit breaking capacity as specified and equal to short circuit withstand values. All short circuit ratings shall be I_{cs} values ($I_{cs} = 100\% I_{cu}$).
- ii) Mechanical and electrical endurance for 2000 operating cycles out of which 100 cycles should be for electrical endurance.
- iii) Electrical overload performance at 6 times the rated current, 110% of the rated voltage as recovery voltage and 0.5 power factor.
- iv) Dielectric test of 2.5 KV applied for one minute on main circuits. Test evidence from a recognized independent laboratory/institution shall be furnished for compliance of the breakers with the above requirements.



- v) Each pole of the ACB's shall be equipped with an inverse time delay thermal over current trip device and an electromagnetic instantaneous over current trip device. The ACB's shall be equipped with under voltage trip release. The trip devices shall be direct acting. ACB shall be capable of providing short circuit, overload, and earth-fault protection (in absolute values) if required, thru microprocessor-based control unit sensing the true RMS values to ensure accurate measurement meeting the EMI/EMS requirement as per the standard.
- vi) Disconnecting devices of approved type shall be provided to facilitate the removal of the circuit breakers from the housing for test and maintenance purposes.
- vii) The ACB's shall be fitted with detachable type re- quenching device on each pole. The ACB's shall have auxiliary contacts for signaling, interlocking etc. The ACB's shall have slow close facilities for checking contact operation and contact gap adjustment.
- viii) All contacts subject to arcing shall be tipped with arc resisting material. Main contacts shall be silver plated to ensure reliability in service.
- ix) Isolating contacts shall be of the silver plated, multi-finger, spring loaded type. Facilities shall be provided to isolate the circuit breaker for inspection purpose. Feature of contact wear inspection indicating the life of contacts shall be provided. The ACB shall have double insulation (class-II) with moving and fixed contacts totally enclosed for enhanced safety and inaccessibility to live parts. The breaker shall have three distinct positions with in the cassette as follows:
- a) `Service Position' - with main and auxiliary contacts connected.
 - b) `Test Position' - with power contacts fully disconnected and control circuit contacts connected.
 - c) `Isolated position' - With both power and control circuit contacts fully disconnected.
- x) Interlocks shall be provided to:
- a) Prevent the breaker from being isolated unless it is in the OFF position.
 - b) Prevent the breaker from being racked into the service position unless it is in the OFF position.
 - c) Prevent the breaker from being accidentally pulled completely OFF the guide rail.
- xi) Safety shutters of an insulation material shall be provided to prevent access to all live contacts, when the breaker is in the inspection position or completely withdrawn.
- xii) Facilities for pad locking the safety shutters when breaker is completely withdrawn shall be provided. Facilities shall be provided for earthing the circuit breaker.
- xiii) Air circuit breaker shall be capable of clearing the maximum fault current which can occur.



- xiv) All electrical closing of breaker should be with Electrical motor wound stored energy spring closing mechanism with Mechanical indicator to provide ON/OFF/Spring Charged status of ACB.

For all ACBs the operating handle should be provided for charging the spring in continuous action. The spring shall be released with ON/OFF push button command in one operation at the correct speed independent of operator speed. A direct mechanical coupling should indicate the ACB in ON to OFF position thus qualifying to disconnection as per the IS/IEC indicating the true position of all the contacts. One set of NO/NC potential free contacts to be provided for operation on building management system. All accessories like shunt release, under-voltage release, motor mechanism etc. shall be front mounted, requiring no adjustments and can be fitted at site. Emergency panels and Panels supplying to Life Safety System (As per NBC-2016, Part-4) shall not be provided with U/V release.

2.5.3 MOULDED CASE CIRCUIT BREAKERS (MCCB):

MCCBs shall satisfy the requirements of IS:60947 and shall be of current limiting type. MCCB shall provide type 'C' protection to the contactors as per IEC 158-1B. MCCBs shall be quick make, quick break, independent manual type with trip free feature with mechanical ON, OFF, and TRIP indications. A trip button shall be provided for tripping the breaker.

MCCB, below 250A, shall have variable thermal and magnetic releases for O/C and Short Circuit protection. MCCB of 250A and above shall have microprocessor-based O/C and S/C protection. MCCBs shall be provided with under-voltage, shunt- trip and earth fault releases as per BOQ and the requirement of system. Emergency panels and Panels supplying to Life Safety System (As per NBC-2016, Part-4) shall not be provided with U/V release.

Alarm and auxiliary contacts, terminal shrouds, sliding type front operation kit with facility for door interlocking and pad locking shall be provided.

2.5.4 FUSE SWITCH UNITS :

The fuse switch units shall be 3 pole double break type suitable for load break duty, quick make and break action. Separate neutral link shall be provided in the switch. All fuse switch units shall be provided with hinged doors duly interlocked with operating mechanism so as to prevent opening of the door when the switch is in "ON" position and also prevent closing of the switch when the door is not properly secured. All contacts shall be silver plated and all live parts shall be shrouded. The incoming and outgoing terminals of switch shall be adequately sized to receive proper size of cables. High rupturing capacity (HRC) fuse links shall be provided with switch fuse units and shall be in accordance with IS: 13703 and having rupturing capacity of not less than 55 MVA at 400 volts. HRC fuse links shall be provided with visible indicators to show that they have operated. The switch fuse unit shall be manufactured in accordance with IS:60947 as amended to date.

2.5.5 MINIATURE CIRCUIT BREAKER :

Miniature circuit breakers shall be quick make and break type and conform to IS / IEC 60898- part-I & 2. The housing of MCBs shall be heat resistant and having a high impact strength. The fault



current of MCBs shall not be less than 10000 amps, at 230 volts. The MCBs shall be flush mounted and shall be provided with trip free manual operating mechanism with mechanical "ON" and "OFF" indications.

The circuit breaker dollies shall be of the trip free pattern to prevent closing the breaker on a faulty circuit.

The MCB contacts shall be silver nickel and silver graphite alloy and tip coated with silver. Proper arc chutes shall be provided to quench the arc immediately. MCB's shall be provided with magnetic fluid plunger release for over current and short circuit protection.

The over load or short circuit devices shall have a common trip bar in the case of DP and TPN Miniature Circuit Breakers. All the MCB's shall be tested and certified as per Indian Standards, prior to installation.

2.5.6 FUSE :

Fuses shall be of high rupturing capacity (HRC) fuse links and shall be in accordance with relevant ISS and having rupturing capacity of not less than 55 MVA at 400 volts. The back up fuse rating for each motor/ equipment shall be so chosen that the fuse does not operate on starting of motors/equipment.

2.5.7 RESIDUAL CURRENT CIRCUIT BREAKER:

The RCCB shall comply with IS:12640 part-1 / IEC:1008. The RCCB shall be current operated independent of the line voltage. The RCCB shall be rated for current sensitivity of a min of 30mA and a max of 300 mA at 230/400 V AC. The terminals shall be protected against finger contact to IP:20 degree of protection. The RCCB shall have a minimum of 20,000 electrical operations.

1. Testing Provision

A test device shall be incorporated to check the integrity of the earth leakage detection system and the tripping mechanism. When the unit is connected to service, pressing the test knob shall trip the RCCB and the operating handle shall move to the "OFF" position.

2.5.8 CONTACTORS:

The contactors shall meet with the requirements of IS:60947.

The contactors shall have minimum making and breaking capacity in accordance with utilization category AC3 and shall be suitable for minimum class II intermittent duty.

If the contactor forms part of a distribution board then a separate enclosure is not required, but the installation of the contactor shall be such that it is not possible to make an accidental contact with live parts.

2.5.9 VOLTMETER: (Digital)



Voltmeter shall comply with IS 13875 (Latest edition) requirements. The dial of the meter shall be square in shape 96 x 96 Sqmm.

The voltmeter selector push button shall be arranged to provide line to line voltage reading and line to neutral voltage reading.

2.5.10 **AMMETER: (Digital)**

Ammeter shall comply with IS 13875 (Latest edition). The dial of the ammeter shall be square in shape of 96 x 96 Sq.mm for main panels. The Ammeter shall be flush pattern with dust and moisture proof enclosure. Separate current transformer shall be provided for all ammeters. Selector Push Button shall be provided for measuring current in different phases.

2.5.11 **CURRENT TRANSFORMER:**

Where ammeters are called for C.T's shall be provided for current measuring. Each phase shall be provided with separate current transformer of suitable accuracy class and protection class (as per BOQ and SLD) and suitable VA burden for operation of associated metering and controls. Current transformer shall be in accordance with IS:2705 as amended up to date.

2.5.12 **TERMINALS:**

The outgoing terminals and neutral links shall be brought out to a terminal block suitably located in the control panels. The current transformer for instruments, metering and for protection shall be mounted on the bus bars. Separate cable compartment shall be provided for incoming and outgoing cables.

2.5.13 **WIRE WAYS:**

A horizontal wire way screwed covers shall be provided at the top to take in the connecting control wiring different vertical sections.

2.5.14 **CABLE COMPARTMENTS:**

Cable compartments of adequate size shall be provided in the control panels for easy termination of all incoming and outgoing cables entering from bottom or top. Adequate and proper supports shall be provided in cable compartments to support cables. All incoming and outgoing terminals shall be brought out to terminal blocks in the cable compartment.

2.5.15 **ROTARY SWITCHES:**

Switches upto 60 amps shall be rotary type with compact and robust construction, built up from one or more stacks with contacts and a positioning mechanism, with stop as required. The terminals shall



be shrouded with insulation to prevent accidental contact with live parts. Rotary switches shall be backed up with moulded type HRC fuse fittings of appropriate rating.

2.5.16 **SELECTOR SWITCH:**

When called for, selector switches of rated capacity shall be provided in control panels, to give the choice of operating equipment in selective mode.

2.5.17 **SWITCHES:**

Switches beyond 60 amps shall be panel mounted double break type and suitable for load break duty, quick make and break action, manufactured in accordance with IEC: 60947, part-3. Switch contacts shall be silver plated and shall be backed up with HRC fuses of appropriate rating. The switch handles shall be located at the front.

2.5.18 **STARTERS:**

Each motor shall be provided with a starter of suitable rating. Starter shall be in accordance with IEC: 60947, part-4. Direct on line starters / Star-Delta starter / Soft starter shall be provided for motors as per BOQ.

All starters shall have auxiliary contacts for inter locking, control & indication. Starters (contactors) shall have 3 main and 4 auxiliary contacts and shall be air break type suitable for making and breaking contact a minimum power factor of 0.35. For design consideration of contactors, the starting current of connected motor shall be assumed to be 6 times the full load current of the motor in case of direct-on-line starters and 3 times the full load current of the motor in case of star delta/reduces Voltage starters. In case of soft starters the current shall be limited to 1.8 times.

Main and auxiliary contacts shall be silver or silver alloy. The insulation for contactor coils shall be of class "E". Operating coils of contactors shall be suitable for $240 \pm 10\%$ volts AC, 50 cycles supply system. The contactor shall drop out when voltage drops to 90% of the rated voltage. The housing of the contactors shall be heat resistant and having high impact strength. Each starter shall have thermal overload protection on all three phases.

2.5.19 **OVER LOAD RELAYS:**

Contactors shall be provided with a three element, positive acting ambient temperature compensated time lagged hand-reset/self-reset type thermal over load relay with adjustable setting. Hand reset button shall be flush with the front door for resetting with starter compartment door closed, Relays shall be directly connected for motors below

35 HP capacity. C.T. operated relays shall be provided for motors above 35 HP capacity. Heater circuit contactors may not be provided with overload relays.

2.5.20 **SINGLE PHASE PREVENTERS:**



Single phase preventers shall be provided as per schedule of quantities and shall be in conformity with relevant IS standards. Single phase preventers shall act when the supply voltage drops down to 90% of the rated voltage or on failure of one or more phases.

2.5.21 TIME DELAY RELAYS:

Time delay relays shall be adjustable type with time delay adjustment from 0-180 seconds and shall have one no. auxiliary contacts for indicating lamp connection.

2.5.22 INDICATING LAMP AND METERING:

All meters and indicating lamps shall be in accordance with the relevant ISS. The meters shall be flush mounted and draw out type. The indicating lamp shall be LED type. Each main panel shall be provided with operated ammeter of suitable range with three Nos. CTs of suitable ratio with three way and off selector switch, phase indicating lamps, and other indicating lamps as called for. Indicating lamps shall be backed up with 2Amp. SPMCB.

2.5.23 TOGGLE SWITCH:

Toggle switches, where called for, shall be in conformity with IS: 3854-1997 and shall be of 5 Amps rating.

2.5.24 PUSH BUTTON STATIONS:

Push button station shall be for manual starting and stopping of motors/equipment as called for. Red and Green colour push buttons shall be provided for starting and stopping operations. Start or stop indicating flaps shall be provided for push buttons. Push buttons shall be suitable for panel mounting/projection mounting and accessible from front without opening door, lock lever shall be provided for stop push button. One set of normally open and one set of normally closed contacts shall be provided in push button stations. The push buttons contacts shall be suitable for 15 Amps current capacity.

3.0 Tests required to be done at Manufacturer's work at the time of Inspection:

- Checking of Effectiveness of Mechanically actuating devices, locks, interlocks etc.
- Checking of Proper mounting of devices & switchgears.
- Checking of Proper laying and dressing of cables & wires.
- Checking of clearness between conductors, between conductor & enclosure as per approved drawings.
- Checking of tightness and proper contact of conductor (Bus Bars, Cables, Wires etc)
- Checking the rating and Model Nos. of ACB/MCCBs/MCBs/SPDs/ CTs etc as per approved BOM.



- Checking of wiring control & power and ferruling as per control schematic drawings.
- Checking of electrical operation, electrical interlocking, tripping of ACBs through relays & tripping of MCCB.
- Checking of insulation resistance of :-
Power and control AC circuit & DC circuits.
- Checking of Electrical continuity of protective circuit (body earthing)
- Checking of panel size as per approved drawing
- Checking of DG Set incomer position as per approved drawing
- Checking of bus bar sizes as per approved drawing
- Checking of earth bus bar size as per approved drawing
- Checking of thickness of painting by Elcometer.
- Checking of sheet thickness by Screw gauge
- Checking of provision for dual source energy meter and wire ducts (as applicable)
- Checking of provision for Knocks out for gas flooding system(as applicable)

3.1 INSPECTION, INSTALLATION, TESTING AND COMMISSIONING:

3.1.1 Inspection:

- The LT panels / MCC shall be inspected and checked as per inspection manual of the manufacturer.
- Various electrical components and accessories of the Panels shall be checked as per drawing / BOM for the respective Panel.
- The Components of LT Panels / MCC shall be checked for rigid mounting, earthing connections, proper rating and size of components, internal wiring, etc.
- All mechanical fasteners and electrical connections shall be checked and tightened before installation.
- Type test certificates for all ACB / MCCB for similar rating shall be reviewed.
- Prior to dispatch of the LT panels, following tests shall be carried out :
 - a) Mechanical endurance test shall carry out by closing and opening of all the ACBs, MCB's switches etc.



b) Over voltage and Insulation resistance test shall be carried out between phases and between phases to earth bus, keeping the isolating switch in ON position. Similar test shall be carried out keeping the isolating switch in closed position.

c) All the interlocks, controls and tripping mechanism of the switch gears shall be tested for their proper functioning and as per control logics.

3.1.2 Pre-Installation Checks:

- Prior to the commencement of the works, access and installation areas will be inspected to confirm they are in a suitable condition to commence installation.
- To carry out pre-Installation Inspection of switch-gear panels plinth, for leveling, prior to off loading and positioning.
- Protection to be ensured, to protect the openings during installation and until the final connections are made to the Panels.
- Check equipment schedule for correct location and reference for the switchgear and panels.
- If the switchgear or panels cannot be installed immediately, then the same shall be stored in clean, dry and properly ventilated location.

3.1.3 Installation:

3.1.3.1 Panels Installation Procedure

- Fully crated panels shipped on a timber sub-base will only be lifted under the sub-base, using soft slings with spreader bars on the topside of the crate. Otherwise the same shall be lifted from panel lifting Hooks, as per manufacturer's instruction.
- When the panels has been moved its final destination, it will be un-crated, unpacked and removed from its timber base.
- Lower panels onto lengths of steel conduit or skate (rolling devices), for movement to final location.
- Care will be taken to ensure the panels do not un-balance whilst being moved to its final location.
- Once in its final location, rolling devices will be removed from under the panels. Caution will be exercised against over balancing, while the panels are being moved.
- Finally the panels should be free standing, self supporting assembly, and will be bolted to the foundation with anchor bolts ensuring the assembly is horizontal and vertically in alignment as detailed on the construction shop drawings.

3.1.3.2 Assembling the Switchgear & Panels At Site

- When the panels are shipped in more than one module, it will be necessary to bolt in individual section together, as per construction drawing, in the presence of manufacturer/supplier representative.
- All fishplates to interconnect bus bars will be carefully installed after removing the appropriate cover plates.
- All connections will be torqued to the required figure as per data from the manufacturer.



3.1.4 Pre-commissioning Checks:

- The panels shall be provided with terminals for both power and control cables. The terminal will be positioned in such manner as to facilitate optimum access to suit the specified type of entry. As detailed on the construction/shop drawing.
- Operate all components (i.e.. fuse switches, circuit breakers, contactors, relays etc.) by hand to ensure that there are no damage to the moving parts.
- A thorough inspection will be carried out to determine that no foreign matter (tools etc.) have been left in the panels after field installation is completed.
- Particular attention will be given to the Bus-bar compartment, ensuring it is free of debris and moisture. All compartments shall be thoroughly cleaned.
- All bus-bar and circuit connections shall be checked carefully to find these are tightened and torqued from the factory, as it is possible for connections to vibrate loose during shipments.
- All connections are checked for tightness/torque prior to energization in accordance with the manufacturer's recommendation.
- All components/door interlocks should be adjusted correctly and must operate freely.

3.1.5 Testing & Commissioning:

- Megger tests on the medium voltage bus shall be applied between each phase separately and ground with other phases tied to ground.
- All breakers shall be racked-out. Each breaker shall be given a megger test in the racked-out and closed position. Megger tests shall be applied between each phase to ground and to each other phase.
- A suitable motor driven or electronic megger shall be used. Each test shall be held until a constant reading is obtained.
- All test readings shall be recorded.
- All circuit breakers shall be operated through at least three (3) open-close-open cycles in both the rack-in and test positions by manual operation and by control circuits from each control point.
- All indication lights, annunciators, alarms and targets shall be observed to determine correct operation and breaker mechanism shall be observed for correct alignment, freedom of binding and good contact.
- All breakers shall be checked for ease of rack-in and rack-out and checked to determine that the breaker cannot be moved out of operation position while the breaker is closed.
- The interchangeability of the circuit breakers shall be demonstrated.
- PT and CT data shall be recorded and PT and CT circuits shall be checked with a multi-tester.
- Protective relays shall be adjusted and calibrated with an injection type test arrangement (multi-amp or equal). Results shall be recorded and the co-ordination of the protective relaying shall be proved.
- After initial energization, switch gear shall be checked for correct phase sequence.

4.0 LT CABLES AND CABLE TRAYS:

4.1 GENERAL SCOPE :



Supply, installation, storing, laying, fixing, jointing / termination, testing and commissioning of Medium Voltage XLPE/PVC insulated, PVC Sheathed armoured aluminium/ copper conductor cables laid in built up trenches, directly buried underground, on cable trays, in pipes, clamped directly to wall or Structures etc. as called for in the drawing.

a) **Type :**

Medium voltage cables shall be circular, multicore annealed copper or aluminium conductor, XLPE/PVC insulated, PVC sheathed and steel wire armoured or steel tape armoured construction or unarmoured. The conductors of cable shall be stranded. Sector shaped stranded conductors shall be used for cables of 50 sqmm size and above. The cables shall conform to IS:1554 Part-I and IS:7098 part-I, in all respects.

Conductors shall be insulated with high quality XLPE/PVC base compound. Insulation and outer sheathing compounds shall conform to IS:5831 – 84.

A common covering shall be applied over the laid-up cores by an extruded sheath of unvulcanised rubber compound.

Armouring of galvanised round steel wires or galvanised flat steel strips shall be provided over the inner sheath.

Outer sheath of FRLSH-PVC shall be extruded over the armouring cables shall be manufactured and tested in accordance with IS 5831.

Unless otherwise specified, all control cables shall be multicore, 1100V grade PVC insulated, armoured and overall FRLSH-PVC sheathed with stranded copper conductors of 2.5 sq.mm, conforming to IS 1554 Part I. Cores shall be identified by colour scheme of PVC insulation.

b) **Rating :**

The cables shall be rated for a voltage of 1100 Volts.

c) **Core Identifications :**

Cores shall be provided with the following colour scheme of XLPE/PVC insulation

- | | | | |
|----|-------------|---|----------------------------------------------|
| 1. | Single Core | : | Green yellow for earthing. |
| 2. | Two Cores | : | Red and Black, Blue & Black, Yellow & Black. |
| 3. | Three Cores | : | Red, Yellow & Blue |
| 4. | Four Core | : | Red, Yellow, Blue & Black |

d) **Selection of Cable:**



- Cables sizes shall be selected considering the current carrying capacity, voltage drop, maximum short circuit duty and the period of short circuit to meet the present and future anticipated loads.
- While deciding cable sizes, the derating factors for type and depth of laying, grouping, ambient temperature, ground temperature and soil resistivity shall be taken into account.

4.2 **STANDARDS :**

The following standards and rules shall be applicable.

IS 7098, Part -I, 1988	XLPE insulated LT cables
IS 3975	Mild steel wires, formed wires and tapes from armouring of cables.
IS 1255	Code of Practice for installation and maintenance of Power cables upto and including 33 KV ratings.
IS 10418	Drums for Electric Cables
IS 1554	PVC insulated (heavy duty) electric cables Part I for working voltages upto and including 1100 V.
IS 8130, 1984	Conductors for insulated electric cables and flexible cords.
IS 3961	Recommended current ratings for cables:(Part 2) PVC Insulated and PVC sheathed heavy duty cables.
IS 5831	PVC insulation and sheath of electric cables.
IS 10810	Methods of Tests for Cables.
IS 4905	Methods for random sampling

The individual cores shall have continuous numbering of the core all along its length and also be provided with identification ferrules at both ends. Individual control cables shall have 20% spare cores.

FRLSH cables (Category – C2) shall be used to prevent flame propagation, smoke reduction and to avoid toxic gas emission in the event of a fire. FRLSH compound shall be tested rigorously for oxygen index as per ASTM D2863, acid gas generation to IEC 754-1, smoke density to ASTM D 2843 and flammability SS 424 1475 class F3, IEEE 383 and IEC 332-1.

Manufacturer's name, ISI Mark, cable size and type shall be clearly embossed at regular intervals on all cables.

4.3 **FIRE RESISTANCE CABLES:**



Fire resistance / fire survival cables shall be rated for 600/1000V. The cables shall confirm to the compliance of BS 7846 for requirement of construction and performance for stranded Aluminium conductor, armoured, fire resistance cables.

The circuit integrity performance of the cables, under fire conditions shall be confirming to the category F120 as per BS 7846 and category 3 as per BS 8519. Type test reports of cables to be submitted for review and approval, before the procurement of material. Cables shall be in compliance to the following test requirements (as per BS 7846 – 2015):-

- a. Resistance to the Fire alone 950 deg.C for 180 min.
(Category F2 test, as per BS 6387-2013, Cat. C, Annex.D.2)
- b. Resistance to fire with water 650 deg.C for 30 min.
(Category F2 test, as per BS 6387-2013, Cat. W, Annex.D.3)
- c. Resistance to fire with mech. Shock 950 deg.C for 15 min.
(Category F2 test, as per BS 6387-2013, Cat. Z, Annex.D.4)
- d. Resistance to fire with mech. Shock and water jet 850 deg.C for 120 min.
(Category F120 test, as per BS 8491-2008, for cable dia. > 20mm.)
- e. The Fire resistant cables of dia. \leq 20mm. to be used for fire detection & alarm system, Emergency Lighting and other life safety system, must meet BSEN 50200 PH 120 classification and Test for 2 hours as per BS 8434-2 with direct flame, indirect impact and water spray.

Fire resistance / fire survival cables shall have limited evolution of smoke and acid gases, under fire condition, in compliance to the BS EN 50268 and BS EN 50267-2-1.

Conductor shall be covered with special grade Mica Glass tape suitable to withstand the high temperature under fire condition. Insulation over the conductor shall be either XLPE (GP 8) confirming to BS 7655-1-3 OR High Module Ethylene Propylene Rubber HEPR (GP 6) confirming to BS 7655-1-2. Insulation shall be applied by extrusion process and cross linked to form a compact and homogeneous layer.

The cores of cables shall be laid – up in the required sequence. The fillers of synthetic material and binder tapes of glass fiber may be used to form a compact and circular shape of the cable.

Bedding of the cable shall be done with the polymeric material compatible with the operating temperature of the cable, through the process of extrusion.

Cables shall be provided with single layer of wire armouring of galvanized steel.

The overall sheath of cable shall be an extruded layer of Polymeric material confirming to the requirements for LTS 1 specified in the BS 7655-6.1.

4.4 **INSPECTION :**



All cables shall be tested inspected at manufacturers works. However upon receipt at site cables shall be checked for physical damages during transit.

4.5 **JOINTS IN CABLES :**

The contractor shall take care to see that all the cables received at site are apportioned to various locations in such a manner as to ensure maximum utilization and avoidance of straight cable jointing. This apportioning shall be got approved by the Construction manager/ Consultant before the cables are cut to lengths.

Where straight joints in cable are unavoidable, the use and location of such straight joints shall be got approved by Construction manager/Consultant.

4.6 **JOINTING BOXES FOR CABLES :**

Cable joint boxes shall be of appropriate size, suitable for PVC insulated armoured cables of particular voltage rating.

4.7 **JOINTING OF CABLES :**

All cable joints shall be made in suitable, approved cable joint boxes, jointing of cables in the joint boxes and the filling in of compound shall be done in accordance with manufacturer's instructions and in an approved manner. All straight joints shall be done in epoxy mould boxes with epoxy resin (Tropolin/M-Seal resin or approved equal). All jointing accessories shall be of RACHEM or approved equal. All terminal leads of conductors shall be Crimped with suitable size Lugs.

All cables shall be joined colour to colour and tested for continuity and insulation resistance before jointing commences. The seals of cables shall not be removed until preparations for jointing are completed. Joints shall be finished on the same day as commenced and sufficient protection from the weather shall be arranged. The conductors shall be efficiently insulated with high voltage insulating tape and by using spreaders of approved size and pattern. The joints shall be completely filled with epoxy compound and tapped so as to ensure that the box is properly filled.

Epoxy compound shall be filled as follows :

Equal quantities of resin and hardener shall be mixed thoroughly by hand until the mixture is free from white patches and has uniform colour. No water, oil or any other liquid shall be added to the mixture to make it soft as this will affect the properties of the compound. The mixture shall be used within 30-40 minutes of mixing. The surface on which epoxy compound is to be used, shall be free from dust, rust, oil, grease and shall be dry. The joint shall neither be disturbed nor moved till the epoxy compound is completely hardened. A smooth surface can be made by rubbing a damp cloth smoothly on the compound before it sets. The joints shall be painted after it has completely hardened.

Alternatively, ready mix of epoxy cable jointing compound may also be used.



4.8 **CABLE MARKERS/CABLE TAGS :**

4.8.1 **Cable Markers:**

All underground cables and cable joints shall be marked on the surface by markers generally manufactured and tested to the requirements of relevant ISS. Approved CI cable markers shall be provided at every 30m along the route of the cables and at both ends of road crossing, indicating cable joints and cables as applicable. Special CI markers shall be provided at all buried cable joints indicating "Electrical Cable Joints". CI plates duly engraved with the size of the cable and the place it serves shall be tied to the cable at regular intervals of 5m for easy identification of cables.

4.8.2 **Cable Tags:**

Cable tags shall be made out of 2 mm thick aluminium sheets, each tag 32 mm in dia with one hole of 2.5 mm dia. 6 mm below the periphery shall be provided for clamping the same with cables.

Cable designation are to be punched with letter/number punches and the tags are to be tied to cables with piano wires of approved quality and size. Tags shall be tied inside the panels beyond the glands as well as below the glands at cable entires. Along trays, tags are to be tied at all bends on straight lengths, tags shall be provided at every 5 meter.

4.9 **TERMINATION OF CABLES :**

Cable termination shall be done in terminal box or cable end box or distribution boards, or apparatus/equipments. Terminations are to be made with double compression gland and of the tinned nickel plated, anti- corrosive, three piece improved pattern which is to grip inner and outer PVC sheaths as well as the armour of the cable. The cable ends or the core conductor are to be connected by solderless lugs or sockets using crimping tool of approved make for all cables. Copper cables shall be connected/joined with tinned, heavy duty, copper lugs/sockets. Wherever Aluminium cables are connected with copper bus bar, bi-metallic, heavy duty lugs shall be used for termination.

All terminations of cable conductors and base conductors shall be mechanically and electrically sound and shall comply with the requirements of relevant Standards and Indian electricity regulations.

The connectors or connecting sockets are to have such dimensions so as to limit temperature rise.

When required the water tightness of the terminal boxes may be obtained by filling with a compound preferably plastic flame retarding and non-dripping type within the normal range of temperatures.

When the cable is cut during the course of installation the open ends are to be sealed immediately by means of self-adhesive non hygroscopic tape over a wax water seal to make an air and watertight joint.

4.10 **INSTALLATION OF CABLES:**



Cable shall be laid in a manner as indicated on the drawings. Generally cables are laid in the following manner.

- i. In the underground masonry trench.
- ii. On the cable tray/or on cable ladders.
- iii. Buried underground.
- iv. Through pipe sleeves.

Various installation methods are discussed in the following paragraphs.

Cables shall be laid by skilled and experienced workmen using adequate rollers to minimize stretching of the cable. The cable drums shall be placed on jacks before unwinding the cable. The cable drums shall be rotated in a direction as indicated by the manufacturer. Care shall be exercised in laying cables to avoid forming kinks. The drums shall be unrolled and cables run over wooden rollers, placed at intervals not exceeding 2 meters.

4.10.1 **General**

All cables shall be adequately protected against any risk of mechanical damage to which they may be liable in normal conditions of service.

When cable pass through holes in metal work, precautions shall be taken to prevent abrasion of the cables on any sharp edges.

In every vertical cable ladders, channel or duct or trunking or cable trench containing cables and exceeding three meters in length, internal barriers shall be provided so as to prevent the air at the top of the unit from attaining an excessively high temperature. In every vertical cable shaft, cable trench or any passage of cable through wall, ceiling, floor barriers against spread of fire and smoke shall be provided for compliance with IEE regulations. `Viper' CABLEMASTIC fr 903 fire resistant painting shall be applied on all XLPE/PVC power cables.

Where cable passes through walls, ceiling, floor, it shall run through sleeve of PVC pipes or hume pipes of adequate diameter. After pulling the cable through sleeve, both the ends of the sleeve shall be sealed water tight with fire resistance material to prevent spread of fire and seepage of water.

Generally along each cable route either in trench or in cable trays/ladders or in pipe separate Two Nos. of earth strips/wires shall run exposed.

Where an installation comprises medium voltage cables as well as extra low voltage circuits, precaution shall be taken in accordance with relevant regulations and shall be physically separated by minimum of 300mm distance.

Metal sheaths and armour of all cables, metal conduits, ducts, trunking, and bare earth continuity conductors associated with such cables, which might otherwise come into fortuitous contact with other fixed metal work shall be effectively bonded there to earth so as to prevent appreciable potential difference at such possible points of contact.



4.10.2 Underground Installations

The cables shall be laid in an excavated trench. The depth of the trench shall be minimum 750 mm below the final ground level but shall be decided on the number of cables to be laid in the trench so that the vertical distance between two adjacent layers of cables shall not be less than 350mm. The width of the trench shall be decided on the number of cables to be laid in the trench so that the distance between two adjacent cables shall not be less than one cable diameter.

a) Width of Trench:

- i) The minimum width of trench for laying single cable shall be 350 mm.
- ii) Where more than over cable is to be laid in the same trench in horizontal formation, the width of trench shall be increased such that the inter axial spacing between the cables, except whether otherwise specified shall be at least 200 mm.
- iii) There shall be clearance of at least 150 mm between axis of the end cables and the sides of the trench.

b) Depth of Trench:

- i) Where cables are laid in single tier formation, the total depth of the trench shall not be less than 750 mm.
- ii) When more than one tier of cables is unavoidable and vertical formation of laying adopted, depth of trench in (i) above shall be increased by 300 mm for each additional tier to be formed.

In addition to above, where gradients and changes in depth are unavoidable, these shall be gradual. The cables shall be protected by placing precast concrete tiles or burnt bricks over the cables on top layer of sand and for the full length of underground cables. Where more than one cable is running in the same trench, the concrete tiles/bricks shall cover all the cables and shall project a minimum of 150mm on either side of the cables.

In any case the top layer of the cables shall be minimum 600 mm below the finished level of the ground.

The top of the cable trench shall be well compacted till the finished level of the ground and shall be approved by the Construction manager/Consultant. If required a laboratory compaction test shall be carried out in presence of the Construction manager/Consultant.

H.V., M.V., cables shall not be laid in the same trench/cable tray and/or along side of water main.

Cables under road crossings and any surfaces subjected to heavy traffic shall be protected by running them through hume pipes of suitable size at a suitable depth.



Where cables cross one another, the cables of higher voltages shall be laid at lower level than the cable of lower voltage.

The relative position of the cables laid in the same trench shall be preserved and the cables shall not cross each other as far as possible. At all changes in direction in horizontal and vertical planes, the cable shall be bent smooth with a radius of bend not less than 15 times the diameter of the cable. Minimum 3 meters long loop shall be provided at both sides of every straight joint and 5 meters at each end of the cable. Distinguishing marks shall be made at the cable ends for identification.

Proximity to Communication Cables:

MV Cables and communication cables shall as per as possible cross at right angles where power cables are laid in proximity to communication cables the horizontal and vertical clearance shall not normally be less than 600 mm.

Insulation tapes of appropriate voltage and in red, yellow, and blue colors shall be wrapped just below the sockets for phase identification.

All the excavation and back fill including timbering, shoring, and pumping required for the installation of the cables shall be carried out as indicated on the drawing and as per requirements laid down elsewhere or as per Construction manager/Consultant direction. Trenches shall be dug true to line and grades. Back fill for trenches shall be filled in layers not exceeding 150mm. At each layer compaction test shall be carried out in presence of Construction manager/Consultant Each layer shall be properly rammed and consolidated before laying the next layer. The contractor shall restore all surfaces, roadways, side walls, curbs, walls, landscaping or other works cut for excavation to their original condition, the satisfaction of the Construction manager/Consultant. Suitable approved type cable markers shall be installed along the cable route & wherever change of direction takes place.

4.10.3 Cables Installed Inside the Building

The cables inside the building shall be installed in one of the following manner, as indicated in the drawing and approved by the Construction manager/Consultant.

4.10.3.1 Installed in Built-up Trench

The cables laid on the bottom of the structural trenches shall not lay freely upon the trench bottom. They shall be raised to prevent the possibility of their coming into contact with deleterious materials.

The cables laid in the trench shall be laid on angle iron brackets/cable tray/cable ladder/cable troughs/cable racks as indicated on the drawings, and as approved by the Construction manager/Consultant. Where cables are clamped to the wall a minimum clearance of 100mm shall be maintained between wall and cable and minimum 150mm vertical clearance shall be maintained between two cables. Where cables are laid on brackets the brackets shall not be fixed more than 500mm apart to avoid sag in the cables. Where the cables are laid on cable tray/ladder/troughs /racks, minimum 300mm distance shall be observed between adjacent tier of tray/ladder/ troughs/racks, and cable shall be fixed minimum 25mm away from the wall, and minimum of one cable diameter



distance shall be observed between two adjacent cables. Cables shall be properly fixed with the tray/ ladder/ troughs/ racks with cable tie or saddles or straps.

4.10.3.2 **Cables on Cable Trays / Ladders under the Ceiling or on Wall**

Where cables are installed under above suspended ceiling or below ceiling or on wall, they shall be laid on a ladder / perforated G.I. cable tray and shall be run in such positions that they are not liable to be damaged by contact with the floor or the ceiling or other fixtures.

The ladder / perforated cable tray shall be properly fixed with channels, angles, tie rod, flats to the ceiling. The metal inserts for fixing channels, angles, tie rod, flats shall be put in place while casting the slab. If insert plates are not placed in position, Anchor fasteners shall be used to support cable trays if required. The cable tray route shall be co-ordinated with other services to avoid crisscross of all the services. While laying the cables on the tray minimum one cable diameter distance shall be observed between two adjacent cables about 20% space shall be kept spare for any future installation.

The width of the cable tray shall be selected so as to accommodate required number of cables to be laid on it, with minimum separation of minimum one cable diameter between two adjacent cables. The cables shall be tied with the cable tray with nylon strip/ Aluminium clamps/GI clamps.

All steel work shall be treated in accordance with the following procedure and in accordance with IS : 6005 "Code of Practice for Phosphating Iron and Steel".

Oil, grease, dirt and swab shall be thoroughly removed by emulsion cleaning.

Rusting and scale shall be removed by Pickling with dilute acid followed by washing with running water, rinsing with slightly alkaline hot water and over drying.

The phosphate coating shall be sealed by the application of two coats of ready mixed stoving type zinc chromate primer.

After application of the primer, two coats of finishing stove enameled paint shall be applied.

The final finished thickness of paint film on steel shall not be less than 50 microns and shall not be more than 100 microns.

Finish painted surface of steel shall present an aesthetically pleasing appearance free from uneven surface.

The finish painting shall be black matt as per ISS or as approved by consultants.

4.10.3.3 **Cables Installed in the Mechanical Room**

The cable reaching the motors in the mechanical room or plant room or machines room or service area shall be laid on cable tray except where indicated in masonry underground trenches.



The unarmored cable reaching the motors shall be protected by rigid galvanized conduits up to a height of 300mm above the floor. Above that height, the cable shall be protected by means of oil tight flexible metallic G.I. conduits to the terminal box of the motor. The connection between the rigid conduit and the flexible conduit shall be done by a screwed coupling of an approved type. The flexible conduit shall be properly fixed with the terminal box of the motor by means of double hexagonal check nut.

4.11 **CABLE TRAY SPECIFICATION :**

4.11.1 GI Cable tray shall be manufactured / fabricated to the design as per IEC 61537 and shall be tested for safe working load with a span length of 2.5 Mtrs.

Cable trays shall be manufactured from steel as per IS 2062, and galvanised. The thickness of galvanization shall be not less than 80 microns.

Cable trays shall generally be of the following type:

- i. for power cables of medium voltage and high voltage - ladder type with slotted channels.
- ii. for control cables and extra low voltage cables - perforated sheet steel type.

Perforated cable trays shall be generally of channel type and the perforations in the trays shall be either 8 x 15mm or 10 x 20 mm oval holes. Control cables, extra low voltage cables and instrument cables shall be laid on perforated cable trays.

Ladder type cable trays shall be made out of perforated hot dip galvanised M.S. Sheet 2 mm thick. The size of the side channel/rails shall be 75x20x2mm hot dip galvanised M.S. Sheet. The size of the rungs shall be 35x15x2 mm hot dip galvanised M.S. sheet. The pitch of the rungs shall be not more than 250mm centre to centre. Rungs shall be welded to the side rails as per requirement.

Cable trays shall be of standard sizes :

Length 2500 mm

Width 150/300/450/600/750/1000mm as required

Side Heights of perforated and ladder type cable trays shall be as per IEC 61537.

Cable trays shall be hot dip galvanised, the thickness of galvanising shall be not less than 80 microns. Quality of zinc used for galvanising shall be 98.8% purity.

4.11.2 **Accessories for Cable Trays**

Following accessories of cable trays, as required, shall be supplied with the cable trays.

Coupler plates

Circular bends - Horizontal and Vertical.



Tees - Horizontal and Vertical.

Reducers

4-way cross

Tray covers

Fasteners.

Accessories also shall be galvanised, thickness of galvanising should not be less than 80 microns.

Fabrication of Tray / Ladder and accessories at site and welding is not permitted. In unavoidable circumstances, If any cut or holes are made in the trays/Ladder/accessories, zinc spray need to be applied over the surface. The metal edge has to be protected by edge protection sleeves to avoid cable damage. Screwed connections and internal fixing Devices should not create any damage to the cable when correctly fixed.

4.12 **TESTING :**

Prior to laying cables, and prior to energizing the cables, following tests shall be carried out :-

4.12.1 Insulation Resistance test between phases and phase to neutral and phase to earth with a 500V megger.

4.12.2 Continuity test of all the phases, neutral and earth continuity conductor.

4.12.3 Sheathing continuity test.

4.12.4 Earth resistance test of all the phases and neutral.

All tests shall be carried out in accordance with relevant Indian Standard Code of practice and Indian Electricity Rules. The Contractor shall provide necessary instruments, equipments and labour for conducting the above test and shall bear all expenses in connection with such tests. All tests shall be carried out in the presence of the Construction manager/Consultant and results shall be recorded in the prescribed forms.

4.13 **STORING :**

All the cables shall be supplied in drums. On receipt of cables at site, the cables shall be inspected and stored in drums with flanges of the cable drum in vertical position. The end of the cable shall be sealed for water tightness.

5.0 **EARTHING:**



5.1 SCOPE:

All the non-current carrying metal parts of electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main cable armour, switch gear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.

5.1.1 G.I.PIPE EARTH STATION :

G.I. pipe shall be of medium class, 40 mm dia and 4.5 m length. Galvanising shall conform to relevant Indian Standards. G.I. pipe electrode shall be cut tapered at the bottom and provided with holes of 12 mm dia drilled not less than 7.5 cm from each other up to 2 M of length from bottom. The pipe electrode shall be as far as practicable embedded below permanent moisture level. Except where rock is encountered, pipes shall be driven to a depth of at least 4.5 mtr. Where rock is encountered at a depth of less than 2.5mtr the electrode may be buried inclined to the vertical and the inclinations shall not be more than 30 deg from the vertical. The pipe electrode shall be made of one piece. Earth leads to the electrode shall be laid in a heavy duty GI pipe and connected to the pipe electrode with brass bolts, nuts and washers. GI pipe shall be terminated in a wire meshed funnel. The funnel shall be enclosed in a masonry chamber of 450 mm x 450 mm dimensions. The chamber shall be provided with C.I. frame and CI inspection cover. The earth station shall also be provided with a suitable permanent identification label tag. The earth electrode shall conform to IS:3043 latest edition. The soil around the earthing electrode shall be treated to reduce the resistivity of the soil by filling the complete depth of electrode with alternative layers of charcoal and salt.

5.1.2 PLATE EARTH STATION :

Plate electrodes shall be made of G.I./copper (CU) plate of 6.30mm/3.15mm thick and 600 x 600mm size. The plate shall be buried vertically in ground at a depth of not less than 4.5 meters to the top of the plate, the plate being encased in charcoal to a thickness of 300 mm all round. It is preferable to bury the electrode to a depth where subsoil water is present. Earth leads to the electrode shall be laid in a heavy duty GI pipe and connected to the plate electrode with brass bolts, nuts and washers. A GI pipe of not less than 20 mm dia shall be clamped with bolts vertically to the plate and terminated in a wire meshed funnel. The funnel shall be enclosed in a masonry chamber of 450 mm x 450 mm dimensions. The chamber shall be provided with GI frame and CI inspection cover. The earth station shall also be provided with a suitable permanent identifications label tag. The earth electrode shall conform to IS: 3043 latest edition.

5.1.3 EARTHING CONDUCTORS :

All earthing conductors shall be of high conductivity copper/or GI as specified and shall be protected against mechanical damage and corrosion. The connection of earth electrodes shall be strong secure and sound and shall be easily accessible. The earth conductors shall be rigidly fixed to the walls, cable trenches, cable tunnel, conduits and cables by using suitable clamps.



Main earth bus shall be taken from the main medium voltage panel to the earth electrodes. The number of electrodes required shall be arrived at taking into consideration the anticipated fault on the medium voltage net work.

Earthing conductors for equipment shall be run from the exposed metal surface of the equipment & connected to a suitable point on the sub main or main earthing bus. All switch boards, distribution boards and isolators disconnect switches shall be connected to the earth bus. Earthing conductors shall be terminated at the equipment using suit able lugs, bolts, washers and nuts.

All conduits cable armouring etc., shall be connected to the earth all along their run by earthing conductors of suitable cross sectional area. The electrical resistance of earthing conductors shall be low enough to permit the passage of fault current necessary to operate a fuse/ protective device or a circuit breaker and shall not exceed 2 Ohms.

5.1.4 EARTHING OF EQUIPMENTS:

Shall be in galvanised Iron Strips/wires, or copper strips/wires as mentioned in Schedule of Quantities.

a) G.I. Earthing:

The main panel shall be connected to the main earthing system of the building by means of 2 Nos. 25mm x 6mm GI strips. All single phase metal clad switches and control panels shall be earthed with minimum 3mm diameter GI conductor wire. All 3 phase motors and equipment shall be earthed with two numbers distinct and independent GI wires/tapes as follows:

- | | | |
|------|-----------------------------------------|-----------------------------|
| i. | Motors upto and including 10 HP rating. | 2 Nos. 4mm dia GI wires |
| ii. | Motors 12.5 HP to 40 HP | 2 Nos. 6mm dia GI wires. |
| iii. | Motors 50 to 75 HP | 2 Nos. 25 x 3mm GI strips. |
| iv. | Motor above 75 HP | 2 Nos. 25mm x 6mm GI strips |

All the switches shall be earthed with two numbers distinct and independent GI wires/tapes as follows:

- | | | |
|-----|----------------------------------------------------------------|-------------------------|
| i. | 3 phase switches and control panels upto 60 Amps rating. | 2 Nos. 4mm dia GI wires |
| ii. | 3 phase switches and control panel 63 Amps to 100 Amps rating. | 2 Nos. 8mm dia GI wires |



- iii. 3 phase switches and control panels 125 Amps to 200 Amps rating. 2 Nos. 25 x 3mm GI tapes.
- iv. 3 phase switches and control panels, bus ducts above 200 Amps rating. 2 Nos. 25mm x 6mm GI tapes.

b. **Copper Earthing:**

The main panel shall be connected to the main earthing system of the building by means of 2 Nos. 25mm x 3mm copper tapes. All single phase metal clad switches and control panels be earthed with minimum 2mm diameter copper conductor wired. All 3 phase motors and equipment shall be earthed with two numbers distinct and independent copper wires/tapes as follows:

- i. Motors upto and including 10 HP rating. 2 Nos. 3mm dia copper wire
- ii. Motors 12.5 HP to 40 HP capacity 2 Nos. 4mm dia copper wire
- iii. Motors 50 to 75 HP capacity 2 Nos. 6mm copper wires.
- iv. Motor above 75 HP 2 Nos. 25mm x 3mm copper wires.

All the switches shall be earthed with two numbers distinct and independent copper wires/tapes as follows:

- i. 3 phase switches and control panels upto 60 Amps rating. 2 Nos. 3mm dia copper Wires.
- ii. 3 phase switches and control panel 125 amps to 200 Amps rating 2 x 6mm dia copper wire.
- iii. 3 phase switches and control panels 63 Amps to 100 Amps rating 2 Nos. 4mm dia copper wires.
- iv. 3 phase switches and control panels, bus ducts above 200 Amps rating. 2 Nos. 3mm x 6mm copper.

The earthing connections shall be tapped off from the main earthing of electrical installation. The overlapping in earthing strips at joints where required shall be minimum 75mm. These straight joints shall be rivetted with and brazed in approved manner. Sweated lugs of adequate capacity and size shall be used for all termination of wires. Lugs shall be bolted to the equipment body to be earthed after the metal body is cleaned off paint and/other only substance and properly tinned.



5.1.5 MOTORS:

All motors shall be confirming to energy efficient motors. IS : 12615 – 2011 (Energy Class IE-3). Motors shall be suitable for (wherever specified) 3 phase, (wherever specified) 415V \pm 10%, 50Hz \pm 5%, combined variation of \pm 10% motors shall be TEFC having class 'F' insulation with temperature rise limited to class 'B'. Degree of protection IP 55, motors shall be suitable to work at 50⁰C ambient temperature.

5.1.6 VARIABLE FREQUENCY DRIVE:

5.1.6.1 GENERAL REQUIREMENTS :

- a) This specification covers complete variable frequency drives (VFDs) designated on the drawing schedules to be variable speed. All standard and optional features shall be included within the VFD.

The VFD shall not be a general purpose product, but a dedicated engineered design required for the system.

The VFD and its options shall be factory mounted and tested as a single unit under full load before dispatch.

The VFD shall be tested to UL 508C. The appropriate UL label shall be applied. VFD shall be manufactured in ISO 9000, 2000 certified facilities.

The VFD shall be CE marked and conform to the European Union Electro Magnetic Compatibility directive.

The VFD shall be UL listed for a short circuit current rating of 100 kA and labeled with this rating.

The manufacturer shall have been engaged in the production of this type of equipment for a minimum of thirty years.

The VFD shall be supported locally by the manufacturer who will provide full technical support, spares holding and trouble shooting capability from their own local facility. A training course shall be provided by the manufacturer to the consultant / contractor / maintenance engineers.

To ensure adequate technical and factory support, VFDs manufactured by others and brand labeled shall not be acceptable.

5.1.6.2 TECHNICAL REQUIREMENTS :

- a) The VFD shall convert incoming fixed frequency three-phase AC power into an adjustable frequency and voltage for controlling the speed of three-phase AC motors. The motor current shall closely approximate a sine wave. Motor voltage shall be varied with frequency to maintain desired motor magnetization current suitable for the driven load and to eliminate the need for motor derating.



When properly sized, the VFD shall allow the motor to produce full rated power at rated motor voltage, current, and speed without using the motor's service factor. VFDs utilizing sine weighted/coded modulation (with or without 3rd harmonic injection) must provide data verifying that the motors will not draw more than full load current during full load and full speed operation.

- b) The VFD shall convert incoming fixed frequency three-phase AC power into an adjustable frequency and voltage for controlling the speed of three-phase AC motors. The motor current shall closely approximate a sine wave. Motor voltage shall be varied with frequency to maintain desired motor magnetization current suitable for the driven load and to eliminate the need for motor derating.

When properly sized, the VFD shall allow the motor to produce full rated power at rated motor voltage, current, and speed without using the motor's service factor. VFDs utilizing sine weighted/coded modulation (with or without 3rd harmonic injection) must provide data verifying that the motors will not draw more than full load current during full load and full speed operation.

The VFD shall include an input full-wave bridge rectifier and maintain a fundamental (displacement) power factor near unity regardless of speed or load.

- c) The VFD shall have a dual 5% impedance DC link reactor (harmonic filters) on the positive and negative rails of the DC bus to minimize power line harmonics and protect the VFD from power line transients. The chokes shall be non-saturating. Swinging chokes that do not provide full harmonic filtering throughout the entire load range are not acceptable.

VFDs with saturating (non-linear) DC link reactors shall require an additional 3% AC line reactor to provide acceptable harmonic performance at full load, where harmonic performance is most critical.

IEEE519, 1992 recommendations shall be used for the basis of calculation of total harmonic distortion (THD) at the point of common coupling (PCC). On request VFD manufacturer shall provide THD figures for the total connected load. The contractor shall provide details of supply transformer rating, impedance, short circuit current, short circuit impedance etc to allow this calculation to be made.

All VFDs shall contain integral EMC Filters to attenuate Radio Frequency Interference conducted to the AC power line. The VFDs shall comply with the emission and immunity requirements of IEC 61800-3 :2004, Category C1 with 50m motor cable (unrestricted distribution). The suppliers of VFDs shall include additional external EMC filters, if required, to meet compliance to this requirement.

The VFD's full load output current rating shall meet or exceed the normal rated currents of standard IEC induction motors. The VFD shall be able to provide full rated output current continuously, 110% of rated current for 60 seconds and 120% of rated torque for up to 0.5 second while starting.

The VFD shall provide full motor torque at any selected frequency from 20 Hz to base speed while providing a variable torque V/Hz output at reduced speed. This is to allow driving direct drive fans without high speed derating or low speed excessive magnetization, as would occur if a constant torque V/Hz curve was used at reduced speeds. Breakaway current of 160% shall be available.



A programmable automatic energy optimization selection feature shall be provided as standard in the VFD. This feature shall automatically and continuously monitor the motor's speed and load to adjust the applied voltage to maximize energy savings.

The VFD must be able to produce full torque at low speed to operate direct driven fans.

Output power circuit switching shall be able to be accomplished without interlocks or damage to the VFD.

An Automatic Motor Adaptation algorithm shall measure motor stator resistance and reactance to optimize performance and efficiency. It shall not be necessary to run the motor or de-couple the motor from the load to perform the test.

Galvanic isolation shall be provided between the VFD's power circuitry and control circuitry to ensure operator safety and to protect connected electronic control equipment from damage caused by voltage spikes, current surges, and ground loop currents. VFDs not including either galvanic or optical isolation on both analog I/O and discrete digital I/O shall include additional isolation modules.

VFD shall minimize the audible motor noise through the use of an adjustable carrier frequency. The carrier frequency shall be automatically adjusted to optimize motor and VFD operation while reducing motor noise. VFDs with fixed carrier frequency or only manually adjustable carrier frequency are not acceptable.

The VFD shall allow up to at least 100 meters of SWA (Single Wire Armour) cable to be used between the VFD and the motor and allow the use of MICS (Mineral Insulated Copper Sheath) cable in the motor circuit for fire locations. VFDs not meeting this requirement of 100meters of cable length between motor & cable because of generation of high U peak Voltage and high dv / dt on the motor terminals, which may cause motor windings to fail or significantly curtail it's life, shall be compensated with the use of external suitable dv/dt or sine wave filters.

5.1.6.3 PROTECTIVE FEATURES :

A minimum of Class 20 I^2t electronic motor overload protection for single motor applications shall be provided. Overload protection shall automatically compensate for changes in motor speed

Protection against input transients, loss of AC line phase, output short circuit, output ground fault, over voltage, under voltage, VFD over temperature and motor over temperature. The VFD shall display all faults in plain English text. Codes are not acceptable.

Protect VFD from input phase loss. The VFD should be able to protect itself from damage and indicate the phase loss condition. During an input phase loss condition, the VFD shall be able to be programmed to either trip off while displaying an alarm, issue a warning while running at reduced output capacity, or issue a warning while running at full commanded speed. This function is independent of which input power phase is lost.



Protect from under voltage. The VFD shall provide full rated output with an input voltage as low as 90% of the nominal. The VFD will continue to operate with reduced output, without faulting, with an input voltage as low as 70% of the nominal voltage.

VFD shall include current sensors on all three output phases to accurately measure motor current, protect the VFD from output short circuits, output ground faults, and act as a motor overload. If an output phase loss is detected, the VFD will trip off and identify which of the output phases is low or lost.

If the temperature of the VFD's heat sink rises to 80°C, the VFD shall automatically reduce its carrier frequency to reduce the heat sink temperature. It shall also be possible to program the VFD so that it reduces its output current limit value if the VFD's temperature becomes too high.

In order to ensure operation during periods of overload, it must be possible to program the VFD to automatically reduce its output current to a programmed value during periods of excessive load. This allows the VFD to continue to run the load without tripping.

The VFD shall have temperature controlled cooling fan(s) for quiet operation, minimized losses, and increased fan life. At low loads or low ambient temperatures, the fan(s) may be off even when the VFD is running.

Protect from output switching : The VFD shall be fully protected from switching a contactor / isolator at the output with out causing tripping e.g.: for switching on/off the isolators of the AHU / ventilation fans / pumps near the motor with VFD in ON mode.

The VFD shall store in memory the last 10 alarms. A description of the alarm, and the date and time of the alarm shall be recorded.

When used with a pumping system, the VFD shall be able to detect no-flow situations, dry pump conditions, and operation off the end of the pump curve. It shall be programmable to take appropriate protective action when one of the above situations is detected.

5.1.6.4 INTERFACE FEATURES :

- a) Hand, Off and Auto keys shall be provided on the control panel to start and stop the VFD and determine the source of the speed reference. It shall be possible to either disable these keys or password protect them from undesired operation.
- b) There shall be an "Info" key on the keypad. The Info key shall include "on- line" context sensitive assistance for programming and troubleshooting.



- c) The VFD shall be programmable to provide a digital output signal to indicate whether the VFD is in Hand or Auto mode. This is to alert the Building Automation System whether the VFD is being controlled locally or by the Building Automation System.
- d) Password protected keypad with alphanumeric, graphical, backlit display can be remotely mounted. Two levels of password protection shall be provided to guard against unauthorized parameter changes.
- e) All VFDs shall have the same customer interface. The keypad and display shall be identical and interchangeable for all sizes of VFDs.
- f) To set up multiple VFDs, it shall be possible to upload all setup parameters to the VFD's keypad, place that keypad on all other VFDs in turn and download the setup parameters to each VFD. To facilitate setting up VFDs of various sizes, it shall be possible to download from the keypad only size independent parameters. Keypad shall provide visual indication of copy status.
- g) Display shall be programmable to communicate in multiple languages including English.
- h) A red FAULT light, a yellow WARNING light and a green POWER-ON light shall be provided. These indications shall be visible both on the keypad and on the VFD when the keypad is removed.
- i) A quick setup menu with factory preset typical HVAC parameters shall be provided on the VFD. The VFD shall also have individual Fan, Pump, and Compressor menus specifically designed to facilitate start-up of these applications.
- j) A three-feedback PID controller to control the speed of the VFD shall be standard.
- k) This controller shall accept up to three feedback signals. It shall be programmable to compare the feedback signals to a common setpoint or to individual setpoints and to automatically select either the maximum or minimum deviating signal as the controlling signal. It shall also be possible to



calculate the controlling feedback signal as the average of all feedback signals or the difference between a pair of feedback signals.

The VFD shall be able to apply individual scaling to each feedback signal.

For fan flow tracking applications, the VFD shall be able to calculate the square root of any or all individual feedback signals so that a pressure sensor can be used to measure air flow.

The VFD's PID controller shall be able to actively adjust its setpoint based on flow. This allows the VFD to compensate for a pressure feedback sensor which is located near the output of the pump rather than out in the controlled system.

The VFD shall have three additional PID controllers which can be used to control damper and valve positioners in the system and to provide setpoint reset.

Floating point control interface shall be provided to increase/decrease speed in response to contact closures.

Five simultaneous meter displays shall be available. They shall be selectable from (at a minimum), frequency, motor current, motor voltage, VFD output power, VFD output energy, VFD temperature in degrees, feedback signals in their own units, among others.

Programmable Sleep Mode shall be able to stop the VFD. When its output frequency drops below set "sleep" level for a specified time, when an external contact commands that the VFD go into Sleep Mode, or when the VFD detects a no-flow situation, the VFD may be programmed to stop. When the VFD's speed is being controlled by its PID controller, it shall be possible to program a "wake-up" feedback value that will cause the VFD to start. To avoid excessive starting and stopping of the driven equipment, it shall be possible to program a minimum run time before sleep mode can be initiated and a minimum sleep time for the VFD.

A run permissive circuit shall be provided to accept a "system ready" signal to ensure that the VFD does not start until dampers or other auxiliary equipment are in the proper state for VFD operation. The run permissive circuit shall also be capable of initiating an output "run request" signal to indicate to the external equipment that the VFD has received a request to run.

VFD shall be programmable to display feedback signals in appropriate units, such as inches of water column (in-wg), pressure per square inch (psi) or temperature (°F). Examples can be room temperature in °C, return air temperature in °C, supply air temperature in °C, CO₂ concentration in ppm, pressure in bar, differential pressure in PSI etc.

VFD shall be programmable to sense the loss of load. The VFD shall be programmable to signal this condition via a keypad warning, relay output and/or over the serial communications bus. To ensure



against nuisance indications, this feature must be based on motor torque, not current, and must include a proof timer to keep brief periods of no load from falsely triggering this indication.

Standard Control and Monitoring Inputs and Outputs:

- Four dedicated, programmable digital inputs shall be provided for interfacing with the systems control and safety interlock circuitry.
 - Two terminals shall be programmable to act as either as digital outputs or additional digital inputs.
 - Two programmable relay outputs, Form C 240 V AC, 2 A, shall be provided for remote indication of VFD status.
 - a) Each relay shall have an adjustable on delay / off delay time.
 - iv) Two programmable analog inputs shall be provided that can be either direct-or-reverse acting
 - Each shall be independently selectable to be used with either an analog voltage or current signal.
 - The maximum and minimum range of each shall be able to be independently scalable from 0 to 10 V dc and 0 to 20 mA.
 - A programmable low-pass filter for either or both of the analog inputs must be included to compensate for noise.
- l) The VFD shall provide front panel meter displays programmable to show the value of each analog input signal for system set-up and troubleshooting,
- a) One programmable analog current output (0/4 to 20 mA) shall be provided for indication of VFD status. This output shall be programmable to show the reference or feedback signal supplied to the VFD and for VFD output frequency, current and power. It shall be possible to scale the minimum and maximum values of this output.
 - b) It shall be possible to read the status of all analog and digital inputs of the VFD through serial bus communications.
 - c) It shall be possible to command all digital and analog output through the serial communication bus.
- m) Optional Control and Monitoring Inputs and Outputs
- i) It shall be possible to add optional modules to the VFD in the field to expand its analog and digital inputs and outputs.
 - ii) These modules shall use rigid connectors to plug into the VFD's control card.
- The VFD shall automatically recognize the option module after it is powered up. There shall be no need to manually configure the module.
- Modules may include such items as:



- Additional digital outputs, including relay outputs
 - Additional digital inputs
 - Additional analog outputs
 - Additional analog inputs, including Ni or Pt temperature sensor inputs.
 - It shall be possible through serial bus communications to control the status of all optional analog and digital outputs of the VFD.
- n) Standard programmable firefighter's override mode allows a digital input to control the VFD and override all other local or remote commands. It shall be possible to program the VFD so that it will ignore most normal VFD safety circuits including motor overload. The VFD shall display FIREMODE whenever in firefighter's override mode. Firemode shall allow selection of forward or reverse operation and the selection of a speed source or preset speed, as required to accommodate local fire codes, standards and conditions.
- o) A real-time clock shall be an integral part of the VFD.
- a) It shall be possible to use this to display the current date and time on the VFD's display.
 - o Ten programmable time periods, with individually selectable ON and OFF functions shall be available. The clock shall also be programmable to control start/stop functions, constant speeds, PID parameter setpoints and output relays. It shall be possible to program unique events that occur only during normal work days, others that occur only on non-work days, and others that occur on specific days or dates. The manufacturer shall provide free PC-based software to set up the calendar for this schedule.
 - o All VFD faults shall be time stamped to aid troubleshooting.
 - o It shall be possible to program maintenance reminders based on date and time, VFD running hours, or VFD operating hours.
 - o The real-time clock shall be able to time and date stamp all faults recorded in the VFD fault log.
- p) The VFD shall be able to store load profile data to assist in analyzing the system demand and energy consumption over time.
- q) The VFD shall include a sequential logic controller to provide advanced control interface capabilities. This shall include:
- a) Comparators for comparing VFD analog values to programmed trigger values.
 - b) Logic operators to combine up to three logic expressions using Boolean algebra
 - c) Delay timers.



d) A 20-step programmable structure

r) The VFD shall include a Cascade Controller which allows the VFD to operate in closed loop set point (PID) control mode one motor at a controlled speed and control the operation of 3 additional constant speed motor starters.

1.1.6.5 OPTIONAL FEATURES :

All optional features shall be built and mounted by VFD manufacturer as an inbuilt factory solution. All optional features shall be UL listed by the VFD manufacturer as a complete assembly and carry a UL label.

SERVICE CONDITIONS :

- a) Ambient temperature at full speed, full load operation with continuous drive rated output current:
 - i) -10 to 45°C for ratings upto 90 kW without derating.
 - ii) -10 to 40°C for ratings 110 kW and higher without derating.
- b) Relative Humidity : 0 to 95%, non-condensing.
- c) Elevation : Up to 3,300 feet without derating.
- d) AC line voltage variation : $\pm 10\%$ of nominal with full output.
- e) VFD Enclosure protection : IP 55, integral, with no additional cabinets.
- f) Side Clearances : No side clearance shall be required for cooling.
- g) All power and control wiring shall be done from the bottom.
- h) All VFDs shall be plenum rated.

5.1.6.7 QUALITY ASSURANCE :

- a) To ensure quality, the complete VFD shall be tested by the manufacturer. The VFD shall drive a motor connected to a dynamometer at full load and speed and shall be cycled during the automated test procedure.
- b) All optional features shall be functionally tested at the factory for proper operation.

5.1.6.8 SUBMITTALS :

- a) This specification lists the minimum VFD performance requirements for this project. Each supplier shall list any exceptions to the specification. If no departures from the specification are identified, the supplier shall be bound by the specification.

5.1.6.9 DRAWINGS:

Shop drawings for control panels and wiring of equipment showing the route of conduit/cable shall be submitted by the contractor for approval of Architect/Consultant before starting the fabrication of panel and starting the work. On completion, four sets of completion "As-installed" drawings incorporating all details like, conduit routes, number of wires in conduit, location of panels, switches, junction/pull and cable route etc. shall be furnished by the Contractor.



5.1.6.10 **TESTING:**

Before commissioning of the equipment, the entire electrical installation shall be tested in accordance with Code of practice IS: 732-1963 (Revised) and test report furnished by a qualified and authorised person. The entire electrical installation shall be got approved by Electrical Inspector and a certificate from Electrical Inspector shall be submitted. All tests shall be carried out in the presence of supervisor.

5.1.6.11 **PAINTING:**

All sheet steel work shall under go a process of degreasing, through cleaning, and painting with a high corrosion resistant primer. All panels shall then be backed in an over the finishing treatment shall be by application of synthetic enamel paint of approved shade.

ANNEXURE- A

APPLICABLE CODES, STANDARDS AND PUBLICATIONS

1.0 All equipment, supply, erection, testing and commissioning shall comply with the requirements of Indian Standards and code of practices. All equipment and material being supplied by the Contractor shall meet the requirements of IS., Tariff advisory committee's regulation (fire insurance), electrical inspectorate and Indian Electricity rules and other Codes/Publications as given below.

A) General:

SP : 6 (1)	Structural steel sections
IS : 27	Pig lead
IS : 325	Three phase induction motors
IS : 554	Dimensions for pipe threads where pressure tight joints are required on the threads.
IS : 694	PVC insulated cables for working voltages up to and including 1100 V.
IS : 779	Specification for water meters (domestic type)
IS : 782	Specification for caulking lead
IS : 800	Code of Practice for general construction in steel
IS : 1068	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium
IS : 1172	Code of basic requirements for water supply drainage and sanitation
IS : 1367 (Part- 1)	Technical supply conditions for threaded steel fasteners: Part 1 introduction and general information.
IS : 1367 (Part- 2)	Technical supply conditions for threaded steel fasteners: Part 2 product grades and tolerances.
IS : 1554 (Part- 1)	PVC insulated (heavy duty) electric cables : Part 1 for working voltages up to and including 1100V.
IS : 1554 (Part- 2)	PVC insulated (heavy duty) electric cables : Part 2 for working voltages from 3.3 kV up to and including 11 kV.
IS : 1726	Specification for cast iron manhole covers and frames



IS : 1742	Code of practice for building drainage.
IS : 2064	Selection, installation and maintenance of sanitary appliances - Code of practice.
IS : 2065	Code of practice for water supply in buildings.
IS : 2104	Specification for water meter boxes (domestic type)
IS : 2373	Specification for water meters (bulk type)
IS : 2379	Colour code for identification of pipe lines
IS : 2527	Code of practice for fixing rainwater gutters and down pipes for roof drainage.
IS : 2629	Recommended practice for hot dip galvanizing on iron and steel
IS : 3114	Code of practice for laying of cast iron pipes
IS : 4111 (Part 1)	Code of practice for ancillary structures in sewerage system : Part 1 manholes
IS : 4127	Code of practice for laying glazed stoneware pipes.
IS : 4853	Recommended practice for radiographic inspection of fusion welded butt joints in steel pipes
IS : 5329	Code of practice for sanitary pipe work above ground for buildings.
IS : 5455	Cast iron steps for manholes.
IS : 6159	Recommended practice for design and fabrication of material prior to galvanizing
IS : 7558	Code of practice for domestic hot water installations
IS : 8321	Glossary of terms applicable to plumbing work
IS : 9668	Code of practice for provision and maintenance of water supplies and fire fighting.
IS : 9842	Preformed fibrous pipe insulation
IS : 9912	Coal tar based coating materials and suitable primers for protecting iron and steel pipe lines.
IS : 10221	Code of practice for coating and wrapping of underground mild steel pipelines
IS : 10234	Recommendations for general pipeline welding.
IS : 10446	Glossary of terms relating to water supply and sanitation.
IS : 11149	Rubber Gaskets
IS : 11790	Code of practice for preparation of butt-welding ends for pipes, valves, flanges and fittings.
IS : 12183 (Part 1)	Code of practice for plumbing in multistoreyed buildings : Part 1 Water supply
IS : 12251	Code of practice for drainage of building basements
IS : 5572	Code of practice for sanitary pipe work
IS : 6700	Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.
IS : 8301	Code of practice for building drainage
BSEN : 274	Sanitary tapware, waste fittings for basins, bidets and baths. General technical specifications.

B) PIPES AND FITTINGS:



IS : 458	Specification for precast concrete pipes (with and without reinforcement)
IS : 651	Salt glazed stone-ware pipes and fittings
IS : 1239 (Part 1)	Mild steel tubes, tubulars and other wrought steel fittings Part 1 Mild Steel tubes
IS : 1239 (Part 2)	Mild steel tubes, tubulars and other wrought steel fittings : Part 2 Mild steel tubulars and other wrought steel pipe fittings.
IS : 1536	Centrifugally cast (spun) iron pressure pipes for water, gas and sewage
IS : 1537	Vertically cast iron pressure pipes for water, gas and sewage.
IS : 1538	Cast iron fittings for pressure pipes for water, gas and sewage
IS : 1729	Sand cast iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.
IS : 1879	Malleable cast iron pipe fittings
IS : 1978	Line pipe
IS : 1979	High test line pipe
IS : 2501	Copper tubes for general engineering purposes
IS : 2643 (Part 1)	Dimensions for pipe threads for fastening purposes : Part 1 Basic profile and dimensions.
IS : 2643 (Part 2)	Dimensions for pipe threads for fastening purposes : Part 2 Tolerances
IS : 2643 (Part 3)	Dimensions for pipe threads for fastening purposes : Part 3 Limits of sizes.
IS : 3468	Pipe nuts
IS : 3589	Seamless or electrically welded steel pipes for water, gas and sewage (168.3 mm to 2032 mm outside diameter)
IS : 3989	Centrifugally cast (spun) iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.
IS : 4346	Specifications for washers for use with fittings for water services.
IS : 4711	Methods for sampling steel pipes, tubes and fittings
IS : 6392	Steel pipe flanges
IS : 6418	Cast iron and malleable cast iron flanges for general engineering purposes.
IS : 7181	Specification for horizontally cast iron double flanged pipe for water, gas and sewage.

C) VALVES:

IS : 778	Specification for copper alloy gate, globe and check valves for water works purposes
IS : 780	Specification for sluice valves for water works purposes (50 mm to 300 mm size)
IS : 1703	Specification copper alloy float valves (horizontal plunger type) for water supply fittings
IS : 2906	Specification for sluice valves for water works purposes (350 mm to 1200 mm size)



- IS : 3950 Specification for surface boxes for sluice valves
- IS : 5312 (Part 1) Specification for swing check type reflux (non return) valves : Part 1 Single door pattern
- IS : 5312 (Part 2) Specification for swing check type reflux (non return) valves : Part 2 Multi door pattern
- IS : 12992 (Part 1) Safety relief valves, spring loaded : Part 1 - Design
- IS : 13095 Butterfly valves for general purposes.

D) WATER QUALITY TOLERANCE:

- IS : 3025 (Part 1 to 44) Method of sampling and test (physical and chemical) for water and waste water
- IS : 4764 Tolerance limits for sewage effluents discharged into inland surface waters
- IS : 10500 Drinking water

E) PUMPS AND VESSELS:

- IS : 1520 Specification for horizontal centrifugal pumps for clear cold fresh water
- IS : 2002 Steel plates for pressure vessels for intermediate and high temperature service including boilers
- IS : 2825 Code for unfired pressure vessels
- IS : 4682 (Part 1) Code of practice for lining of vessels and equipment for chemical processes Part 1 : Rubber lining
- IS : 5600 Specification for sewage and drainage pumps
- IS : 8034 Specification for submersible pump sets for clear, cold, fresh water
- IS : 8418 Specification for horizontal centrifugal self priming pumps

ANNEXURE – B
PIPE COLOUR CODE

S.No.	Pipe lines	Ground Colour	1 st Colour Band	2 nd Colour Band
1.	Filtered water (all cold water lines after filter)	Sea green	French blue	Signal red
2.	Drinking water (normal temperature)	Sea green	Light orange	
3.	Drinking water (chilled temperature)	Sea green	Light orange	Signal red
4.	Domestic hot water	Sea green	Light grey	
5.	Drainage	Black		
6.	LPG	Canary yellow		
7.	Fire Lines	Red		



This colour code is as per I.S. 2379-1983.

11/433 KV COMPACT SUBSTATION

SPECIAL CONDITIONS

SCOPE OF WORK

- 1.1 The scope of work to be carried out under this contract is mentioned in drawings, specifications and schedule of quantities. The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Owner's representative.
- 1.2 Work under this contract consist of furnishing all materials and labour equipment, except those to be supplied at site directly by the Owner as listed under Schedule of Quantities and specified otherwise including transportation, installation, testing and commissioning of the complete work of 11/0.433kV Transformer as described in the technical specifications and as shown on the drawings.

2. CIVIL WORKS RELATED TO ELECTRICAL INSTALLATION

- 2.1 Following civil works associated with related Electrical installation are **EXCLUDED** from the scope of this contract except for all minor civil work like wall chasing by wall chaser, making holes etc. for installation of conduits/cables and making good. These shall be executed by other agencies in accordance with approved shop drawings of, and under direct supervision of the electrical contractor.
 - a) RCC foundation for Transformers with angle iron frame (properly painted with fire retardant paint) at the edges to protect these from damage.

3. DRAWINGS

- 3.1 The Substation layout shall be issued with tenders for confirmation of space requirement.
- 3.2 The selected electrical contractor shall follow the tender drawings for preparation of shop drawings based on GA drawings provided by Supplier.

4. SPECIFICATIONS

- 4.1 Technical Specifications to completely specify all aspects of design/construction features of equipment's and all details of work to be carried out. Nevertheless the intent of the Technical Specification is to ensure that the equipment's and the work shall fully comply with and conform to the relevant Bureau of Indian Standard Specifications, Codes of Practice, Indian Electricity Act, Indian Electricity Rules and other Statutory Regulations as may be applicable and to the best available standards of engineering, design and workmanship. The equipment and work shall perform in manner acceptable to Engineer-in-Charge who shall interpret meaning of the applicable Specifications/Codes and shall have the right to reject any equipment or work, which, in their assessment, is not complete to meet the Standard/Code.



5. TECHNICAL DATA FOR VARIOUS EQUIPMENTS / MATERIAL

- 5.1 Each tenderer shall submit along with his tender, the technical data for all items listed in Annexure-I in the indicated format. Failure to furnish complete technical data with tenders may result in summary rejection of the tender.

SHOP DRAWINGS

- 6.1 The selected vendor shall submit the GA drawings for approval as required by Architect/Consultant/Owner.
- 6.2 In case Architect/Consultant makes any amendment, the contractor shall supply four sets of fresh drawings with the amendments for approval.
- 6.3 Manufacturers drawings, catalogues, pamphlets and other documents submitted for approval shall be in four sets. Each item in each set shall be properly labeled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in the items and the operating characteristics. Data of general nature shall not be accepted.

7. PERFORMANCE GUARANTEE

- 7.1 The contractor shall carry out the installation work strictly in accordance with the approved shop drawings, technical specifications, schedule of quantities and other documents forming part of the contract. The contractor shall be fully responsible for the performance of the selected equipment at the specified parameters and for the efficiency of the installation to deliver the required end result. The contractor shall guarantee that the ELECTRICAL system as installed shall perform to complete satisfaction of the owner.
- 7.2 The contractor shall also guarantee that the performance of various equipment individually, shall not be less than the quoted capacity; also actual power consumption shall not exceed the quoted rating, during testing and commissioning, handing over and guarantee period.

8. LOCAL BY-LAWS AND REGULATIONS

- 8.1 The work shall be carried out to the satisfaction of the Owner's site representative and in accordance with the Specifications, Regulations of the Electric Supply Authority, Indian Electricity Rules and Regulations, latest Indian Standards and as per the requirements of the any other local authority. In case these Specifications and Drawings call for a higher standard of materials and / or workmanship than those required by any of the above regulations and standards, then these Specifications and Drawings shall take precedence over the said regulations and standards. In case if the Drawings and specifications require something which violates the By-laws and Regulations, then the By-laws and Regulations shall govern the requirement of this installation.

9. MANUFACTURERS INSTRUCTIONS



- 9.1 Incase manufacturer has furnished specific instructions, relating to the material and equipment used in this project, covering points not specifically mentioned in these documents, such instructions shall be followed in all cases.

10. INSPECTION AND TESTING

- 10.1 The Owner may carry out inspection and testing at manufacturer's works for this contract. No equipment shall be delivered without prior written confirmation from the Owner's site Engineer. In case factory inspection is carried out then all travelling and lodging expenses for two persons one from owner and one from consultants shall be borne by the Contractor, also all expenses related to testing shall be to Contractor account.

- 10.2 Tests on site of completed works shall demonstrate the following:

- 10.2.1 That the equipment installed complies with specification in all respect and is of the correct rating for the duty and site conditions. That all circuits are fully protected and that protective devices are properly coordinated. That all non-current carrying metal parts are properly and safely grounded in accordance with the specification and appropriate Codes of Practice.

The contractor shall provide all necessary instruments and labour for testing, shall make adequate records of test procedures and readings, shall repeat any test requested by the Owner and shall provide test certificate signed by a authorized person.

- 10.2.2 Such test shall be conducted on all materials, equipment's and tests on completed work as called for by the Owner at contractor's expenses unless otherwise called for. If it is proved that the installation or part thereof is not satisfactorily carried out then the contractor shall be liable for the rectification of the same. Owner Site Engineer's decision as to what constitutes a satisfactory installation shall be final.

11. OPERATING INSTRUCTION & MAINTENANCE MANUAL

- 11.1 Upon completion and commissioning of Electrical system the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit required sets of complete bound sets of typewritten operating instructions and maintenance manuals; one each for retention by Consultant and Owner's site representative and two for Owners Operating Personnel.
- 11.2 Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labour and helpers for operating the entire installation for a period of fifteen working days of ten hours each, to enable the Owner's staff to get aquatinted with the operation of the system. During this period, the contractor shall train the Owner's personnel in the operation, adjustment and maintenance of all equipment installed.

SECTION I – 1000 KVA, 11 KV Outdoor Type Compact Sub-Station



1. COMPACT SUB-STATION

The compact sub-station should have a SF6 circuit breaker HT incomer 630 A / 20 KA /3 Sec. Oil type transformer, 1000 KVA, 11 / .433 KV DYn 11 copper wounded Oil type transformer and LT breaker with O/L, under voltage, short circuit & over voltage protection as per detail as mentioned in BOQ.

The transformer should be suitable to operate continuous at 100% load. The percentage impedance of the transformer should be as per IS (no negative tolerance shall be allowed).

The single panel shall be free standing, floor mounting, manufactured out of CRCA sheet steel of 2mm thickness and shall be rated for 11 KV 350 MVA with copper bus bar and continuous copper earth bus, safety shutter, if metallic, should be earthed and provision for phase segregation of the buses when the breaker is in service condition. The panel shall have a space heater with timer control arrangement suitable for 240 V AC.

The electrically operated 3 pole HT breaker shall be rated for 630 Amp, 20 KA for 3 second with 3-pole earth switch; low energy shunt trip coil and closing coil with a TNC switch or ON/OFF push buttons and with all protective inter locking arrangement of the breaker with the panel.

Red-ON / Green – OFF / Amber – TRIP / White – TRIP CIRCUIT HEALTHY / SPRING CHARGE Lamps suitable for 24 V.D.C.

1 No. – Line P.T of 11 KV / $\sqrt{3}$ /110 V / $\sqrt{3}$, CL '1', 50 VA

1 No. – Digital Volt Meter of 96x96mm size and scaled 0-15 KV / MFM.

3 Nos. – Cast Resin insulated CTs, (depending on Transformer rating).

Protective Relays :

- a) 1 No. – Self Powered Over Current and Earth Fault Relay
- b) 1 No. – Master Trip Relay
- c) 1 No. – Trip Circuit Supervision Relay
- d) 1 No. – Under Voltage Relay
- e) Auxiliary Relays

6 – Windows Annunciator with Facia:

- a) Transformer winding temp. Alarm
- b) Transformer winding temp. trip
- c) Transformer door open / RMU trip
- d) Breaker tripped on over account
- e) Breaker tripped on earth fault
- f) Breaker tripped on under voltage



1 No. – Common Hooter for Transformer winding temperature alarm / trip and Transformer door open.

Test, Accept, Reset Push Buttons

Transformer Neutral should be connected through copper strip.

GENERAL SPECIFICATIONS FOR OIL TRANSFORMER INSIDE

THE COMPACT SUB-STATION

The Oil transformer shall be in accordance with the specification and tender drawings.

The Oil transformer will be located inside the inside type compact substation. This transformer cubicle will be located adjacent to the switchgear cubicles such that 415V switchgear busses in incomer-breaker can be connected to the L.V side (i.e. 415V bus) of transformers through LT cables. Transformer Manufacturers shall make the required provisions to match with switchgear manufacturer’s bus bars in all respects and Transformer compartment of the Package substation should have bolted cover.

The contractor will be required to prove that all components are designed to meet requirements of this specification (such as temperature limits, constructional requirements, short circuit withstand & noise level. Contractors should enclose with their offer, type test certificates for components that have already been type tested and are known to meet the requirements of this specification.

All material offered shall be new first class in all respects.

2.1 Standards Applicable

The design, manufacture and performance of equipment shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. Nothing in this specification shall be constructed to relieve the VENDOR of this responsibility.

Unless otherwise specified, equipment shall conform to the latest editions of the applicable standards and in particular to following standards. In case of conflict between the applicable standard and this specification, this specification shall govern.

1.	IS:226	Structural Steel
2.	IS:7098 (Part-1)	XLPE insulated cables for working voltages up to and including 1100 volts.
3.	IS:1271-1958	Classification of insulating materials for electrical machinery and apparatus in relation to their thermal stability in service.
4.	IS: 11171-1985/IEC 76-2	Oil Type transformers
5.	IS:2099	Bushings for alternating voltages above 1000V



6.	IS:2147-1962	Degrees of protection provided by enclosures for low voltage switchgear and control gear.
7.	IS:2705	Current transformers.
8.	IS:3114-1981	Methods of test for mineral wool thermal insulation materials.
9.	IS:3639-2966	Fittings and accessories for power transformers.
10.	IS:8183-1976	Bonded mineral wool

11.	IEC:551	Measurement of transformer and reactor sound levels.
12.	IEC:606	Application guide of power transformers
13.	IEC :616	Terminal and tapping markings for power transformers.
14.	IS:7098 (Part-2)	H.T Cross linked polyethylene insulated PVC sheathed cables.

3. GENERAL CONSTRUCTIONAL FEATURES:

All material used shall be of best quality and of the class most suitable for working-under the conditions specified and shall withstand the variations of temperature and atmospheric conditions, overloads, over-excitation, short-circuits as per specified standards, without-distortion or deterioration or the setting up of undue stresses in any part, and also without affecting the strength and suitability of the various parts for the work which they have to perform

4. CORE:

The magnetic circuit shall be constructed from Imported C.R.O; Grade M-4 Silicon Steel properly annealed after shearing and shall be of 'core' type. The core shall be painted with suitable resin to protect it against corrosion. The insulation structure for the core to bolts and core to clamp plates shall be such as withstand the specified voltage as per relevant standards for the minute.

5. VENTILATED ENCLOSURE:

Core and Coil assembly should be inside a ventilated enclosure with louvers or screens. The enclosure shall be of best quality M.S Sheet with minimum thickness of 2mm.

6. INTERNAL EARTHING:



The framework and clamping arrangements of core and coil shall be securely earthed by copper strip connection to the main frame and enclosure. Two separate earthing terminals shall be available for earthing from outside.

7. TERMINATION:

Transformers shall be suitable to received 11kV XLPE armoured cables of specified size. L.T side (433V) terminals shall be connected by means of XLPE armoured Cable.

The bus bars shall be of Electrolytic grade copper. Bus bars shall be sized such that maximum hot spot temperature shall not exceed 70 Deg. C for plain joints & 105 Deg. C for silver plated joints, at rated current. Sizing of bus bars shall be subject to PURCHASER'S approval after placement of purchase order.

The neutral of the star-connected winding shall be in two branches and shall be brought out two separate bushing terminals. One neutral bushing shall be provided to facilitate leading the earth conductor down to the ground level. A second bushing shall be provided for connecting neutral bus bar to switchgear. The neutral connections shall be of copper.

Cable box at HT & LT Termination

8. HV CABLE TERMINATION:

The HV cable termination facility on the transformers shall be designed for connecting aluminium conductor, XLPE cable terminated in crimping type lugs, (cable lugs are to be included in the scope of supply). The cable entry is from the top / bottom. The HV bushings shall be located in the lower half side of the transformer, at a convenient height.

Phase to phase and phase to ground clearance within the enclosure shall be such as to enable either the transformer or cable to be subjected separately to H.V tests. Clearances shall be subject to the Purchaser's approval.

9. MARSHALLING BOX:

The contractor shall provide a marshalling box and shall Marshall to it all the contacts / terminals of all electrical devices (such as CTs, winding temperature indicator, thermistor electrical circuit etc.) required for the transformer. The contractor shall provide the inter-connection cabling between the marshalling box and the devices on the transformer. This interconnection shall be through wires in GI conduits or through armoured cables. The insulation for the wires / cables shall be consistent with the ambient temperature at the location and shall have at least 70 Deg. C PVC insulation. Compression type brass cable glands required for these inter-connections at the marshalling box, shall be included in the scope of supply. Cable glands required for purchaser's external connections are also included in the scope of supply.



The marshalling box shall be mounted in an easily accessible position on the transformer and painted suitably. All doors covers and plates shall be fitted with neoprene gaskets. Bottom shall be at least 600mm from floor level and provided with removable, bolted, undrilled gland plate.

All contracts for alarm, trip and indication circuits shall each be electricity free-wired for auxiliary DC supply as specified and brought out to separate terminals at the terminal blocks in the marshalling box. Terminals shall be rated for 10A. Wiring shall be with stranded copper conductor of sizes not smaller than 1.5 sq.mm. for control and 2.5 sq.mm. for CT circuits. CT terminals shall be provided with shorting facility. Wiring insulation shall be consistent with the ambient at the location.

All sheet metal work shall be phosphated in accordance with IS: 6005. After phosphating, through rinsing shall be carried with clean water, followed by final rinsing with dilute dichromate solution and oven drying. The phosphate coating shall be sealed by the application of two coats of ready mixed stoving type primer. The first coat may be flash dried while the second coat shall be stoved. After application of primer, two coats of finishing epoxy paint shall be applied, each coat by stoving. The second finishing coat shall be applied after completion of tests. Each coat of primer and finishing paint be of slightly different shade to enable inspection of the paint. The final finished thickness of paint film on steel shall not be less than 75 microns and shall not be more than 100 microns. Surface treatment procedures not complying with the foregoing requirements are liable to be rejected. A small quantity of finishing paint shall be supplied for minor touching-up required at site after the installation. The colour of finishing paint shall be air craft grey shade No. 693 as per IS.

10. ELECTRICAL & THERMAL PERFORMANCE REQUIREMENTS:

Transformers shall be rated to continuously carry the full load current. The maximum temperature rise specified shall not be exceeded when loaded as above with AN cooling. Transformers shall be designed for 11% continuous over fluxing withstand capability.

The continuous and short time overloading capacities shall be furnished in detail. Terminals, tap changers or other auxiliary equipment shall not limit the over loading specified above. The neutral terminal of windings with star connection shall be designed for the highest over current that can flow through this winding.

Every care shall be taken to ensure that the design and manufacture of the transformers shall be such as to reduce noise and vibration to the level obtained in good modern practice. The contractor shall ensure that the weighted sound power level of transformer does not exceed 65 dB when measured in accordance with IEC-551.

11. TEMPERATURE RISE:

The maximum temperature rise of the winding shall not exceed the following values as per IEC 76-2, when measured by the winding resistance method.

Class of Insulation	Maximum Temperature Rise in Deg. C
---------------------	------------------------------------



B (130 Deg. C)	70
F (155 Deg. C)	90
H (185 Deg. C)	115
C (220 Deg. C)	140

12. FITTINGS AND ACCESSORIES:

12.1 Terminal complete with connectors for the Purchaser’s external conductors as specified.

- a) Neutral bushing terminal with clamp for connection of bus bars to switchgear.
- b) Neutral bushing terminal complete with connector for earth conductor.
- c) Rating and terminal marking plates.
- d) Two earthing terminals for Purchaser’s connections.
- e) Lifting lugs for lifting complete transformer (core and coil assembly) and separately for enclosure.
- f) Jacking pads (Transformers weighting above 3000 kg).
- g) The under base provided with channels etc. for fixing rollers.
- h) Four bi-directional rollers in base frame.

12.2 Conventional winding temperature indicators consisting of:

- a) Temperature sensing element.
- b) Image coil.
- c) Bushing or turret mounted CT.
- d) Local indicating instrument with electrically independent contact brought out to separate terminals for winding temperature ‘high’ and ‘too high’ alarms. Contacts shall be suitable for 110V DC rated minimum 1.0A. R.T.D based or thermistor based winding temperature indicating and alarm units. (This unit will form the main protection system for the transformer and the conventional, C.T base W.T.I. as specified will be used as back-up complete details of the thermistor based or R.T.D. based system offered shall be furnished.

OFF LOAD TAP CHANGER shall be provided on the **HT** winding of the transformer.

ANNEXURE-I



COMPACT TYPE SUB-STATION

S. No. Technical Parameters

OIL TYPE

1. Type and class of insulation
2. Output in KVA (Continuously rated)
3. Rated Voltage
 - a. HV (Volts)
 - b. LV (Volts)
4. No. of phase
5. Type of cooling
6. Frequency
7. Winding Connection
8. Tapings
9. Vector Group
10. Ref. Ambient temperature
Temperature rise winding
Class of insulation
11. Physical Dimensions
 - a. Length (in mm)
 - b. Width (in mm)
 - c. Height (in mm)
12. % Impedance
13. Iron losses at normal voltage ratio
14. Copper loses at normal voltage ratio



at full load

- 15. Efficiency at unity power factor
 - a. Full load
 - b. 75% load
 - c. 50% load

S. No. Technical Parameters

OIL TYPE

- 16. Regulation at unit power factor
- 17. Regulation at 0.8 power factor
- 18. Approximate weight
 - a. Core & winding (Kgs.)

Total Weight (Kgs.)

L.T SWITCHBOARDS

Item	Data to be furnished by tenderer against each item
COMPONENTS	
Air Circuit Breakers	
Make	
Ics value	
DC voltage for shunt trip coil	
MCCBs	
Make	



Ics	
Balance component makes	
MV Contactors	
Capacitors	
Energy Management System	
Energy Meter	
Cast Resin current transformers	
Meters	
Selector switches	
Protective relays	
APFC relay	
CONSTRUCTIONAL FEATURES	
Material – CRCA or Hot Rolled MS sheets	
Sheet metal thickness for Panels and doors	
Ingress protection.	
Base channel details	
Blank space between floor of switchboard and bottom most units.	

Item	Data to be furnished by tenderer against each item
Overall Height	
Provision for 25% spare feeders	
Bus bar size	



Bus bar insulation	
Bus bar jointing	
Whether accessible bare joints shrouded ?	
Whether knockouts for cable/conduit entry provided ?	
Whether cable termination kits, lugs, glands etc provided ?	
Details of surface treatment prior to Painting	
Paint finish provided ?	

Dome camera Specification:

All the Cameras shall be new (manufactured not more than 1 year ago) and not retrofitted.



S. NO.	DESCRIPTION	MINIMUM SPECIFICATION
(a)	Housing	IP-66 / NEMA or relevant Indian standard-4 & IK 10 vandal Resistant
(b)	Image Sensor	0.357" Progressive Scan CMOS
(c)	Lens	2.7-13.55 Motorized Varifocal Lens
(d)	Video Compression	H.264, H.265, H.265+, MJPEG
(e)	Streaming	Triple Streaming
(f)	Networking	10/100 Mbps Ethernet with Cat -6 cable
(g)	ONVIF Support	Profile (S, G, T)
(h)	Supported Protocol	UDP, SNMP, IGMP, DHCP, RTP, HTTP, HTTPS, DNS, SMTP, FTP, ICMP, RTSP, RTCP, NTP, UPnP, QoS, TCP/IP, PPPoE, Unicast, Multicast, IPV4, IPV6, ARP, IEEE 802.1x
(i)	Minimum Illumination (50IRE)	Colour: 0.01lx (F1.4, AGC ON) or better B/W : 0 lx (IR LED: ON) or better
(j)	Frame rate (FPS)	5, 15, 25, 30
(k)	Day / Night Mode feature	Yes [Configurable & Automatically selectable]
(l)	IR Illuminator	Adaptive IR of minimum 30 m
(m)	IR Type	Adaptive Type Smart IR
(n)	Active Pixels (No. of effective pixels)	4 Mega pixels or better
(o)	Resolution	D1 (704X480 pixels), HD (1280X720 pixels), Full HD (1920X1080 pixels)
(p)	Motion Detection	Available on the entire Camera Capture Frame
(q)	Privacy Zone Mask	Available
(r)	Power Supply	12/24V (DC/AC) and POE (IEEE Standard)
(s)	Power Consumption	Max 10 watts
(t)	Certifications	BIS mandatory; FCC or CE and UL optional
(u)	Features	White Balance (Indoor / Outdoor / Manual Selectable), Auto Gain Control (On / Off selectable), Back-light Compensation, Remote Administration (Remote configuration and status using web-based tool) Remote System Update over Network, PC Client, Web Client
(v)	Operating Temp. / Humidity	(-) 10°C to (+) 60°C / 95% RH
(w)	Iris Control	Yes
(x)	Focus Mode	Auto, Zooming, One Push, Manual



S. NO.	DESCRIPTION	MINIMUM SPECIFICATION
(y)	Viewing Angle	Horizontal (120 degree)
(z)	Digital Zoom	16X
(aa)	Electronic Shutter Speed	1 to 1/100,000 s
(bb)	Minimum Illumination	Colour : 0.01lx (F1.4, AGC ON) or better 0 lx (IR LED: ON) or better B/W :
(cc)	Edge Based analytics	<ul style="list-style-type: none"> ✓ Face detection ✓ Object left over ✓ Object removal ✓ Intrusion detection ✓ Passing /Trip wire Camera tampering alarm
(dd)	Edge Storage	Minimum 128 GB (SD / MicroSD cards to be supplied along-with each Cameras)
(ee)	Wide Dynamic range (WDR)	✓ Minimum 120 dB
(ff)	SNR	Minimum 50dB
(gg)	Construction	Metal Body
(hh)	Make & Model	Pelco, Honeywell, Infinova or equivalent.

BULLET FIXED COLOUR CAMERAS Specification

All the Cameras shall be new (manufactured not more than 1 year ago) and not retrofitted.

S. NO.	DESCRIPTION	MINIMUM SPECIFICATION
(a)	Housing	IP-66 / NEMA or relevant Indian standard-4 & IK 10 vandal Resistant
(b)	Imager	0.357” Progressive Scan CMOS / MOS
(c)	Lens	2.7-13.55 Motorized Varifocal Lens
(d)	Video Compression	H.264, H.265, H.265+ & JPEG
(e)	Streaming	Triple Streaming
(f)	Networking	10/100 Mbps Ethernet with Cat -6 cable
(g)	ONVIF Support	Profile (S, G, T)
(h)	Supported Protocol	UDP, SNMP, IGMP, DHCP, RTP, HTTP, HTTPS, DNS, SMTP, FTP, ICMP, RTSP, RTCP, NTP, UPnP, QoS, TCP/IP, PPPoE, Unicast, Multicast, IPV4, IPV6, ARP, IEEE 802.1x
(i)	Night View	0 Lux with IR ON.



S. NO.	DESCRIPTION	MINIMUM SPECIFICATION
(j)	Frame rate (FPS)	5, 15, 25, 30
(k)	Day / Night Mode feature	Yes [Configurable & Automatically selectable]
(l)	IR Illuminator	Adaptive IR of minimum 60 m
(m)	IR Type	Adaptive Type Smart IR
(n)	Active Pixels (No. of effective pixels)	4 Mega pixels or better
(o)	Resolution	D1 (704X480), HD (1280X780), FHD (1920X1080)
(p)	Motion Detection	Available on the entire Camera Capture Frame
(q)	Privacy Zone Mask	Available
(r)	Power Supply	12/24V (DC/AC) and POE (IEEE Standard)
(s)	Power Consumption	Max 10 watts
(t)	Certifications	BIS mandatory; FCC / CE / UL optional
(u)	SNR	Minimum 50dB
(v)	Wide Dynamic range (WDR)	Minimum 120 dB
(w)	Features	White Balance (Indoor / Outdoor / Manual Selectable), Auto Gain Control (On / Off selectable), Back-light Compensation, Remote Administration (Remote configuration and status using web-based tool) Remote System Update over Network, PC Client, Web Client
(x)	Operating Temp. / Humidity	(-) 10°C to (+) 60°C / 95% RH
(y)	Edge Storage	Minimum 128 GB (SD / MicroSD cards to be supplied along-with each Cameras)
(z)	Edge Based analytics	<ul style="list-style-type: none"> ✓ Face detection ✓ Object left over ✓ Object removal ✓ Intrusion detection ✓ Passing /Trip wire ✓ Camera tampering alarm
(aa)	Construction	Metal Body
(bb)	Make & Model	Pelco, Honeywell, Infinova or equivalent.



PTZ CAMERAS Specification

All the Cameras shall be new (manufactured not more than 1 year ago) and not retrofitted.

S. NO.	DESCRIPTION	MINIMUM SPECIFICATION
(a)	Housing	IP-66 / NEMA-4 & IK 10 vandal Resistant should be same make of supplied camera.
(b)	Imager	1/2.0” Progressive Scan CCD/ CMOS / MOS
(c)	Illumination	Colour Mode: 0.01 Lux @ 50IRE, Black & White: 0.005 Lux with IR at minimum 150 m
(d)	Active Pixels (No. of effective pixels)	2 Mega pixels or better
(e)	Resolution:	D1 (704X480 pixels), HD (1280X720 pixels), Full HD (1920X1080 pixels)
(f)	Shutter Time	1 - 1/10000 sec or better
(g)	IR Range	IR at minimum 150 m
(h)	IR Type	Adaptive Type Smart IR or Better
(i)	Pan Range	360 degrees (Continuous)
(j)	Tilt Range	0-90 Degree (minimum)
(k)	Focal length	f=4.5 to 162 mm
(l)	Frame Rate (fps)	25, 30, 50, 60
(m)	Compression format	H.265+, H.265(HEVC), H.264+, H.264, MJPEG
(n)	Streaming	Triple streaming
(o)	Optical Zoom	36x
(p)	Digital Zoom	16X
(q)	Wide Dynamic range	120 dB
(r)	S / N Ratio	≥ 50
(s)	Day / Night mode feature	Yes [Configurable & Automatically selectable]
(t)	Motion Detection	Available on the entire Camera Capture Frame
(u)	Certifications	BIS mandatory; FCC or CE and UL optional
(v)	ONVIF Support	Profile (S, G, T)



S. NO.	DESCRIPTION	MINIMUM SPECIFICATION
(w)	Supported Protocol	UDP, SNMP, IGMP, DHCP, RTP, HTTP, HTTPS, DNS, SMTP, FTP, ICMP, RTSP, RTCP, NTP, UPnP, QoS, TCP/IP, PPPoE, Unicast, Multicast, IPV4, IPV6, ARP, IEEE 802.1x
(x)	User	4 simultaneous unicast users
(y)	Interface	Ethernet 10BASE-T/100BASE-TX (RJ-45)
(aa)	Edge Storage	Minimum 64 GB SD/MicroSD Card
(bb)	Ports	Sensor input, Alarm output
(cc)	Power requirements	12/24V (DC/AC) and POE (IEEE Standard)
(dd)	Power consumption	60 W max.
(ee)	Edge Based analytics	<ul style="list-style-type: none"> ✓ Face detection ✓ Object left over ✓ Object removal ✓ Intrusion detection ✓ Passing /Trip wire ✓ Camera tampering alarm
(ff)	White Balance	Automatic with Manual override
(gg)	Presets	Minimum 64
(hh)	Other Features	Programmable Tours, Programmable Auto Pans, Privacy Zones / Video Blanking Sectors, E-flip / Auto- flip, EIS, Auto tracking
(ii)	Alarm Trigger	Intelligent video motion detection
(jj)	Alarm Event	Event server: FTP server, SMTP server, Web browser
(kk)	Camera Housing & pole-mount	<p>The camera mount, housing, lens should be:</p> <ul style="list-style-type: none"> ➤ Of the same make as that of camera or from OEM-approved firms and suitable for the model number offered as specified by the manufacturer and should be an integrated unit. ➤ Should support the weight of camera and accessories such as housing, pan & tilt head in any vertical or horizontal position etc.
(ll)	Operating Temp. / Humidity	(-) 10°C to (+) 60°C / 95% RH
(mm)	Privacy Zone Mask	Available
(nn)	Construction	Metal Body
(oo)	Make & Model	Pelco, Honeywell, Infinova or equivalent.



TECHNICAL SPECIFICATION FOR 42U NETWORK/Server RACK:	
1	Racks manufactured out of steel sheet punched, formed, welded and Powder coated
2	Rack should be from ISO 14001 ,27000 Certified Company & UL Listed
3	Standard for Racks configuration will be welded/CKD frame and side panels and vented top cover
4	Rack should have Front Toughened Glass Door and Dual Perforated door at Rear.
5	Rack should have 2 no's of removable side panel with slam latch.
6	Rack should have provision to mount racks on Floor
7	Rack should be 42U (1U = 44.45 mm) in Height.
8	Width & Height should be as per standard for 42U Network/Server Rack and depth should be minimum 800MM.
9	Rack should include adopter kit 1 no (loop type)
10	Rack should Conform to DIN 41494 or Equivalent EIA /ISO / EN Standard
11	Rack should have Adjustable mounting depth,
12	Rack 4 No Adjustable, 19" verticals with Punched 9mm Square Hole and Universal 12.7mm-15.875mm-15.875mm alternating hole pattern offers greater mounting flexibility, maximizes usable mounting space.



13	Rack should have Numbered U positions,
14	Rack should have 100% assured compatibility with all equipments conforming to DIN 41494 (General industrial standard for equipments)
15	Powder coated finish with seven Tanks pre-treatment process meeting IS
16	Rack should have Proper Grounding & Bonding
17	Rack should have Fan module Mount Provision on top Cover
18	Rack should have Fan tray with 4 no's 90 CFM Fan
19	Rack should have 2 Nos Fixed shelf with 715mm depth for mounting NON Rack mountable Equipments
20	Rack should have 1 No Key Board shelf with 715mm depth
21	Rack should have 2 Horizontal Cable manager
22	Rack should have 2 No Server /IT Rack mount intelligent power distribution unit, 1Ph,230V, 32A, 50/60Hz, Zero U standard with 12 X Indian Round Pin 5/15A, 16A MCB X 2 Circuits- PDU Rating 7.3KVA/Bottom feed-3Mt/ Black/ Inlet Plug Not Installed
23	Rack should have provision for cable entry Exit from Both top & Bottom.
24	Rack should have 1 Packet of mounting hardware, Pack of 20.
25	Rack should have 1 no of 48 port patch panel and 1 no of 24 patch panel installed
26	Rack should have Climate Monitoring Module with Fan Control with alarm

Technical Specifications

Specifications for VC Endpoint

Type of End Point	Point-To-Point
Does it require mandatory registration with MCU	NA
Video Conferencing Codec System Resolution	1080p, 60 fps
Minimum Bandwidth Required for Specified video quality at End point/far-site end (Kbps)	2560
Type of Camera	PTZ
Camera Resolution	Full HD
Camera Positioning System	Preset
Type of sensor	CMOS
Camera Control (focusing, brightness, and white balance)	Automatic
Multiple Camera System in case of Automatic Voice activated CameraTracking	NA
Optical zoom	12X



Digital zoom	NA
Field of View at zoom (Degree)	70 or Higher
Pan range Minimum to Maximum (+/- Degree)	130, -130
Tilt Range (Degree)	-20, 90
Cord and Connector to be supplied	Yes
System delivers Full HD video and voice & Full HD content for an overall Full HD experience at specified bandwidth	Yes
Video coding support Protocol	H.264AVC, H.264 High Profile or H.265
System has G-722/ G-711/ G-729 or equivalent wideband audio coding support	Yes
System supports sharing of video and graphics content during the video call	1080p, 30fps
It is possible to see both the near and far site on one Screen thus making most efficient use of a single display area	Yes
System is equipped with one or more Omni directional High Definition Microphones as required to cover large conference room	Yes
System supplied complete with the following components from the same OEM (a) Codec (b) Camera (c) All two Microphones with suitable connectivity (d) Remote Control/Touch Panel (e) Data sharing capability using H/W or S/W (f) Necessary Cables	Yes
Number of microphone supported	3
Number of microphone supplied	2
Number of camera support from the same OEM	2
Number of Ethernet connection points for System supports for RJ-45, 10/100/1000 Mbps Base-T Ethernet connection	1
Wi Fi Connectivity	No
If Yes, Type of Wi Fi Connectivity	NA
System supports AES encryption video calls; System has Encryption On and Off capability	Yes
Video Codec shall support 16:9 format	Yes
Power supply: 230 + or - 10% volts, 50 Hz	Yes
Shall come with easy to use infra-red hand held remote control / Touch Panel with operating distance	Yes
All equipment are in compliance with the requirements of ITU-T (SIP Protocol & H.323) Standard related to Video Conferencing	Yes
System to be IPv6 ready from day one	Yes
System uses standards based protocols & the offered system is inter operable with any existing H.323 AVC/SVC based VC equipment in a P to P call on VC end point; All H/W and S/W required to make it interoperable is included in the scope of supply	Yes
Number of Input DVI Ports	0



Number of Input HDMI or equivalent Ports	2
Number of Input USB Ports	0
Number of Output DVI Port	0
Number of Output HDMI or equivalent Port	2
Number of output USB Port	0
Calendering Feature	No
Recording @1080p on the end point	No
Type of Microphone	Omni Directional
System is also tropicalized and report available from ILAC/NABL/Govt Lab with all add on including Environmental Sequence	No
(a) Dry Heat- For 16 hrs at 55 deg C as per IS:9000/pt-3/sec-5/1977(b) Cold-For 4 hrs at 0 deg C as per IS:9000/pt-2/sec-4/1977 (c) Damp Heat- For 2 Cycles of 24 h each at 40 deg C & 95% RH as per IS:9000/pt- 5/sec-1/1991 (All Reaffirmed 2007)	No
After each environmental test and a recovery period of two hours, the video conferencing system has been checked for complete functional parameters, and the results found satisfactory	No
Type Test Report from ILAC/NABL/Govt lab confirming conformance to above technical specifications - to be made available to buyer	No
BIS Registration under CRS of Meity	NA
BIS Registration Number and its Validity	NA
UL/CE certification	Yes
If Yes, UL/CE certificate Number (Corresponding UL/CE Certificate to be furnished when demanded by the buyer)	Yes
Minimum Operating temperature (Degree C)	0
Maximum Operating Temperature (Degree C)	40
Minimum Operating humidity (%RH)	15
Maximum Operating humidity (%RH)	80
Free installation and commissioning	Yes
On Site OEM Warranty (Year)	5
	Preferred Make - Polycom
Additional Specification Parameters - Video Conferencing End Point	
1.) VC Codec and Camera must be from same OEM. 2.) VC Codec must have Gigabit Ethernet port. 3.) VC Codec must be a custom built hardware and not software loaded on pc. 4.) The VC system should support Media Encryption (AES-128) for H.323 & SIP calls.	Yes



VC Codec should have inbuilt USB Device mode functionality to make use of the system as an external camera and microphones when connected to a Laptop/PC over single USB cable for cloud based Video Conferences like Zoom, Webex, Teams, Google Meet, etc including perpetual license . It should support 720p 30fps or higher video to the connected Laptop/PC over USB cable.	Yes
The microphones and VC codec should have have visual indication for identification of microphones in Mute/Unmute condition. In case any one microphone is pressed or Mute/Unmute, the effect should be synchronized at VC codec level and audio from all the connected microphones.	Yes
The proposed VC system should be interoperable with existing Cisco On-Premise MCU Infrastructure for Video, Audio and Content Sharing.	Yes
One Stereo line In and Line Out Audio	Yes
All licenses, activation keys required to meet the above specs should be provided with perpetual nature of licenses with the VC Codec	Yes
All the connecting Cables should be provided, including minimum 10 meter USB 3.0 and HDMI 2.0 (Brand - Kramer/Extron) or of higher length as per site requirement	Scope of SI

TECHNICAL SPECIFICATIONS AND DRAWING

5.1 DETAILED TECHNICAL SPECIFICATION OF IP BASED EPABX SYSTEM AND ASSOCIATED ITEMS

A) Environmental Conditions: The offered IP based EPABX system shall be capable of maintaining its guaranteed performance when operating continuously round-the-clock under the following environmental conditions.

Operational Temperature Range	+5 degC to +50 degC or better
Storage Temperature Range	0 degC to +60 degC or better
Humidity	20% to 80% without condensation
Shock and vibration	The equipment shall withstand transportation & handling by air sea & road under packed conditions
Electro Magnetic	As required for electronic equipment working in vicinity of HF/VHF/UHF systems



B) TEC Approval: The offered model of IP based EPABX system should have approval from TEC for interfacing with PSTN. In this regard, duly notarized copy of TEC certificates (IR & ER) are required be submitted with the un-priced bid document.

The offered IP based EPABX system shall conform to the latest editions of standards like ITU-T, IEC, IEEE, EIA etc.

5.2 SYSTEM ARCHITECTURE

5.2.1 The IP based EPABX system shall be built around a server platform having CPU controller of following configuration:

- Minimum 2 GHz Multi core commercial Processor
- Minimum 8 GB RAM
- Minimum 512 GB Hard Disk /Flash disk/SSD Storage supporting (eSATA/ Raid 1)
- Minimum 2x Gigabit Ethernet port supporting IPV4 and IPV6
- Designed to operate on 230VAC

The above configuration should be fully duplicated at Central Units (Main Locations).

Bidder may also provide OEM make call control servers in hot/standby mode without compromising the total line capacity, call handling capacity and the technical conditions mentioned within this document..

5.2.2 The Architecture of the exchange must be completely IP based Server & Gateway type communications system with ability to run both IP and TDM (Analog & Digital) end points with controlling signalling purely on IP across LAN/WAN. The legacy PCM/TDM based systems are not acceptable.

5.2.3 The IP based EPABX system should support VOIP solutions as an integral part of the system. No separate/dedicated hardware, unit/module shall be required for providing telephone services for IP phones. It also should not involve any dedicated external gateways, routers etc. for VoIP support.

5.2.4 Offered solution should provide enterprise-grade, communication platform thus delivering a collaborative business application extending features instant messaging/telephony presence, click to call (dial by name, answer, release), call log, P2P audio/video/screen sharing feature should be available from day one for all the extensions equipped in the IP EPABX.

5.2.5 Call control server / appliance should be Intel based hardware with necessary configuration to support the desired expandability. It is must to have virtualization support & Virtualization technologies i.e. V-Motion. However, bidder may also provide OEM make call control servers in hot/standby mode.

5.2.6 The system should have non -blocking architecture at all levels like System processing, Switching fabric and other resources and should provide 100% non -blocking connectivity.

5.2.7 The complete system including all associated HW shall be designed to operate on 230 VAC power supply, which includes servers, media gateway, switches, all control /peripheral cards, self-survivability and any other device, which is part of main system.

5.2.8 The IP based EPABX system should be able to restart automatically & resume its normal operation without human intervention when power supply to the EPABX system is resumed after complete power failure.



- 5.2.9 The IP based EPABX system should be based on universal port architecture and be modular in design to enable seamless growth of subscriber & trunk interfaces, by adding the desired necessary cards as and when required. System should not impose any restriction in terms of slots usage (except slots for CPU/Controller and Power Supply modules may be fixed) for a particular functional benefit.
- 5.2.10 The IP based EPABX system should support CAC (Call Admission Control) mechanisms to optimize the usage of the bandwidth in the WAN for multi-site configurations.
- 5.2.11 The IP based EPABX call switching for internal calls (i.e., limited to a single location) should be based on the G.711 uncompressed PCM standard, but WAN calls outside the location may use the G.711, G.729A/B compression algorithm.
- 5.2.12 The IP based EPABX system should support for voice encoding using the following standards as a minimum: G.711, G.729A/B, G722 wideband.
- 5.2.13 The IP based EPABX system must support Network Time Protocol (NTP) to synchronize the system data/time of network devices.
- 5.2.14 The IP based EPABX system should be suitable to accommodate both Decadic Pulse (DP) and DTMF telephones. The system should support outgoing DTMF transmission even from Digital / IP phones.
- 5.2.15 The offered system shall be capable of Hot Swapping of cards without switching off the system where the necessary cards can be interchanged or replaced even in online conditions. There should be no distance – limitation between the media gateway and the system.
- 5.2.16 Call server, Media Gateway, Self-survivability system, all Control and Peripheral Cards, Digital phones and IP phones must be of the same OEM make only.
- 5.2.17 The IP based EPABX system should support following traditional TDM or mixed IP-TDM or full 100% IP configurations on the same platform using same loaded software:
- IP Communication Devices e.g. IP Phones, Mobile IP Phones, multimedia PCs, SIP phones, Soft Phone or H.323 terminal devices etc.
 - Legacy TDM communication devices (Digital and analog 2 Wire telephone instruments with or without caller-id (Both FSK and DTMF), Fax, modems etc.). Digital Phones & Analog Phones of EPABX system shall have smooth & trouble- free operation using standard 2-wire 0.5 mm telephone cable with minimum length of 800m and 8 Km respectively from EPABX system. All Analog lines offered should be of long line type with min loop limit of 1500 ohms without phone.
 - All analog extensions should have typical idle line voltage of -48 V DC ($\pm 5\%$) for supporting long distance off premise extensions. Accordingly, the analog extension boards should not be of low voltage type.
 - The system should support outgoing DTMF transmission even from Digital/ IP phones.
 - Analog PSTN (2 wire Central Office [CO] line) trunk & Digital (ISDN-PRI, BRI, E-1) trunk
 - Wireless/ Mobility/ Limited mobility in local loop like VoWLAN, WiFi.



- Dual mode Fixed Mobile Convenience (WiFi/ Cellular)
- DECT extension

5.3 APPLICABLE STANDARDS

- 5.3.1 The communication feature server and gateway should support IPV6 from day one.
- 5.3.2 The system should be fully compliant to VOIP standards like H.323 and SIP (session initiation protocol). The system should be able to operate with any H.323/SIP compliant.
- 5.3.3 The SIP proxy, SIP register should be inbuilt in the system and should support any open SIP stack compliant hard phones or soft phones, if required, it should be able to inter operate with H.323 standard based external gatekeepers.
- 5.3.4 The offered system should have Voice compression and decompression in accordance with G.711, G.722, G.729A, H.264 ITC recommendations and optional echo-cancellation in accordance.
- 5.3.5 System should support the QOS features for the VOIP implementation. It should be compliant with both QOS standards (layer 2 – 802.1 p/q) and layer 3- diffserv/tos).
- 5.3.6 The System must support Network Time Protocol V4.1.2 (RFC 1305) to synchronize the system data/time of network devices.
- 5.3.7 The exchange including Servers, Operating System, System Software etc, must be IPv6 complaint and should interoperate with other systems and protocols.
- 5.3.8 System should have commercial grade encryption security with minimum 128-bit key security for both signalling and voice with in a node for all IP subscribers, all call server to media gateway and media gateway to media gateway communication.

5.3 TELEPHONY SUPPORTED FEATURE

- 5.3.1 The core of IP based EPABX system shall consist of various Servers (termed as “Core Servers” in this tender) like: Call Control Server, Signalling Server, Media Server, SIP Server etc., as required to meet the functional & technical requirements of the tender document. The word “Server” as would be referred to in this tender document shall mean Server Software Application installed in a Server Hardware Platform.
- 5.3.2 Various Core Server Software Applications may reside inside a single Server Hardware Platform or may be distributed in different Server Hardware Platforms depending upon architecture offered by an OEM. However, in case of a distributed architecture, each server hardware must have its own hot-standby architecture.
- 5.3.3 The Core Server(s) of IP based EPABX system shall have duplicated & redundant configuration to ensure high availability and no single point of failure of telephony services of EPABX system. Hence, all Core Server Software Applications of IP based EPABX system shall reside & run on duplicated/redundant Server Hardware Platforms in Active/Hot Stand-by configuration. The hot standby or slave Core Server(s) should always be in sync (database) with the active/master Core Server(s) without any need of manual configuration & administration. It should also conform to the model of complete "mirroring" of the information (both static and dynamic data).



- 5.3.4 These duplicated/redundant/hot standby core server hardware platforms should not be in the same unit/cabinet sharing the same active backplane/motherboard, which will facilitate their placement at physically different locations (geo-redundant) for better survivability of the total system in the LAN/WAN network.
- 5.3.5 During failure of Active Server, there must be transparent takeover by the hot standby server ensuring no drop in ongoing communications (TDM-to-TDM / IP-to-TDM / IP-to-IP). The switchover to standby core server in case of failure of active core server must be automatic (without any manual intervention) & without dropping any active calls.
- 5.3.6 The proposed call control server should not be in load balancing mode, in case of main/active server failure there should not be any compromise in active functional features, like all users, trunks should work without degradation of services.(Each server should be capable for catering 100% load for wired and expandable capacity as mentioned in system architecture clause) [Acceptable make of Core Server: Dell, IBM, HP, or EPABX OEM make only]
- 5.3.7 No additional equipment must be required for achieving active hot standby configuration.
- 5.3.8 Call processing function shall take place in the core server. Intra IP- EPABX calls between IP extensions and calls from IP extension to public IP network via Ethernet interface shall not be affected in case the media gateway is powered off/faulty.
- 5.3.9 All the users are to be managed in a single database; centrally. Multiple databases are not acceptable. Call processing function shall take place in the core server.
- 5.3.10 License should be centrally hosted and not in media gateway.
- 5.3.11 The offered Core Servers should not be End-of-Life or End-of-Support declared products. A declaration from the server OEM or EPABX OEM in this regard or other suitable documentary evidence shall be submitted by the bidder in the un-priced bid.
- 5.3.12 The system should be capable of supporting a high traffic and should support minimum Busy Hour Call Completion (BHCC) 2,50,000 & above.
- 5.3.13 Each of the Offered PABX system shall be scalable to 500 Users (Analog, Digital and IP) from day 1.
- 5.3.14 Availability - The IP PBX System must be highly reliable with uptime of at least 99.99%. All cards/sub-assemblies shall be rated for continuous operation of the system round the clock
- 5.3.15 IP EPABX should be suitable for up to 8-digit extension numbering scheme. This numbering scheme should be flexible. System should also allow mixed numbering scheme.
- 5.3.16 The offered EPABX should be QSIG Complaint and should support QSIG over ISDN PRI and IP. The system should be capable of supporting basic & supplementary services of QSIG features such as Basic Call setup, Name & Number Transport (Caller Line Identification), Call Transfer, etc. over trunk for integration of offered exchange with exchanges of other makes.
- 5.3.17 System should support the attribution of an external number DID or individual line or a bundle head to a trunk, a bundle, an attendant, a group of attendance, a subscriber, a group of subscriber or virtual



equipment. The unanswered DID communication can overflow, to attendant or attendant group, local subscriber, network subscriber, automated attendant, abbreviated number, external number.

- 5.3.18 System should provide distinctive ringing for internal calls, junction calls, auto call-backs, back up service and emergency reporting service, immediate forwarding call pick-up. Call- parking, call tracing, call waiting indication/ voice prompt.
- 5.3.19 Calling line identification restriction for internal calls camp on busy telephone/hunting group/voice mail, controlled private call by pin code and password. Minimum
- 5.3.20 Video calling, IP video phones must be able to make video calls using extension numbers between 2 extension.
- 5.3.21 The proposed system should support automatic route selection (ARS) and least cost routing (LCR) features to route the calls based on priorities related to user profile, tariff, and network availability, along the most cost-effective path. This service will be transparent for users and irrespective of the physical carrier connection.
- 5.3.22 The IP based EPABX system should support automatic route selection to route the calls based on user definable priorities. This service will be transparent for users and irrespective of the physical carrier connection.
- 5.3.23 The IP based EPABX shall be equipped with integrated/in-built Automatic Attendant application, which shall automate the handling of incoming calls. The system shall answer the incoming call & guide the caller through a voice guidance menu of various options – to choose extension, operator, or directory service. The call shall be automatically routed to the destination. In case of non- response from the caller's end, the call will automatically flow over to the operator, after a pre-set delay.
- 5.3.24 Auto-attended system should be able to answer minimum (08) incoming calls simultaneously.
- 5.3.25 Basic Telephone features:
- Speed dialling (system should support up to 5000 numbers for speed dialling)
 - Account code charging (should support 12-digit code)
 - Private call
 - Appointment reminder (1000 Simultaneous ringing)
 - Associate (definition, modification by user)
 - Automatic call back on free/busy extension (must offer 1000 simultaneous call back request)
 - Broker's call (system should support 15,000 broker's call)
 - Call forwarding unconditional on busy/no reply to extension, hunt group, operator, paging
 - Call pick-up
 - Call log (minimum 100 Number of entries per user)



- Hot line
- Call waiting indication
- Calling line identification restriction for internal calls and external call
- Camp on busy telephone/hunting group
- Conditional external forwarding (busy or no reply)
- Call waiting
- Controlled private call by pin code and password (should support 8-digit PIN)
- Boss Secretaries - (1000 Filtered / non-filtered number tables & should support 16 Manager per secretary)
- Distinctive ringing according to hierarchical levels.
- Do not disturb
- General night service
- Hunting group (fix head, cyclic, longest idle time, parallel)
- Immediate forwarding
- Individual hold
- Individual call directory
- Internal/external music on hold
- Internal/external inquiry call
- Intrusion
- Last internal/external number redial
- Local and external call
- Moving service
- Multiline appearance (MLA) on applicable sets.
- Multiline selective forwarding
- Multiple conference calls
- Multiple call protection



- Calling line identification presentation/restriction (CLIP/CLIR)
- Digit-by-digit dialing mode
- End-block dialing (digit correction possible)
- ISDN, H.323 or SIP identification (CLIP) converted into name
- ISDN mini-text messages (carrier-dependent)
- Malicious call identification
- 5 hrs. on demand call recording storage for each require extension
- Priority call feature (Priority call feature allows a set to be connected to another set of the installation, even if this one has a call in progress. The previous call is immediately released to the benefit of the priority call)

5.4 MEDIA GATEWAY SPECIFICATION

- 5.4.1 Media Gateway must be standard rack-mountable solution having universal-slots architecture for flexibility in putting in any type of interface cards/modules for Analog & Digital Subscriber & Trunks including Analog CO lines and ISDN PRI/BRI. FXO/FXS based gateway solutions shall not be considered.
- 5.4.2 The gateway card should have dual Ethernet. 10/100/1000 Base -T connection with TCP/IP connectivity to end equipment's, trunks or remote gateways. It should provide services as per H.323/SIP Protocol Stack.
- 5.4.3 The control unit / module of Media Gateway LAN interface should be duplicated in redundant hot-standby mode with 10/100/1000 mbps.
- 5.4.4 The Media Gateway of EPABX system should boot from Flash RAM/Flash Disk/Hard disk.
- 5.4.5 Media Gateway shall be of the call control architecture. In normal operations Core servers process all call control intelligence, however, it would undertake local call processing while working in self-survivable mode
- 5.4.6 Media Gateway shall be self-survivable, i.e. all analog and digital extensions should be working with full feature set even if both core servers are down or IP connectivity to servers is broken.
- 5.4.7 Media Gateway(s) shall have IP connectivity to Core Servers of IP based EPABX system. Under normal circumstance, Media Gateway(s) shall work in conjunction with or under the control of Core Servers as an integral part of IP based EPABX system. However, under isolation/disconnection condition (at IP connectivity level) of Media Gateway from Core Servers of IP based EPABX system, the Media Gateway shall support survival mechanisms that allow it to maintain 100% of the telephony services for its subscribers /trunks, in case of failure in IP connectivity with Core Servers of IP based EPABX system for a minimum duration of 20 days. Once the IP connectivity between Media Gateway & Core Servers is restored back, the Media Gateway shall work in conjunction with Core Server(s).



- 5.4.8 The communication between Core servers and Media gateway shall be through open standard protocols such as Media Gateway Control Protocol as per IETF RFC 3435 or through proprietary protocol of the EPABX OEM (over IP). It must have security features through authentication or encryption so that unauthorized entities cannot interfere in the system. The aconnection between Core servers and Media gateway should not use SIP / H.323 trunks. The idea is that Core servers and Media Gateway should have master / slave architecture and not peer to peer architecture.
- 5.4.9 All management functions like: System Configuration, Programming, Fault/Alarm management, System database backup, Accounting/Logging of traffic/calls etc for the connected Media Gateway shall be provided remotely from the Core Server. It should not require separate login to Media Gateway.
- 5.4.10 Media Gateway should have modular architecture with the ability to stack multiple gateways in a single location. One or more such stacks should be placed in each location under the same Core Server control, offer system should support minimum 50 media gateway scalability.
- 5.4.11 Media Gateway should be able to restart automatically & shall support providing 100% of telephony service without human intervention at Media Gateway as well as at Core Server level when the input power supply to the Media Gateway is resumed after complete power failure, even under the failure of IP connectivity with Core Servers of IP based EPABX system.
- 5.4.12 Media Gateways should not host services such as proxy, FTP or local dynamic routing except those required for software Up-gradation /backup etc. to prevent exploitation in Distributed Denial of Service attacks. It should use SFTP service for firmware loading.

5.4 SYSTEM SURVIVABILITY

- 5.4.1 The IP based EPABX system should offer maximum availability along with redundancy provision for its critical common & control resource elements. The critical common & control resource elements of IP based EPABX system shall minimum include all Core Servers (comprising of respective Core Server Software Application, Core Server Hardware Platform), DSP resources, Tone generators, Power supplies, Ring generators, DTMF receivers, Tone detectors. A single incident of fault/failure in any of the critical resource elements of EPABX system shall not disrupt/affect all its extension & trunk telephony services.
- 5.4.2 It will be preferred that all hardware-units/modules of the system have their own separate power supplies mounted on the PCB itself, for better reliability and avoiding any dependence on a single card of the system.
- 5.4.3 The bidder must specify list of redundant items / modules included in the hardware & software configuration of the system to be supplied.
- 5.4.4 The Management Platform of IP based EPABX system must provide a backup mechanism for all critical system information in both a manual and an automatic/scheduled archival and a Disaster Recovery mechanism.
- 5.4.5 Addition / replacement of faulty units/modules in IP based EPABX system shall be hot swappable (i.e. on power on condition).



5.4 SECURITY PROVISIONS

- 5.4.1 Access to the system should be secure. For the purpose of access over IP network, system should only allow secured access mechanism like SSH and HTTPS.
- 5.4.2 There should be provision of defining password aging, one-time passwords. Provision shall be available to bar unauthorized user to connect to the system. The system should monitor and report the following types of security violations: Login violations, Authorization code violations, Station security code violations etc.
- 5.4.3 Provision shall be available to protect the system against various network-based attacks & broadcast storms.
- 5.4.4 System should have commercial grade encryption security with minimum 128-bit key security for both signaling and voice with in a node for all IP subscribers' communications.
- 5.4.5 Media Gateways should not host services such as proxy, FTP, Telnet or local dynamic routing to prevent exploitation in Distributed Denial of Service attacks.
- 5.4.6 IP Phones should not support direct, external initiated, connections via HTTP, telnet, FTP, TFTP or any other protocol as means to prevent distributed Denial of Service attack exploitation.
- 5.4.7 IP Phones must support 802.1x (EAP-MD5 or better) for authentication and access control to the network, this mechanism must allow the user to be connected to the call server once he has passed the authentication process; not before.
- 5.4.8 Account access authentication/restriction using external RADIUS resources.

5.5 SYSTEM MANAGEMENT, MONITORING AND DIAGNOSTIC FEATURES

5.5.1 Network management should be based on client server architecture and support redundancy as and when required.

The IP based EPABX system shall be field programmable using PC/Server based Programming & Maintenance system for setting / modifying all the system, user, trunk, operator parameters & features. The access control for system management operation shall be through password protection and must provide Role Based Account Management to define different levels of administrator access depending on specific function responsibility as mentioned below:

It should be FCAPS based.

User	: For viewing purpose only
Operator	: For view and modify station/ trunk/ network features
Owner	: For viewing and modification of all system level setting configuration

For this purpose, Desktop Workstation capable of running 24X7 of reputed make like: Dell, HP, Lenovo having latest hardware configuration & operating system shall be provided by the vendor for Programming & Maintenance system and also for Call Billing operations. Both Programming & Maintenance and Call Billing operations shall be possible simultaneously from one desktop PC platform using single Ethernet interface.



Programming & Management system console should also support programming and maintenance through following options:

- 1) Browser based web interface over HTTPS
- 2) Command line over SSH

All management traffic between the remote console/session and the control & management system/ unit must be encrypted for necessary system data security.

The management platform must provide a user friendly GUI (Graphical User Interface) for the following tasks/operations:

5.5.2 Configuration and Programming:

Configuration and Programming of services, users, categories and all system parameters and features. This module must provide centralized management in local or remote environments of a single system or a network. The network manager will be able to quickly and easily edit, create or delete any network object by the use of import/export functions and multiple operations.

5.5.3 Faults and Alarms Management

It shall have the provision for instant fault information, provision of automatically identifying and isolating faulty extensions & trunks and capability for malicious call tracing. It should also manage all the incidents and generate event/alarms reports informing date, hour & severity level with colour indication according to the severity level of the alarm. This module must be able to centralize the alarms and events of the total system (including remote units if any). Optionally, the system should also have provision for configuring of automatic email alerts for notification of faults.

5.5.4 Accounting

Accounting of all calls generated by the users including cost, date, hour. Must provide different options to group the monitoring of the calls (cost center, extension number, trunk, user, city/area associated to dialled numbers). EPABX system should have buffer of last 30 days / last 15,000 call details in case of Call billing system/ management system failed.

5.5.5 System backups and Restore

The management system should have the provisioning for taking manual as well as scheduling of automatic periodic backup of complete system & data in Flash RAM / Flash Disk / Hard disks/CD/DVD for at least for one year and capable to restore the back up in EPABX Call server.

5.5.6 Reports

Provision for generation of reports in printable formats for Faults, Alarms, Call Accounting etc. The exchange must provide real time data of call details on the LAN for subscriber extensions at project office and remote location and these details must be captured on a dedicated CDR station.

All Software and hardware required for this is in the scope of vendor. The CDR capturing software must store the data in a database for exchange and provide customized reports in front-end.



5.5.7 Call management/logging traffic Statistics

The software offered should have adequate call management facilities and generate logs and collect traffic statistics for each extension/group of extensions, the number of calls made/failed during a day, duration per call, number dialled with date and time of call through screen display and report print out on request for continuous basis.

5.5.8 System restoration/ recovery procedures

The operating software should be able to adequately handle and be able to restore the system after various failures and recover to the best extent possible to degraded performance level, if failure persists, otherwise to normal state in the absence of any critical failures. Proper recovery procedures shall be available under various situations.

5.5.9 System Administration, Management and Monitoring System

Windows 10/11 based Desktop computer for Monitoring of the System. The vendor must provide required hardware and centralized GUI software for configuration, management and monitoring of the PBX system. It shall be possible to carry out maintenance and administration of the entire network (Servers and gateways) from a central location. Monitoring system shall provide a continuous real-time indication of the system status. All hardware and software required for this function except desktop computer is in the scope of vendor. The System should have provision of instant fault information.

5.5.10 Remote Units

The Central Unit of IP based EPABX system shall support provisioning, operation & management of Remote Unit(s) at different locations. The Remote Unit shall meet the following as a minimum:

- a. The Remote Unit shall be an integral part/unit of central IP based EPABX system. The integrating link/interface between the central EPABX system & Remote unit shall be an IP link (over LAN/WAN).
- b. All management functions like: System Configuration, Programming, Fault/Alarm management, and System database backup, Accounting/Logging of traffic/calls etc. for the connected Remote units shall be provided remotely from the central EPABX system.
- c. The Remote unit shall provide all features & facilities as those of central IP based EPABX system without the mandatory provision of redundancy of its common & control unit(s).
- d. The Remote Units shall provide following types of inter-office/unit both-way communications in addition to normal intra-office/unit communication:
 - Between central EPABX system and Remote unit over redundant IP Link
 - Inter Remote units (say between location-A & location-B) over TDM and/or IP trunk
 - Inter Remote units (say between location-A & location-B) via central EPABX system over TDM and or IP trunk
 - Between Remote unit and other EPABX system (other than central EPABX) over TDM link



- Between Remote unit and other IP EPABX system over IP links (other than central EPABX and running on same IP trunking protocol)
- e. Remote unit shall support survival mechanisms that allow them to maintain 100% of the telephony services for their user / trunk interfaces without any degradation in the intra & inter unit calls/traffic over available media / trunks, in case of failure in IP connectivity with central EPABX system for a minimum duration of 30 days. Once the IP connectivity between remote unit & central EPABX system is restored back, the remote unit shall work with central EPABX system, without any manual intervention.
- f. The Remote unit should be able to restart, reboot automatically & shall provide 100% of telephony service as mentioned.
- g. All components, modules, sub-systems of a Remote unit shall be able to operate in the input 230 VAC system.

5.5.11 Interoperability of other EPABX system

5.5.11.1 The IP based EPABX system should be able to inter-connect with GAIL's existing Alcatel, Coral, Tadiran, Ericsson, Siemens, Avaya EPABX systems through different types of Subscriber lines, Junctions, Analog, Digital and Compatible SIP/IP Trunks.

5.5.11.2 The IP based EPABX system shall work seamlessly in multi-vendor (Q-sig compliant) EPABX network environment with connectivity to PSTN. The Exchange shall support Q-Sig on PRI / BRI and shall be suitable of being networked with the existing ISDN EPABX systems with feature transparency.

5.5.11.3 IP Trunking: Offered IP Based EPABX system should be capable of providing seamless IP trunking with existing IP EPABX systems (equipped with IP /SIP trunking module) connected over LAN/WAN/VLAN and VPN/SVPN over public Data Network.

5.5.11.4 IP based EPABX system should be equipped and capable of taking power from at least two different power sources.

5.5.11.5 Each Shelf, Sub rack, media gateways (having same backplane for mounting system or peripheral board) shall be equipment with at least two different power supply modules.

5.5.11.6 Any other system peripherals which require different supply must be connected using suitable AC/DC converters designed to operate on round the clock basis. Use of AC/DC Adapters etc. is not acceptable for technical reasons.

5.5.12 Interfacing facilities

The IP based EPABX system shall be able to provide following interfacing facilities:

- a. All the Analog & Digital extensions should operate on two wires only.
- b. The exchange must support following trunk interfaces/protocols:
PRI trucking, IP / SIP Trucking and CO line trunking



5.5.13 Hardware Configuration

The bidder shall supply the same model of cards for any given type of extension/trunk interface such as Analog line, Digital extension line, BRI, PRI etc. for each site. Multiple models of cards for same type of interface are not acceptable. In general, following specification design guidelines should be strictly followed for delivering the offered IP Based EPABX system:

- All EPABX hardware should be 19” rack mountable
- Each media gateway/remote shelve should have at least 2x 10/100/1000 Mbps LAN ports supporting 1+1 or 1:1 configuration
- Each media gateway / remote shelf should be modular having minimum 09 universal slots per module without having any restriction of backplane bus capacity.
- Peripheral modules should support following hardware configuration:

Analog subscriber Board	= minimum 16 Circuits/ per Board
CO/ PSTN Trunk Board	= minimum 08 Circuits/ per Board
ISDN/ PRI Trunk Board	= minimum 02 Circuits /per Board

5.5.14 Main Distribution Frame (MDF)

Main Distribution Frame (MDF) for exchange side of supplied EPABX system shall meet the following as a minimum:

- a. Connectors : Genuine Krone LSA module equipped as per total wired capacity per site
- b. Type of enclosure : Metallic Fully covered Floor Mounted (Rack) Or Wall mounted (DB)
- c. Size : Should be sufficient to accommodate at least 2000 analogue ports
- d. Insertion tools : 4 No’s Genuine Krone Make at each site
- e. To be equipped with line protection units (IPM) fuse for all Trunk & CO lines.
- f. 100 number of Jack for line isolation and monitoring for each site

5.5.15 Earthing System

Vendor shall provide separate earthing arrangement, (if existing earthing system cannot be utilized) without any additional cost implication to GAIL at each location. The specifications for the telecom earthing system are as follows:

The pit will consist of a copper plate of 600 mm (W) x 600 mm (D) x 6 mm (T) being placed into the ground. Earth Pit shall have a minimum of 1.5 meter clearances from the walls of the building/ Shelter.

The earthing pit installation procedure shall be as per the following:

A pit of 2500 mm depth and 1000 mm diameter will be made. The copper plate 600 mm (W) x 600 mm (D) x 6 mm (T), the copper strip 25 mm (W) x 3 mm (T) and ¾” GI Pipe will be bolted with brass nut and bolt. The bottom of the pit will be filled with the charcoal and salt layers as shown in the diagram. Assembly of the electrode will be inserted in the pit and will be hold vertically till the next below mentioned fillings are made. The copper plate will be at the depth of

1.65 metres from the stiff soil. The copper plate shall be covered in layers of charcoal, salt and mud as shown in the drawing. The electrode is surrounded by a homogenous layer of highly conductive material. With average moisture content, this will form a conductive electrolyte throughout a wide region surrounding the earth electrode, thus reducing the earth resistivity. The earth resistance offered by this pit is less than or equal to 2 ohms for Telecom earth. For watering these layers, the GI pipe will



have holes of 14 mm diameter at equal intervals for water to flow in the pit to maintain the earth resistivity at regular intervals. This GI Pipe will have funnel on top to pour water and bolted with copper plate of size 250 mm (W) x 50 mm (D) x 4 mm (T) and this plate shall be laid horizontally as shown in the drawing. One insulated Copper cable (cross-section: 25 mm²) will be extended and connected to Telecom Earth Bus bar 250 mm (W) x 30 mm (D) x 5 mm (T) in Telecom room. The bar will be mounted on ceramic insulators. On completion of compacting the filling material a chamber of 400 mm(L) x 600 mm (W) will be prepared using bricks and cement around the earth electrode funnel. On curing of the cement, a MS cover plate 450 mm (L) x 450 mm (W) will be installed on top of the chamber for protection.

5.6 TECHNICAL SPECIFICATIONS OF ASSOCIATED ITEMS

Detailed technical specifications of following associated items are enclosed in these sections for designing, building and delivering the required site-specific configurations:

- 5.6.1 TECHNICAL SPECIFICATIONS OF 42 U, 19” RACK ENCLOSURE
- 5.6.2 TECHNICAL SPECIFICATIONS OF VOICE, DATA, SIGNAL AND POWER CABLES
- 5.6.3 TECHNICAL SPECIFICATION OF INSTALLATION MATERIAL
- 5.6.4 TECHNICAL SPECIFICATION OF IP PHONE
- 5.6.5 TECHNICAL SPECIFICATION OF OPERATOR CONSOLE PHONE
- 5.6.6 TECHNICAL SPECIFICATION OF GIGABIT MANAGED SWITCH
- 5.6.7 TECHNICAL SPECIFICATION OF POE SWITCH
- 5.6.8 TECHNICAL SPECIFICATION OF POWER SUPPLY SYSTEM
- 5.6.9 TECHNICAL SPECIFICATIONS DESKTOP WORKSTATION/CONSOLE PC FOR IP BASED EPABX SYSTEM
- 5.6.10 TECHNICAL SPECIFICATIONS OF LOCAL CRAFT TERMINAL

5.6.1 Technical Specifications of 24U, 19” Rack Enclosure

Industrial enclosure /Networking Rack to be provided at each EPABX locations to accommodate following equipment’s / subsystems:

- Communication Servers
- Central Unit Media Gateway, Peripheral shelves
- Remote Gateways, peripheral Shelves
- L2/L3 Switch
- Modular UPS (vendor may plan to keep the UPS outside the rack)
- SMF battery banks (vendor may plan to keep the battery banks outside the rack)
- Any other associated hardware
- Space for future up gradation

The offered equipment racks shall meet or exceed following specifications:

S/No.	Parameter	Min Specification
1	Make	OEM of IP EPABX/APW/PRESIDENT/RITTAL/SCHNEIDER/APC
2	Model	Vendor to Specify
3	Description	19”, 24U Rack Enclosure



4	Dimension	min 800x800 (WxD) in mm
5	Height	min 24U
6	Equipment mount	19 "rail
7	Front door	PERFORATED STEEL SINGLE DOOR WITH LOCK
8	Rear door	PERFORATED STEEL SINGLE/DOUBLE DOOR WITH LOCK
9	FAN	4 x 230V, 90 CFM – fitted at the top
10	Lighting	02x CFL (8W) /LED (3W) lights with automatic on/off Switch
10	Heavy duty shelf	to accommodate SMF batteries (vendor may plan to keep the battery banks outside the rack)
11	Shelves	to accommodate / support equipment's modules smaller than 19"
12	Mounting frames	as per site requirement
12	Support Angles	to support heavy modules - as per site requirement
14	AC distribution unit	as per site requirement
15	DC distribution unit	as per site requirement
15	Cable management	As per requirement
16	Earthing continuity	01 set
17	Material standard	Vendor to specify
18	Finish	Vendor to specify
19	Color	Vendor to indicate available options

5.6.2 Technical Specifications of Voice, Data, Signal and Power Cables

Specifications of Voice, data, control and signalling cables, connectors etc. shall be FTP/STP type and approved by OEM of EPABX system as per International/ National standards, practice and guidelines meeting the following as minimum:

Subscribers Cables : From Analog, Digital, ISDN subscriber interface module to Main Distribution Frame

Conductor type : Min 0.4mm tinned copper

Cable type : Shielded twisted color-coded pairs overall PVC insulated

Termination (EPABX end): Factory Assembled, Tested and pre-terminated connector with latch/locking mechanism

Termination at MDF end: Open for termination at site in MDF (Krone connector)

Capacity /Pairs : to match with number of ports available in subscriber modules

Digital trunk (PRI) interfaces cable: Screened EMC Shielded as per TIA/EIA/ITU/TEC standards



5.6.3 Technical Specifications of Installation Materials

All installation materials required for installation testing and commissioning of complete IP based EPABX systems shall be included in the scope of supply including the following as minimum:

S/No	Details/Locations/ Application	Material Description	Quantity
1	Routing of subscribers, trunks cables from EPABX Rack to Main Distribution Box	Min 12” Perforated Galvanized cable tray/Or heavy duty aluminum Ladder type cable tray with all hardware angles brackets etc. to accommodate all cable	As per Site requirement
2	Routing of AC cable Power supply cable	Min 2”x2” Solid PVC Conduit/Cable Drain	As per Site requirement
5	Routing of CAT 6 Patch cables inside equipment rack	Through horizontal and vertical cable managers (to be supplied with Equipment rack)	As per site equipment
7	Other hardware fittings - Anchor bolts, angles, cable ties, markers, Hook and loop ties, wraps, cable tags, flag ties, lugs, terminals, nuts and bolts etc.	For completing mechanical and electrical installation works	As per site requirement
8	Earthing Strip and Earthing conductors	Telecommunications Main Grounding Bushbars with Equipment Bonding Conductor min 6/10 AWG green wire with yellow horizontal stripe pre-terminated	One set for each site
9	Other hardware fitting		As per site requirement

5.6.4 Technical Specifications of IP Phone

Entry-Level IP Phone (Type-I) – To be provided with Power adapters

- 2 line, 2.3 Inches B&W display, Resolution =64X128
- IPV6 Support
- 2 SIP Accounts
- Hands-free and amplified listening modes with volume control
- 4 programmable keys
- Message key with LED
- Alphanumeric keyboard for dial by name.
- 2xEthernet switched Port
- 10/100 Ethernet Support
- EPABX OEM Make Only



- POE: Class 1

Entry-Level IP Phone (Type-II) – To be provided with Power adapters

- 2-line B&W display, Resolution =64X128
- IPV6 Support
- Hands-free and amplified listening modes with volume control
- Functional Keys 2 X 3
- 6 programmable keys
- Message key with LED
- Alphanumeric keyboard for dial by name.
- 2xEthernet switched Port
- 10/100/1000 Ethernet Support
- EPABX OEM Make Only
- POE: Class 2

Mid - Level IP Phone (Type-III) - To be provided with Power adapters

- 6-line High Resolution, 240 X 320 pixels,3.5” Colour display
- IPV6 Support
- Hands-free and amplified listening modes with volume control
- Functional Keys 2 X 5
- 6 programmable keys
- Message key with LED
- Alphanumeric keyboard
- 2xEthernet switched Port
- 10/100/1000 Ethernet Support
- POE: Class 2 ,Energy Efficient Feature, Power Saving in idle condition
- EPABX OEM Make Only

High - Level IP Phone (Type-IV) - To be provided with Power adapters

- 5.5” touch screen Colour display , 720*1280 Pixels
- IPV6 Support
- Hands-free and amplified listening modes with volume control
- Functional Keys 2 X 5
- 6 programmable keys
- Message key with LED
- Acoustic echo cancellation
- Bluetooth support
- Alphanumeric keyboard
- 2xEthernet switched Port
- 10/100/1000 Ethernet Support
- POE: Class 2 ,Energy Efficient Feature, Power Saving in idle condition
- EPABX OEM Make Only

The offered IP phone (both Type-I and Type-II) must be best in the class of OEM and must include following features as a minimum:



- a) Desktop digital telephone with tilted/elevated support/stand.
- b) Messages wait Indicator.
- c) Incoming call indication through Display and Optical (Visual) Alert
- d) Incoming call indication (thru display/Optical alert)
- e) Four (4) ways keys for menu navigation.
- f) Incoming Speech Gain Control.
- g) Ringer Volume Control.
- h) Full Speakerphone with high audio quality in Hands-free operation (full Duplex) & mute facility.
- i) On-Hook dialling from keypad (no need to press speaker, line, or other function keys, before dialling a telephone number).
- j) Hot dialling from keypad for transfer, conference (no need to press hold, flash or other function keys, while a conversation is already in progress)
- k) Adjustable Handset and Monitor speaker volume.
- l) Optical call alert (LED/LCD) for incoming call
- m) Alphanumeric keypad for dial-by-name
- n) Make: OEM of EPABX system only

Offered Desktop IP Phone of both makes shall be included in POC testing for verifying Build quality, aesthetics, ruggedness, ease of operation and technical features, functions etc.

5.6.5 Technical Specifications of Operator Console IP Phone (Attendant)

IP Phone Based Operator Console should support following features:

- Phone based operator console with minimum 8 programmable Hard keys and 10 programmable keys module.
- Operator Console Phone with Colour Display and Loudspeaker functionality.
- Alarm LED indicating Calls and alarm status.
- An information bar indicating the current date and time displaying icons
- Transfer on no Answer
- Transfer on Busy
- Barge-in on Busy or Partially Busy
- Directory access with Qwerty keyboard .

- Automated Attendant (AA) - The enterprise welcome service (Automated Attendant) is an essential service to handle external (or internal) calls. It allows a caller to be guided to the correct company department or user, and it may be used to assist attendants when there are too many simultaneous calls. In all cases, the purpose is to ensure that no call goes unattended.



5.6.6 Technical Specifications of minimum 10 Port L2 Managed Switch

Connectors / Port Requirements:

Ports -Min. 10x10/100/1000T

Uplink Ports -2 Nos 1 Gbps with SFP+ (Single mode SFP 1000Base-LX for Single mode Fiber.)

Interface -RJ-45, 4 x SFP+

Switch Fabric Capacity

- Min. 24 Gbps (Full duplex) switching bandwidth Features
- Min. 16,000 MAC Addresses Support, Min. 4000 VLAN Support, IPV4, IPV6 Compliant

Switching services

- L2 switching, Port Aggregation Protocol 802.1Q (VLAN)
- IPv4/IPv6 Routing , Classless Inter-Domain Routing, OSPF, Routing Information Protocol version 2
- Jumbo Frame Support

Management

- Web, SNMP, Console
- Support for Port Mirroring & Remote Monitoring USB Port / Console File backup

QOS

- 802.1 P (Traffic Prioritization)
- 802.1x Port based network access control
- ACLs based on source and destination MAC addresses Support for Private VLAN / Port Isolation or Equivalent 802.1D, Spanning-Tree Root Guard
- MAC address Locking
- Rack Mounting
- Max 1U size

5.6.7 Technical Specifications of POE Switch

1. 24 Port POE Managed

2. Connectors / Port Requirements

Min. 24 UTP Ports – Autosensing 10/100/1000 Mbps (POE Enabled)

With two 1G* RJ45/SFP combo, 2 SFP+ (1G/10G) uplink or VFL ports.

3. Switch Fabric capacity

Min. 128 Gbps (Full duplex) switching bandwidth and forwarding rate 68 Mbps

4. Features

- Min. 16000 MAC Addresses Support



- Min. 4000 VLANs Support
- IPV4, IPV6 Compliant from Day One

5. Switching Services

- L2 Switching, Port Aggregation Control
- 802.1Q (VLAN)
- Should support DHCP RFC 2131

6. Management

- Web, SSH, Telnet, SNMP, Console
- Support for Port Mirroring & Remote Monitoring
- USB Port / Console file backup

7. QOS

- 802.1 P (Traffic Prioritization)
 - Policy-based QoS
 - Auto QoS for switch management traffic
- Priority Queues: Eight hardware-based
 - queues per port
 - SPQ
 - WRR

8. Security

- 802.1x Port based network access control
- ACLs based on source and destination MAC addresses
- Support for Private VLAN / Port Isolation or Equivalent
- 802.1D, Spanning-Tree Root Guard
- MAC address Locking
- SSHv2 and SNMPv3, DHCP snooping, IGMPv3 snooping, IGMP Filtering
 - Prevention from ARP attacks
 - Web based Authentication
 - Built-in CPU protection against malicious attacks
 - RFC 2284 PPP EAP
 - RFC 1826/1827/4303/4305 Encapsulating Payload (ESP) and crypto algorithms
 - RFC 2104 HMAC Message Authentication

9. POE

- Min. 15W for each Ethernet port
- Minimum total POE Power Budget of the switch should be at least 380W

10. Rack Mounting



- Max 2U size
- OEM Rack Mounting Kit to be provided
- All necessary cables – power & accessories should be supplied.

11. Approved Makes: OEM of IP EPABX OR Rad, Tejas, ECI, Cisco, NSN, Enterasys, Alcatel Lucent, Avaya, Moxa, Juniper, Moxa, HP ,TeLCO, Overture, Erricsson,

5.6.8 Technical Specifications of Power Supply System

All units/components of IP based EPABX system (like: Core Servers, Media Gateways/Remote Gateways etc.) shall operate with 230 VAC input. GAIL shall provide 230 V AC (raw) at a single point only. However, vendor has to install rack mountable UPS system with a backup provision of minimum 24 hours. Only SMF batteries are to be used. The UPS system is to be designed considering 40% additional load capacity,

5.6.9 Technical Specifications of Desktop Workstation/Console PC

Application: Offered desktop Workstation PC Console should be designed for heavy-duty applications to run round the clock basis without need for any preventive maintenance, shutdown etc. for the following type of applications and services:

- 1) Installation and running of Call monitoring and Billing Application
- 2) Installation and running of EPABX NMS, Maintenance console and other services.

S/No	Parameter	Specification
1	Make	Dell/HP/IBM/ Lenovo
2	Model	Vendor to Specify
3	Application	For running EPABX Applications and Functionalities on round the clock basis (24 x 7 x 365 days)
4	Type	Workstation PC designed to operate on 24x7 basis
5	Orientation	Horizontal / vertical
6	Processor	Min Intel® Corei5 Processor of latest configuration
7	Operating System	HW should support Windows(R) 10/11 Professional 64bit
8	Security	Licensed Genuine Antivirus, spam/malware filter, Internet security software to be provided preloaded by the vendor with up to 5 years subscription.
9	Chassis	Minitower/other
10	Display	To be supplied with Min 21” Widescreen Flat Panel Monitor of same OEM
11	Memory	Min 8GB
12	Hard Drive	Min 1TB SATA (10,000RPM) Hard Disk Drive,
13	Optical Drive	16X max SATA DVD+/-RW with Dual Layer Write Capabilities
14	Video Card	Min NVIDIA Quadro 600 or Equivalent (1GB)
15	Network Cards	Min 1x 10/100/1000 Ethernet



16	Keyboard	Enhanced Multimedia USB Keyboard
17	Mouse	USB Optical Mouse
18	Speaker	Internal Speaker
19	Usb Ports	Min 4 Nos
20	Software	Genuine OS CD with License Genuine Antivirus / Security CD with license, Microsoft office 2016 or higher System recovery CD/DVD Resource /Utility DVD Burning SW

5.6.10 Technical Specifications of Local Craft Terminal

Laptop - Intel Core i5 11th Gen or better, 8 GB RAM or more, min. 256 GB SSD, 1 TB HDD, min. 14" display, Windows 10/11, MS Office, Antivirus with min. 2 year validity. The laptop must have inbuilt LAN port.

GUIDELINES FOR CONDUCTING POC

To verify completeness of technical solution offered by the bidder for this tender, the bidder will provide Proof of Concept (PoC) without any cost implication to GAIL in presence of GAIL’s representatives in line with the following. Not carrying out the PoC by the bidder will lead to rejection of their bid:

1. Proof of concept shall be in the form of a technical presentation of offered IP based EPABX by the bidders clearly explaining design concepts and selection of particular solution submitted in technical part along with demonstration of samples, equipment etc. as per technical specifications.
2. The PoC will be carried out as part of the technical evaluation of the bids before the opening of price bids. Bidder must qualify for Technical BEC criteria before PoC. GAIL shall intimate the bidder 7 days in advance for undertaking PoC by the bidder.
3. The PoC shall be carried out at GAIL Jaipur and shall be completed within 1 day (inclusive of setup and demonstration) by the bidder.
4. During the PoC, the bidder shall clearly explain their technical offering/solution, submitted with the technical document. Following points needs to be included in the POC presentation as a minimum:

Design considerations and selection of particular solution shall be clearly explained during PoC.

System capabilities, features, functions etc. shall be clearly explained by referring the same BOM and HW /SW version as offered in the tender consisting of (1+1) communication servers, media gateways, remote shelf interconnected over LAN /WAN and all other functions and features as mentioned in the tender document.

Vendor has to explain switching capability and other technical functions covering the following as minimum:

- System redundancy feature
- 100% IP configuration with server and IP phones using LAN/WAN network



- IP-TDM mixed configuration
- Networking capabilities
- IP trunking capability
- NMS capability
- Voice quality using different encoders /compression techniques

Demonstration of feature and function of offered Digital Phone and IP phones design considerations and selection of particular solution shall be clearly explained during POC.

The PoC report, enlisting the observations made during PoC test and jointly signed by the representatives of GAIL & bidder, will be considered under the technical bid evaluation.

The PoC shall in no way absolve the successful bidder from his responsibility & obligations under the contract for the successful completion of the project.

It would be responsibility of the bidder to bring all relevant details (specifications, standards, approvals, drawings, certifications etc. for successfully conducting PoC.

TECHNICAL SPECIFICATIONS COMPLIANCE SHEET

Instructions: Compliance to each & every Specification/ parameter shall be clearly indicated as YES/NO in COMPLIANCE (In case of compliance write YES in column “YES” & in case of non- compliance/deviation write NO in column “NO”)

Sr. No.	Specifications/features	Compliance
1	1+1 Hot Standby CPU system with duplicated and redundant configuration	
3	All the components of IP based EPABX system & IP telephones should support IPV6	
3	EPABX System shall support CLI with name for all IP, digital	
4	Programming through GUI web Interface	
5	Should display call log(missed call, received calls etc.) for Digital and IP Subscribers	
6	Dial by name for Operator Console ,Auto-Attendant ,Reception feature	
7	Dial by name for Digital Key Phone, IP Phone	
8	Compatibility with other GAIL EPABX system of Alcatel, Ericsson, Siemens, Unify ,Coral, Avaya Global Connect etc.	



9	Trunk features:- Support all signaling standards. Q-Sig Compatibility with all features. Area code restriction. Silent Monitoring. Night attendant Console.	
10	Installation of software and programming the exchange to suit the user specifications	
11	TEC Certificate enclosed	
12	Detailed catalogues having features and specifications of the offered make and model of EPABX System enclosed with tender document	
13	Offered EPABX system complies all the technical specifications .	
14	Make of the offered EPABX System Mention Make: Product Catalogue Enclosed:	
17	Make and model of Switch Mention Make: Mention Model: Product catalogue Enclosed:	

BMS DESIGN BASIS REORT
FOR
EASTERN REGION HEADQUARTER FOR
JHBDPL AT, RANCHI, JHARKHAND
GAIL (INDIA) Limited



Building Management System

General

The Building Automation System (BACS) supplier shall furnish and install a fully integrated building automation system, incorporating direct digital control (DDC) for energy management, equipment monitoring and control, suitable for the building usage. The control strategies shall be developed to ensure that the specified environmental conditions are maintained, whilst giving due regard to minimizing of energy consumption.

The system design shall utilise the latest technology in “open” network architecture, distributive intelligence and processing, and direct digital control. The BACS system offered should be from the latest offerings and should be of freely programmable management and automation stations for the full spectrum of today’s building application services.

The system offered shall be completely modular in structure and freely expandable at any stage from the smallest system through to large distributed systems. Each level of the system shall operate independently of the next level up.

To provide maximum flexibility and to respond to changes in the building use, the system offered shall support the use of BACnet, LON, Profibus and Ethernet TCP/IP communication technologies.

The contractor shall establish the number of equipment to be controlled / monitored by the BMS from the drawing/ schedule/ specifications. This information shall be furnished to the BMS supplier. All plant and equipment requiring control and / or monitoring functions shall be fitted with all necessary interfacing equipment readable by the BMS network. The contractors shall co-ordinate and ensure that this equipment shall provide the required signals to the BMS.

Essential functions of system

The system comprises the supply, engineering, testing and commissioning of an integrated building management system by a specialist manufacturer.

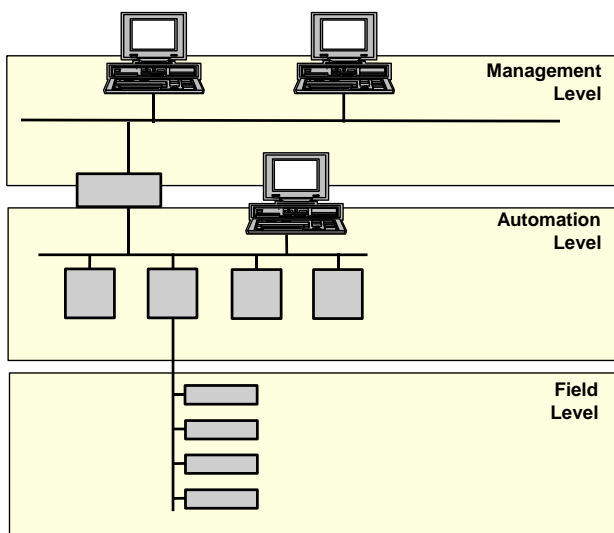
The essential functions of the system are as follows:



- Centralised air conditioning systems (remote control)
- CCTV Camera Security connected for control optimization
- Server files & networking management.
- Telecommunication System connected for control optimization.
- Control optimisation of all connected electrical
- Tenant Billing
- Early recognition of faults
- Faults statistics for identification
- Trend register to identify discrepancies, energy consumption, etc.
- Preventive maintenance
- Optimum support of personnel
- Prevention of unauthorised or unwanted access
- Own error diagNos.,is integrated system
- AutoCAD integration

General System Architecture

The system shall be logically structured into three distinctive levels, which are Management Level, Automation Level, and Field Level. Each level shall be autonomous from the other. Peer to peer communication shall be possible on all system levels and the system design shall be modular in structure to allow straightforward extensions.



Use of communication standards



Only the following standards are appropriate to be used at the three levels.

- Management level - BACnet, Ethernet TCP/IP
- Automation level - BACnet on LonTalk
- Field level - LonTalk with LonMark profiles

Management Level

The head-end management and operation of the plant shall include process visualization, data analysis, and exchange of data with 3rd parties. At the management level, it shall be possible for communication to flow in all directions, across networks and via direct connections.

Personal computer based operator management stations shall be provided for plant supervision and operation, alarm management, information and database management function. All real-time control functions shall be resident in the DDC controllers to facilitate greater fault tolerance and reliability.

The operator management station should be capable of multi-tasking 32-bit programs by utilizing a Microsoft latest Windows.

The management level of the system shall consist of one, and shall be capable of handling more management station PCs and the Associated software modules. The number of total number of management station PCs shall be as described elsewhere in the specifications.

The management station shall be capable of the following:

- Display of graphical representations of the plant overlaid with live data
- High quality dynamic graphics with true multitasking of all active pages
- Monitor and operate / influence process devices
- Receiving of alarm messages from the process level and directing them to the appropriate reporting device e.g. printer, pager, fax, e-mail
- Monitor process devices for communication problems and other device faults.
- Alarm handling – all the alarms shall be displayed in a graphical tree structure in order located alarms quick and easily.



- Adjusting time strategies in the process level.
- Long term storage of logged data from the process devices
- Multi level user access control for individual access to sites, applications, functions and objects
- Display graphically the logged data
- Custom application programming
- Use of graphical genies to allow manipulation of data.
- The user interface shall be based on a basic taskbar, which is always visible.
- History logging for alarms, user actions, system events and messages
- Alarm handling – all the alarms shall be displayed in a graphical tree structure in order located alarms quick and easily.
- Simultaneous connection of at least of 4 sites via serial connections / 50 sites via LAN/WAN connections for a comprehensive overview on geographically distributed projects

For maximum fault tolerance, the management stations connect to the process level via point-to-point communications. This shall be via RS232, Ethernet/TCP/IP LAN / WAN or via AutoDial links.

Automation Level

General Purpose controllers shall be used for monitoring / controlling equipment which have to perform based on a customized logic, such as air conditioning equipment controlling & monitoring, signals from Fire Alarm panels, generators, transformers etc.,.

At the heart of the DDC system shall be the Microprocessor based modules, which can be individually programmed according to the functional requirements.

The automation level DDC controllers shall monitor and control the main plant in the building. The DDC controller outstations shall be freely programmable and have the ability to perform all the following routines

- Process control & interlock functions.



- Generate alarms/events based on comparing measured values against known parameters.
- Time control strategies
- Runtime tantalization
- Trend logging of specific data-points with transmission of the logged values to the management level
- Energy calculations
- Backup of the data/program

The DDC controllers shall be selected from either a modular or compact type of unit to suit the most economic inclusion of all the data points specified. Each control module shall be capable of operating on a stand-alone basis without control from a central computer..

The input/output connection to Modular controllers shall be via individual plug-in modules suitable for the particular peripheral device. The digital modules shall have visual indication of the status of the input/output. Digital input modules shall be capable of accepting control voltages up to 230vac and will have integral status indication.

It shall be possible to integrate both types of control module onto the same BACnet communication network. Each controller performance shall be to 0.5% control accuracy with sample rates of less than one second.

Main plant DDC controllers shall be 16 / 32 bit freely programmable. Controllers meant for VAV controls cannot be used as DDC controllers.

All DDCs must be UL approved, must have an in-built real time clock and be suitable for PID control.

The products used in constructing the BMS management and automation levels shall conform to BACnet protocol on a LONtalk data communications network, for building automation and control networks. All product types shall have attained a BACnet Testing Laboratories (BTL) listing and display BTL logo.



Room units shall utilize a two-wire communication link at each controller for the acquisition of room temperature and local set point. These will also provide an integral temperature/set point digital display

The system shall have the facility for a Web server to be added to allow full operation of all automation station control modules connected to the LonTalkBACnet network via a standard thin client/web browser. Functions to include

- Display of graphical representations of the plant overlaid with live data
- Data point display and operation of all measured values, set points, plant states, operating states and parameters
- Alarm monitoring with acknowledgement and visual and audible alarm indication.
- Alarm and event history
- Alarm transmission via SMS and e-mail
- Operation of all time schedules, exception calendar and heating curves.
- Reading of trend data with facility to export data to Microsoft Excel.
- Multi user level access protection
- Ethernet or Modem connection

DDC Control Module

The DDC controllers shall be selected from either a modular or compact type of unit to suit the most economic inclusion of all the data points specified. The DDC controllers being used should confirm to the following specifications as a minimum:

- Based on ANSI/ASHRAE standard 135-2001 (BACNet), ENV13321-1
- Operation standalone or as part of LonTalk (clause 11) system network TP/FT-10, 78kBits with Built in BACnet/Lontalk interface
- Optional connection to operator terminal, management station and via Web browser with Web server device.
- Freely Programmable
- Flash ROM, real time processing and multi tasking
- 32 bit dual processor system, 1.5 MB program memory
- Supply voltage AC 24V +/-20% 50/60 Hz
- Event driven data transmission
- Automatic mains recovery
- PPS2 connection for up to five two wire QAX room units
- Digital output to be 250V 2A rated changeover contacts



- Historical data memory storage
- Software application stored in memory
- Battery back up

For the generation of the application programs, the following function elements are required as a minimum.

- Reset functions
- Set point jump
- Positioning time
- P-controller (reverse or direct acting)
- PI-controller (reverse or direct acting)
- PI-controller with I-deletion (reverse or direct acting)
- PID controller (reverse or direct acting)
- 2-point controller (reverse or direct acting)
- Proportional additional sequences (reverse or direct acting)
- Data transmitter (digital or analogue)
- Data converter (analogue-digital or digital-analogue)
- Ring Counter
- Timer (switch on or switch off)
- Logic operations:
 - logic "AND" (2,3 or 4)
 - logic "OR" (2,3 or 4)
 - logic "EXOR"
 - logic "NOT"
- Comparative operations:
 - Maximum values (2,3 or 4)
 - Minimum values (2,3 or 4)
 - Average values (2,3 or 4)
- Enthalpy calculation
- Optimiser
- Mean value calculation
- Hysteresis
- Output steps (digital or analogue)

Digital outputs shall be potential free outputs. Analog outputs shall be true analog outputs (0-10 V DC, 0-20 V DC, 0-20 ma & 4-20 ma)

Above blocks shall be resident in the DDC Controllers and independent of any high level interfaces/controllers.



Further, the DDC unit software must have the following additional functions:

Free selection of range and unit (dimension) of all signals (measured values, accumulated values, calculated values, etc.)

Free allocation of access protection in accordance with operating priorities

Free definition of manual override priorities (software) from operator terminal and/or management station.

Each DDC Controller shall have a resident real time clock with a battery back up.

All DDC controllers shall be housed in IP 54 enclosures with proper termination of peripheral devices at the terminal strip and not directly to the controller.

Field Level

Individual terminal unit controllers for autonomous room – by – room comfort control, based on application specific logic written on the controllers. All the terminal unit controllers shall fulfil following general requirements:

- LONMARK communication
- AC230 V power supply
- Mountable with screws or DIN rail
- Optional terminal cover for local installation without cabinet
- Downloadable application software /adjustable parameter set, the type of use shall be defined by downloadable pre-tested application software.

Common functions like grouping, scheduling, etc., shall be realised within a master controller on automation level.



All terminal unit controllers supplied on the project shall have the facility for local set point adjustment via a room unit.

Application specific controllers shall be used for terminal devices such air-conditioning equipment and the like. These controllers shall be with LonMark compatible bus communication. Any failure problem in communication bus should not affect the working of the controller. A dedicated stand alone controller shall be provided for each IDU. A common controller for IDUs serving different areas shall not be acceptable. These controllers shall be looped with a bus cable and connected to the BMS via an interface unit.

In general they shall comply with the following specifications

- For control & monitoring fire alarm systems
- For control & monitoring CCTV & Security systems
- Telecom operation
- For control & monitoring all electrical equipment
- Downloadable application software
- LonMark compatible bus communication
- To be integrated to the management software
- Operating Voltage □ 230 V
- Internal fuse, thermal, automatic reset

The application specific controllers shall be capable of working in conjunction with the following type of room controllers. The specific type of room controller to be used in specific applications shall be selected from any one of the following types to meet the description written in the sequence of operation.

TYPE 1

- Integrated room temperature sensor

TYPE 2

- Integrated room temperature sensor
- Dial for temperature set point



TYPE 3

- Integrated room temperature sensor
- Dial for temperature set point
- Rocker switch for off/auto1 mode (single speed fan)

TYPE 4

- Integrated room temperature sensor
- Dial for temperature set point
- Rocker switch for off/auto1 mode and fan speeds (3 speed fan)

TYPE 5

- Integrated room temperature sensor
- Dial for temperature set point
- Rocker switch for off/auto1 mode and fan speeds (3 speed fan)
- LCD display of measured temperature

TYPE 6

- Integrated room temperature sensor
- Rocker switch for temperature set point (raise/lower)
- Rocker switch for off/auto1 mode and fan speeds
- LCD display of measured temperature
- Communication with controllers via Lon bus
- Exchangeable rocker switches for lighting and blinds
- Selection of downloadable software applications for the operation of lighting and blinds
- Operating mode 'auto' –comfort, 'off' – standby or economy

Networks & File Servers

Wherever the building configuration supports in - built network cables, the system shall be able to accommodate several PCs hooked up at locations designated by the user at a later date. The management station software shall support the two leading network systems, Windows NT Advanced Server and NOVELL NetWare.



The management station(s) shall be set up on the network in two different ways, either operating independently or as client management stations in conjunction with an (optional) file server.

To facilitate central storage of data and programs, the file server is envisaged. Central management of user-specific information such as passwords and protected access to data and programs shall thus be made easily possible. The file server shall also support software updates and changes in the project data. The file server shall also support consistent central archiving of alarms, off-line trend data, log data, graphics, data backup etc.

Printing

It shall be possible to connect printers either directly to the management station or to the file server.

Remote Monitoring and Control (Optional)

It shall be possible, with additional hardware if necessary, to interrogate the system remotely via the following possible methods:

- Telephone connection
- Building IT network
- Web browser technology with password access via IT networks accessing information stored on dedicated embedded web server device installed on automation controller network.
- Alarm reporting to mobile pagers/phones/e-mail etc
- Energy usage monitoring and control via Design Insight Building Management Systems.

BMS – Records

General



The details of the building automatic system shall include all the manufacturers Technical Data Sheets and User Manuals. Control valve schedules shall be provided the flow rates; valve pressure drop and system design basis on which the particular valve type was selected.

DDC Control System Software Strategies

Controller strategies shall be provided, in both hard copy and on CD-ROM, for inclusion in the Operating & Maintenance Manuals.

Copies of all the preliminary strategies, in both hard copy and on CD-ROM, shall be supplied to the Engineer prior to commencement of control systems commissioning.

Copies of all the 'As Installed' strategies, in both hard copy and on CD-ROM, shall be supplied to the Engineer within three months of hand over of control systems.

Hardware Requirements

DESKTOP COMPUTER

Type : core i7 5th generation (windows 10 pro)

RAM : 16 GB

Hard Disk : > 1TB HDD

Graphics card : Latest

Monitor : 21"

Printer : 132 column, dot matrix, black & white

CD drive, multimedia kit, modem card



BACnet Routers

In addition to exchanging data with the management station and the other Controllers in the same network, a further capability of transferring non-critical, global data between DDC modules in different groups (i.e. on different buses).

The BMS offered must be capable of being extended with controllers on the BACnet protocol and the LON bus.

The BMS must allow integrating future BACnet controllers on the process level and providing inter-process communication with existing controllers.

The BMS must allow to be extended with controllers on the BACnet protocol and the LON Talk technology.

The BMS must allow for integration of BACnet devices on the process level via LON bus and on the management level via Ethernet TCP/IP.

DDC LON network

This network shall allow the DDC modules to communicate with each other and provides the user with access via the operator terminal to all the connected DDC controllers.

- The DDC controllers, wherever used, within the same enclosure, should be connected to each other via flat bus cable and it should have the DATA network cable between distant controllers.
- Upto 30 DDC modules, and a maximum of 10 operator terminals may be connected to one DDC LON network.
- Data must be kept even in the event of power failure. Power failures and peak loads must not cause data loss.
- Permanent self-monitoring of the system must be ensured by integrated test and service functions.
- Suitable interfaces and appropriate in/outputs must allow the integration of all electrical and mechanical equipment.

Tender Inviting Authority: GAIL India Ltd

Name of Work: Project : INTERIOR, MEP AND RELATED WORKS FOR OFFICE BUILDING AT RANCHI, JHARKHAND

Contract No: GAIL/NOIDA/C&P/PROJ/INT. WORKS-OF RANCHI/23-58

Name of the Bidder/ Bidding Firm / Company :							
PRICE SCHEDULE							
(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)							
Sl. No.	Item Description	Item Code	Quantity	Units	UNIT RATE INCLUSIVE OF ALL TAXES & DUTIES EXCEPT GST (CGST & SGST/UTGST or IGST) (Rs. In Figures)	TOTAL AMOUNT INCLUSIVE OF ALL TAXES & DUTIES EXCEPT GST (CGST & SGST/UTGST or IGST) (Rs. In Figures)	TOTAL AMOUNT INCLUSIVE OF ALL TAXES & DUTIES EXCEPT GST (CGST & SGST/UTGST or IGST) (Rs. In Words)
1	2	3	4	5	13	53	55
1	CIVIL AND INTERIOR RELATED WORKS	1					
2	SECTION-A: EARTHWORK	A					
3	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, for all leads and all lifts, disposed earth to be levelled and neatly dressed. All kinds of soil	A.1	50.00	M3		0.00	INR Zero Only
4	Disposal of excavated excess earth/ rock away from the site including conveyance of materials upto an average lead of 5 KM away from the site, and corresponding required lift, loading, unloading etc. complete as directed by the Engineer-in-charge. (The quantity considered shall be net quantity of capacity of truck after deduction of 20% for looseness) (Considering the maximum disposal location at 5 KM distance and is to be done at designated area as per prevailing local norms at Contractor's own responsibility including any royalties, etc. all) By mechanical transport including loading, unloading and stacking. (Lead upto 5 KM away from the site)	A.2	40.00	M3		0.00	INR Zero Only
5	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, for all leads and for all lift.	A.3	10.00	M3		0.00	INR Zero Only
6	Surface dressing of the ground including removing vegetation and inequalities and disposal of rubbish, for all leads and all lifts. All kinds of soil	A.4	75.00	M2		0.00	INR Zero Only
7	Excavating, supplying stacking, filling and compaction of Locally available Good earth/ Moorum (including royalty) by mechanical transport for all leads also including ramming and watering of the earth in layers not exceeding 20 cm and compacted complete.	A.5	5.00	M3		0.00	INR Zero Only
8	Extra for Disposal against item No. A.2 and J.61 beyond 5 KM per additional KM per Cubic metre away from the site, of excavated excess earth/ rock/ complete unserviceable material/ debris/ steel/ moorum/ building rubbish/ malba/ similar unserviceable, dismantled or waste material including conveyance of materials as directed by the Engineer-in-charge. (At designated area as per prevailing local norms at Contractor's own responsibility including any royalties, etc. all) By mechanical transport including loading, unloading and stacking. (PER means per additional KM per Cubic metre)	A.6	50.00	PER		0.00	INR Zero Only
9	SECTION-B: CONCRETE WORKS	B					
10	Providing and laying in position cement concrete of specified grade INCLUDING the cost of centering and shuttering - All work at all level: 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	B.1	5.00	M3		0.00	INR Zero Only
11	SCREED CONCRETE Providing and laying in position cement concrete of specified grade INCLUDING the cost of centering and shuttering - All work : Concrete 1:3:6 (1 cement:3 Coarse Sand:6 graded stone aggregate 20 mm nominal size) of 70-75 mm average thickness.	B.2	7000.00	M2		0.00	INR Zero Only
12	Providing and injecting approved grout in proportion recommended by the manufacturer into cracks/honey-comb area of concrete/ masonry by suitable gun/pump at required pressure including Providing and inserting 12mm dia galvanised steel injection nipple in honey comb area and along crack line including drilling of holes of required diameter (20mm to 30mm) up to depth from 30mm to 80mm at required spacing and making the hole & crack dust free by blowing compressed air, sealing the distance between injection nipple with adhesive chemical of approved make and allow it to cure complete as per direction of Engineer-In-Charge and cutting of nipples after curing etc. complete as per directions of Engineer-in-Charge. (The payment shall be made on the basis of actual weight of approved grout injected.) Epoxy injection grout in concrete/ RCC work of approved make	B.3	200.00	KG		0.00	INR Zero Only
13	Providing and laying cement concrete/ RCC in parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor and all similar places of retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses etc., at all levels, INCLUDING the cost of centering, shuttering and finishing but EXCLUDING the cost of reinforcement: 1:1½:3 (1 cement : 1½ coarse sand : 3 graded stone aggregate 20 mm nominal size)	B.4	5.00	M3		0.00	INR Zero Only
14	SECTION-C: REINFORCED CEMENT CONCRETE WORKS	C					

15	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland / Portland Slag cement , admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads and heights : INCLUDING the cost of centering, shuttering (for all elements and shuttering for slab upto 6.0 mtr. height (in single length)), finishing but EXCLUDING the cost of reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement. All works (Suspended floors, roofs, landing, beams, column, slab and balconies, Retaining wall, Foundations, footings, bases of columns, Walls (any thickness) including attached pilasters, buttresses, plinth and string courses, Lintels, beams, plinth beams, girders, bressumers and cantilevers, Columns, Pillars, Piers, Abutments, Posts and Struts, stairs, etc.) at all level: Concrete of M25 grade with minimum cement content of 330 kg /cum	C.1	2.00	M3		0.00	INR Zero Only
16	Add for using extra cement in the items of design mix over and above the specified cement content therein up to 10% of the minimum specified cement content in design mix (QT means Quintal here)	C.2	2.00	QT		0.00	INR Zero Only
17	Steel Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete at all level: Thermo-Mechanically Treated bars of grade Fe-500D or more	C.3	300.00	KG		0.00	INR Zero Only
18	Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections.	C.4	5.00	M		0.00	INR Zero Only
19	SECTION-D MASONRY WORK	D					
20	Brick work with non modular fly ash bricks conforming to IS:12894, class designation 7.5 average compressive strength all works at all level in: Cement mortar 1:6 (1 cement : 6 Coarse sand)	D.1	50.00	M3		0.00	INR Zero Only
21	Half brick masonry with non modular fly ash bricks of class designation 7.5, conforming to IS :12894 INCLUDING providing and placing in position 2 Nos 6mm dia. M.S. bars at every third course of half brick masonry all works at all level in: Cement mortar 1:4 (1 cement : 4 coarse sand)	D.2	50.00	M2		0.00	INR Zero Only
22	SECTION-E: FINISHING WORK	E					
23	12/ 15 mm cement plaster of mix : 1:6 (1 cement: 6 coarse sand) INCLUDING Scaffolding at all levels	E.1	200.00	M2		0.00	INR Zero Only
24	6 mm cement plaster for all heights including scaffolding etc. complete of mix : 1:3 (1 cement : 3 fine sand)	E.2	50.00	M2		0.00	INR Zero Only
25	Extra for providing and mixing water proofing material in cement plaster work in proportion recommended by the manufacturers. (PER means per bag of 50KG Cement Used in Mix here)	E.3	40.00	PER		0.00	INR Zero Only
26	Providing and applying Plaster of Paris putty of 2 to 4 mm thickness over plastered surface to prepare the surface even and smooth complete.	E.4	50.00	M2		0.00	INR Zero Only
27	Wall painting with acrylic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work INCLUDING primer complete	E.5	4500.00	M2		0.00	INR Zero Only
28	Neat cement punning	E.6	250.00	M2		0.00	INR Zero Only
29	Providing and applying white cement based putty of average thickness 2-3 mm , of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete	E.7	4500.00	M2		0.00	INR Zero Only
30	Distemping with 1st quality acrylic distemper , having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, INCLUDING one coat of water thinnable cement primer of approved brand and manufacture and applying additional coats wherever required, to achieve even shade and colour. Two coats	E.8	50.00	M2		0.00	INR Zero Only
31	Finishing walls with textured exterior paint of required shade : New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	E.9	50.00	M2		0.00	INR Zero Only
32	Finishing with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications : Painting wood work with Deluxe Multi Surface Paint of required shade. Two or more coat applied @0.90 ltr/10 sqm over an under coat of primer applied @0.75 ltr/ 10 sqm of approved brand or manufacture	E.10	100.00	M2		0.00	INR Zero Only
33	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work	E.11	50.00	M2		0.00	INR Zero Only
34	18 mm cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement : 5 coarse sand) finished with a top layer 6 mm thick cement plaster 1:6 (1 cement : 6 fine sand) - at all level including scaffolding etc. complete	E.12	50.00	M2		0.00	INR Zero Only
35	Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	E.13	50.00	M2		0.00	INR Zero Only
36	White washing with lime to give an even shade : New work (three or more coats)	E.14	5000.00	M2		0.00	INR Zero Only
37	SECTION-F: FLOORING AND CLADDING WORK	F					
38	Polished Kota stone slab in flooring over 20 mm (average) thick base laid over with base of cement mortar 1 : 4 (1 cement : 4 coarse sand), and in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) INCLUDING pre finished nosing to treads of steps, and risers using single length up to 2.00 metre, rubbing, rounding and polishing complete and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing, rounding and polishing complete, 20 mm thick Polished Kota stone	F.1	880.00	M2		0.00	INR Zero Only
39	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, laid on 20 mm thick bed of cement mortar 1:4 (1 Cement : 4 Coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including pointing the joints with white cement and matching pigments etc., complete.	F.2	20.00	M2		0.00	INR Zero Only

40	Providing and fixing 1st quality Ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	F.3	220.00	M2		0.00	INR Zero Only
41	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, including the cost of nosing of steps etc. complete. 40mm thick with 20mm nominal size stone aggregate.	F.4	50.00	M2		0.00	INR Zero Only
42	Providing and fixing 18 mm thick Polished Granite stone flooring\ cladding in required design and patterns, in linear as well as curvilinear portions of the building all complete/ gang saw cut, mirror polished, pre moulded and pre polished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations, for wall lining (veneer work) including dado, skirting, risers of steps etc., of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including fixing in facia and drops of width upto 150 mm with epoxy resin based adhesive, including cleaning etc. complete and providing opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter and similar location, including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete and rubbing, curing, edge moulding (including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge) and polishing of edges to give high gloss finish etc. complete at all levels. Granite stone slab of any colour and texture as approved for all granite works with minimum base rate of Approx Rs. 2000/ sqm.	F.5	1400.00	M2		0.00	INR Zero Only
43	Providing and fixing 18 mm thick stone slab with table rubbed , edges rounded and polished, fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the chase with epoxy grout or with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm nominal size) as per direction of Engineer-in-charge and finished smooth. Granite Stone of approved shade with minimum base rate of Approx Rs. 2000/ sqm.	F.6	20.00	M2		0.00	INR Zero Only
44	Providing and laying vitrified tiles for flooring laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) and for wall lining (veneer work) including dado, skirting, risers of steps etc., over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand) in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joints with white cement and matching pigments etc., complete.	F.7					
45	Size of Tile 600x600 mm	F.7.1	1200.00	M2		0.00	INR Zero Only
46	Size of Tile 1000x1000 mm	F.7.2	2000.00	M2		0.00	INR Zero Only
47	Providing and laying Vitrified tiles for flooring laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) and for wall lining (veneer work) including dado, skirting, risers of steps etc., over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand) 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, 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. Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, levelling system and rubber mallet for placing the tiles gently and easily.	F.8					
48	Double charge vitrified tile polished finish of - Size of Tile 1000 x 1000 mm	F.8.1	1000.00	M2		0.00	INR Zero Only
49	Glazed vitrified tiles polished finish of size	F.8.2					
50	Size of Tile 600 x 600 mm	F.8.2.1	400.00	M2		0.00	INR Zero Only
51	Size of Tile 600 x 1200 mm	F.8.2.2	500.00	M2		0.00	INR Zero Only
52	Glazed Vitrified tiles Matt/Antiskid finish of size	F.8.3					
53	Size of Tile 600 x 600 mm	F.8.3.1	200.00	M2		0.00	INR Zero Only
54	Size of Tile 600 x 1200 mm	F.8.3.2	550.00	M2		0.00	INR Zero Only
55	Providing and laying machine cut, mirror polished 18 mm thick Italian Marble stone in flooring, in required design (Simple geometrical, abstract etc.) and in patterns in combination with Italian marble stones of different colours, shades and finished surface texture etc., in linear portions of the building, all complete as per the architectural drawings, laid over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with white cement slurry @ 4.4 kg/sqm, and for wall lining (veneer work) including dado, skirting, risers of steps etc., in required design and pattern (if required with marble stone slab pieces of different shapes, sizes & texture but of even thickness) on 12 mm (average) thick cement mortar 1:3 (1 cement : 3 coarse sand) laid and jointed with white cement slurry @ 3.3 kg/sqm including pointing with white cement slurry admixed with pigment to match the marble shade, including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge. 18 mm thick Italian Marble stone slab, Perlato, Rosso verona, Fire Red or Dark Emperadore etc. The stone to be fixed after putting dabs of neat cement on walls & resting stone on them. The Stone to be anchored at bottom and at top with "L" Shaped MS Cleats as per details. Back of stone to be filled with white cement slurry complete. Size of the stone to be atleast 2100mm height /length x 600mm wide. Joints to be minimal and filled with white cement mixed with colour pigment to match colour of stone. The item include polishing the laid stone to give a plain, level and smooth finish complete.	F.9					
56	For Lift Lobby, Corridor & Reception Flooring with (Botticino Classic ,Grey William, Royal Diana, Statuario Marble, Rosso Verona Perlato, Fire Red or Dark Emperadore etc. with minimum base rate of Approx Rs. 465/Sqft.)	F.9.1	430.00	M2		0.00	INR Zero Only

57	For Lift Lobby,Corridor & Reception Wall dado Marble slabs (Botticino Classic ,Grey William, Royal Diana, Statuario Marble, Rosso Verona Perlato, Fire Red or Dark Emperadore etc. with minimum base rate of Approx Rs. 465/Sqft.)	F.9.2	230.00	M2		0.00	INR Zero Only
58	Crystallization treatment for Italian Marble flooring - Honing, polishing and crystallization of marble/Italian by using single disc machine by filling the gaps with Tenax to match the colour, applying liquid crystallizer (Taski Jontec Terranova or equivalent) on floor, buffing thereafter to give an mirror like glossy shine on the floor surface and providing anti-slip properties.	F.10	660.00	M2		0.00	INR Zero Only
59	Providing and fixing Glass mosaic tiles with minimum base rate of Approx Rs. 2049/ sqm. on finished plain wall surface of size 20 mm x 20 mm x 4 mm in all colour, design , fixing in customize design as per direction of Engineer-in- Charge. The glass mosaic tiles to be fixed on the wall surface with the help of approved adhesive applied at the rate of 2.5 kg per sqm and grouting of the same. The rate is inclusive of all operation, material and required pattern approved by Engineer-in-Charge	F.11	100.00	M2		0.00	INR Zero Only
60	Providing and laying Pre-Laminated Engineered wooden flooring with minimum base rate of Approx Rs. 160/ sqft. (Grade AC4 or AC4+ laminates) 8mm thick, having a good backing layer made up of plastic laminate or melamine, core made up of medium-density fibreboard (MDF), which is less resistant to impact damage and less resistant to being dented by heavy furniture, having a décor layer to give each floor its appearance and consisting of one or more sheets of paper impregnated with melamine resin and top wear layer having clear aluminium oxide finish that protects the decorative layer & imparts the desired level of sheen, from full gloss to low gloss, duly fixed to the base floor using adhesive as approved by the manufacturer.	F.12	500.00	M2		0.00	INR Zero Only
61	Providing and fixing removable raised/ false access flooring with system and its components of approved make for different plenum height with possible height adjustment upto 50 mm, comprising of modular load bearing floor panels supported on G.I. rectangular stinger frame work and G.I. Pedestal etc. all complete, as per the architectural drawings, as specified and as directed by Engineer-in-charge consisting of: (a) Providing at required spacing to form modular framework, pedestals made out of GI tube of thickness minimum 2 mm and 25 mm outer diameter, fully welded on to the G.I. Base plate of size 100mm x 100mm x 3mm at the bottom of the pedestal tube, G.I. pedestal head of size 75mmx75mmx3.5 mm welded with GI fully threaded stud 16mm outer diameter with two GI Check nuts screwed on the stud for level adjustment upto 50mm, locking and stabilizing the pedestal head in position at the required level. The pedestals shall be fixed to the subfloor (base) through base plate using epoxy based adhesive of approved make or the machine screw with rawl plug. (b) Stringers system in all steel construction hot dipped galvanized of rectangular size 570x20x30x0.80mm thick having holes at both ends for securing the stringers on to the pedestal head using fully threaded screws ensuring maximum lateral stability in all directions,	F.13	70.00	M2		0.00	INR Zero Only
62	the grid formed by the pedestal and stringer assembly shall receive the floor panel, this system shall provide adequate solid, rigid support for access floor panel, the system shall provide a minimum clear uninterrupted clearance between the bottom of the floor for electrical conduits and wiring etc. all complete as per the architectural drawings, as specified and as directed by the Engineer-in-charge. (c) Providing and fixing Access Floor panel of 600x600x32 mm medium grade Filled Steel anti static high pressure Lamination of 800H grade (FS800H). Access Floor panel shall be steel welded construction with an enclosed bottom pan with uniform pattern of 64 hemispherical cones. The top and bottom plates of Steel Gauges: top 0.6 mm and bottom 0.7 mm fused spot welded together (minimum 64 welds in each dome and 20 welds along each flange). The panel should be Corroresist epoxy coated for lifetime rust protection and cavity formed by the top and bottom plate is filled with Pyrogrip noncombustible Portland cementitious core mixed with lightweight foaming compound. The access floor shall be factory finished with Anti-static High Pressure laminate with Non Warp technology upto 1mm thickness for superior adhesion and Surface flatness within 0.75mm. The panel is to withstand a Concentrated Load of 363 kgs applied on area 25mm x 25mm without collapse in the centre of the panel which is placed on four steel blocks. The panel will withstand and Uniformly Distributed Load (UDL) minimum 1250 kg/sqm and an impact load of 50kg all complete as per the approved manufacturers specification and as per the direction of Engineer-in-charge. All specification must be printed on the side of the panel to ensure the quality of the product. 300 mm Finished Floor Height (FFH)						
63	Providing and laying 18 mm thick flamed finish Granite stone flooring/ Cladding in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in- Charge. INCLUDING fixing by means of clamps, anchor fasteners and pins, etc. wherever required as directed by Engineer-In-Charge complete at all levels. 18 mm thick flamed finish Granite stone slab of any colour and texture as approved with minimum base rate of Approx Rs. 2000/ sqm.	F.14	100.00	M2		0.00	INR Zero Only
64	Chequered precast cement concrete tiles 22 mm thick in footpath & courtyard, jointed with neat cement slurry mixed with pigment to match the shade of tiles, including rubbing and cleaning etc. complete, on 20 mm thick bed of cement mortar 1:4 (1 cement: 4 coarse sand). Light shade pigment using white cement	F.15	80.00	M2		0.00	INR Zero Only
65	Providing and fixing of GFRP coarse stone wall cladding tiles of size 180x90 mm in minimum 12 mm thickness. Tiles to be made with white portland cement of Birla white, fine graded silica sand with fine aggregate, reinforced with glass fiber of Owens Corning or equivalent make and using synthetic inorganic colour pigments of Laxness make as per approved colour. Fixing of tiles to be done using exterior grade tile adhesive and necessary screws/ clamps etc. (COST INCLUDED) and including grouting with matching pigment and two coats of silica paint FOR ALL HEIGHTS as per direction of engineer in charge. ALL ITEMS MENTIONED HEREIN ARE INCLUDED IN THE COST	F.16	10.00	M2		0.00	INR Zero Only
66	SECTION-G: ROOFING WORK	G					

67	<p>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, 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 moisture resistant board</p>	G.1	4000.00	M2		0.00	INR Zero Only
68	<p>Providing and fixing tiled false ceiling of specified materials of size 595x595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanized steel sections (galvanized @ 120 grams/ sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to center and cross "T" of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x 1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanised butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T-sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge GI Metal Ceiling Lay in perforated Tegular edge global white color tiles of size 595x595 mm and 0.5 mm thick with 8 mm drop; made of GI sheet having galvanizing of 100 gms/sqm (both sides inclusive) and 20% perforation area with 1.8 mm dia holes and having NRC (Noise Reduction Coefficient) of 0.5, electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending and perforation, and backed with a black Glass fiber acoustical fleece.</p>	G.2	1000.00	M2		0.00	INR Zero Only
69	<p>Providing and fixing tiled false ceiling of specified materials of size 595x595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanized steel sections (galvanized @ 120 grams/ sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to center and cross "T" of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x 1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanised butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T-sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge GI Metal Ceiling Lay in plain Tegular edge Global white color tiles of size 595x595 mm, and 0.5 mm thick with 8 mm drop; made of GI sheet having galvanizing of 100 gms/sqm (both sides inclusive) and electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending.</p>	G.3	1100.00	M2		0.00	INR Zero Only
70	<p>Wooden ceiling finish with veneer: Providing and fixing IS 71012 mm thick plywood false ceiling as per drawing & instruction of EIC & sample approved (complete with frame work). finish with 4 mm th veneer gurjan base ply Semi glossy malamine finish polish. Plywood shall be fixed with required fabrication work and ply frame work with all necessary accessories Rate shall include cost of making of all cutouts for light fixtures, gadgets, gizmo, pelmets, grooves, beads and also provide support/template where ever required. The rate shall be in sq.mt for all floors and at all heights including all costs the shop drawing (or a sample mock of 5 Sqm minimum of the frame work and ceiling) shall be approved from EIC 5mm Groove shall be provided at the junction of the false ceiling & the wall. (considering all levels with require all fabrication work and fitting from RCC slab to false ceiling 100 to 1000 mm)</p>	G.4	200.00	M2		0.00	INR Zero Only

71	ACOUSTICAL SOUNDSCAPE PANEL Providing and Fixing SoundScapes - Acoustical clouds which are 30 mm thick, flat glass fiber panels with Humidity Resistance RH 90% & Recycled Content of minimum 30%, come in various shape options like Square / Convex / Concave / Circle / Hexagon / Trapezoid / Parallelogram (Left & Right) / Rectangle (Small & Large) and in standard Traffic White color with LR 90% or in the color specified by the Architect / Engineer in charge (Ivory / Pale Green / Pastel Blue / Traffic Grey / Pale Brown), or in the color specified by the Architect / Engineer in charge . The size and sound absorption details are as :2.12 metric sabin.Shape- Circle ,Nominal Size- circular- of different diameters as below. The back of each panel to have embedded square frame bracket system of 610 x 610mm in which provisions are already made for integration of installation system for suspension of individual or grouped panels.The panels to be suspended individually using the SoundScapes Deck hanging kit. Each kit to consist of gripper structure anchors with an outer diameter of 16mm and height 23mm, aircraft cables of 1.5mm dia 2.44 LM in length and bottom end cable adjusters of 8.9mm outer diameter. Each panel to be suspended using the aircraft cables which are suspended from the soffit using the gripper structure anchors and its other end passing through the bottom end cable adjuster which are screwed in the 4 corners of the frame bracket system The height & level of the panels can be adjusted using the bottom end cable adjusters.	G.5					
72	1200 mm dia	G.5.1	10.00	EA			0.00 INR Zero Only
73	900 mm dia	G.5.2	5.00	EA			0.00 INR Zero Only
74	600 mm dia	G.5.3	5.00	EA			0.00 INR Zero Only
75	SITC of BAFFLE FALSE CEILING - Aluminium 50 BD Panel of approved colour consisting of panel 50 mm wide x 100mm depth x 1 mm thick panel length up to 6 mtrs coil coated on a continuous paint line double baked and roll formed from enameled corrosion Resistance Aluminum Alloy AA3005 / AA5050 for higher strength and good Roll forming characteristics. Panels shall be mounted in a module of 100 mm on a mullion profile grooved (Slotted Fastening Profile) by means Locking Clips and PopRivet. Slotted Fastening Profile shall be fixed at 150 mm from panel ends and at a distance of maximum 1200 mm center to center across the panel span and Slotted Fastening Profile shall be fixed to a suitable sub-structure by means of Square Brackets (contractor scope). Paint Finish: Panel shall be stove enamelled and finished with Luxacote, a patented special three layered coating system (consisting of first a conversion layer of thickness 800-2000mg/sq mtr, a polyurethane basecoat of 16-20 microns, and a special top coat of polyamide particles of 8-12 microns thick to provide excellent abrasion and damage resistance) in a continuous coil coating process of the approved colour on the exposed side and the reverse side with epoxy. Makes : Hunter Douglas, High Steel, Anutone, Armstrong, Prominace	G.6	150.00	M2			0.00 INR Zero Only
76	Frameless cloud ceiling - Frameless cloud ceiling Providing and fixing cloud ceiling 1200x600x25mm or 1200x1200x30mm, a horizontal element with painted edges and without profiles, with painted epoxy surface in universal white on all sides and can be weekly wet cleaned and daily dusting or vacuum cleaned. the light reflectance of the ceiling should be 85% of which more than 99% is diffuse reflection. The element withstand a permanent ambient RH upto 95% at 30 degree C without sagging, warping or delaminating (ISO 4611). The glasswool core of the element is tested and classified as non combustible. It should consist of four spiral anchor and four adjustable wire hangers for hanging from ceiling adjustable wire length should be adjustable upto 2 meters.	G.7	1.00	NUM			0.00 INR Zero Only
77	Providing and fixing zinc alloy coated high tensile steel roofing sheets in 0.45 mm thickness and having minimum yield strength of 550 Mpa in colour as decided by EIC. The sheet shall be fixed with self drilling/ self tapping screw with EPDM seal complete. The cost shall include the cost of erecting the sheets and fixing the same with approved make screw/ washer etc complete but excluding the cost of truss, crimp ridge and crimp eaves. The area measured in plan shall be measured for payment and no extra payment shall be made for overlaps. Accordingly the bidder is required to quote his rates Approved make is Tata Bluscope DURASHINE	G.8	10.00	M2			0.00 INR Zero Only
78	Providing and fixing Crimp Ridge of Tata Bluscope DURASHINE make including fixing with necessary self drilling screws and EPDM washer complete	G.9	1.00	M			0.00 INR Zero Only
79	Providing and fixing Crimp Eaves of Tata Bluscope DURASHINE make on two ends of the sheet including fixing with necessary self drilling screws and EPDM washer complete	G.10	2.00	M			0.00 INR Zero Only
80	Providing and fixing Gutter of Tata Bluscope DURASHINE make on two ends of the sheet including fixing with necessary self drilling screws and EPDM washer complete	G.11	2.00	M			0.00 INR Zero Only
81	Providing & fixing Anavertical Linear Baffle Box Curtain Closed Ceiling made out of Aluminum Extrusion of 1 mm thickness. The baffle blade shall be in size of 30 x 100 x 3000mm in powder coated finish of approved shade or wooden texture. The baffle blade shall be suspended using Slotted U-profile powder coated to black colour at an on-center spacing of 100/150/200mm. The C-Channel/U profile shall be suspended at every 1200mm on-centre using 6mm threaded rod/4mm rod/12 gauge hanger wire from the structural soffit at every 1200mm intervals using U-profile hanger/C-channel hanger. Multiple lengths of U-profile/C-channel shall be connected using U-profile connector/ C-channel connector. The baffle blades shall be suspended from the C-channel/U-profile carrier bars at the required intervals (100/150/200/250mm) using baffle hangers. Spacing between blades shall be adjusted using the slots in carrier.	G.12	25.00	M2			0.00 INR Zero Only
82	SECTION-H STEEL WORKS	H					
83	Steel work in single section, fixed with or without connecting plate, riveted, bolted or welded in built up sections, trusses and framed work, in built up sections/ framed work (In stringers, treads, landings etc. of stair cases, including use of chequered plate wherever required, all complete, gratings, frames, guard bar, ladder, railings, brackets, gates, frames, door shutter and similar works, in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position, providing and fixing bolts including nuts and washers complete wherever required and INCLUDING Painting with synthetic enamel paint of approved brand and manufacture to give an even shade - two or more coats on new work and applying a priming coat of approved steel primer all complete.	H.1	2000.00	KG			0.00 INR Zero Only

84	Providing and fixing carbon steel galvanised (minimum coating 5 micron) dash fastener of 10 mm dia double threaded 6.8 grade (yield strength 480 N/mm ²), counter sunk head, comprising of 10 m dia polyamide PA 6 grade sleeve, including drilling of hole in frame , concrete/ masonry, etc. as per direction of Engineer-in-charge. 10 x 60 mm	H.2	250.00	EA			0.00	INR Zero Only
85	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete. INCLUDING fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	H.3	2900.00	KG			0.00	INR Zero Only
86	Providing Toughened glass 12 mm thickness fixed to stainless steel (Grade 304) railing made of Hollow tubes including glass formwork/ mould of MDF/ PLY as per manufacture's requirement and fixing accessories such as nuts, bolts, fasteners, etc. (excluding Stainless steel railing	H.4	75.00	M2			0.00	INR Zero Only
87	SECTION-I WOOD AND PVC WORK	I						
88	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed, wooden moulded beading Including iron hold fast, bolts, nuts and wooden plugs, dash fasteners of required dia & length, iron screws, plugs and priming coat of wood primer and two or more coats of melamine/ french spirit polish - good quality chemically treated Seasoned hard wood	I.1	3.00	M3			0.00	INR Zero Only
89	Providing and fixing ISI marked flush door shutters 35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters INCLUDING melamine polish complete and providing lipping with 2nd class teak wood battens 25 mm minimum depth on all edges of flush door shutters and providing vision panel (rectangular/ square/ circular) not exceeding 0.1 sqm in all type of flush doors (cost of glass excluded) (over all area of door shutter to be measured) and INCLUDING Providing & fixing glass panes and glazing clips in Flush doors, windows, clerestory windows, all complete with : With clear toughened glass panes of 6 mm thickness and EXCLUDING all required fittings wherever required as directed by Engineer-In-Charge	I.2	175.00	M2			0.00	INR Zero Only
90	Providing and Fixing approved brand and manufacture of SS 304 Hinge Hettich (9268384) 100x75x3mm Round Ball Bearing Hinge , EN 1935 Certified for 200,000 Cycle,105 min Fire rated, 5 years Functional Warranty SS 304 Hinge 100x75x3mm Round Corner (Hole Pattern: C) complete in all respects as per manufacture specifications & as directed by Engineer-in-charge.	I.3	310.00	EA			0.00	INR Zero Only
91	Providing and fixing approved brand and manufacture of Stainless Steel Tower bolt 300 mm long with 10 mm dia along with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge.	I.4	160.00	EA			0.00	INR Zero Only
92	Providing and approved brand and manufacture of Stainless Steel Door stopper Hettich (9228709) - Door Mounted Hanging Type SS Satin Finish along with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge	I.5	80.00	EA			0.00	INR Zero Only
93	Providing and fixing approved brand and manufacture of Stainless Steel Door Buffer wall mounted 22 mm dia,75 mm long (DB (22) along with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge	I.6	80.00	EA			0.00	INR Zero Only
94	Providing and fixing Sliding bolt (baby latch) with SS lock strip 5" (BL(B)) along with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge	I.7	5.00	EA			0.00	INR Zero Only
95	Providing and fixing approved brand and manufacture of Surface Mounted with slide rail K (Symmetric) Mechanism Door Closer Hettich (9227816) , Weight of door: 40-80 Kg, Width of door: 850-1100 mm, Tested & Certified 200,000 cycles, Silver Finish, Door closer power adjustment by change of position from hinge line along with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge.	I.8	70.00	EA			0.00	INR Zero Only
96	Providing and fixing approved brand and manufacture of SS 304 Solid die cast Mortice Lever handle Hettich (9228111) with 8 mm spindle . With Restoring spring along with Steel base PVD coating: 16 micron with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge.	I.9	70.00	EA			0.00	INR Zero Only
97	Providing and fixing approved brand and manufacture of Mortice Sash lock Lock type : PZ - 72 W (W = handle/knob execution) , Basket : 55mm, Face plate: Stainless steel, Face plate width: 24 mm / Hub: 8 mm, With closed lock case with 3 - fold fastening, Lock case: zinc - plated, Shiftable latch bolt. Latch bolt can be shifted without opening the lock case, with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge.	I.10	70.00	EA			0.00	INR Zero Only
98	Providing and fixing approved brand and manufacture of Euro Profile Cylinder hettich (9228176) with One side key and one side knob 60 mm , for max door thickness - 40 mm - SS Finish along with necessary accessories and screws etc. complete in all respects as per manufacture specifications & as directed by Engineer-in-charge	I.11	2.00	EA			0.00	INR Zero Only
99	SECTION-J MISCELLANEOUS WORK	J						
100	Providing and fixing 12mm thk. Toughened float glass glazing cut including glass formwork/ mould of MDF/ PLY as per manufacture's requirement using a special extruded aluminium structure and fixed in openings of desired shape as per drawing with 3/4" beveling all around , fixed with the help of SS patch fittings, with top and bottom 'C' channels as per manufacture's specifications, fixed firmly to the slab/ MS Structure , including filling of Silicon sealant in the joints or optional vertical transparent polycarbonate joints to ensure that the glass panes remain perfectly flush with each other as directed by Engineer in Charge. Stability and soundproofing are ensured by a series of soft extruded PVC seals, located along the outside perimeters, securing the glass panes. Area of openings to be measured. Rate of above item to include P/F of : 20x20mm "C" channel or as specified by manufacturer, SS patch Fittings. Makes: - KUBIK, KLIO, OR EQUIVALENT	J.1	800.00	M2			0.00	INR Zero Only

101	Providing and fixing 12mm thk. Toughened glass door , cut and fixed in openings of desired shape as per drawing with 3/4" beveling all around and acid wash etching, fixed with the help of SS patch fittings as per drawing and as directed by Engineer in Charge / Architect. (Area of openings to be measured) . Assume frameless glass. Rate of above item to include P/F of : 1) Pin cylinder lock in Stainless Steel finish (Hettich make) as directed by Engineer in Charge	J.2	310.00	M2		0.00	INR Zero Only
102	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and door weight upto 125 kg, for doors, including cost of cutting floors, embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge. With stainless steel cover plate minimum 1.25 mm thickness	J.3	100.00	EA		0.00	INR Zero Only
103	Providing and fixing Back to Back Set of Pull Handles Hettich (9228527) Dia. 25mm, CTC Length upto 450 mm approx., SS Finish O/A 400 in satin stainless steel.	J.4	85.00	EA		0.00	INR Zero Only
104	Providing and fixing Stainless steel 304 Grade H- type pull handle Hettich(9228554) of size min 32 mm dia and 1200mm long of approved make including SS screws, including making holes of required size in shutter etc. complete as per direction of Engineer-in-Charge.	J.5	30.00	EA		0.00	INR Zero Only
105	Partition Work - Providing and fixing in position opaque partition consisting of frame work in extruded aluminium sections 1.6 mm thick, of approx size 50 x50 mm , placed at center to center at not more than 600 mm vertically and 1200 mm horizontally , joined using angle 35x35x 3 mm . Securely fixed to wall and , floor and ceiling complete in all respect . The rates shall be inclusive of cutting , punching of holes for drawings conduits and boxes for electrical works etc. Providing and fixing to aluminium frame work , Particle/ MDF / Ply Boards etc., fixed with fully threaded parallel shank screws at 200 to 300 mm centre to centre , on both sides of framework. Joints staggered on either sides of the partitions to avoid through joints complete as per directions of Engineer-in-Charge. (Ply Board work to be measured and paid separately).	J.6	2100.00	M2		0.00	INR Zero Only
106	Panelling Work - Providing and fixing in position opaque panelling consisting of frame work in extruded aluminium sections 1.6 mm thick, of approx size 50 x25 mm , placed at center to center at not more than 600 mm vertically and 1200 mm horizontally , joined using angle 35x35x 3 mm . Securely fixed to wall and , floor and ceiling complete in all respect . The rates shall be inclusive of cutting , punching of holes for drawings conduits and boxes for electrical works etc. Providing and fixing to aluminium frame work , Particle/ MDF / Ply Boards etc., fixed with fully threaded parallel shank screws at 200 to 300 mm centre to centre , on both sides of framework. Joints staggered on either sides of the partitions to avoid through joints complete as per directions of Engineer-in-Charge. (Ply Board work to be measured and paid separately).	J.7	200.00	M2		0.00	INR Zero Only
107	Providing and fixing infill of 50mm thick & min. 60 kg / m3 density Mineral Wool Insulation. Mineral wool packed in polyweave packets inside partition frame work fixed to wall with Clip, screw, rawel plug & washers and held in position by criss crossing GI wire etc. complete as per directions of Engineer-in-Charge.	J.8	200.00	M2		0.00	INR Zero Only
108	Providing and fixing - Panelling with 12.5 mm thick Gypsum double skin fire rated board including taping and jointing complete (Rate Includes cost of two skin)	J.9	100.00	M2		0.00	INR Zero Only
109	VENEER PANELING Providing and fixing of 3.5 mm thick Ply Veneer cladding of Maple or approved shade on existing partitions/ panelling fixed with adhesive, matching grains and including spray applied matte melamine polishing, primer, groove etc. complete. Veneer to be fixed in panels of width as specified and 4mm grooves as per drawing including taping jointing and groove etc complete. Minimum Basic price of Veneer @ Rs.1000/ Sqmt + taxes	J.10	320.00	M2		0.00	INR Zero Only
110	GLOSSY/ MATT LAMINATE 1 mm thick - Supply and installation of approved shade Glossy/ Matt Laminated sheets of desired colour and shade including taping jointing and groove and glue/ adhesive to applied on laminate and ply etc. complete.	J.11	4100.00	M2		0.00	INR Zero Only
111	Supplying and providing Duco Paint on new work two or more coats including preparing surface and primer etc. complete	J.12	100.00	M2		0.00	INR Zero Only
112	Providing and fixing - 4/6 mm thick charcoal board panel including taping jointing and groove etc complete	J.13	100.00	M2		0.00	INR Zero Only
113	Providing and fixing - 6 mm thick commercial ply including taping jointing and groove etc complete	J.14	80.00	M2		0.00	INR Zero Only
114	Providing and fixing - 12 mm thick both sides Pre-laminated cement bonded wood particle board including taping jointing and groove etc complete	J.15	60.00	M2		0.00	INR Zero Only
115	Providing and fixing Single layer of 12mm thick BWP Ply as per details on single side of the existing aluminium partitions framework or elsewhere as required as per drawing details/site requirement including taping jointing and groove etc complete and shall be provided as per the direction of EIC.	J.16	4100.00	M2		0.00	INR Zero Only
116	Providing and fixing Single layer of 12mm thick MDF Ply as per details on single side of the existing aluminium partitions framework or elsewhere as required as per drawing details/site requirement including taping jointing and groove etc complete and shall be provided as per the direction of EIC.	J.17	300.00	M2		0.00	INR Zero Only
117	Providing & applying exterior texture paint (Finished thickness 1.2mm to 1.5 mm) SUZUKA STONEY of Ultratech make or equivalent make of OIKOS, and SKK with natural stone crushed powder applied over plaster surface within grooves comprising of following operations :- First coat of Acrylic primer added with wall sealer to be applied over the surface for better adhesion of the texture with surface. Second coat - Texture coat to be applied with chips of stone powder having available natural stone base shade with stainless steel trowel finished with spray gun to be applied with spray gun with 2hp pressure Final coat of siloxiene FSI Clear base protection coat to be applied which make the product completely water repellent / dust resistant / anti fungal Warranty of 07 years on shades and sustainability is to be provided by the applicator Grooves are to be crafted in plaster as per approved design approved by engineering in charge. All works upto floor seven level including scaffolding etc complete. APPROVED MAKE ULTRATECH, OIKOS, SKK, THIS IS A HIGH VALUE SPECIALISED ITEM TO BE APPLIED AT SITE BY TRAINED APPLICATOR OF THE MANUFACTURERS OF APPROVED MAKE, AND THE BIDDERS ARE THEREFORE REQUESTED TO CONFIRM THE RATES BEFORE QUOTING	J.18	50.00	M2		0.00	INR Zero Only

118	Providing and fixing 10x10x7.50 cm Granite stone block hand cut and chisel dressed on top, for CORBELLED paving in floors, drains etc. laid over 20mm thick base mortar 1:4 (1cement:4 coarse sand) with joints 10mm wide filled with same mortar including ruled pointing etc. complete as per direction of engineer-in charge.	J.19	50.00	M2			0.00 INR Zero Only
119	Supplying and installing roller blinds of approved make, model and shade at all heights and location and required width and comprising of approved shade and quality fabric, 1 mm thick anodized extruded Aluminium alloy roller tube of 38-mm O.D. a bidirectional operating Clutch mechanism designed for adjustment-free, slippage-free, crash proof smooth operation for all heights, high strength fiber glass reinforced polyester idler, powder coated steel Insert type brackets fitted with roller tube, round bottom rail, control unit engrooved with a Ball Pitch of minimum 6.5mm, Stainless Steel Ball Chain, and powder coated atomized steel installation brackets. The clutch mechanism comprises of a SS beaded chain and carbon steel spring wrapped by means of a high strength fiber glass reinforced polyester assembly to transmit motion from driving to driven members. The installation brackets shall facilitate overhead, side or face mounting with clutch assembly on either end of the roller. Idler shall consist of a centre shaft and outside sleeve which provide bearing surface for roller tube and rotate freely on centre shaft for smooth and quiet operation.	J.20	1400.00	M2			0.00 INR Zero Only
120	Bottom rail along with the fabric shall be enclosed in a suitably created pocket and shall be of powder coated aluminium tube and closed from sides with end caps. The item includes all fittings, accessories, brackets, screws, anchor fasteners, fabric as per approved sample and shade all complete as per drawings, tender specifications, relevant standards and direction of Engineer in charge. (Height of blind from top bracket to bottom tube and width from bracket to bracket shall be measured for payment)						
121	Manual Roller Blinds with following specification: Composition- 30% Polyester (max),70% PVC on Polyester(min), Openness factor- 3-5%(as approved) Weight (gram/ sqm)- min 440 gm/sqm Thickness- min 0.60 mm Fire Classification- Class A(NFPA 101 or Class 1 (UNE EN 13773) or equivalent as per relevant standards and specifications Fastness to light- 6-7/8 or higher Indoor Air Quality- GreenGuard / Eco-Codice Certified. Manufacturer's warrantee- minimum 5 years						
123	Providing and fixing Glass Reinforced Concrete (G.R.C) Screen at all levels & heights in approved size, pattern, design, thickness (minimum 35mm) and color. The Screens should be made from White Portland Cement, Quartz, Fine Silica Sand, Alkali Resistant Glass Fiber, Super Plasticizers, Polymers and U.V resistant inorganic pigments should be used for pigmentation. The material casting should take place in Synthetic Rubber / FRP Mould. The fixing of Jali should be 'Dry fixing' i.e. to be done with MS/SS 'L' shaped Clamps, dash fasteners and pins etc complete as per site requirement and direction of Engineer-in-charge.	J.21	10.00	M2			0.00 INR Zero Only
124	Designing, Fabricating, Manufacturing, Installation and testing of Glass Reinforced Concrete G.R.C. from liners in approved size, pattern, design, thickness and color with dry fixing method, the form liners should be made from approved white Portland cement in grade 18, quartz, fine silica sand, alkali resistant glass fiber manufactured. Polymers manufactured by approved manufacturer or equivalent, super plasticizers manufactured by approved manufacturer or equivalent with UV resistant synthetic inorganic pigments made by approved manufacturer or equivalent. The material casting should be done in synthetic rubber/FRP. Fixing of GRC form liners to be fixed on/between RCC/Block work column or structural steel work with dry fixing method with appropriate steel frame work, using fasteners, and necessary hardware etc. In building façade the form liners shall be securely fixed with stainless steel bolts and anchor fasteners (304 Grade) of required size at specified locations. The fixing shall be done by the specialized approved agency as directed by Engineer-in-charge.	J.22	50.00	M2			0.00 INR Zero Only
125	Room Signages (Stainless Steel with single color/Multi color engravings) Providing and Fixing Room Signages for Office/ Reception/ Conference room/Cabin/Stationary/ Store room/Server / ups /electrical room/G.Toilet & Ladies Toilet with symbol/Pantry/Fire exist/rest room or for any other area as per the direction of EIC. The SS plate shall be 304 grade 2 mm thick glossy matt finish of approved shape as per drawing. single color/Multi color engraved signage Font and letter sizing shall be got approved by the architect-sample shall be submitted. Rate shall include all hardware and necessary arrangement for fixing.	J.23	14.00	M2			0.00 INR Zero Only
126	MDF Jali in S.S : Providing and making and fixing 18 mm thick exterior grade MDF Jali fixing 35x 50 mm Stainless steel frame as per suggested pattern CNC cutting work complete. All wooden surfaces finish with semi gloss PU finish The work shall be done as per the specifications, sample approved and as directed by the Architect and Engineer-in-charge. The rate shall be for complete item inclusive of all material, labour, wastages, necessary tools & tackles, adhesives, consumable hardware & required SS 304 grade hardware/ accessories of approved make. (At all floor)	J.24	25.00	M2			0.00 INR Zero Only
127	Providing and laying modular carpet of approved make and shade and made with 100% nylon 6/6.6 tufted textured tip sheared/ cut & loop piles, tiles of minimum 500mm x 500mm in size, stain resistant, anti microbial, and having colour fastness to water, fastness to light, rubbing fastness and castor chair suitability as per relevant standard for heavy commercial usage, with PVC free backing, nominal total thickness of minimum 6.50 mm, pile height minimum 3.4 mm, minimum Total Pile weight – 800g/sqm). Material shall be CRI GREEN LABEL PLUS certified, and shall have recycled content complying to GRIHA requirement, including fixing with GRIHA compliant adhesive of approved make, all complete as per drawings, manufacturer's specifications and direction of Engineer in Charge.	J.25	300.00	M2			0.00 INR Zero Only

128	FABRIC PANELING Providing & fixing in position wall panelling at all heights of thickness 25 mm with Fiber Glass Acoustical Wall Panels of size 600X600 /600x1200 mm creda, resin bonded square edges having NRC of 0.9 minimum. The panels should be manufactured from high density bio-soluble resin bonded glass wool absorber having density of 96 Kgs/m3 and wrapped on the front side with an acoustically transparent fabric having option of colours and fabric options like jute etc. as per approved by architect/engineer-in-charge, plain tissue backer and fabric wrapped hardened edges. Panels should have humidity resistance up to 90 %, thermal conductivity ≤ 0.03 ($m^2 k / w$) thermal resistance ≥ 0.9 ($m^2 k / w$) & moisture rate $\leq 1\%$ (JC/T670 – 2005). The panel should be fully recycled and fire retardant as per Class A. The installation comprises surface impalers having projecting elements called spikes shall be fixed on the plain surface at 1200 mm center to center horizontally and 600 mm center to center vertically or as per approved by engineer-in-charge, using self-tapping screws. Silica based construction adhesive to be dabbed on to the projecting elements (spikes) of the impalers. Wall Panels shall be pierced through the spikes of the impalers ensuring line & level of panel are maintained. The panels should be mounted on the impalers horizontally or vertically as per the approved design or as per the directions of the engineer-in-charge.	J.26	25.00	M2			0.00	INR Zero Only
129	LAQUER GLASS PARTITION/ PANELLING Providing & Fixing of lacquer glass 4 mm thick as per approval in any color fixed on existing ply/ any other similar base with all other accessories as per architectural drawing. The Lacquered glass shall be highly durable, humid resistance, polyurethane lacquer glass. The glass to be manufactured by industrial curtain coating process. It should meet quality standards as per BS EN 1036 1999 & conform to perso hardness test of at least 220 oscillations. The substrate of the glass should confirm to Standard BS EN 572 1995 parts 1 & 2. Lacquered glass to be manufactured to tight specifications, relating to consistency of color, opacity and homogeneity throughout production campaigns and also to the ageing properties, mechanical resistance, and resistance to humidity and to chemical agents of the lacquer. The color of the lacquer should remain stable when exposed to normal levels of ultra-violet light in interior applications (Ply Board/ any other similar base work to be measured and paid separately).	J.27	150.00	M2			0.00	INR Zero Only
130	WALLPAPER Providing and fixing of approved shade of Wallpaper with minimum base rate of Approx Rs. 100/ sqft. Wallpaper to be stickered using Adhesives , including all necessary hardware required for it etc., complete as per the detail drawing.	J.28	300.00	M2			0.00	INR Zero Only
131	Aluminium Corrugated Louvers - Providing and fixing Horizontal / Vertical Aluminium Corrugated Louvers as per approved shade, fabricated out of heavy duty aluminium extruded profiles (Powder coated / anodised) fixed with Aluminium tube outer frame. All aluminium members & profiles shall be of AC 25 grade as per specification. The Aluminium members shall be protected with Masking Tapes all around the profiles for safety against external scratches at site (Masking Tapes shall be removed only at the time of handing over as per the instructions of Developer). The fabrication shall be done with all the joints mitered; the Outer Frames and Mullions jointed with appropriate Stainless Steel Screws, Heavy Duty Aluminium Angle, Cleat, box sleeve etc. EPDM gaskets to be used for preventing bimetallic corrosion wherever required. The fixing shall be done on to Aluminium frames or existing openings at anchorage locations, in windows , walls , Glazing jamps, cills and heads etc by drilling holes with an electric drill, inserting fasteners, stainless steel counter sunk screws etc.	J.29	50.00	M2			0.00	INR Zero Only
132	BUILT IN / JOINERY & MISCELLANEOUS General Note: - The dimensions of the furniture as given in the respective items as below are indicative and there shall be no deviation of cost on account of this. However, the dimensions mentioned below may vary in between $\pm 10\%$ during execution as directed by Engineer-In-Charge.							
133	Providing and fixing in desired position STORAGE 450mm deep. The front shutter, side of cupboard top, bottom and back shall be made of 19mm thick factory pressed BWP grade marine ply as per IS 710, all exposed edges to be finished with teak wood lipping. The front shutter and all other exposed surface of 19mm thick factory pressed BWP grade marine ply board shall be clad with 1mm thick laminate of required shade and texture and all internal surfaces shall be finished with 1 mm thick frosted white backing laminate as specified. The item shall include P/F all fittings/ stainless steel hardware like handles/ knobs tower bolts, ball magnetic catchers, lock, SS soft closing hinges etc. including making of trough /pelmet for lighting. The rear side of the cupboard to be treated with the anti-termite oil as approved by the EIC/ Architect. Complete as drawings ,for the purpose of payment, the front plan area of the cupboard excluding the trough/ pelmet for lighting shall be measured. COST OF ALL ITEMS MENTIONED HEREIN ARE INCLUDED.	J.30	80.00	M2			0.00	INR Zero Only
134	Providing and fixing film etching with plotter cutting and application of 3MM/ LUMAR/ GARWARE make as per approved design on glass surfaces all complete as per instructions and patterns and design of the Architect/ Engineer-In-Charge.	J.31	300.00	M2			0.00	INR Zero Only
135	Providing and fixing coloured glass film etching with plotter cutting and application of 3MM/ LUMAR/ GARWARE make as per approved design on glass surfaces all complete as per instructions and patterns and design of the architect.	J.32	250.00	M2			0.00	INR Zero Only
136	CORE CUTTING Drilling with core cutting machine in Post RCC beams, slabs, floors etc. if not mentioned in the drawing but required by Project Manager for laying pipes and rendering the same in RCC 1:2:4, finishing the same to the satisfaction of the Project Manager, including nominal reinforcement wherever required, complete. The quoted rate shall also include for providing EPOXY based water proofing compound for sealing the joints around the pipes. (Maximum thickness of RCC members shall be 300mm for slab & wall , 600 mm for beam).	J.33						
137	RCC Slabs	J.33.1						
138	75 mm dia	J.33.1.1	20.00	EA			0.00	INR Zero Only
139	100mm dia.	J.33.1.2	15.00	EA			0.00	INR Zero Only
140	150mm dia	J.33.1.3	12.00	EA			0.00	INR Zero Only
141	200mm dia	J.33.1.4	5.00	EA			0.00	INR Zero Only
142	RCC Beams	J.33.2						
143	65mm dia.	J.33.2.1	25.00	EA			0.00	INR Zero Only
144	160mm dia	J.33.2.2	10.00	EA			0.00	INR Zero Only

145	180mm dia	J.33.2.3	5.00	EA		0.00	INR Zero Only
146	RCC Walls	J.33.3					
147	65mm dia.	J.33.3.1	5.00	EA		0.00	INR Zero Only
148	160mm dia	J.33.3.2	10.00	EA		0.00	INR Zero Only
149	180mm dia	J.33.3.3	8.00	EA		0.00	INR Zero Only
150	Tensile Fabric Roof: Providing, Designing , fabricating, assembling and erection of Tensile Fabric Roof along with Insulation. Top Skin Membrane: Type III Opaque fabric having minimum weight of 1050 g/sqm. Flame retardant as per particular specifications . PVDF lacquer on both sides. Any Color of the fabric. warranty of minimum 10 years or as per manufacturer's specifications whichever is higher on the fabric. Second Skin (Middle Insulation Skin): 50mm + 50mm Fiberglass insulation of 0.036 w/mk of thermal conductivity as per ASTM C 518 or IS3346. Product should have density of minimum 24 Kg/m3 density and two layers of 50mm to be installed to get desired thermal and acoustics performance. Incombustibility rating of BS476 – part 4 insulation of 24kg/cum density. Third Skin: PVDF lacquered on Top side having min. weight of 650 gms/ sqm, with flame retardant as per manufacturer's specification. (any colour), Warranty of minimum 10 years or as per manufacturer's specifications whichever is higher on the fabric, over steel frames with all fittings and fixtures such as Galvanised MS Membrane/ End Plate, Shackles, Rigging Screws, Turnbuckles, swedge, fork, keder rods & galvanized MS strands/ cables with stainless steel end terminals complete as per Drawing/ Detail & as per technical specifications and as per the directions of Engineer-in-charge. All the required civil works such as excavation, RCC/Brick foundation whatever is required shall be in the scope of the contractor. All the MS structure work such as base plate , Bolt, Pole , truss, etc shall be in the scope of the contractor. The shop drawing including Design Calculation shall be submitted and Approved from the architect before execution. Accessories wherever required complete including lifts upto all heights, tools and plants, and necessary scaffolding and all civil works etc. required for all operations in all respect as per particular specifications & direction of Engineer-In-Charge.	J.34	260.00	M2		0.00	INR Zero Only
151	Corian Surface:- Providing & fixing 'Corian' finish using Acrylic solid surface wherever required of 6 mm thickness on top of tables, facia, storage units, door jams, columns, cladding, skirting etc. at all heights wherever directed by Engineer-In-Charge. The rate to include all materials, labour, transportation, wastages etc. complete.	J.35	300.00	M2		0.00	INR Zero Only
152	Automatic Sliding Doors Automatic sliding door operator - supply of automatic sliding door Set 1 operator of DORMA/ OZONE/ HAFELE (ES 200 easy) as per approved dwg. Compliant with European standards and produced according to the guidelines for power-operated windows, doors and gates, BGR 232, the UVV and the VDE regulations. TÜV design tested, tested according to the low voltage guidelines, fulfils DIN 18650 standards for Pedestrian Safety, TÜV Design Tested for Durability of 1 Million Cycles. The track profile should be separate from the main profile for enabling reduction in vibration insulation. Operator length = 6250 mm, clear passage opening width = 3000 mm, clear passage height = 2500 mm, includes micro processor controlled drive unit, with self learning mechanism, program selector with knob, motion detector (eagle 6 radars, 02 nos), mechanical components, toothed belt, cover profile, floor guide for frameless glass (02 nos), glass clamping rail (02 nos), safety device-light barrier (01 pair). Body finish : standard silver anodised operator profile, electromechanical lock with 12 mm plain toughened frameless glass for complete elevation - 2 moving panels, Including motor control unit, return pulley, end stopper, belt, etc. all as required. The above work complete in all respect as per approved drawings and to the satisfaction of engineer-in-charge / architect consultant.	J.36	1.00	EA		0.00	INR Zero Only
153	Providing & Fixing Of Rhythmscape/Hunterdouglas/Techno Ceiling/Armstrong/ Continuum Acoustic Hastag Ceiling of depth 120mm made of 9mm thick of acoustic Pet Flake with NRC of 0.5 as approved to be installed using special aircraft suspension system with custom caps capable of locking at any distance as per the manufacture specification Including Scaffolding, etc. all complete All material should be of approved make & complete as per the drawing, specification and approval of architect.	J.37	125.00	M2		0.00	INR Zero Only
154	Providing & Fixing Of Rhythmscape/Hunterdouglas/Techno Ceiling/Armstrong/ Continuum Fabric Wood Panel 1800mm x 600mm as per the drawing made of 12mm real walnut wood species with Custom wooden stain finish with an Organic base and a trimer of cyanamide with 1-3-5 Triazine with custom machine coat finish as approved to be installed using z profile system as per the manufacturer specification. All material should be of approved make & complete as per the drawing, specification, and approval of the architect.	J.38	4.00	NUM		0.00	INR Zero Only
155	Providing & Fixing Of Rhythmscape/Hunterdouglas/Techno Ceiling/Armstrong/ Continuum Ripple Light Ceiling made of 25mm thick & 150mm depth coherent air ply bonded with custom polymer wooden finish with an Organic base and a trimer of cyanamide with 1-3-5 Triazine with the edge perimeter of 1mm polymethyl from evonika to be integrated with flexible 3000k Edison Led in White/Warm White as approved to be installed using air craft suspension system with brass jammers capable of locking at any distance and angle as per the manufacture specification. All material should be of approved make & complete as per the drawing, specification and approval of architect.	J.39	120.00	M		0.00	INR Zero Only
156	Providing & Fixing Of Rhythmscape/Hunterdouglas/Techno Ceiling/Armstrong/ Continuum Acoustic Trapezium Panels 300mm x 450mm in custom size as per the drawing made of 35mm thick high performance wood fibre with custom stretchable scuba with owen cornings fibre class 24kg/m3 Nrc 0.9 in petal form with special Organic base and a trimer of cyanamide with 1-3-5 Triazine with custom shade as approved to be installed using Z profile system with special hook as per the manufacture specification. All material should be of approved make & complete as per the drawing, specification and approval of architect, Including Scaffolding etc. all complete	J.40	90.00	NUM		0.00	INR Zero Only
157	Providing & Fixing Of Rhythmscape/Hunterdouglas/Techno Ceiling/Armstrong/ Continuum Acoustic Petal Ceiling in modules of 212mm x 300mm with 100mm depth made of high performance Acoustic 12mm Pet Flake as approved to be installed using special clip system as per the manufacture specification. Including Scaffolding etc. all complete. All material should be of approved make & complete as per the drawing, specification and approval of architect.	J.41	50.00	M2		0.00	INR Zero Only

158	Providing and fixing certified restroom cubicle system of approved make comprising of green guard certified solid compact laminated water proof board, minimum 18 mm thick made as per IS: 2046 (phenolic core board) and as per BS-476/97 for fire retardant for toilet showers, water closet etc . The board shall be manufactured under high pressure and temperature by impregnating kraft papers and outer decorative papers with thermosetting phenolic/ melamine resins (low VOC). The cubicle system shall be resistant towards water, chemical, scratch, impact and heat and shall be anti bacterial, colour fast and shall have accessories like door knob, Gravity/ auto return hinges, privacy thumb turn with occupancy indicator, coat Hook, etc all in SS 304. The hardware and fixings includes anchoring of all fixed front panel to floor with SS 316 L brackets/ base plates with a clearance height upto 110 mm, and covered with SS 316 Shoe box plates, wall and corner joineries (brackets and channels) shall be SS 304 grade, SS 304 screws, rubber noise reduction tape . The cubicle unit shall be installed in approved finish, shades and colours as per specifications and directions of Engineer-In-Charge, including minimum 5 (five) years warranty against any moisture related damages to all intermediate panels, doors, hardwares etc. Standard dimension of the cubicle system shall be of approx. 2100 mm Height(overall) x 1500mm Depth and 1000 mm Width which includes 750mm door size width. L shaped Cubicle System consisting of front face panel including door, intermediate panel and all necessary accessories, fittings and hardware etc.	J.42	21.00	EA		0.00 INR Zero Only
159	Approval & running permission for required capacity of DG Set Following are the scope of work:- 1.Preparation of drawing & document. 2.Submission of drawing & document to the concerned authority / office with a copy of all correspondence to EIC. 3.Payment of drawing approval fees. (Shall be reimbursed on production of original challan/bill) 4.Submission of work completion report as per approved drawing. 5.Arranging the inspection of the installation. The traveling, lodging, boarding and other expenses of statutory authorities for inspections shall be born by the contractor. 6.Follow up at various level. 8.Payment of inspection fees. (Shall be reimbursed on production of original challan/ bill) 9. Any other related job to obtain approval and running permission. Lump sum rate is to be quoted for one complete activity unit/job (EA means 1 Job here)	J.44	1.00	EA		0.00 INR Zero Only
160	Making 'T' connection from the Corporation water supply main line with all necessary works and specials including road cutting and making good the road after the connection etc., complete. The quoted rate shall include for the necessary road cutting charges to be paid to corporation/ statutory body and liaison work with the authorities for obtaining orders (The necessary official deposits, etc. shall be paid reimbursed by GAIL on submission of demand note and challan/ bill in proof of submission of fees). Lump sum rate is to be quoted for one complete activity unit/job (EA means 1 Job here)	J.45	1.00	EA		0.00 INR Zero Only
161	Making 'T' connection from the Corporation sewer line with all necessary works and specials including road cutting and making good the road after the connection etc., complete. The quoted rate shall include for the necessary road cutting charges to be paid to corporation/ statutory body and liaison work with the authorities for obtaining orders (The necessary official deposits, etc. shall be paid reimbursed by GAIL on submission of demand note and challan/ bill in proof of submission of fees). Lump sum rate is to be quoted for one complete activity unit/job (EA means 1 Job here)	J.46	1.00	EA		0.00 INR Zero Only
162	Getting approval and completion certificate from LOCAL municipal corporation/development authority including liasoning, submission of as built drawings, inspection and clearance etc complete. Statutory fees to be paid if any shall be reimbursed by GAIL on submission of demand note and challan/ bill in proof of submission of fees. the scope of contractor shall be to get the completion certificate from corporation. Lump sum rate is to be quoted for one complete activity unit/job (EA means 1 Job here)	J.47	1.00	EA		0.00 INR Zero Only
163	Approval for load sanction and contract demand of required load capacity with State Electricity Borad as per following scope of work:- 1.Preparation of all drawings and documents required for obtaining approval/sanction. 2.Submission of drawings and documents to the appropriate authority/office with a copy to EIC. 3.Complete liasoning with state electricity board. 4.Payment of all statutory fees. The statutory fees, security deposits and contract demand charges shall be reimbursed by GAIL on production of original Challan. 5.Arranging inspections by statutory authorities. The travelling, lodging, boarding and other expenses of statutory authorities shall be born by the contractor. 6.Doing regular follow-up. 7.Any other related job to obtaining the load approval / contract demand. 8.Final charging of 11 KV Sub - Station. Lump sum rate is to be quoted for one complete activity unit/job (EA means 1 Job here)	J.48	1.00	EA		0.00 INR Zero Only
164	FIRE APPROVAL - Following are the scope of work:- 1.Preparation of drawing & document. 2.Submission of drawing & document to the concerned authority / office with a copy of all correspondence to EIC. 3.Payment of drawing approval fees. (Shall be reimbursed on production of original challan) 4.Submission of work completion report as per approved drawing. 5.Arranging the inspection of the installation. The traveling, lodging, boarding and other expenses of statutory authorities for inspections shall be born by the contractor. 6.Follow up at various level. 8. Completion of all fire related works such as fire-fighting works, PA/ Fire Alarm etc. all as per norms of the Building Approval Authority/ any other regulator as required and instructed by Engineer- In-Charge 10. Any other related job to obtain approval and running permission Lump sum rate is to be quoted for one complete activity unit/job (EA means 1 Job here)	J.49	1.00	EA		0.00 INR Zero Only
165	Supply and Installation of 6mm thick Exterior grade F- Quality panels of standard size with both side décor. Exterior panels are Duromer high-pressure laminates (HPL) as per EN 438-6 type EDF manufactured with norm conformity of EN 438-7 using patented NT Technology (NT is Non fading high performance acrylic polyurethane surface Technology). Panels will be double hardened including acrylic polyurethane resin and thermally cured under high pressure. These Panels will have CE-Mark necessary for their use in building applications. Installation of panels will be done by MBE Rivets (with Fixed and Sliding Points) with recommended Aluminium T section of 75x37x2.8 mm thick and L section 38x38x2.8mm thick held by Aluminium Wall Bracket with Wind load and Dead load slot as designed anchored by standard anchor fasteners along with Thermal Separator. Installation of Panels will be done using Rear Ventilated Principles only, which is ensured by providing ventilation gap minimum 200 cm ² / per Meter (for free flow of air behind the façade) for the façade and using the framework with no horizontal section (for all levels and all height upto 35 m including scaffolding etc. complete)	J.50	10.00	M2		0.00 INR Zero Only

166	Providing and supplying 'Optra Acoustical Wall Paneling with square edges made of fibre glass substrate 25mm thick and wrapped on the front side with an acoustically transparent and classified for Fire reaction Class A as per ASTM E-84 fabric with an option of colors – Husk, Copper, Sangria, Sesame, Coffee, Charcoal, Titanium, Flame, Peanut & Shell as per the choice of the Architect/ Engineer-In-Charge of size 600X600 mm providing a minimum sound absorption level of 0.85 NRC to be affixed to wall using Wall panel impalers and construction adhesives as per the instructions laid down by the manufacturer.	J.51	20.00	M2		0.00	INR Zero Only
167	Providing and fixing Trap doors in ceiling made of 19mm thick factory pressed BWP grade marine ply as per IS 710 & finished in 1 mm thick laminate (Laminate of approved shade and sample) from both side with concealed solid wooden frame as per detail drawing with framework in 100mm x 50mm teak wood section @ hinged supports on both sides. Shutter panels (2 no's) shall consisting of plywood strip of size 40mm x 19mm in section around periphery fixed for holding 19 mm thick factory pressed BWP grade marine ply as per IS 710 skinning on both side with 12mm thk TW lipping on exposed edges to form shutter panel. Top of the panel to be treated with anti-termite treatment and finished with 1 coat of approved colour polish. Door shutters should be complete with necessary hardware such as brass hinges, locking system, hanging SS chain etc. All exposed surface should be finished with TW lipping & matching colour polish. All complete as per detailed drawings & instruction of Architect. Quoted Rates are for all heights , scaffolding, depths, levels, leads and lifts and for all design and pattern shown in drawings	J.52	50.00	M2		0.00	INR Zero Only
168	BOREWELL PERMISSION - Getting approval for Borewell permission for Building Construction works etc. all from LOCAL municipal corporation/ development authority including liasoning, submission of drawings, inspection and clearance etc complete. Statutory fees to be paid if any shall be reimbursed by GAIL on submission of demand note and challan bill in proof of submission of fees. The scope of contractor shall be to get the permission from corporation. Commissioning of Borewell complete as per norms of the Building Approval Authority/ any other regulator as required and instructed by Engineer-In-Charge. Any other related job to obtain approval and running permission. Lump sum rate is to be quoted for one complete activity unit/job (EA means 1 Job here)	J.53	1.00	EA		0.00	INR Zero Only
169	Providing and laying factory made coloured chamfered edge Cement Concrete paver blocks of required strength, thickness & size/shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50mm thick compacted bed of fine sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with jamuna sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand in footpath, parks, lawns, drive ways or light traffic parking etc. complete as per manufacturer's specifications & direction of Engineer-in-Charge. 60mm thick cement concrete paver block of M-35 grade with approved colour, design & pattern.	J.54	1500.00	M2		0.00	INR Zero Only
170	Multi – B Ceiling System - Supply of LUXALON® Aluminium, un-perforated, Multi B Ceiling System with V closed groove: Providing & Fixing of Luxalon 80B / 130B / 180 Bun-perforated Aluminium panel ceiling 0.4mm thick with square edges, panel length upto 6mtrs, Coil Coated on a Continuous Paint Line. Double baked and roll formed from enamelled corrosion resistance Aluminium Alloy AA5050 (Al.Mg) for higher strength and good roll forming characteristics. The ceiling panel shall be manufactured on high speed, high precision roll forming machinewith ARKUSIX Hi configuration roller levelling process to ensure the flatness and to avoid the failure of metal at corners which may occur normally on press brake machine. Panel shall be clipped to baked enamelled Aluminium panel carrier of 62mm wide x 29mm deep made of 0.95mm thick in standard length of 5mtrs made of double Baked enamelled Aluminium alloy AA5050 (Al.Mg.) black with cutouts to hold the panels in a module of 50mm (width of gap 20mm open) The Carrier shall be suspended by means of G.I. suspension rod 4mm diameter and a Galvanised suspension spring clip at a distance of 1.7mtrs c/c. Paint finish: Aluminium panels shall be chromatised for maximum bond between metal and paint enamelled twice under high temperature, one side with full primer and finish coat the other side (innerside) with a primer coating and Skin Coat on a Continuous Paint Line. The ceiling system should meet the required standards for GreenPro certification and should qualify as green product as per CII green products and services council. The manufacturer should be ISO 9001:2015 Quality Management System Certification compliant with in house testing facility and should have their own manufacturing plant in India. Mode of Measurements: Measurements shall be wall to wall without any deductions for lights, diffusers, columns etc. All ceiling shall be Green pro Certified: For LEED certification by Indian Green Building council (IGBC). Ceiling manufacturer should have local manufacturing unit in India. Manufacturer should have Roll-forming machine to produce Baffle panels & in-house testing lab in India & having more than 20 years of existence in India. Approved Makes - Hunter Douglas, Gorden, SAS, Armstrong	J.55	20.00	M2		0.00	INR Zero Only
171	"Luxalon® Aluminium Plain U-Baffle Roll Formed coil coated Ceiling: Supply of U Baffle made up of Aluminium panel multi level / size baffle panel ceiling of approved colour consisting of panel size 55 mm wide and 110 mm deep and 55 mm wide and 145 mm deep using 0.7mm thick, minimum length of panel is 5mt, Coil Coated on a Continuous Paint Line. Double baked and roll formed from enamelled corrosion resistance Aluminium alloy for higher strength and good roll forming characteristics. The ceiling panels coil undergoes through levelling process on advanced CAD/CAM equipment to achieve levelling through ARKU SIX Hi configuration roller levelling process to ensure the flatness of the coil in the manufacturing process and relives stresses of coil. Baffle Panels should be manufactured from Roll forming machine only in India to get the high-quality Baffle panels with accurate dimensions. The baffle coils to go through 4 stages of pre-treatment, three times oven baked through conversion coating, priming and finish coat ensuring superior adhesion, high corrosion resistance and good colour stability. The coils to be painted on both sides after degreasing. Inside surface to have a primer of 5microns and a coat of natural colour of 5microns, exposed surface to have a primer of 5microns, binder of 5microns and topcoat of approved colour of 15 microns. Panels shall be clipped to a galvanized steel carrier of 0.5 mm thick, Black Colour coated, one leg of the carriers with cut outs to hold the panels in a module of 150 mm.	J.56	15.00	M2		0.00	INR Zero Only

172	Panel carrier shall be suspended by means of threaded rod at a distance of 1.8 mtr. c/c. The Metal ceiling should be Tested for Seismic Zone V compliance as per IS 1893 part 1-2016. Paint Finish: The baffle coils to go through 4 stages of pre-treatment, three times oven baked through conversion coating, priming and finish coat ensuring superior adhesion, high corrosion resistance and good colour stability. The coils to be painted on both sides after degreasing. Inside surface to have a primer of 5microns and a coat of natural colour of 5microns, exposed surface to have a primer of 5microns, binder of 5microns and topcoat of approved colour of 15 microns. All ceiling shall be Green pro Certified: For LEED certification by Indian Green Building council (IGBC). Ceiling manufacturer should have local manufacturing unit in India. Manufacturer should have Roll-forming machine to produce Baffle panels & in-house testing lab in India & having more than 20 years of existence in India Approved Makes - Hunter Douglas, Gorden, SAS, Armstrong					
173	Triangular Cell Ceiling System Supply & Installation of Luxalon® Aluminium AA3105 Cell Ceiling 50E manufactured by HDI of approved colour consisting of Main Runner, Cross Runner, Upper Sections, Lower Sections all of U-Shaped Profiles 10mm wide x 50mm deep x 0.5mm thick with inwardly returned edges of 2.5mm. Coil coated on a continuous Paint Line, Double baked and roll formed from enamelled corrosion resistance Aluminium alloy for higher strength and good roll forming characteristics. The ceiling panels coil undergoes through levelling process on advanced CAD/CAM equipment to achieve levelling through ARKU SIX Hi configuration roller levelling process to ensure the flatness of the coil in the manufacturing process and relieves stresses of coil. Cell ceiling panels should be manufactured from Roll forming machine to get the high-quality panels with accurate dimensions. Aluminium Alloy (Al.Mg) AA3105 for higher strength and good Roll Forming characteristics. The Main Runner shall be fixed at a distance of 1.2mtrs c/c and shall be suspended by means of G.I. Suspension Rod 4mm diameter and a Galvanized Suspension Spring Clip at a distance of 1.2mtr c/c. The Cross-Runner shall be fixed to the Main Runner at a distance 0.6mtrs c/c., with a self-locking device. The Upper Section and Lower section shall be fixed to the Main Runner and Cross Runner in a form of a Cell Structure of module 100 X 100 mm x 100mm in triangular cell shape with a self-locking device. Paint Finish: The baffle coils to go through 4 stages of pre-treatment, three times oven baked through conversion coating, priming and finish coat ensuring superior adhesion, high corrosion resistance and good colour stability. The coils to be painted on both sides after degreasing. Inside surface to have a primer of 5microns and a coat of natural colour of 5microns, exposed surface to have a primer of 5microns, binder of 5microns and topcoat of approved colour of 15 microns. All ceiling shall be Green pro Certified: For LEED certification by Indian Green Building council (IGBC). Ceiling manufacturer should have local manufacturing unit in India. Manufacturer should have Roll-forming machine to produce Baffle panels & in-house testing lab in India & having more than 20 years of existence in India Approved Makes - Hunter Douglas, Gorden, SAS, Armstrong	J.57	20.00	M2		0.00 INR Zero Only
174	BXD Ceiling System Supply of LUXALON® Aluminium, un-perforated, Multi BXD Ceiling System with V closed groove: Providing & Fixing of Luxalon BXD ceiling of Aluminium panel of panel of size 30 X15 / 30X39 / 30X64 /80X15 /80X64 /120 X 15 /130 X 64 of 0.5mm/0.6mm thick, with square edges, panel length up to 6 mtr, Coil Coated on a Continuous Paint Line. Double baked and roll formed from enamelled corrosion resistance Aluminium Alloy AA5050 (Al.Mg) for higher strength and good roll forming characteristics. The ceiling panel shall be manufactured on high speed, high precision roll forming machine with ARKUSIX Hi configuration roller levelling process to ensure the flatness and to avoid the failure of metal at corners which may occur normally on press brake machine. Panel shall be clipped to baked enamelled Aluminium panel carrier of 62mm wide x 29mm deep made of 0.95mm thick in standard length of 5mtrs made of double Baked enamelled Aluminium alloy AA5050 (Al.Mg.) black with cutouts to hold the panels in a module of 50mm (width of gap 20mm open) The Carrier shall be suspended by means of G.I. suspension rod 4mm diameter and a Galvanised suspension spring clip at a distance of 1.7mtrs c/c. Paint finish: Aluminium panels shall be chromatised for maximum bond between metal and paint enamelled twice under high temperature, one side with full primer and finish coat the other side (innerside) with a primer coating and Skin Coat on a Continuous Paint Line. The ceiling system should meet the required standards for GreenPro certification and should qualify as green product as per CII green products and services council. The manufacturer should be ISO 9001:2015 Quality Management System Certification compliant with in house testing facility and should have their own manufacturing plant in India. Mode of Measurements: Measurements shall be wall to wall without any deductions for lights, diffusers, columns etc. All ceiling shall be Green pro Certified: For LEED certification by Indian Green Building council (IGBC). Ceiling manufacturer should have local manufacturing unit in India. Manufacturer should have Roll-forming machine to produce Baffle panels & in-house testing lab in India & having more than 20 years of existence in IndiaApproved Makes - Hunter Douglas, Gorden, SAS, Armstrong	J.58	20.00	M2		0.00 INR Zero Only

175	PERFORATED METAL LINEAR PLANK CEILING 300mm wide Perforated panel + NWT - Providing 300mm wide perforated 2.0 mm diameter 5mm c/e pasted with NWT corrosion resistant Aluminium Magnesium Alloy metal ceiling consisting of panel 300mm wide x 30 mm deep x 0.7 mm thick with bevel edge having panel minimum length of 5mtrs. coil coated on a continuous paint line. Double baked and roll formed for higher straight and good roll forming characteristics with 21% perforation in White finish color. The ceiling panel shall be manufactured on high speed, high precision roll forming machinery with ARKUSIX Hi configuration roller levelling process to ensure the flatness and to avoid the failure of metal at corners which may occur normally on press brake machine. The panel ends are raised up to 29 mm . The panel about each other with a narrow V groove. Panel shall be clipped to a backed enamelled aluminium panel carrier of 41.5 mm wide x 62 mm deep x 0.95 mm thick in standard length of 5 mtrs. made of double baked enamelled aluminium magnesium alloy black with cut outs to hold panels module of 300 mm and at distance of 2.4 mtrs. the carrier shall be suspended by means of GI suspension rod 4mm diameter and suspension clip at 1.3 mtr. distance. The coils to go through 4 stages of pre-treatment, three times oven baked through conversion coating, priming and finish coat ensuring superior adhesion, high corrosion resistance and good colour stability. The coils to be painted on both sides after degreasing. Inside surface to have a primer of 5 microns and a coat of natural colour of 5 microns, exposed surface to have a primer of 5 microns, binder of 5 microns and topcoat of approved colour of 15 microns. If any MS Sub structure is required, it shall be paid separately in the respective individual item. The Metal ceiling should be Tested for Seismic Zone V compliance as per IS 1893 part 1-2016.	J.59	20.00	M2		0.00 INR Zero Only
176	Paint finish : The coils to go through various stages of pre-treatment, oven baked through conversion coating, priming and finish coat ensuring superior adhesion, high corrosion resistance and good colour stability. The coils to be painted on both sides after degreasing. Inside surface to have a primer of 5 microns and a coat of natural colour of 5 microns, exposed surface to have a primer of 5 microns, binder of 5 microns and topcoat of approved colour of 15 microns. Green-pro certification: For LEED certification by Indian Green Building Council (IGBC) and ISO 9001: 2015 Quality Management System Certification. Approved Makes - Hunter Douglas, Gorden, SAS, Armstrong					
177	SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF Spider Rope Descender System along with Full Body Harness for minimum 30 mtr. height for Building facade cleaning and maintenance consisting of following equipments which collectively makes 1 SET: Grip Descender - EN 34 Type E2 Class A & EN 12841 Type C - 1 No. Edge Protector - EN 12278 - 1 No. HPPE liner with Embossed latex - EN 388 & EN 407 - 1 Pair Set Kernmantle rope with connector - EN 1891 - 50 mtr. - 2 Set Steel Screw locking Karabiner - PN112 EN 362 (Class B) (Class M) Anchorage webbing sling - EN 795 Type B - 1.2 mtr. - 2 No. Guided type fall arrestor system on flexible anchorage line - EN 353.2 - 1 No. Tower harness - EN 361/ 358/ 813 - 1 No. Bag - BG 12 - 1 No. Parapet Anchor of Minimum Breaking Strength : 23kN, Flange width adjustable from 60mm to 360mm - EN 795 : 2012 - 1 No. The rate includes 1 Site Demonstration of complete setup by trained personnel in front of client/ end user. Approved Makes - Karam, IBS Safety, Neo Safety Products, 3M, Udyogi	J.60	5.00	SET		0.00 INR Zero Only
178	Demolishing of C.C./ R.C.C./ R.B./ Brick/ Concrete Block/ Stone Masonry/ Dressed stone work/ steel, etc. work manually/ by mechanical means including stacking of steel bars and disposal of complete unserviceable material/ debris/ steel/ moorum/ building rubbish/ malba/ similar unserviceable, dismantled or waste material by mechanical transport including loading, transporting, unloading to approved municipal dumping ground for lead upto 5 KM away from the site and for all lifts (considering the maximum disposal location at 5 KM distance and is to be done at designated area as per prevailing local norms at Contractor's own responsibility including any royalties, etc. all), complete as per directions of Engineer-in-charge. Note - item to be applicable in urban areas having directions for restricted hours for movement/ plying of load carrying motor vehicle of 3.5 cum or more as per direction of Engineer - in- charge. All such unserviceable material/ debris/ steel/ moorum/ building rubbish/ malba/ similar unserviceable, dismantled or waste material to be completely cleared as directed by Engineer-In-Charge. The cost is inclusive of all to complete all demolishing, disposal, transportation, loading/ unloading, stacking etc. Bidders are requested to visit site to analyze all such quantum of work before quoting.	J.61	11.00	M3		0.00 INR Zero Only
179	FIRE FIGHTING WORK	2				
180	FIRE FIGHTING WORK	K				
181	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :	K.1				
182	25 mm dia	K.1.1	1400.00	M		0.00 INR Zero Only
183	32 mm dia	K.1.2	100.00	M		0.00 INR Zero Only
184	40 mm dia	K.1.3	200.00	M		0.00 INR Zero Only
185	50 mm dia	K.1.4	200.00	M		0.00 INR Zero Only
186	65 mm dia	K.1.5	200.00	M		0.00 INR Zero Only
187	80 mm dia	K.1.6	300.00	M		0.00 INR Zero Only
188	100 mm dia	K.1.7	70.00	M		0.00 INR Zero Only
189	150 mm dia	K.1.8	300.00	M		0.00 INR Zero Only
190	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required :	K.2				

191	150 mm dia	K.2.1	7.00	EA		0.00	INR Zero Only
192	80mm dia	K.2.2	16.00	EA		0.00	INR Zero Only
193	Providing, installation, testing and commissioning of non-return valve of following sizes conforming to IS:5312 complete with rubber gasket, GI bolts, nuts, washers etc. as required : 150 mm dia	K.3	1.00	EA		0.00	INR Zero Only
194	Supplying and fixing single headed internal hydrant valve with instantaneous Gunmetal/Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required : Single headed Gunmetal	K.4	16.00	EA		0.00	INR Zero Only
195	Providing & fixing flow switch in following sizes M.S. pipe including connection etc as required. 100 mm dia	K.5	14.00	EA		0.00	INR Zero Only
196	Supplying and fixing first-aid Hose Reel with MS construction spray painted in post office red, conforming to IS 884 complete with the following as required. 20 mm nominal internal dia water hose thermoplastic (Textile reinforced) type -2 as per IS: 12585 20 mm nominal internal dia gun metal globe valve & nozzle. Drum and brackets for fixing the equipments on wall. Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket. 40 m	K.6	14.00	EA		0.00	INR Zero Only
197	Providing & fixing angle iron (40 mm x 40 mm x 5mm) door frame and MS sheet (2mm thick) cum glass shutter of size 2.1 mtr. X 1.2 mtr. (N.S.) with 25 mm x 25 mm x 3 mm angle fram all around & stiffened in between i/c hinges, handle, locking arrangement, painting with approved synthetic enamel paint i/c sign writing on grass at internal hydrant including providing & fixing M.S. Sheet 2 mm thick on remaining portion above door to close opening i/c painting etc. as required.	K.7	14.00	EA		0.00	INR Zero Only
198	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female couplings duly bound with GI wire, rivets etc. conforming to IS 636 (type-A) as required : Gun Metal	K.8	32.00	EA		0.00	INR Zero Only
199	Providing and fixing standard fire man's axe (Tested for 20000 volts) with heavily insulated rubber handle (ISI marked)	K.9	16.00	EA		0.00	INR Zero Only
200	Providing, fixing, testing & commissioning of 5mm dia quartzoid bulb type sprinklers of rating 68 degree centigrade with required accessories :	K.10					
201	Upright Sprinkler	K.10.1	670.00	EA		0.00	INR Zero Only
202	Pendent Sprinkler	K.10.2	670.00	EA		0.00	INR Zero Only
203	Horizontal side wall sprinkler	K.10.3	14.00	EA		0.00	INR Zero Only
204	Supplying, installation, testing & commissioning of sprinkler flexible pipe (UL Listed) of stainless steel complete with 15 NPT on reducer thread with maximum working pressure of 175 PSI test pressure of 875 PSI (Burst) with branch line (Inlet) 25mm NPT male thread to sprinkler head (Outlet) 15mm NPT female thread with reducer, nipple, 2 side brackets, center bracket, stockbar of following sizes complete as required.	K.11					
205	700mm	K.11.1	70.00	EA		0.00	INR Zero Only
206	1000mm	K.11.2	70.00	EA		0.00	INR Zero Only
207	1200mm	K.11.3	70.00	EA		0.00	INR Zero Only
208	1500mm	K.11.4	70.00	EA		0.00	INR Zero Only
209	Providing & fixing dial type pressure gauge (dial diameter 100 mm, calibration 0-15 kg/sqcm) with ball valve and pipe at hydrant station.	K.12	30.00	EA		0.00	INR Zero Only
210	Providing, fixing and installation of 25mm dia gunmetal inspecting & testing assembly with ball valve, gunmetal sight glass, bye pass valve & connected to drain line complete in all respects. (Flow switch shall be set to activate between 30 to 60 second upon opening of the test valve.)	K.13	14.00	EA		0.00	INR Zero Only
211	Supplying and fixing orifice plate made out of 6 mm thick stainless steel (Grade 304) with orifice of required size to be fitted between flange & landing valve of external and internal hydrants to reduce pressure at the outlet to the level of 3.5 kg/cm ² complete as required.	K.14	14.00	EA		0.00	INR Zero Only
212	Providing and fixing MS cabinet (size 600 x 450 x 150 mm) fabricated from 16 gauge MS sheet with full front glass door & locking arrangement with suitable shelves for keeping 60 Nos. spare sprinklers & one no. spanner properly fixed in shelves. Cabinet shall be painted with enamel paint of approved shade. (Cost shall include 25 Nos. (Pendent 15 Nos, upright 5 & extended through Side wall 5 Nos) spare sprinklers & one No. spanner).	K.15	1.00	EA		0.00	INR Zero Only
213	Providing and fixing gunmetal single acting air release valve for each risers with screwed inlet with ball valve as per IS : 12992 rated for 16 Kg/cm ² pressure rating. (25 mm dia)	K.16	4.00	EA		0.00	INR Zero Only
214	Providing and fixing in position approved fire bucket of 24 gauge, galvanized steel, standard 9 liters capacity and of round bottom shape, panted white inside and red outside and black on bottom dome with letters 'FIRE' in black and gold with all mounting bracket and screws.	K.17	4.00	EA		0.00	INR Zero Only
215	Providing and fixing of fire Bucket Stand including sheet metal (16 gauge) shade for 4 buckets. Platform and associated civil works complete.	K.18	8.00	EA		0.00	INR Zero Only
216	Providing and fixing of ISI marked Portable Fire Extinguisher, CO2 type of 6 Kg capacity flat base conforming to IS: 15683 : 2006 including valve, discharge hose of not less than 10mm dia. 1m long and complete in all respect including initial fill with CO2 gas conforming to IS: 307-1966 filled to a filling ratio of not more than 0.667 and wall suspension bracket.	K.19	14.00	EA		0.00	INR Zero Only
217	Providing and fixing of 6 Kg capacity Dry Chemical Powder, Portable Fire Extinguisher, dry powder type (Gas Cartridge) conforming to IS: 15683 : 2006 with cylinder initially fully charged with dry powder, ISI marked conforming to IS:15683 : 2006 complete with standard discharge valve with tube, CI bracket for wall mounting.	K.20	14.00	EA		0.00	INR Zero Only
218	Providing and fixing of ISI marked portable fire extinguisher Mech. Foam type capacity 9 liters conforming to IS: 15683 : 2006 with gunmetal cap and nozzle and complete in all respects including initial fill and wall suspension.	K.21	3.00	EA		0.00	INR Zero Only
219	Providing and fixing of ISI marked Fire and wall suspension bracket, Extinguisher, Trolley mounted carbon-dioxide type capacity 22.5 Kg. conforming to IS: 2878 Flat base including valve, discharge hose of not less than 10mm dia 1m long complete in all respects including wheeled trolley, carrying handle and initial fill with CO2 gas as per IS: 307-1996 filled to a filling ratio of not more than 0.667.	K.22	3.00	EA		0.00	INR Zero Only
220	Providing and fixing of ISI marked fire extinguisher Trolly mounted Mechanical Foam type capacity 50 liters with gunmetal cap and nozzle, trolley mounted and complete in all respects including initial fill.	K.23	3.00	EA		0.00	INR Zero Only

221	Providing & fixing ISI marked portable fire extinguisher, water Carbon dioxide (CO2) type of 9 liters capacity conforming to IS : 15683 : 2006 with gun metal cap and nozzle and complete in all respects including initial fill and wall suspension brackets.	K.24	14.00	EA		0.00	INR Zero Only
222	Providing & fixing of weather proof hose cabinets fabricated from 16 g M.S. sheet with full glass door and locking arrangement, suitable to accommodate 2 nos.15m long 63mm dia hose, 1 branch pipe, 1 No fire man's axe."Fire Hose" written on front including suitably mounted on a raised masonry platform as required. (Approx.size 0.6 m x 0.6m x 0.45m). Cabinet shall be provided with angle at the edges to reinforced the cabinet.	K.25	2.00	EA		0.00	INR Zero Only
223	Providing of ABC modular type Fire Extinguisher, ceiling mounted 5 KG. Capacity, complete in all respect.(automatic)	K.26	35.00	EA		0.00	INR Zero Only
224	PLUMBING WORK	3					
225	INTERNAL COLD WATER SUPPLY SYSTEM	L					
226	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 fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings INCLUDING bend, elbow, door, tee, Y tee, end cap etc. all complete wherever required 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	L.1					
227	15mm dia nominal bore	L.1.1	370.00	M		0.00	INR Zero Only
228	20mm dia nominal bore	L.1.2	220.00	M		0.00	INR Zero Only
229	25mm dia nominal bore	L.1.3	100.00	M		0.00	INR Zero Only
230	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes , having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings INCLUDING bend, elbow, door, tee, Y tee, end cap etc. all complete wherever required with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall	L.2					
231	20mm dia nominal bore	L.2.1	20.00	M		0.00	INR Zero Only
232	25mm dia nominal bore	L.2.2	20.00	M		0.00	INR Zero Only
233	32mm dia nominal bore	L.2.3	40.00	M		0.00	INR Zero Only
234	40mm dia nominal bore	L.2.4	150.00	M		0.00	INR Zero Only
235	50mm dia nominal bore	L.2.5	100.00	M		0.00	INR Zero Only
236	65mm dia nominal bore	L.2.6	40.00	M		0.00	INR Zero Only
237	80mm dia nominal bore	L.2.7	5.00	M		0.00	INR Zero Only
238	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :	L.3					
239	25 mm nominal bore	L.3.1	30.00	EA		0.00	INR Zero Only
240	20 mm nominal bore	L.3.2	10.00	EA		0.00	INR Zero Only
241	40 mm nominal bore	L.3.3	4.00	EA		0.00	INR Zero Only
242	50 mm nominal bore	L.3.4	1.00	EA		0.00	INR Zero Only
243	80 mm nominal bore	L.3.5	1.00	EA		0.00	INR Zero Only
244	32 mm nominal bore	L.3.6	3.00	EA		0.00	INR Zero Only
245	63 mm nominal bore	L.3.7	3.00	EA		0.00	INR Zero Only
246	Providing and fixing in position of approved quality high pressure rated Gun Metal Float Valve with copper ball float and brass rods of required length suitable for test pressure of not less than 15 Kg/sqcm of the following sizes: 25 mm dia	L.4	2.00	EA		0.00	INR Zero Only
247	Providing & fixing Auto Air vent for cold water supply risers, suitable for pressure not less than 15Kg/Sq.cm 25 mm dia	L.5	2.00	EA		0.00	INR Zero Only
248	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc, INCLUDING Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality, Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work) :	L.6					
249	25 mm nominal dia Pipes	L.6.1	50.00	M		0.00	INR Zero Only
250	32 mm nominal dia Pipes	L.6.2	50.00	M		0.00	INR Zero Only
251	40 mm nominal dia Pipes	L.6.3	50.00	M		0.00	INR Zero Only
252	50 mm nominal dia Pipes	L.6.4	200.00	M		0.00	INR Zero Only
253	65 mm nominal dia Pipes	L.6.5	100.00	M		0.00	INR Zero Only
254	80 mm nominal dia Pipes	L.6.6	10.00	M		0.00	INR Zero Only
255	Providing and fixing Connectors for connecting GI Pipe with CPVC pipes complete	L.7	30.00	NUM		0.00	INR Zero Only
256	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete	L.8					
257	20 mm nominal bore	L.8.1	12.00	EA		0.00	INR Zero Only
258	25 mm nominal bore	L.8.2	33.00	EA		0.00	INR Zero Only
259	32 mm nominal bore	L.8.3	1.00	EA		0.00	INR Zero Only
260	40 mm nominal bore	L.8.4	4.00	EA		0.00	INR Zero Only
261	50 mm nominal bore	L.8.5	1.00	EA		0.00	INR Zero Only
262	INTERNAL HOT WATER SUPPLY SYSTEM WORK	M					
263	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 fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings INCLUDING bend, elbow, door, tee, Y tee, end cap etc. all complete wherever required 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	M.1					
264	15mm dia nominal bore	M.1.1	80.00	M		0.00	INR Zero Only

265	20mm dia nominal bore	M.1.2	50.00	M		0.00	INR Zero Only
266	25mm dia nominal bore	M.1.3	5.00	M		0.00	INR Zero Only
267	Providing and fixing nitrle rubber insulation on hot water supply / return pipes.	M.2					
268	15 mm dia (9 mm thickness of Insulation)	M.2.1	80.00	M		0.00	INR Zero Only
269	20 mm dia (9 mm thickness of Insulation)	M.2.2	50.00	M		0.00	INR Zero Only
270	25 mm dia (9 mm thickness of Insulation)	M.2.3	5.00	M		0.00	INR Zero Only
271	INTERNAL DRAINAGE, SOIL, WASTE & VENT SYSTEM	N					
272	Providing, fixing, jointing, testing and commissioning of UV stabilised UPVC pipes, Type B as per IS:13592 for soil, waste and vent, including all fittings with or without access i.e bends, junctions, cowls, offsets, couplers, connectors, heavy duty Metal pipe clamps with rubber seal/clips/holders etc. and jointing with heavy duty solvent cement, complete as per manufacturer's specifications including cutting holes in walls and floors, wherever required and making good the same, complete as directed by the Engineer-in-Charge. (vertical pipes can be jointed through rubber O rings)	N.1					
273	110 mm dia	N.1.1	600.00	M		0.00	INR Zero Only
274	75 mm dia	N.1.2	130.00	M		0.00	INR Zero Only
275	Providing, fixing, jointing, testing and commissioning of PVC pipe as per IS 4985, Class-3, 6Kg/cm2 with cement solvent joint, complete with all fittings and clamps etc including cutting and making good the walls and floors for waste pipes from wash basins, urinals and sinks & balcony drainage, as directed by the Engineer-in-charge.	N.2					
276	63mm dia	N.2.1	85.00	M		0.00	INR Zero Only
277	40mm dia	N.2.2	125.00	M		0.00	INR Zero Only
278	Providing & fixing in position uPVC full bore P / S trap with 50 mm water seal of following sizes for embedded area, making proper connection with M seal .including cutting chase / hole in floors /slabs and bringing the same in proper condition and shape after placing the trap in right position complete as required. 100 mm inlet and 100 mm outlet.	N.3	72.00	EA		0.00	INR Zero Only
279	Providing, fixing, testing and commissioning of uPVC pipe inlet fittings with maximum 3 inlets 40, 50 & 63mm OD size fixed to 'P' traps including Drips/Pipe seal/solvent weld joint/rubber ring joint complete .	N.4	72.00	EA		0.00	INR Zero Only
280	Providing and fixing heavy duty S.S. Floor grating (Cockroach proof) with frame of approved design including setting in floor with cement mortar to match with floor finish as per architect requirement. Make - Jaquar or equivalent	N.5					
281	Size 150 mm x 150 mm or 125 mm dia	N.5.1	72.00	EA		0.00	INR Zero Only
282	Size 100 mm x 100 mm or 100 mm dia	N.5.2	40.00	EA		0.00	INR Zero Only
283	Providing and fixing PVC ceiling COP /FCO with suitable insert keys for opening as per approved sample, properly jointed to soil and waste pipe as per requirement, complete as per instructions of the Engineer in charge. For 100 mm dia pipe	N.6	25.00	EA		0.00	INR Zero Only
284	Rain Water Drainage Providing, fixing, jointing, testing and commissioning PVC Type B, IS:13592, 6Kg/cm2, Rain water down take pipe conforming to IS:4985 cut to required lengths including all necessary fittings and specials, fixing at wall/ceiling level supported by galvanized steel clamps & hangers, making proper connection with cement solvent joint as per BIS / manufacturer. Cutting, chases / holes in floors / walls / slab.	N.7					
285	110 mm diameter	N.7.1	25.00	M		0.00	INR Zero Only
286	160 mm diameter	N.7.2	175.00	M		0.00	INR Zero Only
287	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	N.8	10.00	EA		0.00	INR Zero Only
288	SANITARY FIXTURES & FITTINGS:	O					
289	Providing and fixing white vitreous china extended wall mounting water closet of size 770x380x630 mm of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 2 litre/ 4 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete. (JAQUAR Cat No - WHT-353SPZ or equivalent)	O.1	33.00	EA		0.00	INR Zero Only
290	Providing and fixing Hand shower (health Faucet) with 8mm dia 1.2 Meter long Flexible tube And wall Hook of quality and make as approved by Engineer - in - charge. (JAQUAR Cat No - ALD-CHR-573 or equivalent)	O.2	33.00	EA		0.00	INR Zero Only
291	Providing and fixing first quality white vitreous china Under Counter Basin with Fixing Accessories Size: 605x430x200 Mm shape: Oval basin for under counter mounting , specially fabricated CI / MS brackets, painted with two or three coats of enamel paint of approved shade over a coat of primer, waste coupling, 32 mm CP brass waste and CP brass cast bottle trap and pipe to wall with CP brass flange and rubber adopter for waste connection complete including filling gap between counter and wash basin with approved type poly sulphide sealant, cutting and making good the walls wherever required (JAQUAR Cat No - CNS-WHT-705 or equivalent)	O.3	34.00	EA		0.00	INR Zero Only
292	Providing, fixing and testing of Sensor faucet for wash basin with base flange (battery operated) and easy-to-use of approved quality. (JAQUAR Cat No - SNR-CHR-51011 or equivalent)	O.4	32.00	EA		0.00	INR Zero Only
293	Providing and fixing, testing & commissioning of Single lever basin mixer with or without popup waste system with 450mm long braided hoses complete as required. (JAQUAR Cat No - FLR-CHR-5001B or equivalent)	O.5	2.00	EA		0.00	INR Zero Only
294	Providing and fixing white vitreous china Urinal (back inlet) with fixing accessories size: 385x325x635 mm Sensor mini concealed type flushing valve for urinal complete set with installation box (battery operated) battery based infrared sensor operated urinal having pre & post flushing with water (250 ml & 500 ml consumption) , having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge. (JAQUAR Cat No - URS-WHT-13253N or equivalent) (JAQUAR Cat No - SNR-STL-51083 or equivalent)	O.6	30.00	EA		0.00	INR Zero Only

295	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required 610x510 mm bowl depth 200 mm	O.7	8.00	EA		0.00	INR Zero Only
296	Providing and fixing SS-304. square Towel ring of approved quality. (JAQUAR Cat No - ACN-CHR-1121N or equivalent)	O.8	18.00	EA		0.00	INR Zero Only
297	Providing and fixing Single towel rail 600mm long, stainless steel with PVC rawl plug & C.P. brass screw complete as required. 600 mm long towel rail with total length of 645 mm, width 78 mm and effective height of 88 mm (JAQUAR Cat No - ACN-CHR-1111SM or equivalent)	O.9	2.00	EA		0.00	INR Zero Only
298	Providing and fixing SS steel toilet paper holder with flap of approved quality: (JAQUAR Cat No - ACN-CHR-1153N or equivalent)	O.10	33.00	EA		0.00	INR Zero Only
299	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931 15mm nominal bore	O.11	100.00	EA		0.00	INR Zero Only
300	Providing and fixing uplasticised PVC connection pipe with brass unions : 45 cm length 15 mm nominal bore	O.12	100.00	EA		0.00	INR Zero Only
301	Providing and Fixing SS automatic sensor based liquid soap container with bracket of the same materials with snap fittings of approved quality . (JAQUAR Cat No - SDR-BLC-DJ0160AS or equivalent)	O.13	34.00	EA		0.00	INR Zero Only
302	Providing & fixing 6mm thick beveled edge Looking mirror of Make: Modiguard/ Saint Gobain with 12mm thick BWP plywood in back & 75 x 50mm size frame of Teak Wood on perimeter of mirror & 10" x 2" size designer moulding as per drawing on top of Mirror including Melamine polish on wood frame & designer moulding, fixing with necessary screws etc. all complete as per directions by Engineer-in-charge	O.14	100.00	M2		0.00	INR Zero Only
303	Providing and fixing CP. brass bib cock of approved quality conforming to IS:8931 : (JAQUAR Cat No - CHR-5047N or equivalent) 15 mm nominal bore	O.15	35.00	EA		0.00	INR Zero Only
304	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete. Flexible pipe 40 mm dia	O.16	8.00	EA		0.00	INR Zero Only
305	Providing and Fixing stainless steel twin coat hook complete as required. (JAQUAR Cat No - ACN-CHR-1161N or equivalent)	O.17	33.00	EA		0.00	INR Zero Only
306	Providing and fixing first quality white vitreous china Under Counter Basin for handicapped toilet with Fixing Accessories Size: 605x430x200 Mm shape: Oval basin for under counter mounting , specially fabricated CI / MS brackets, painted with two or three coats of enamel paint of approved shade over a coat of primer, waste coupling, 32 mm CP brass waste and CP brass cast bottle trap and pipe to wall with CP brass flange and rubber adopter for waste connection complete including filling gap between counter and wash basin with approved type poly sulphide sealant, cutting and making good the walls wherever required. (JAQUAR Cat No - CNS-WHT-705 or equivalent)	O.18	7.00	EA		0.00	INR Zero Only
307	Providing and Fixing 2 Nos. support arms and backrest to mounted on the track (vertically and laterally) for handicap toilet complete as required. (JAQUAR Cat No - CHR-1507 or equivalent) (JAQUAR Cat No - WAC-WHT-0800 or equivalent)	O.19	7.00	EA		0.00	INR Zero Only
308	Providing and fixing white vitreous china extended wall mounting water closet of size 770x380x630 mm for handicapped toilet of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 2 litre/ 4 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete. (JAQUAR Cat No - WHT-353SPPZ or equivalent)	O.20	7.00	EA		0.00	INR Zero Only
309	Providing and fixing stainless steel 450 mm long and 32 mm diameter Straight Grab Bar (1 nos.) with 2 nos CP brass wall flange including cutting & making good the walls wherever required complete in all respect as per direction of engineer - in - charge . (Make - Jaquar, Euronics or equivalent)	O.21	7.00	EA		0.00	INR Zero Only
310	Providing and fixing stainless steel Horizontally and Vertically Movable Swing Disabled Grab Bar of 32 mm diameter (1 nos.) with necessary fittings including cutting & making good the walls wherever required complete in all respect as per direction of engineer - in - charge. (Make - Jaquar, Euronics or equivalent)	O.22	7.00	EA		0.00	INR Zero Only
311	Providing and Fixing, testing and commissioning of C.P. brass wall / counter mounted sink mixer with C.P. wall flange, overhead swinging spout complete as required and making good. (JAQUAR Cat No - CHR-5309 or equivalent)	O.23	8.00	EA		0.00	INR Zero Only
312	Providing and Fixing fully automatic stainless steel " NO TOUCH " hand drier suitable to operate on 220 volts, single phase 50 Hz, A.C power supply and directly plugged to power point complete. (JAQUAR Cat No - HDR-SSF-AK2803D or equivalent)	O.24	23.00	EA		0.00	INR Zero Only
313	Providing, fixing and testing & Commissioning of storage type water heater of approved shade with copper container, glasswool insulation, stove enamelled MS jacket, thermostatically controlled inner heater with pilot neon lamps, complete as required.	O.25					
314	10 Liters (JAQUAR Cat No - ELM-WHT-V010 or equivalent)	O.25.1	9.00	EA		0.00	INR Zero Only
315	25 Liters (JAQUAR Cat No - ELM-WHT-V025 or equivalent)	O.25.2	1.00	EA		0.00	INR Zero Only
316	Providing, fixing and testing & Commissioning of storage type solar water heater/ geyser system including piping and connections all of complete as required. The solar water heating system shall be designed according to the following design criterion and shall conform to the following technical specifications. 1. Design criterion:- a. Capacity : 300 LPD x 1 No. b. Output water temperature : 60 deg C c. Collector Type : Evacuated tube collector d. System Type : Non-Pressurized e. Application : Cooking/washing f. Circulation : Thermosyphon	O.26	1.00	EA		0.00	INR Zero Only

317	Evacuated Tube shall meet the following specifications Diameter of Tube:58mm (OD) Length of the tube: 1800mm Thickness of glass tube: 1.6mm Glass material:Borosilicate No: of tubes: 100 Absorber coating: 3 layer selective coating Absorption efficiency: >90% Emittance: <8% Vacuum: P<3x10 ⁻³ Pa						
318	The tank shall be non pressure type and made of stainless steel of grade X04Cr19Ni9 or X07Cr18Ni9 of IS 1570 part 5 – 1985, TIG welded. All sockets and internal fittings of the tanks should of stainless steel. The tank shall be insulated with Polyurethane foam 50 mm thick duly formed with injunction in a machine and cladding of GI pre-coated sheet. All sockets and internal fittings of the tanks should be of stainless steel. External of the tank should be properly insulated so that hot water temperature does not decrease by more than 5 deg. C in about 16 hrs. Make: - Racold/ Sudarshan Saur/ Nuetech/ Sunrise						
319	Providing and fixing ECO365 X22 Dual Flow Chrome Finish Jet And Eco Flow Aerator of stainless steel and of inner thread diameter 22 mm and outer thread diameter 24 mm complete for all taps, faucet, etc. complete as required.	O.27	100.00	EA			0.00 INR Zero Only
320	Providing & fixing white vitreous china water less urinal of size 600 x 330 x 315 mm having antibacterial /germs free ceramic surface, fixed with cartridge having debris catcher and hygiene seal.	O.28	2.00	EA			0.00 INR Zero Only
321	EXTERNAL SEWORAGE, STORM WATER DRAINAGE, & WATER SUPPLY SYSTEM :	P					
322	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, for all depth, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, for all leads All kind of soil Pipes, cables etc, exceeding 80mm dia but not exceeding 300 mm dia	P.1	80.00	M			0.00 INR Zero Only
323	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design: 150x100 mm size P type With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	P.2	5.00	EA			0.00 INR Zero Only
324	Constructing brick masonry road gully chamber 50x45x60 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design : with common burnt clay F.P.S.(non modular) bricks of class designation 7.5	P.3	2.00	EA			0.00 INR Zero Only
325	Constructing brick masonry rectangular type manhole with 75 class designation bricks in cement mortar 1:4 (1 cement : 4 coarse sand) , RCC top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size), inside and outside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement inside and rough plaster on outside and making channels in cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), neatly finished complete as per standard design including excavation, refilling and disposal of surplus earth as per instructions of the Engineer-in-charge. Inside size 600x600mm and 600mm deep including S.F.R.C Perforated cover and frame (medium duty MD-10 grade designation) 455x610mm internal dimensions.	P.4	2.00	EA			0.00 INR Zero Only
326	Constructing brick masonry circular type manhole 0.91 m internal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement : 4 coarse sand) , in side cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, foundation concrete 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size), and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design : 0.91 m deep with SFRC Cover and frame (heavy duty, HD-20 grade designation) 560 mm internal dia confirming of to I.S 12592 total weight of cover and frame not less than 182.Kg. fixed in cement concrete 1:2:4 (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering shuttering all complete (Excavation, foot rest and 12 mm thick plaster at the external surface shall be paid for separately) with common burnt clay F.P.S.(non module) brick of class designation 7.5	P.5	4.00	EA			0.00 INR Zero Only
327	Extra depth for circular type manhole 0.91m internal dia (at bottom) beyond 0.91 m to 1.67 m. With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	P.6	10.00	M			0.00 INR Zero Only
328	Constructing brick masonry circular manhole 1.22 m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement :4 coarse sand) inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design : 1.68 m deep with SFRC Cover and frame (heavy duty HD20 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182 kg. fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering, shuttering all complete (Excavation, foot rests and 12 mm thick cement plaster at the external surface shall be paid for separately) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	P.7	2.00	EA			0.00 INR Zero Only

329	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910, on 12 mm dia steel bar conforming to IS: 1786 , having minimum cross section as 23 mmx25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.	P.8	20.00	EA		0.00	INR Zero Only
330	Providing, Laying, jointing and testing socket and spigot RCC pipes (NP2 class) conforming to IS:458 with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) laid to correct levels below ground in trenches upto required depth including excavation in all kind of soil (hard / soft), dewatering, refilling, watering, ramming and removing the surplus excavated material and making good the same complete as required. The quoted price shall be inclusive of providing protection to pipe all round / haunches as per specification.	P.9					
331	300 mm dia	P.9.1	11.00	M		0.00	INR Zero Only
332	250 mm dia	P.9.2	22.00	M		0.00	INR Zero Only
333	200 mm dia	P.9.3	22.00	M		0.00	INR Zero Only
334	150 mm dia	P.9.4	22.00	M		0.00	INR Zero Only
335	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :	P.10					
336	25 mm nominal bore	P.10.1	2.00	EA		0.00	INR Zero Only
337	50 mm nominal bore	P.10.2	3.00	EA		0.00	INR Zero Only
338	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design : With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	P.11	2.00	EA		0.00	INR Zero Only
339	Constructing masonry Chamber 60x45x50 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for water meter complete with C.I. double flap surface box 400x200x200 mm (inside) with locking arrangement and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design : With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	P.12	1.00	EA		0.00	INR Zero Only
340	Constructing masonry Chamber 30x30x50 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for stop cock, with C. I. surface box 100x100 x75 mm (inside) with hinged cover fixed in cement concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12mm thick, finished with a floating coat of neat cement complete as per standard design : With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	P.13	2.00	EA		0.00	INR Zero Only
341	Providing, fixing, Testing and commissioning water meter with totaliser and direct reading Dial in KL with necessary fitting such as threaded Pieces, union pressure gauge and isolation cock, flanges/union complete with all necessary testing charge and obtaining Test Certificate from Municipal Authorities, on following size pipe line with 3 Nos. valve with by pass arrangement with 1 no. strainer shall be provided at inlet and cost shall be inclusive for the same. (sample of water meter to be approved from Client and manufacturers/ performance guarantee to be submitted to Client). 50 mm dia	P.14	1.00	M		0.00	INR Zero Only
342	Constructing recharge pit size 3 m Dia. 3 m deep (effective depth below inlet) in brick masonry in cement mortar 1:6 (1 cement : 6 coarse sand), including necessary earth work in excavation in all kinds of soil, disposal of surplus excavated earth, malba for all leads , returning the earth in layers surrounding brick work/ pipes ramming and watering etc., laying 150 mm thick plain cement concrete 1:4:8 (1 cement: 4 coarse sand: 8 graded stone aggregate 40 mm nominal size) in base, 150 mm thick RCC top slab, RCC columns and beams in cement concrete 1:2:4 (1 cement 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) if required as per structural requirements, including steel work welded in built-up sections/framed work, cutting hoisting and fixing in position required for gratings, frames, guard bars, ladders, brackets etc and applying a priming coat of approved steel primer with two or more coats of synthetic enamel paint. (Shop drawing to be got approved before execution)	P.15	6.00	EA		0.00	INR Zero Only
343	Boring 300mm dia- 1 Nos. bore (Min 25 m depth or at least 5M above water table) with calyx machine or as required, including the cost of transportation of boring machine to site and taking back after completion of work, providing and fixing a) 160 O.D. uPVC pipe (class 6 Kg/cm2) with fittings in bore b) 160 O.D. uPVC slotted (Supreme/Finolex class 6 Kg/cm2) with fittings in bore , as per site conditions. Providing and fixing bail plug and well cap for 160 OD pipe, supplying and filling 300 mm thick round Boulders (50-200 mm size) in first layer, 300 mm thick Gravels (5-10 mm size) in second layer, 300 mm thick Coarse Sand/fine gravel (1.5 to 2 mm size), Pea gravel packing between bore and pipe 3-6 mm size, 2 nos. 560 mm dia M.S. MH cover heavy duty fixing in top slab. Complete in all respects as per drawings enclosed.	P.16	6.00	EA		0.00	INR Zero Only

344	De-Silting Chamber: Construction of brick masonry desilting chamber of size 2000x1500x750mm (effective depth) before recharge well with 75 class designation bricks in cement mortar 1:4 (1 cement : 4 coarse sand) , foundation concrete 1:4:8 mix (1 cement : 4 coarse sand; 8 graded stone aggregate 40mm nominal size), inside and outside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement inside and rough plaster on outside, including fixing of grating, neatly finished complete in all respects including necessary excavation, refilling and disposal of surplus earth, complete.	P.17	6.00	EA		0.00	INR Zero Only
345	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.(External work) 50 mm nominal outer dia Pipes	P.18	80.00	M		0.00	INR Zero Only
346	Providing and fixing polyshield outer mechanical protection on nitrile rubber insulation comprising of wrapping with poly glass tape helically wound and subsequently applying 2 coats of polyshield material (resin & hardner) for external water pipes as per manufacturers specification. 50 mm dia (13 mm thickness of insulation)	P.19	80.00	M		0.00	INR Zero Only
347	Supplying & installation of automatic type switching submersible pump set for DEWATERING at trenches, etc. directly coupled with 5 HP motor nominal speed 2900 RPM suitable for operation on 3-phase, 50 cycles, 400 + 5% volts A.C. power supply including MCC/ Control panels with level controller, auto control, NRV and to give yield of 5000 LPH at a head of 50 mtrs. Rate to be quoted complete for pump including all cabling, starter, gauge, NRV, inlet outlet valve, flanges and gauge, etc. complete in all respect. Total head = 50 Mt Flow rate = 9000 LPH H P = Minimum 5 HP (Or as per site condition)	P.20	1.00	SET		0.00	INR Zero Only
348	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, IS : 12701 marked, with cover and suitable locking arrangement and making necessary holes foinlet, outlet and overflow pipes but without fittings and the base support for tank. (L means Litre here)	P.21	2000.00	L		0.00	INR Zero Only
349	BOREWELL WORKS	Q					
350	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer –in-charge upto 90 metre depth below ground level. All types of soil 300 mm dia	Q.1	100.00	M		0.00	INR Zero Only
351	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) pipes with ribs , conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge. 200 mm nominal size dia	Q.2	50.00	M		0.00	INR Zero Only
352	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well Casing (CM) pipes with ribs , conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge. 200 mm nominal size dia	Q.3	50.00	M		0.00	INR Zero Only
353	Gravel packing in tubewell construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.	Q.4	6.00	M3		0.00	INR Zero Only
354	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge. (H means Hour here)	Q.5	20.00	H		0.00	INR Zero Only
355	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of: 200 mm dia	Q.6	1.00	EA		0.00	INR Zero Only
356	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts of required size complete. 200 mm clamp	Q.7	1.00	EA		0.00	INR Zero Only
357	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I). 200 mm dia	Q.8	1.00	EA		0.00	INR Zero Only
358	Providing and fixing factory made precast RCC perforated drain covers, having concrete of strength not less than M-25, of size 1000 x 450x50 mm , reinforced with 8 mm dia four nos longitudinal & 9 nos cross sectional T.M.T. hoop bars, including providing 50 mm dia perforations @ 100 to 125 mm c/c, including providing edge binding with M.S. flats of size 50 mmm x 1.6 mm complete, all as per direction of Engineer-in-charge.	Q.9	1.00	EA		0.00	INR Zero Only
359	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) : 50 mm nominal bore	Q.10	1.00	EA		0.00	INR Zero Only
360	Providing and fixing gun metal non- return valve of approved quality (screwed end) : 50 mm nominal bore	Q.11	1.00	EA		0.00	INR Zero Only
361	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.	Q.12					
362	65 mm dia nominal bore	Q.12.1	30.00	M		0.00	INR Zero Only
363	80 mm dia nominal bore	Q.12.2	10.00	M		0.00	INR Zero Only
364	Supplying & installation of submersible pump set directly coupled with 5 HP motor nominal speed 2900 RPM suitable for operation on 3-phase , 50 cycles, 400 + 5% volts A.C. power supply to give yield of 5000 LPH at a head of 50 mtrs. Total head = 50 Mt Flow rate = 9000 LPH H P = Minimum 5 HP (Or as per site condition)	Q.13	1.00	SET		0.00	INR Zero Only
365	Providing, laying, testing & commissioning of C' class heavy duty G.I. pipe conforming to IS 1239 including welding, fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required 80 mm dia (coloumn pipe)	Q.14	50.00	M		0.00	INR Zero Only
366	STP AND WTP WORK	4					
367	STP AND WTP WORK	R					

368	Supply, installation, testing & commissioning of Chlorine dosing system comprising of 100 ltrs HDPE tank with 0-12 lph electronic metering type pump.	R.1	2.00	SET		0.00	INR Zero Only
369	ELECTRICAL WORK	5					
370	WIRING	S					
371	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. Group C (P means POINT here)	S.1	900.00	P		0.00	INR Zero Only
372	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required.	S.2					
373	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	S.2.1	12800.00	M		0.00	INR Zero Only
374	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	S.2.2	16500.00	M		0.00	INR Zero Only
375	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	S.2.3	30.00	M		0.00	INR Zero Only
376	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	S.2.4	125.00	M		0.00	INR Zero Only
377	4 X 16 sq. mm + 2 X 6 sq. mm earth wire	S.2.5	110.00	M		0.00	INR Zero Only
378	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required	S.3					
379	20mm	S.3.1	120.00	M		0.00	INR Zero Only
380	25mm	S.3.2	135.00	M		0.00	INR Zero Only
381	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	S.4	25.00	EA		0.00	INR Zero Only
382	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch , connections etc. as required.	S.5	300.00	EA		0.00	INR Zero Only
383	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch , connections etc. as required.	S.6	260.00	EA		0.00	INR Zero Only
384	Supplying and fixing 3 pin, 5 A ceiling rose on the existing junction box/ wooden block including connections etc. as required	S.7	14.00	EA		0.00	INR Zero Only
385	Supplying and fixing brass batten/ angle holder including connection etc. as required.	S.8	12.00	EA		0.00	INR Zero Only
386	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 2 nos. 3 pin 5/6 A modular socket outlet and 2 nos. 5/6 A modular switch , connections etc. as required. (For light plugs to be used in non residential building)	S.9	300.00	EA		0.00	INR Zero Only
387	Supplying & fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc. as required	S.10	4.00	EA		0.00	INR Zero Only
388	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the FLOOR and making good the same in case of recessed conduit as required. 25 mm	S.11	940.00	M		0.00	INR Zero Only
389	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required. Group – C (P means POINT here)	S.12	1000.00	P		0.00	INR Zero Only
390	Supplying and fixing of following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc as required.	S.13					
391	1 or 2 module (75mmx 75mm)	S.13.1	20.00	EA		0.00	INR Zero Only
392	3 module (100mmx 75mm)	S.13.2	3.00	EA		0.00	INR Zero Only
393	6 module (200mmx 75mm)	S.13.3	5.00	EA		0.00	INR Zero Only
394	LIGHTS AND FAN FIXTURES	T					
395	Installation ,Testing, Commissioning of wall bracket /ceiling fittings with chain of all sizes and shapes containing upto two GLS/CFL/LED lamps per fitting, complete with all accessories including connections etc. as required	T.1	1600.00	EA		0.00	INR Zero Only
396	Installation, testing and commissioning of ceiling fan , including wiring the down rods of standard length (upto 45 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required	T.2	1.00	EA		0.00	INR Zero Only
397	Installation of exhaust fan in the existing opening, including making good the damage, connection, testing, commissioning etc. as required Upto 450 mm sweep	T.3	1.00	EA		0.00	INR Zero Only
398	Supply of lighting fixtures	T.4					
399	Pendant luminaire Alcove with LED (Light Emitting Diode), system power 18W , luminous flux of luminaire 1980 lm, direct light emission CRI>80, colour temperature of 4000K, Neutral white, 230V constant current driver, 70% of luminous flux after 50,000 operating hours, energy efficient LEDs, luminaire profile in aluminium, Plastic moulded end caps, Polyester powder Aluminium white coloured coat applied over a 5- stage pre-treatment, high efficiency glare-free snap fit micro-prismatic diffuser for homogeneous light distribution, ZHLS (Zero Halogen Low Smoke) internal wiring, integral electronic control gear, adjustable suspender, Protection class I, IP20, L = 1199 mm, B = 75 mm, H = 90 mm, PL max = 1500 mm Regent Model No. 7027 or equivalent in Philips/ Wipro	T.4.1	45.00	NUM		0.00	INR Zero Only

400	COB based LED recessed directional downlight Zena, with HPE (High-Performance Efficiency), with system power: 12 W , Luminous flux of luminaire 1200 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230V constant current driver, 70% of luminous flux after 50,000 operating hours; energy-efficient LEDs, direct light emission, housing in die-cast aluminium, Polyester powder-white coloured coat applied over a 5-stage pre-treatment ceiling trim, Clear glass cover with aluminium reflector and a beam angle of 36°, ZHLS (ZERO HALOGEN LOW SMOKE) wiring, electronic control gear, Protection class II, IP 20, Ø = 114 mm, DA(Ø) = 108 mm, H = 110 mm. Regent Model No.0032 or equivalent in Philips/ Wipro	T.4.2	115.00	NUM			0.00	INR Zero Only
401	COB based LED recessed directional downlight Zena, with HPE (High-Performance Efficiency), with system power: 15 W , Luminous flux of luminaire 1500 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230V constant current driver, 70% of luminous flux after 50,000 operating hours; energy-efficient LEDs, direct light emission, housing in die-cast aluminium, Polyester powder-white coloured coat applied over a 5-stage pre-treatment ceiling trim, Clear glass cover with aluminium reflector and a beam angle of 36°, ZHLS (ZERO HALOGEN LOW SMOKE) wiring, electronic control gear, Protection class II, IP 20, Ø = 114 mm, DA(Ø) = 108 mm, H = 110 mm. Regent Model No. 0032 or equivalent in Philips/ Wipro	T.4.3	160.00	NUM			0.00	INR Zero Only
402	Recessed luminaire Casella with LED (Light Emitting Diode) system power: 32 W , Luminous flux of luminaire 3200 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, 1.4 mm thick extruded aluminium profile with Polyester powder white coloured coat applied over a 5- stage pre-treatment, Protuded opal diffuser for glare-free uniform illumination, ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Protection class I, IP 40, L = 595 mm, B = 595 mm, H = 75 mm, A = 14 mm. Regent Model No. 0701 or equivalent in Philips/ Wipro	T.4.4	130.00	NUM			0.00	INR Zero Only
403	LED recessed luminaire Zen22 - SM with LED(Light Emitting Diode) system power: 32W , colour temperature of 4000K, 230V constant current driver, 70% of luminous flux after 50,000 operating hours, energy efficient LEDs, CRI>80, luminous flux of 3200 lm,direct light emission, Sheet Metal frame, polyester white powder coat applied over a 5-stage pre-treatment, Opal diffuser for glare-free uniform light, electronic control gear, Protection class I, IP40, MacAdam 3, T.H.Δ: 10%, driver efficiency≥ 88%, surge protection of 2.5kV, L = 595mm, B = 595mm, H = 70mm Regent Model No. 0820 or equivalent in Philips/ Wipro	T.4.5	130.00	NUM			0.00	INR Zero Only
404	Pendant luminaire Hexel with LED (Light Emitting Diode) system power: 18 W , luminous flux of luminaire 1800 lm, 4000 K, Neutral white, CRI>80, 230 V constant current driver, direct light emission, aluminium profile polyester powder coated black applied over a 5-stage pre-treatment, prismatic diffuser for homogenous light distribution, Electronic control gear, Protection class I, IP 20, L = 400 mm, B = 350 mm, H = 67 mm, PL max 1500 mm Regent Model No. 0814 or equivalent in Philips/ Wipro	T.4.6	20.00	NUM			0.00	INR Zero Only
405	Pendant luminaire Solo slim with HPE (High-Performance Efficiency) LED (Light Emitting Diode) system power: 26 W luminous flux of luminaire 2600 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, luminaire housing in aluminium, Polyester powder white coloured coat applied over a 5- stage pre-treatment, pre-wired backplate luminaire, Prismatic diffuser for homogenous light distribution, ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Pendant tube with a ball joint, for self-levelling (+/-20°). Protection class I, IP20, Ø = 530 mm, H = 70 mm, PL = 900 mm Regent Model No. 0116 or equivalent in Philips/ Wipro	T.4.7	10.00	NUM			0.00	INR Zero Only
406	Recessed luminaire shopping with 2 spotlights, system power: 2 x 6 W , luminous flux of luminaire 1200 lm, colour temperature of 4000K, CRI>90, 230V constant current driver, 70% of luminous flux after 50,000 operating hours, direct light emission, sheet metal housing with luminaire part in aluminium, polyester black powder coat applied over a 5-stage pre-treatment, with reflector, beam angle of 38°, Electronic control gear,Protection class II, IP20, L = 265 mm, B = 145 mm, H = 155 mm, cutout = 248 mm x 128 mm Regent Model No. 2728 or equivalent in Philips/ Wipro	T.4.8	6.00	NUM			0.00	INR Zero Only
407	Pendant luminaire Groove 2 with with HPE (High Performance Efficiency) LED (Light Emitting Diode), system power: 18 W , luminous flux of luminaire 1890 lm, Colour temperature of 4000 K, neutral white, CRI > 80, 230V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, Luminaire housing in aluminium, Polyester powder black coloured coat applied over a 5- stage pre-treatment, Opal diffuser for a homogenous light distribution ZHLS (Zero Halogen Low Smoke) internal wiring, Electronic control gear, Protection class I, IP 20, Ø = 427 mm, H = 227 mm PL =1500 mm. Regent Model No. 6128 or equivalent in Philips/ Wipro	T.4.9	4.00	NUM			0.00	INR Zero Only
408	Recessed luminaire Zen 14 SM with LED (Light Emitting Diode), system power: 36 W , luminous flux of 3600 lm, colour temperature of 4000 K, Neutral white, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours, energy-efficient LEDs, CRI > 80, direct light emission, Luminaire housing in CRCA, polyester white powder coat applied over a 5-stage pre-treatment, Opal diffuser for glare-free uniform light, integral electronic control gear, Protection class I, IP40, L = 1195 mm, B = 295 mm, H = 70 mm Regent Model No. 0820 or equivalent in Philips/ Wipro	T.4.10	300.00	NUM			0.00	INR Zero Only
409	LED recessed mounted downlight BLAIRE with LED (Light Emitting Diode) for system power 10W , luminous flux of 1000 lm, CRI> 80, 230V constant current driver, colour temperature of 4000K, direct light emission, white housing with ceiling trim, in die-cast aluminium, polyester powder coat applied over a 5-stage pre-treatment, deep white satin diffuser, passive cooling, electronic control gear, Protection class II , IP 40 Ø = 140, DA(Ø) = 125mm, HT = 56 mm Regent Model No. 3445 or equivalent in Philips/ Wipro	T.4.11	170.00	NUM			0.00	INR Zero Only

410	Wall / Surface / Ceiling Mounted luminaire Vela with HPE (High Performance Efficiency) LED (Light Emitting Diode) system power: 36 W, Luminous flux of luminaire 4680 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, Luminaire profile in anodised aluminium, snap fit linear prismatic diffuser for a homogenous light distribution. ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Protection class I, IP 40, L = 1188 mm, B = 65 mm, H = 42 mm Regent Model No. 6667 or equivalent in Philips/ Wipro	T.4.12	55.00	NUM		0.00 INR Zero Only
411	COB based recessed spotlight Aston for 12W LED, luminous flux of luminaire 1260lm, CRI>80, 230V, 4000K constant current driver, direct light emission, aluminium housing thermo painted silver with white trim, clear acrylic, high quality reflector with 38° beam angle, electronic control gear, Protection class II, IP40, Φ= 136mm, DA(Φ) = 125mm, H = 150, Regent Model No. 3138 or equivalent in Philips/ Wipro	T.4.13	290.00	NUM		0.00 INR Zero Only
412	Pendant luminaire Victor with LED (Light Emitting Diode), system power: 64 W (36UP, 28DN), luminous flux of luminaire 7360 lm, colour temperature of 4000K, neutral white, CRI >80, 230V constant current driver, direct-indirect light emission, 48% UP, 52% DN aluminium housing, polyester powder coated white applied over a 5 stage pre-treatment, Opal diffuser, electronic control gear, Protection class I, IP20 L = 1186 mm, B = 220 mm, H = 105 mm Regent Model No. 0945 or equivalent in Philips/ Wipro	T.4.14	20.00	NUM		0.00 INR Zero Only
413	Pendant luminaire Alcove with LED (Light Emitting Diode), system power 28W (14W up, 14W dn), luminous flux of luminaire 3335 lm, direct-indirect light emission, CRI > 80, 4000K, neutral white, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours, energy-efficient LED's, luminaire profile in aluminium, Plastic moulded end caps, Polyester powder Aluminium white coloured coat applied over a 5- stage pre-treatment, snap-fit prismatic diffuser for homogeneous light distribution, ZHLS (Zero Halogen Low Smoke) internal wiring, integral Electronic control gear, with bluetooth controller, adjustable suspender, Protection class I, IP 20, L = 1199 mm, B = 75 mm, H = 90 mm, PL max = 1500 mm. Regent Model No. 7047 or equivalent in Philips/ Wipro	T.4.15	45.00	NUM		0.00 INR Zero Only
414	Pendant luminaire Ring with HPE (High Performance Efficiency) LED (Light Emitting Diode) system power: 60 W, Luminous flux of luminaire 5400 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, Luminaire profile in aluminium, Polyester powder black coloured coat applied over a 5- stage pre-treatment, Prismatic diffuser for a homogenous light distribution, ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Protection class I, IP20, Ø = 980 mm, W = 100 mm, H = 67 mm, PL = 1500 mm Regent Model No. 0115 or equivalent in Philips/ Wipro	T.4.16	8.00	NUM		0.00 INR Zero Only
415	Pendant luminaire Ring with HPE (High Performance Efficiency) LED (Light Emitting Diode) system power: 85 W, Luminous flux of luminaire 7650 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, Luminaire profile in aluminium, Polyester powder black coloured coat applied over a 5- stage pre-treatment, Prismatic diffuser for a homogenous light distribution, ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Protection class I, IP20, Ø = 1200 mm, W = 100 mm, H = 67 mm, PL = 1500 mm Regent Model No. 0115 or equivalent in Philips/ Wipro	T.4.17	5.00	NUM		0.00 INR Zero Only
416	Pendant luminaire Lightup Direct with LED(Light Emitting Diode), system power: 28W/4feet, luminous flux of luminaire 3080 lm, colour temperature of 4000K, neutral white, 230V constant current driver, 70% of luminous flux after 50,000 operating hours, energy efficient LEDs, CRI>80, luminaire profile in aluminium, polyester powder coated white applied over a 5 stage pre-treatment, dual optics of lens + raster with dual asymmetric lens, ZHLS(ZERO HALOGEN LOW SMOKE) internal wiring, electronic control gear, sliding fixing wire suspension, Protection class I, IP40, L = 5190 mmX 900mm, B = 68 mm, H = 60 mm, max.PL = 1500mm Regent Model No. 0593 or equivalent in Philips/ Wipro	T.4.18	3.00	NUM		0.00 INR Zero Only
417	Pendant luminaire Lightup Direct with LED(Light Emitting Diode), system power: 28W/4feet, luminous flux of luminaire 3080 lm, colour temperature of 4000K, neutral white, 230V constant current driver, 70% of luminous flux after 50,000 operating hours, energy efficient LEDs, CRI>80, luminaire profile in aluminium, polyester powder coated white applied over a 5 stage pre-treatment, dual optics of lens + raster with dual asymmetric lens, ZHLS(ZERO HALOGEN LOW SMOKE) internal wiring, electronic control gear, sliding fixing wire suspension, Protection class I, IP40, L = 6000 mmX 900mm, B = 68 mm, H = 60 mm, max.PL = 1500mm Regent Model No. 0593 or equivalent in Philips/ Wipro	T.4.19	1.00	NUM		0.00 INR Zero Only
418	COB based pendant downlight luminaire Rea 100 with system power: 15 W, Luminous flux of luminaire 1500 lm, Colour temperature of 3000 K, warm white, SDCM 3, CRI > 80, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, Luminaire housing in aluminium, Polyester powder black coloured coat applied over a 5- stage pre-treatment, Clear glass cover, beam angle of 40°, ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Protection class II, IP 20, Ø = 100 mm, H = 165 mm, PL = 1500 mm. Regent Model No. 3045 or equivalent in Philips/ Wipro	T.4.20	105.00	NUM		0.00 INR Zero Only
419	Recessed luminaire Slash with HE-High Efficiency LED (Light Emitting Diode) system power: 28W, luminous flux of luminaire 2800lm, colour temperature of 4000K, neutral white, CRI>80, 230V constant current driver, 70% of luminous flux after 50,000 operating hours, energy efficient LEDs, direct light emission, luminaire profile in anodised aluminium, pre-wired batten luminaire, opal APD (Added Performance Diffuser) diffuser for a homogenous light distribution, ZHLS(ZERO HALOGEN LOW SMOKE) internal wiring, integral electronic control gear, Protection class I, IP40 L = 1183 mm, EL = 1195 B = 48 mm, EB = 61mm, H = 70 mm Regent Model No. 0571 or equivalent in Philips/ Wipro	T.4.21	20.00	NUM		0.00 INR Zero Only

420	Ceiling mounted luminaire Slash with HE-High Efficiency LED (Light Emitting Diode) system power: 28W , luminous flux of luminaire 2800lm, colour temperature of 4000K, neutral white, CRI>80, 230V constant current driver, 70% of luminous flux after 50,000 operating hours, energy efficient LEDs, direct light emission, luminaire profile in anodised aluminium, pre-wired batten luminaire, opal APD (Added Performance Diffuser) diffuser for a homogenous light distribution, ZHLS(ZERO HALOGEN LOW SMOKE) internal wiring, integral electronic control gear, Protection class I, IP40L = 1189 mm B = 48 mm H = 70 mm P = max. 1500 mm Regent Model No. 0571 or equivalent in Philips/ Wipro	T.4.22	20.00	NUM		0.00	INR Zero Only
421	Pendant spotlight luminaire Crest with LED (Light Emitting Diode) system power: 14 W , Luminous flux of luminaire 1120lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230 V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, Luminaire profile in aluminium, Polyester powder black coloured coat applied over a 5- stage pre-treatment, Clear glass cover with anti - glare dark reflectors and beam angle of 45 degrees, ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Protection class I, IP 20, L = 1188 mm, B = 55 mm, H = 80 mm, PL = 1500 mm Regent Model No. 7048 or equivalent in Philips/ Wipro	T.4.23	10.00	NUM		0.00	INR Zero Only
422	LED strip (flexible) with 60 LEDs per meter, 10W per Meter , 500lm, 3000K, 2835 SMD package with thermal tape of high thermal convection factor, beam angle of 120°, MacAdum 5, constant voltage driving circuit, L = 1000mm, H = 10mm, B = 1.4mm Regent Model No. 5001 or equivalent in Philips/ Wipro	T.4.24	900.00	M		0.00	INR Zero Only
423	Pendant luminaire Solo slim with HPE (High-Performance Efficiency) LED (Light Emitting Diode) system power: 26 W luminous flux of luminaire 2600 lm, Colour temperature of 4000 K, Neutral white, CRI > 80, 230V constant current driver, 70% of luminous flux after 50,000 operating hours; Energy efficient LEDs, Direct light emission, luminaire housing in aluminium, Polyester powder white coloured coat applied over a 5- stage pre-treatment, pre-wired backplate luminaire, Prismatic diffuser for homogenous light distribution, ZHLS (ZERO HALOGEN LOW SMOKE) internal wiring, Electronic control gear, Pendant tube with a ball joint, for self-levelling (+/-20°). Protection class I, IP20, Ø = 530 mm, H = 70 mm, PL = 900 mm Regent Model No. 0116 or equivalent in Philips/ Wipro	T.4.25	15.00	NUM		0.00	INR Zero Only
424	Supply of ceiling fan 1200 sweep with all accessories. Make -havels or equivalent	T.5	1.00	EA		0.00	INR Zero Only
425	Supply of exhaust fan 450 sweep with all accessories and louvers	T.6	2.00	EA		0.00	INR Zero Only
426	Supplying, installation, testing and commissioning of Passive Infrared (PIR) technology based occupancy sensor having high performance, non regulating programmable type, suitable for connected load upto 10Amp, for mounting height up to 2.8 mtr and for 5 m diameter coverage area along with necessary fixing arrangements i/c programming at site etc. complete as required.	T.7	10.00	EA		0.00	INR Zero Only
427	Supplying, installation, testing and commissioning of Passive Infrared (PIR) technology based occupancy sensor with day light dimming (lighting level shall be regulated as per availability of natural day light in an area along with occupancy detection.) having high performance, regulating programmable type, suitable for connected load upto 10Amp, for mounting height up to 2.8 mtr and for 5 m diameter coverage area along with necessary fixing arrangements i/c programming at site etc. complete as required.	T.8	30.00	EA		0.00	INR Zero Only
428	DISTRIBUTION BOARD	U					
429	Supplying and fixing following way single pole and neutral, sheet steel, MCB distribution board (IP Rating - IP52) , 240 V, on surface/ recess, complete with tinned copper bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)	U.1					
430	6 way, Double door	U.1.1	2.00	EA		0.00	INR Zero Only
431	8 way, Double door	U.1.2	11.00	EA		0.00	INR Zero Only
432	Supplying and fixing following way horizontal type three pole and neutral, sheet steel, MCB distribution board , 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)	U.2					
433	6 way (4 + 18), Double door	U.2.1	3.00	EA		0.00	INR Zero Only
434	8 way (4 + 18), Double door	U.2.2	4.00	EA		0.00	INR Zero Only
435	Supplying and fixing of following way surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted , inclusive of 200 A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs (but without MCBs and incomer) as required. (Note : Vertical type MCB TPDB is normally used 8 way (4 + 24), Double door	U.3	1.00	EA		0.00	INR Zero Only
436	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.	U.4					
437	Single pole and neutral	U.4.1	760.00	EA		0.00	INR Zero Only
438	Triple pole and neutral	U.4.2	20.00	EA		0.00	INR Zero Only
439	Supplying and fixing following rating, four pole, 415 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required 63 A	U.5	9.00	EA		0.00	INR Zero Only
440	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB) , having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required. 25A	U.6	9.00	EA		0.00	INR Zero Only
441	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB) , having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.	U.7					
442	25A	U.7.1	14.00	EA		0.00	INR Zero Only
443	63A	U.7.2	8.00	EA		0.00	INR Zero Only
444	Supplying and fixing DP sheet steel enclosure on surface/ recess along with 25/32 A 240 V "C" curve DP MCB complete with connections, testing and commissioning etc. as required.	U.8	2.00	EA		0.00	INR Zero Only
445	Supplying and fixing TP sheet steel enclosure on surface/ recess along with 16/25/32 A 415 V "C" curve TP MCB complete with connections, testing and commissioning etc. as required.	U.9	5.00	EA		0.00	INR Zero Only

446	Supplying and fixing following way horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar , neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator) 12 way tpn DB -double door	U.10	14.00	EA		0.00	INR Zero Only
447	TRAY, RACEWAYS	V					
448	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.	V.1					
449	300 mm width X 50 mm depth X 1.6 mm thickness	V.1.1	65.00	M		0.00	INR Zero Only
450	450 mm width X 50 mm depth X 2.0 mm thickness	V.1.2	32.00	M		0.00	INR Zero Only
451	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.	V.2					
452	300 mm width X 50 mm depth X 1.6 mm thickness	V.2.1	10.00	EA		0.00	INR Zero Only
453	450 mm width X 50 mm depth X 2.0 mm thickness	V.2.2	4.00	EA		0.00	INR Zero Only
454	Supplying, installation, testing & commissioning of GI openable top cover raceway made from 2mm thick pre-galvanized sheets for top, bottom and sides and complete with 2mm thick top cover complete with rubber gasketing. The junction box shall be suitable to accommodate GI raceways specified below. Necessary civil work to support/ clamp from RCC slab/floor need to be included here too. (Junction Box price not included in the item).	V.3					
455	300 mm wide x40 mm deep	V.3.1	30.00	M		0.00	INR Zero Only
456	200 mm wide x40 mm deep	V.3.2	150.00	M		0.00	INR Zero Only
457	150 mm wide x40 mm deep	V.3.3	70.00	M		0.00	INR Zero Only
458	100 mm wide x40 mm deep	V.3.4	60.00	M		0.00	INR Zero Only
459	50 mm wide x40 mm deep	V.3.5	50.00	M		0.00	INR Zero Only
460	Supplying, installation, testing & commissioning of floor/ceiling recessed junction boxes for GI raceway systems fabricated from 3 mm MS sheets finished with pre-galvanized sheets, including 2 nos. GI strip at side for earthing, with 1, 2 or 3 nos "+" , "I" , "L" shaped support in the centre in case required with 3 mm thick neoprene gasketed removable cover fixed by counter sunk cadmium plated screws including the cost of earth links at all joints to ensure earth continuity and including the cost of chasing and making good recess in floor etc complete as required and as below. (in ceiling / Floor)(With Stainless Steel Top Cover Plates .) Thickness 2 mm	V.4					
461	350X50mm	V.4.1	3.00	EA		0.00	INR Zero Only
462	250X50mm	V.4.2	8.00	EA		0.00	INR Zero Only
463	200X50mm	V.4.3	2.00	EA		0.00	INR Zero Only
464	150X50mm	V.4.4	6.00	EA		0.00	INR Zero Only
465	100X50mm	V.4.5	4.00	EA		0.00	INR Zero Only
466	CABLE WORKS	W					
467	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required Upto 35 sq. mm (clamped with 1mm thick saddle	W.1					
468	4CX 16SQMM	W.1.1	280.00	M		0.00	INR Zero Only
469	4CX10SQMM	W.1.2	200.00	M		0.00	INR Zero Only
470	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.	W.2					
471	4CX10SQMM	W.2.1	10.00	EA		0.00	INR Zero Only
472	4CX 16SQMM	W.2.2	8.00	EA		0.00	INR Zero Only
473	Supply of PVC insulated and PVC sheathed PVC/ XLPE insulated Aluminium/copper conductor power multicore armoured cable of 1.1 KV grade	W.3					
474	4CORE X 16 SQMM	W.3.1	145.00	M		0.00	INR Zero Only
475	4CORE X 10 SQMM	W.3.2	110.00	M		0.00	INR Zero Only
476	4CORE X 25 SQMM	W.3.3	25.00	M		0.00	INR Zero Only
477	4CORE X 6 SQMM	W.3.4	40.00	M		0.00	INR Zero Only
478	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.	W.4					
479	3½ X 185 sq. mm	W.4.1	10.00	EA		0.00	INR Zero Only
480	3½ X 240 sq. mm	W.4.2	20.00	EA		0.00	INR Zero Only
481	3½ X 300 sq. mm	W.4.3	16.00	EA		0.00	INR Zero Only
482	4CX10SQMM	W.4.4	10.00	EA		0.00	INR Zero Only
483	4CX 16SQMM	W.4.5	8.00	EA		0.00	INR Zero Only
484	4 X 25 sq. mm	W.4.6	14.00	EA		0.00	INR Zero Only
485	3½ X 50 sq. mm	W.4.7	6.00	EA		0.00	INR Zero Only
486	3½ X 70 sq. mm	W.4.8	8.00	EA		0.00	INR Zero Only
487	3½ X 95 sq. mm	W.4.9	4.00	EA		0.00	INR Zero Only
488	3½ X 120 sq. mm	W.4.10	10.00	EA		0.00	INR Zero Only
489	3½ X 150 sq. mm	W.4.11	6.00	EA		0.00	INR Zero Only
490	2 X 6 sq. mm	W.4.12	12.00	EA		0.00	INR Zero Only
491	2 X 10 sq. mm	W.4.13	2.00	EA		0.00	INR Zero Only
492	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.	W.5					
493	Upto 35 sq. mm	W.5.1	200.00	M		0.00	INR Zero Only
494	Above 35 sq. mm and upto 95 sq. mm	W.5.2	20.00	M		0.00	INR Zero Only

495	Above 95 sq. mm and upto 185 sq. mm	W.5.3	24.00	M		0.00	INR Zero Only
496	Above 185 sq. mm and upto 400 sq. mm	W.5.4	28.00	M		0.00	INR Zero Only
497	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.	W.6					
498	Upto 35 sq. mm	W.6.1	500.00	M		0.00	INR Zero Only
499	Above 35 sq. mm and upto 95 sq. mm	W.6.2	250.00	M		0.00	INR Zero Only
500	Above 95 sq. mm and upto 185 sq. mm	W.6.3	500.00	M		0.00	INR Zero Only
501	Above 185 sq. mm and upto 400 sq. mm	W.6.4	120.00	M		0.00	INR Zero Only
502	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing masonry open duct as required.	W.7					
503	Above 35 sq. mm and upto 95 sq. mm	W.7.1	160.00	M		0.00	INR Zero Only
504	Above 95 sq. mm and upto 185 sq. mm	W.7.2	150.00	M		0.00	INR Zero Only
505	Above 185 sq. mm and upto 400 sq. mm	W.7.3	300.00	M		0.00	INR Zero Only
506	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.	W.8					
507	Upto 35 sq. mm (clamped with 1mm thick saddle)	W.8.1	250.00	M		0.00	INR Zero Only
508	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	W.8.2	1600.00	M		0.00	INR Zero Only
509	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	W.8.3	200.00	M		0.00	INR Zero Only
510	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	W.8.4	250.00	M		0.00	INR Zero Only
511	Supplying and fixing cable route marker with 10 cm X 10 cm X 5 mm thick G.I. plate with inscription there on, bolted/welded to 35 mm X 35 mm X 6 mm angle iron, 60 cm long and fixing the same in ground as required.	W.9	20.00	EA		0.00	INR Zero Only
512	Laying of one number XLPE power cable of 11 KV grade of following size in the existing masonry open duct as required. Above 120 sq. mm and upto 400 sq. mm	W.10	15.00	M		0.00	INR Zero Only
513	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.	W.11					
514	3½ X 185 sq. mm (57mm)	W.11.1	10.00	EA		0.00	INR Zero Only
515	3½ X 240 sq. mm (62mm)	W.11.2	20.00	EA		0.00	INR Zero Only
516	3½ X 300 sq. mm (70mm)	W.11.3	15.00	EA		0.00	INR Zero Only
517	4 X 10 sq. mm (25mm)	W.11.4	10.00	EA		0.00	INR Zero Only
518	4 X 16 sq. mm (28mm)	W.11.5	20.00	EA		0.00	INR Zero Only
519	4 X 25 sq. mm (28mm)	W.11.6	15.00	EA		0.00	INR Zero Only
520	3½ X 50 sq. mm (35mm)	W.11.7	6.00	EA		0.00	INR Zero Only
521	3½ X 70 sq. mm (38mm)	W.11.8	8.00	EA		0.00	INR Zero Only
522	3½ X 95 sq. mm (45mm)	W.11.9	4.00	EA		0.00	INR Zero Only
523	3½ X 120 sq. mm (45mm)	W.11.10	10.00	EA		0.00	INR Zero Only
524	3½ X 150 sq. mm (50mm)	W.11.11	6.00	EA		0.00	INR Zero Only
525	2 X 6 sq. mm (19mm)	W.11.12	12.00	EA		0.00	INR Zero Only
526	2 X 10 sq. mm (19mm)	W.11.13	2.00	EA		0.00	INR Zero Only
527	Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required 300 sq. mm	W.12	4.00	EA		0.00	INR Zero Only
528	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required 300 sq. mm	W.13	1.00	EA		0.00	INR Zero Only
529	HT Cable - Supplying of following sizes of XLPE aluminium conductor, cross linked polythylene, individual core screwed flat steel strip armoured, PVC sheathed cable of 11KV grade (earthed) conforming to IS: 7098 (Part 2), with up to date amendment complete as required. 3 C x 300 Sq.mm XLPE HT cable (Earthed)	W.14	160.00	M		0.00	INR Zero Only
530	MV Cable - Supply, following sizes of PVC sheathed PVC/XLPE insulated Aluminium conductor/copper conductor power/ multicore control armoured cable of 1.1 KV grade.	W.15					
531	3 ½ C - 300 sq mm Aluminium	W.15.1	300.00	M		0.00	INR Zero Only
532	3 ½ C - 240 sq mm Aluminium	W.15.2	250.00	M		0.00	INR Zero Only
533	3 ½ C - 185 sq mm Aluminium	W.15.3	200.00	M		0.00	INR Zero Only
534	3 ½ C - 150 sq mm Aluminium	W.15.4	50.00	M		0.00	INR Zero Only
535	3 ½ C - 120 sq mm Aluminium	W.15.5	60.00	M		0.00	INR Zero Only
536	3 ½ C - 95 sq mm Aluminium	W.15.6	100.00	M		0.00	INR Zero Only
537	3 C - 70 sq mm Aluminium	W.15.7	20.00	M		0.00	INR Zero Only
538	3 ½ C - 50 sq mm Aluminium	W.15.8	50.00	M		0.00	INR Zero Only
539	3 ½ C- 35 sq mm Aluminium	W.15.9	50.00	M		0.00	INR Zero Only
540	4C- 25 sq mm Aluminium	W.15.10	20.00	M		0.00	INR Zero Only
541	4C- 16 sq mm Aluminium	W.15.11	160.00	M		0.00	INR Zero Only
542	4C- 10 sq mm Aluminium	W.15.12	120.00	M		0.00	INR Zero Only
543	4C- 6 sq mm Aluminium	W.15.13	40.00	M		0.00	INR Zero Only
544	3C- 6 sq mm Aluminium	W.15.14	40.00	M		0.00	INR Zero Only
545	3C- 10 sq mm Aluminium	W.15.15	30.00	M		0.00	INR Zero Only
546	2C- 6 sq mm Aluminium	W.15.16	60.00	M		0.00	INR Zero Only
547	1C-70 sq mm CU	W.15.17	500.00	M		0.00	INR Zero Only
548	Supply, installation, testing & commissioning of all materials and making terminations of control cable terminations for control cables as per item 7.6 above complete with single brass compression glands, copper lugs etc. as required:	W.16					
549	4 C x 2.5 sq.mm control cable	W.16.1	15.00	NUM		0.00	INR Zero Only
550	12 C x 2.5 sq.mm control cable	W.16.2	30.00	NUM		0.00	INR Zero Only
551	EARTHING	X					

552	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	X.1	12.00	EA		0.00	INR Zero Only
553	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	X.2	16.00	EA		0.00	INR Zero Only
554	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	X.3	10.00	EA		0.00	INR Zero Only
555	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	X.4	100.00	M		0.00	INR Zero Only
556	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	X.5	125.00	M		0.00	INR Zero Only
557	Supplying and laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	X.6	150.00	M		0.00	INR Zero Only
558	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe FRLSom earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	X.7	100.00	M		0.00	INR Zero Only
559	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	X.8	100.00	M		0.00	INR Zero Only
560	Providing and laying earth connection from earth electrode with 6 SWG dia G.I. Wire in 15 mm dia G.I. pipe from earth electrode including connection with G.I. thimble excavation and re-filling as required.	X.9	50.00	M		0.00	INR Zero Only
561	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	X.10	20.00	M		0.00	INR Zero Only
562	Supplying & laying of 25x5 mm size G.I. strips drawn on surface from earth electrode to Electrical switch gears machineries etc complete with supply of G.I. nuts & bolts, screws etc including riveting, soldering & making necessary connection as approved, specified and directed by the deptt.	X.11	20.00	M		0.00	INR Zero Only
563	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required	X.12	80.00	M		0.00	INR Zero Only
564	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	X.13	300.00	M		0.00	INR Zero Only
565	LIGHTNING PROTECTION SYSTEM	Y					
566	Providing and fixing lightning conductor finial, made of 25mm dia 300mm long, copper tube, having single prong at top, with 85mm dia 6 mm thick copper base plate including holes etc. complete as required.	Y.1	20.00	EA		0.00	INR Zero Only
567	Jointing copper / G.I. tape (with another copper/ G I tape, base of the finial or any other metallic object) by riveting / nut bolting/ sweating and soldering etc as required.	Y.2	65.00	EA		0.00	INR Zero Only
568	Providing and fixing GI tape 20mm x 3mm thick on parapet or surface of wall for lightning conductor as required. (for horizontal run).	Y.3	320.00	M		0.00	INR Zero Only
569	Providing and fixing G.I. tape 20mm x 3mm thick on parapet or surface of wall for lightning conductor as required. (For vertical run.)	Y.4	300.00	M		0.00	INR Zero Only
570	Providing and fixing testing joint, made of 20mm x 3mm thick G.I. strip, 125mm long with 4 Nos. of G.I. bolts, nuts, check nuts and spring washers etc. complete as required.	Y.5	28.00	EA		0.00	INR Zero Only
571	Providing and laying G.I. tape, 32mm x 6mm thick, from earth electrode directly in ground as required.	Y.6	75.00	M		0.00	INR Zero Only
572	Earthing with G.I. earth pipe 4.5 metre long, 40mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement etc. with charcoal or coke and salt complete as required.	Y.7	20.00	SET		0.00	INR Zero Only
573	LT PANELS	Z					
574	DETAILED TECHNICAL SPECIFICATIONS:						
575	The panel will be of low tension, Indoor type, floor mounting, dust and vermin proof with IP42 protection						
576	and bus bar of Electro grade Aluminium suitable for 3 phase 4 wire supply. The panel will be designed for						
577	front access and cable entry from bottom. Bus bars will be insulated with heat shrinkable PVC colour code sleeves.						
578	The panel is made out of 2.0/1.6 mm thk. CRCA sheets, PRE-TREATED and POWDER COATED-						
579	with Siemens gray.						
580	TESTING :						
581	The following tests shall be carried out in presence of your representative at our site.						
582	Operational and functional tests						
583	Insulation test using 1KV megger						
584	H.V. test of 2.5 K.V. for one minute						
585	Load test up to rated current with loading transformer						
586	COMMON NOTES:-						
587	All Control wiring would be 2.5Sq. m.m. copper wires						
588	Busbar will be provided with heat shrinkable colour code PVC sleeve.						
589	All meters will be of size 96 x 96 mm.						
590	Each Compartment will be labelled with aluminium anodised engraved labels as per specifications.						
591	MAIN LT PANEL	Z.1	1.00	EA		0.00	INR Zero Only
592	INCOMING FROM 1000KVA TRF						
593	1600A 4P 50KA EDO ACB with Microprocessor base O/L, S/C & E/F Protection Release with Communication Port-1						
594	ACB Under Voltage Release 220VAC-1						
595	6A SP 10KA MCB-6						
596	6A DP 10KA MCB-2						
597	Auxiliary Contactor (4NO+4NC)-5						
598	Digital Multifunction Meter with Rs485 Port-1						
599	Digital Amp Meter With Selector Switch -1						
600	Digital Volt Meter With Selector Switch -1						

601	Under Voltage Relay-1								
602	Over Voltage Relay-1								
603	Master Trip Relay-1								
604	Trip Circuit Supervision Relay-1								
605	Ristricted Earth Fault Relay-1								
606	Breaker Control Switch-1								
607	Auto Manual selector switch-1								
608	R, Y, B Phase Indicating Lamps-3								
609	ON/OFF/Trip Indicating Lamps-3								
610	CT's 1600/5A class-1 15VA Cast Resin-3								
611	CT's 1600/5A class-1 15VA Cast Resin for CAPACITOR PANEL-1								
612	CT's 1600/5A class -PS 15VA -1								
613	INCOMING FROM 50KW SOLAR-								
614	125A 4P 50KA MCCB with Microprocessor base Base O/L, S/C & E/F Protection Release-1								
615	Extended Rotatory Handle, Spreaders & Auxilary Block-1								
616	125A 4P 4P Power Contactor-1								
617	Auxilary Contactor (4NO+4NC)-5								
618	6A SP 10KA MCB-4								
619	R, Y, B Phase Indicating Lamps-3								
620	ON/OFF/Trip Indicating Lamps-3								
621	Digital Multifunction Meter with RS485 Port-1								
622	CT's 150/5A class-1 15VA Cast Resin-3								
623	INCOMING FROM 380KVA DG X 1-								
624	800A 4P 50KA EDO ACB with Microprocessor base O/L, S/C & E/F Protection Release with Communication Port-1								
625	ACB Under Voltage Release 220VAC-1								
626	6A SP 10KA MCB-6								
627	6A DP 10KA MCB-2								
628	16A DP 10KA MCB-1								
629	Auxilary Contactor (4NO+4NC)-5								
630	Digital Multifunction Meter with Rs485 Port-1								
631	Digital Amp Meter With Selector Switch -1								
632	Digital Volt Meter With Selector Switch -1								
633	Under Voltage Relay-1								
634	Over Voltage Relay-1								
635	Reverse Power Relay -1								
636	Master Trip Relay-1								
637	Trip Circuit Supervision Relay-1								
638	Breaker Control Switch-1								
639	Auto Manual selector switch-1								
640	R, Y, B Phase Indicating Lamps-3								
641	ON/OFF/Trip Indicating Lamps-3								
642	Start/ Stop Push Button-2								
643	Emergency Stop Push Button with Key-1								
644	CT's 800/5A class-1 15VA Cast Resin-3								
645	CT's 800/5A class-SP10 15VA Cast Resin-3								
646	Auxiliary Relay 24VDC-4								
647	0-30A DC Amp Meter-1								
648	0-30V DC Amp Meter-1								
649	16A 24VDC battery Charger-1								
650	INCOMING FROM 160KVA DG SET-2-								
651	400A 4P 50KA MCCB with Microprocessor base Base O/L, S/C & E/F Protection Release-1								
652	Extended Rotatory Handle, Spreaders & Auxilary Block-1								
653	400A 4P 4P Power Contactor-1								
654	Auxilary Contactor (4NO+4NC)-5								
655	6A SP 10KA MCB-6								
656	6A DP 10KA MCB-2								
657	16A DP 10KA MCB-1								
658	Auxilary Contactor (4NO+4NC)-5								
659	Digital Multifunction Meter with Rs485 Port-1								
660	Digital Amp Meter With Selector Switch -1								
661	Digital Volt Meter With Selector Switch -1								
662	Under Voltage Relay-1								
663	Over Voltage Relay-1								
664	Reverse Power Relay -1								
665	Master Trip Relay-1								
666	Trip Circuit Supervision Relay-1								
667	Auto Manual selector switch-1								
668	R, Y, B Phase Indicating Lamps-3								
669	ON/OFF/Trip Indicating Lamps-3								
670	Start/ Stop Push Button-4								

671	Emergency Stop Push Button with Key-1								
672	CT's 400/5A class-1 15VA Cast Resin-3								
673	CT's 400/5A class-5P10 15VA Cast Resin-3								
674	Auxiliary Relay 24VDC-4								
675	0-30A DC Amp Meter-1								
676	0-30V DC Amp Meter-1								
677	16A 24VDC battery Charger-1								
678	BUS COUPLER-								
679	1000A 4P 50KA EDO ACB without Protection Release -1								
680	ACB Under Voltage Release 220VAC-1								
681	6A SP 10KA MCB-6								
682	6A DP 10KA MCB-2								
683	Auxiliary Contactor (4NO+4NC)-5								
684	Breaker Control Switch-1								
685	Auto Manual selector -1								
686	ON/OFF Indicating Lamps-2								
687	PLC INTERLOCKING & D.G. AMF-								
688	PLC with IOS -1								
689	PLC Power Supply 220VAC/24VDC 10A-2								
690	Power Pack -1								
691	1KVA Online UPS-1								
692	DC Auxiliary Realy Card -4								
693	DC Auxiliary Contactor 24VDC-30								
694	PLC Auto /Manual Selector Switch-1								
695	PLC Fault Indicating Lamps-1								
696	PLC Reset Push Button-1								
697	6A Piano Type Switch Socket-2								
698	Inspection Lamps with Door Switch-2								
699	BUS BAR-								
700	2000A/1000A TPN 415V 50Hz ALUMINIUM BUS BAR-								
701	OUTGOING SECTION-1-								
702	800A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-1								
703	Extended Rotatory Handle, Spreaders -1								
704	6A SP 10KA MCB-4								
705	Digital Multifunction Meter with RS485 Port-1								
706	R, Y, B Phase Indicating Lamps-3								
707	CT's 800/5A class-1 15VA Cast Resin-3								
708	630A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-1								
709	Extended Rotatory Handle, Spreaders -1								
710	6A SP 10KA MCB-4								
711	Digital Multifunction Meter with RS485 Port-1								
712	R, Y, B Phase Indicating Lamps-3								
713	CT's 600/5A class-1 15VA Cast Resin-3								
714	250A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-2								
715	Extended Rotatory Handle, Spreaders-2								
716	6A SP 10KA MCB-8								
717	Digital Multifunction Meter with RS485 Port-2								
718	R, Y, B Phase Indicating Lamps-6								
719	CT's 250/5A class-1 10VA Cast Resin-6								
720	125A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-7								
721	Extended Rotatory Handle, Spreaders -7								
722	6A SP 10KA MCB-28								
723	Digital Multifunction Meter with RS485 Port-7								
724	R, Y, B Phase Indicating Lamps-21								
725	CT's 150/5A class-1 10VA Cast Resin-21								
726	63A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-1								
727	Extended Rotatory Handle, Spreaders-1								
728	6A SP 10KA MCB-4								
729	Digital Multifunction Meter with RS485 Port-1								
730	R, Y, B Phase Indicating Lamps-3								
731	CT's 150/5A class-1 10VA Cast Resin-3								
732	OUTGOING SECTION-2-								
733	630A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-1								
734	Extended Rotatory Handle, Spreaders -1								
735	6A SP 10KA MCB-4								
736	Digital Multifunction Meter with RS485 Port-1								
737	R, Y, B Phase Indicating Lamps-3								
738	CT's 600/5A class-1 15VA Cast Resin-3								
739	250A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-3								
740	Extended Rotatory Handle, Spreaders -3								
741	6A SP 10KA MCB-12								

742	Digital Multifunction Meter with RS485 Port-3							
743	R, Y, B Phase Indicating Lamps-9							
744	CT's 250/5A class-1 10VA Cast Resin-9							
745	200A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-2							
746	Extended Rotatory Handle, Spreaders -2							
747	6A SP 10KA MCB-8							
748	Digital Multifunction Meter with RS485 Port-2							
749	R, Y, B Phase Indicating Lamps-6							
750	CT's 200/5A class-1 10VA Cast Resin-6							
751	125A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-3							
752	Extended Rotatory Handle, Spreaders -3							
753	6A SP 10KA MCB-12							
754	Digital Multifunction Meter with RS485 Port-3							
755	R, Y, B Phase Indicating Lamps-9							
756	CT's 150/5A class-1 10VA Cast Resin-9							
757	100A TPN 36KA MCCB with Thermal Magnetic Base O/L, S/C Protection Release-1							
758	Extended Rotatory Handle, Spreaders -1							
759	6A SP 10KA MCB-4							
760	Digital Multifunction Meter with RS485 Port-1							
761	R, Y, B Phase Indicating Lamps-3							
762	CT's 100/5A class-1 5VA Cast Resin-3							
763	Inspection Lamps with Door Switch-8							
764	Space Heater with Thermostate-8							
765	330 KVAR APFC PANEL	Z.2	1.00	EA			0.00	INR Zero Only
766	INCOMER							
767	800A TPN 50KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1							
768	Extended Rotatory Handle, Spreaders-1							
769	6A SP 10KA MCB -4							
770	Digital VAF Meter -1							
771	Auxiliary Contactor with 4NO+4NC-5							
772	APFC Relay 12-Stage-1							
773	Auto /Manual Selector Switch-1							
774	R,Y,B Phase Indicating Lamps-3							
775	CT's 600/5A class-1 15VA Cast Resin-3							
776	Axial Fan with Filter-6							
777	BUS BAR-							
778	700A TPN ALUMINIUM BUS BAR-							
779	OUTGOING-							
780	50KVAR Capacitor Bank × 3-							
781	125A 3P 36KA MCCB with Thermal Magnetic Trip-3							
782	Spreaders-3							
783	50KVAR Switching Thyristor-3							
784	50KVAR 7% Detuned Reactor-3							
785	50KVAR MPP Type 480V Heavy Duty Capacitor -3							
786	Auxiliary Relay 12VDC-3							
787	ON/OFF Indicating Lamps-6							
788	Start/Stop Push Button-6							
789	25KVAR Capacitor Bank × 4-							
790	63A 3P 36KA MCCB with Thermal Magnetic Trip-4							
791	25KVAR Switching Thyristor-4							
792	25KVAR 7% Detuned Reactor-4							
793	25KVAR MPP Type 480V Heavy Duty Capacitor -4							
794	Auxiliary Relay 12VDC-4							
795	ON/OFF Indicating Lamps-8							
796	Start/Stop Push Button-8							
797	15KVAR Capacitor Bank × 4-							
798	40A 3P 36KA MCCB with Thermal Magnetic Trip-2							
799	15KVAR Switching Thyristor-2							
800	15KVAR 7% Detuned Reactor-2							
801	15KVAR MPP Type 480V Heavy Duty Capacitor -2							
802	Auxiliary Relay 12VDC-2							
803	ON/OFF Indicating Lamps-4							
804	Start/Stop Push Button-4							
805	10KVAR Capacitor Bank × 1-							
806	32A 3P 36KA MCCB with Thermal Magnetic Trip-1							
807	10KVAR Switching Thyristor-1							
808	10KVAR 7% Detuned Reactor-1							
809	10KVAR MPP Type 480V Heavy Duty Capacitor -1							
810	Auxiliary Relay 12VDC-1							
811	ON/OFF Indicating Lamps-2							
812	Start/Stop Push Button-2							

813	5KVAR Capacitor Bank × 2-						
814	20A 3P 36KA MCCB with Thermal Magnetic Trip-2						
815	5KVAR Switching Thyristor-2						
816	5KVAR 7% Detuned Reactor-2						
817	5KVAR MPP Type 480V Heavy Duty Capacitor -2						
818	Auxiliary Relay 12VDC-2						
819	ON/OFF Indicating Lamps-4						
820	Start/Stop Push Button-4						
821	MAIN DISTRIBUTION PANEL - GROUND FLOOR	Z.3	1.00	EA		0.00	INR Zero Only
822	125A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
823	Extended Rotatory Handle, Spreaders-1						
824	Auxiliary & Trip Alarm Contact-1						
825	6A SP 10KA MCB -4						
826	Digital Multifunction Meter with Rs485 Port -1						
827	R,Y,B Phase Indicating Lamps-3						
828	CT's 150/5A class-1 5VA -3						
829	BUS BAR-						
830	150A TPN ALUMINIUM BUS BAR-						
831	OUTGOING-						
832	63A 4P 10KA MCB-2						
833	32A 4P 10KA MCB-4						
834	MAIN DISTRIBUTION PANEL - FIRST FLOOR-	Z.4	1.00	EA		0.00	INR Zero Only
835	INCOMER-						
836	125A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
837	Extended Rotatory Handle, Spreaders-1						
838	Auxiliary & Trip Alarm Contact-1						
839	6A SP 10KA MCB -4						
840	Digital Multifunction Meter with Rs485 Port -1						
841	R,Y,B Phase Indicating Lamps-3						
842	CT's 150/5A class-1 5VA -3						
843	BUS BAR-						
844	150A TPN ALUMINIUM BUS BAR-						
845	OUTGOING-						
846	63A 4P 10KA MCB-2						
847	32A 4P 10KA MCB-4						
848	MAIN DISTRIBUTION PANEL - SECOND FLOOR-	Z.5	1.00	EA		0.00	INR Zero Only
849	INCOMER-						
850	250A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
851	Extended Rotatory Handle, Spreaders-1						
852	Auxiliary & Trip Alarm Contact-1						
853	6A SP 10KA MCB -4						
854	Digital Multifunction Meter with Rs485 Port -1						
855	R,Y,B Phase Indicating Lamps-3						
856	CT's 250/5A class-1 5VA -3						
857	BUS BAR-						
858	300A TPN ALUMINIUM BUS BAR-						
859	OUTGOING-						
860	125A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-2						
861	Extended Rotatory Handle, Spreaders-2						
862	63A 4P 10KA MCB-2						
863	32A 4P 10KA MCB-4						
864	MAIN DISTRIBUTION PANEL - THIRD FLOOR-	Z.6	1.00	EA		0.00	INR Zero Only
865	INCOMER-						
866	125A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
867	Extended Rotatory Handle, Spreaders-1						
868	Auxiliary & Trip Alarm Contact-1						
869	6A SP 10KA MCB -4						
870	Digital Multifunction Meter with Rs485 Port -1						
871	R,Y,B Phase Indicating Lamps-3						
872	CT's 150/5A class-1 5VA -3						
873	BUS BAR-						
874	150A TPN ALUMINIUM BUS BAR-						
875	OUTGOING-						
876	63A 4P 10KA MCB-2						
877	32A 4P 10KA MCB-4						
878	MAIN DISTRIBUTION PANEL - FOURTH FLOOR-	Z.7	1.00	EA		0.00	INR Zero Only
879	INCOMER-						
880	125A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
881	Extended Rotatory Handle, Spreaders-1						
882	Auxiliary & Trip Alarm Contact-1						
883	6A SP 10KA MCB -4						

884	Digital Multifunction Meter with Rs485 Port -1						
885	R,Y,B Phase Indicating Lamps-3						
886	CT's 150/5A class-1 5VA -3						
887	BUS BAR-						
888	150A TPN ALUMINIUM BUS BAR-						
889	OUTGOING-						
890	63A 4P 10KA MCB-2						
891	32A 4P 10KA MCB-4						
892	MAIN DISTRIBUTION PANEL - FIFTH FLOOR-	Z.8	1.00	EA		0.00	INR Zero Only
893	INCOMER-						
894	125A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
895	Extended Rotatory Handle, Spreaders-1						
896	Auxiliary & Trip Alarm Contact-1						
897	6A SP 10KA MCB -4						
898	Digital Multifunction Meter with Rs485 Port -1						
899	R,Y,B Phase Indicating Lamps-3						
900	CT's 150/5A class-1 5VA -3						
901	BUS BAR-						
902	150A TPN ALUMINIUM BUS BAR-						
903	OUTGOING-						
904	63A 4P 10KA MCB-2						
905	32A 4P 10KA MCB-4						
906	MAIN DISTRIBUTION PANEL - SIXTH FLOOR	Z.9	1.00	EA		0.00	INR Zero Only
907	INCOMER						
908	125A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release						
909	Extended Rotatory Handle, Spreaders						
910	Auxiliary & Trip Alarm Contact						
911	6A SP 10KA MCB						
912	Digital Multifunction Meter with Rs485 Port						
913	R,Y,B Phase Indicating Lamps						
914	CT's 150/5A class-1 5VA						
915	BUS BAR						
916	150A TPN ALUMINIUM BUS BAR						
917	OUTGOING						
918	63A 4P 10KA MCB						
919	32A 4P 10KA MCB						
920	UPS INPUT PANEL -	Z.10	1.00	EA		0.00	INR Zero Only
921	INCOMER-						
922	250A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-2						
923	Extended Rotatory Handle, Spreaders-2						
924	Auxiliary & Trip Alarm Contact-2						
925	250A 4P Power Contactor for electrical & machanical Interlocking -2						
926	6A SP 10KA MCB -8						
927	Digital Multifunction Meter with Rs485 Port -2						
928	R,Y,B Phase Indicating Lamps-6						
929	CT's 250/5A class-1 10VA -6						
930	BUS BAR-						
931	300A TPN ALUMINIUM BUS BAR-						
932	OUTGOING-						
933	160A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-2						
934	Extended Rotatory Handle, Spreaders-2						
935	6A SP 10KA MCB -3						
936	Digital Amp Meter with builtin selector switch-2						
937	CT's 200/5A class-1 10VA -6						
938	32A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
939	Extended Rotatory Handle, Spreaders-1						
940	6A SP 10KA MCB -1						
941	Digital Amp Meter with builtin selector switch-1						
942	CT's 30/5A class-1, 5VA -3						
943	UPS OUTPUT PANEL -	Z.11	1.00	EA		0.00	INR Zero Only
944	INCOMER-						
945	160A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-						
946	Extended Rotatory Handle, Spreaders-						
947	Auxiliary & Trip Alarm Contact-						
948	160A 4P Power Contactor for electrical & machanical Interlocking -						
949	6A SP 10KA MCB -						
950	Digital Multifunction Meter with Rs485 Port -						
951	R,Y,B Phase Indicating Lamps-						
952	ON/OFF/ Trip Indicating Lamps-						
953	Start/ Stop Push Button-						
954	Auto manual selector switch-						

955	CT's 200/5A class-1 10VA -						
956	160A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-						
957	Extended Rotatory Handle, Spreaders-						
958	Auxiliary & Trip Alarm Contact-						
959	160A 4P Power Contactor for electrical & machanical Interlocking -						
960	6A SP 10KA MCB -						
961	6A DP 10KA MCB -						
962	On Delay Timer-						
963	ON/OFF Indicating Lamps-						
964	Start/ Stop Push Button-						
965	Auto manual selector switch-						
966	BUS BAR-						
967	300A TPN ALUMINIUM BUS BAR-						
968	OUTGOING SECTION-1-						
969	63A 4P 10KA MCB-						
970	40A 4P 10KA MCB-						
971	40A DP 10KA MCB-						
972	OUTGOING SECTION-2-						
973	63A 4P 10KA MCB-						
974	40A 4P 10KA MCB-						
975	40A DP 10KA MCB-						
976	PRESSURIZATION PANEL -	Z.12	1.00	EA		0.00	INR Zero Only
977	INCOMER-						
978	160A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
979	Extended Rotatory Handle, Spreaders-1						
980	Auxiliary & Trip Alarm Contact-1						
981	6A SP 10KA MCB -4						
982	Digital Multifunction Meter with Rs485 Port -1						
983	R,Y,B Phase Indicating Lamps-3						
984	CT's 200/5A class-1 10VA -3						
985	BUS BAR-						
986	200A TPN ALUMINIUM BUS BAR-						
987	OUTGOING-						
988	63A TPN 10KA MCB-8						
989	40A TPN 10KA MCB-1						
990	32A TPN 10KA MCB-2						
991	SMOKE EXHAUST PANEL -	Z.13	1.00	EA		0.00	INR Zero Only
992	INCOMER-						
993	250A 4P ATS-1						
994	250A 4P 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
995	Extended Rotatory Handle, Spreaders-1						
996	Auxiliary & Trip Alarm Contact-1						
997	6A SP 10KA MCB -8						
998	Auxiliary Contactor with 2NO+2NC 230VAC-2						
999	Digital Multifunction Meter with Rs485 Port -1						
1000	On Delay Timer-2						
1001	Voltage Monitoring Relay-2						
1002	R,Y,B Phase Indicating Lamps-3						
1003	CT's 250/5A class-1 10VA -3						
1004	BUS BAR-						
1005	300A TPN ALUMINIUM BUS BAR-						
1006	OUTGOING-						
1007	160A TPN 25KA MCCB With Thermal Magnetic Base O/L, S/C Protection Release-1						
1008	Extended Rotatory Handle, Spreaders-1						
1009	63A TPN 10KA MCB-1						
1010	32A TPN10KA MCB-16						
1011	UPS	ZA					
1012	Supply, installation, testing & commissioning of One Set of 1 Nos., 80 KVA UPS. Each UPS of 80 KVA should have following specifications in addition to tender requirements : (i) True online double conversions, IGBT Rectifier & inverter based UPS. (ii) Three phases Input/ three phase output (Input Line Voltage: 340 - 478 Volt, 3 phase, Output Line Voltage 400 volt, 3 phase) (iii) SMF batteries complete with MS Fabricated battery rack to accommodate the complete battery system. (iv) Suitable for 30 Min backup on Full load at 0.8 Load P.F., with required nos. of Battery with each UPS. (v) Output THD is less than 3% for full linear load & Less than 5 % for nonlinear load. (vi) Crest factor 3:1 (vii) over load 125% for 10 min, 150% for 1 min and should be able to operate continuously at 115% load on bypass mode. (viii) Battery type should be Valve regulated lead-acid (VRLA).	ZA.1	2.00	EA		0.00	INR Zero Only

1013	(ix) Inbuilt Delta - Star Input Isolation Transformer, parallel communication port, RS232, USB, EPO and SNMP interface, BMS interface. (x) Dust Filter at Air Inlet point are required. (xi) UPS should be provided with environment monitoring probe to measure temperature and humidity of UPS room on SNMP card software. (xii) LCD Display indicating all important parameters. (xiii) UPS shall be provided with Temperature and Humidity Sensors to monitor Temperature and Humidity over LAN. (xiv) Battery open rack with top cover, battery interlinks and battery breaker. (xv) Battery to UPS cable as required should be provided with UPS systems. (xvi) UPS system shall be parallelable upto 6 units in case required in future. (xvii) Each UPS shall be compatible for working in parallel redundant mode with other. MAKE-EMERSON, UNILINE, 3EM (Testing will be as per IEC 62040)						
1014	Supply, installation, testing & commissioning of One Set of 1 Nos., 5 KVA UPS. Each UPS of 5 KVA should have following specifications in addition to tender requirements : (i) True online double conversions, IGBT Rectifier & inverter based UPS. (ii) Three phases Input/ three phase output (Input Line Voltage: 340 - 478 Volt, 3 phase, Output Line Voltage 400 volt, 3 phase) (iii) SMF batteries complete with MS Fabricated battery rack to accommodate the complete battery system. (iv) Suitable for 30 Min backup on Full load at 0.8 Load P.F., with required nos. of Battery with each UPS. (v) Output THD is less than 3% for full linear load & Less than 5 % for nonlinear load. (vi) Crest factor 3:1 (vii) over load 125% for 10 min, 150% for 1 min and should be able to operate continuously at 115% load on bypass mode. (viii) Battery type should be Valve regulated lead-acid (VRLA).	ZA.2	1.00	EA			0.00 INR Zero Only
1015	(ix) Inbuilt Delta - Star Input Isolation Transformer, parallel communication port, RS232, USB, EPO and SNMP interface, BMS interface. (x) Dust Filter at Air Inlet point are required. (xi) UPS should be provided with environment monitoring probe to measure temperature and humidity of UPS room on SNMP card software. (xii) LCD Display indicating all important parameters. (xiii) UPS shall be provided with Temperature and Humidity Sensors to monitor Temperature and Humidity over LAN. (xiv) Battery open rack with top cover, battery interlinks and battery breaker. (xv) Battery to UPS cable as required should be provided with UPS systems. (xvi) UPS system shall be parallelable upto 6 units in case required in future. (xvii) Each UPS shall be compatible for working in parallel redundant mode with other. MAKE-EMERSON, UNILINE, 3EM (Testing will be as per IEC 62040)						
1016	MISCELLANEOUS ITEMS	ZB					
1017	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick , and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	ZB.1	7.00	EA			0.00 INR Zero Only
1018	Supply and fixing glass framed shock treatment chart.900mm x 600mm high, printed preferably in three languages i.e. Hindi, English & local language;	ZB.2	1.00	EA			0.00 INR Zero Only
1019	Supplying and fixing of high voltage insulation mat of class B having 1.1 KV dielectric strength , 1000mm width and thickness of 2.0 mm ISI approved as required including cutting to required lengths.	ZB.3	7.00	M2			0.00 INR Zero Only
1020	Supply and installation of DCP type fire extinguisher of capacity 5 kg with upright operation conforming to IS:2171 having a jet length of 8m with discharge time of 10 sec including all accessories.	ZB.4	7.00	EA			0.00 INR Zero Only
1021	Standard first aid box - prescribed by St.John Ambulance brigade or India Red Cross shall be provided (First aid box should be of 18 gauge M.S sheet of size 14" x 17" x 5"):-	ZB.5	2.00	EA			0.00 INR Zero Only
1022	11 KV, 3 Phase Overhead HT Line work comprising of following:-	ZB.6	500.00	M			0.00 INR Zero Only
1023	A. Supplying & Fixing 11kV Pin / Disc insulators confirming to IS-731 / 1971 & IS 2486 (Part-II)/1989 on existing structure / pole etc. as required along with complete accessories including Cross arms, Top Clamps, Guarding Cross arms, etc. (M/s. JSI / BHEL / HTIF / Punjab Ceramic / W S Ind. / Allied Ceramic / India Potteries / or any reputed make)						
1024	B. Supplying and laying of A.C.S.R. weasel conductor confirming to IS-398 (Part-I & II) / 1996 of overall dia. of 7.77mm on the existing pole on insulators including binding, testing, commissioning etc.						
1025	C. The 11KV guarding cross arm is to be fitted on the pole (which are already erected, and if any extra pole is to be installed the same shall be apid seperately) as per standard engineering practice for guarding the line with 8 SWG GI wire as guard wire and 10 SWG GI wire for lacing. Guarding cross arm made of 75x40x6 mm angle 5 feet long should be clamped at 300mm below the bottom arm of 'V' cross arm.						
1026	D. ANTI-CLIMBING DEVICE: Barbed wire weighing 3.5 Kg per pole should be wrapped at a height of 3000 mm above ground level stretching in 900 mm length. Both ends of barbed should be clamped suitably to avoid coming down from its location.						
1027	E. DANGER BOARD: Danger Board for 11KV voltage and danger mark conforming to IS:2551-1963 should be fixed on each location.						
1028	F. GUYS: The guys shall consist of anchor plate, stay rod with bow and ratchet assembly, thimbles stay wires, stay grips and stay clamps. All iron fittings of stay shall be painted with Red Oxide paint. The minimum size of stay wire shall be 7/4.0 mm with ultimate breaking strength of 6450 Kg. The stay rod shall be 20 mm dia 2 meters long fitted with bow and ratchets assembly having ultimate tensile strength of 8000 Kg. The anchor plate shall not be less than 300 x 300 x 6 mm size made up of mild steel. Turnbuckles with 20 mm dia. screw shall have ultimate breaking strength of 8000 kg.						

1029	Supply, installation, testing and commissioning of Metering cubicle as per local electric authority norms including providing required CT and PT complete as required, dust, damp and vermin proof, cubicle HT. Metering Panel made out of 14 gauge CRCA sheet steel complete with 5 Amp electronic trivector meter, C.T.'s of 20/10/5 Amp, 0.5 Class, 15 VA Burden, and P.T.'s of 11 KV / $\sqrt{3}$, 110V / $\sqrt{3}$, 100 VA conforming to relevant IS Standards and complete as required. H.T. Metering cubicle along with C.T.'s, P.T.'s and trivector meter shall be got tested and approved from local electricity supply authority. The GA drawing shall be got approved from the local statutory authorities before fabrication. Note: The contractor shall ensure that the above panel meets the requirement as insisted by local electricity authorities for satisfactory operation and as per the Drawings	ZB.7	1.00	SET		0.00	INR Zero Only
1030	250 KVA DG Set Equipment With AMF Panel Providing, Installing, Testing and Commissioning of 250 KVA Continuous rating 'Silent Type (Prime rating)' radiator cooled Diesel Generating set along with complete fuel oil piping, antivibration mounts, base frame, required hardware, Batteries, Engine control panel with accessories, residential silencer, flexible connection, bellow/ expansion joints, etc. complete with all associated equipment/ work as per specifications or requirements as per site having Prime Power Rating, 415 volts at 1500 RPM, 0.8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0.85 Load Factor and consisting of the followings including making necessary civil foundation etc. complete as required (Factory test or load test as per ISO3046 & ISO8528)	ZB.8	1.00	SET		0.00	INR Zero Only
1031	Diesel Engines:						
1032	Diesel engine 4 stroke water cooled, electric start, of suitable BHP at 1500 RPM suitable for delivering required output of alternator at 40 Degree C, 50% RH & at 1000 Meter MSL and conforming to BS 5514, BS 649, IS 10000, capable of taking 10% over loading for one hour after 12 hours of continuous operation. The engine will be fitted complete with all the required accessories.						
1033	Engine mounted Instrument Panel fitted with and having digital display for following:						
1034	DG set shall be supplied with built in acoustic enclosure as per pollution control board norms and as per specification complete in all respect.						
1035	The DG Set shall be complete with PCC (Power Command Control) or equivalent DG Controller module suitable for AMF (auto-mains failure), Auto Load Sharing & Interface with PLC mounted in the LT panel for ACB/MCCB switching and Auto load sensing and Auto load Management, including communication card and networking gateway and software as required.						
1036	Note: Item rate shall be include 1st time filling of Lube oil & diesel and also include the cable termination box suitable for termination of 4 Runs 3.5 C X 300 Sqmm. XLPE AL cables at alternator.						
1037	Battery charger for 1X250 KVA DG sets						
1038	Supply, installation, testing & commissioning of Battery Charger as described in Specifications and described below:						
1039	Rating						
1040	AC Input: 230 V + 10% AC 50 Hz single phase.						
1041	DC Output: To float / boost charge the batteries (with required AH as per D.G. rating) and also supply a continuous load or as per offered DG set requirement.						
1042	Current Rating: 30 A						
1043	Float Mode: 27.0 V nominal (Adjustable) between 24-28.0 V.						
1044	Boost Mode: 29.0 V nominal (Adjustable) between 24-32.0 V						
1045	Voltage Regulation: + 2% for AC input variation of 230 V + 10%. Frequency Variation of 50 Hz + 5% and DC load variation 0-100%						
1046	Ripple: Less than 5%						
1047	Alternator :						
1048	Synchronous alternator rated at 250KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0.8 lagging power factor at 40 Degree C, 50% RH & at 1000 Meter MSL. The alternator shall be having SPDP enclosure, brushless, continuous duty, self-excited and self-regulated through AVR conforming to IS: 4722/BS 2613 suitable for tropical conditions and with class-F/H insulation.						
1049	Base Frame & Foundation:						
1050	Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer.						
1051	Fuel Tank:						
1052	Daily service fuel tank of 990 liters capacity respectively fabricated out of 2 mm thick M.S. sheet complete with all standard accessories and fuel piping between fuel tank and diesel engine with MS class 'C' pipes of suitable dia. Complete with valves, level indications & accessories as required as per specifications.						
1053	Oil Piping						
1054	Supply, installation, testing & commissioning of the following MS class 'C' pipes cut to required lengths and installed with all welded joints. Providing the necessary fittings like elbows, tees and reducers, sockets, hot dip galvanized supports and accessories including ceiling Hanger, Hardware complete as per site requirement.						
1055	25 mm dia MS pipes of required length as directed by Engineer-In-Charge						
1056	25 mm dia. ball valves of required numbers as directed by Engineer-In-Charge						
1057	Exhaust System:						
1058	Dry exhaust manifold with hospital exhaust silencer and catalytic convertor.						
1059	Starting System:						
1060	24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete with suitable nos. of batteries (180 AH capacity lead acid type) as required as per specifications.						
1061	Acoustic and weather proof enclosure with arrangement for fresh air intake for cooling of the engine & alternator, extraction, discharging hot air in to the atmosphere as per specifications, For in house power Generation for Emergency loads suitable for 250KVA						

1062	Supplying and fixing Exhaust gas piping of 1x100 dia. welded black MS, B Class pipe conforming to IS:3589 cut to required lengths and installed with necessary bends, supports and clamps, anti-vibration mountings, insulation of exhaust system with mineral wool/ Rockwool, 50 mm thick wire mesh & aluminum cladding etc., as required as per specifications The height will be governed by existing structures nearby and as per norms and bye-laws (if any) and/or as per design requirement as per the decision of Engineer-In-Charge. Cost of framing and all supports complete in all respect is included.	ZB.9	1.00	SET			0.00 INR Zero Only
1063	Supply, installation, testing & commissioning of MS class-C exhaust pipe as per IS 1239 and all fixing accessories and hardwares. The exhaust pipes shall be insulated with 75 mm thick mineral wool (density 150 kg/m3) insulation wrapped in chicken mesh and clad with 26 gauge aluminium sheet including all hot dip galvanized support structural as required.						
1064	125 mm dia MS class-C pipe & 75mm thick mineral wool insulation as per description given above of required length as directed by Engineer-In-Charge						
1065	100 mm dia MS class-C pipe & 75mm thick mineral wool insulation as per description given above of required length as directed by Engineer-In-Charge						
1066	Contractor should furnish calculation for exhaust piping size for approval by the Consultant. The system should meet the performance of the engine without exceeding the back pressure limit prescribed by engine supplier.						
1067	Support Structure						
1068	Supply, installation, testing & commissioning of miscellaneous structural support (MS angle iron / MS Plates / MS Channel etc.) for horizontal/vertical exhaust piping at suitable interval as per approved Shop drawing including fabrication, hardwares / flanges and painting (2 coats of primer and 2 coats of enamel paint) complete in all respect.						
1069	Additional Material Required						
1070	Supply, installation, testing & commissioning of 125 mm dia Flexible Bellows of required numbers as directed by Engineer-In-Charge						
1071	Supply, installation, testing & commissioning of 100 mm dia Flexible Bellows of required numbers as directed by Engineer-In-Charge						
1072	Supply, installation, testing & commissioning of Thermal Cladding of Silencers of required numbers as directed by Engineer-In-Charge						
1073	Supply, installation, testing & commissioning of following 1100 volt grade XLPE PVC insulated sheathed copper conductor armoured cable including supplying of bimetallic crimping lugs, double compression glands with earthing, as per specification.						
1074	4 C x 2.5 sq.mm control cable of required length as directed by Engineer-In-Charge						
1075	12 C x 2.5 sq.mm control cable of required length as directed by Engineer-In-Charge						
1076	AMF PANEL - Fabricating, supplying, installation, testing and commissioning of Automatic Mains Failure Control (AMF panel) including auto by-pass panel, suitable for 250 KVA , silent type DG set complete with relay, timers, set of CTs for metering & protection and energy analyser to indicate currents, phase and line voltage, frequency, power factor, KWH, KVARH and provision for overload, short circuit, restricted earth fault, under frequency, control cabling from AMF panel to diesel engine and elsewhere if required, all complete and inter locking including the following:	ZB.10	1.00	SET			0.00 INR Zero Only
1077	(a) 1 No. 400 AMP., 4 Pole motorised molded case circuit breaker.						
1078	(b) Auto/Manual/Test/Off selector switch						
1079	(c) 2 Nos. over voltage relay, 2 nos.reverse power relay and 2 nos. under voltage relay						
1080	(d) 3 Sets of Current Transformer 15P 10 accuracy for protection and 15 VA class-I for metering						
1081	(e) Energy analyzer unit to indicate current voltage frequency power factor and KWH						
1082	(f) indication lamps for load on mains and load on set						
1083	(g) fuse for instruments						
1084	(h) Battery charger, complete with transformer/ rectifier, D.C voltmeter and ammeter, selector switch for trickle, off and boost and current adjustment.						
1085	(i) Main supply failure monitor						
1086	(j) Supply failure timer						
1087	(k) Restoration timer						
1088	(l) Control unit with three impulse automatic engine start/stop and failure to start lockout.						
1089	(m) Impulse counter with locking and reset facility.						
1090	(n) ON/OFF/Control circuit switch with indicator						
1091	(o) Audio/Video annunciation for						
1092	(i) High water temperature (ii) Low lubricating oil pressure (iii) Engine over speed (iv) Engine fails to start (v) Full load/maximum load warning						
1093	SOLAR SYSTEM 50KW	ZC					
1094	Supply, Installation, Testing and Commissioning of ongrid Solar Photovoltaic Power Plant conforming to MNRE specifications as amended, consisting of Mono/Poly Crystalline silicon solar cells, net metering facility, necessary protections, earthing, mounted on Aluminium/GI structure of suitable strength with following components complete as required:- a) Solar Photovoltaic Module of capacity 330 Wp or above, manufactured in India, conforming to IS 14286/IEC 61215, IS/IEC 61730-Part-1, IS/IEC 61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 16.5%. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. b) Power Conditioning Unit (PCU) of 350-800 V DC Input voltage range and 400 V AC, three phase, 4 wire, 50Hz +/- 2.5 Hz, output voltage suitable to generate AC Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degree C. The PCU shall adjust the voltage and frequency level to suit the Grid Voltage Frequency. c) Data Monitoring System complete with accessories. d) Fixing of Array junction box & Main junction box with IP 65 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required.(KWH means KWP here)	ZC.1	50.00	KWH			0.00 INR Zero Only

1095	LV WORK	6				
1096	FIRE AND PUBLIC ADDRESS SYSTEM	ZD				
1097	FIRE ALARM SYSTEM	ZD.1				
1098	Supplying, installation, testing and commissioning of microprocessor based intelligent addressable main fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 320 character graphics/ LCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5% V, 50 Hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger. The panel shall have facility to connect printer to printout log and facility to have seamless integration with analog/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories. The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications. 8 loop	ZD.1.1	1.00	SET		0.00 INR Zero Only
1099	Supply, installation testing and commissioning of Integrated facilities monitoring network Work station with GUI based main network software capable of graphically representing each facility being monitored with floor plans and icons depicting the actual locations of the various systems; and / or sensors' locations. The Work station shall be located in control room in one of the blocks and shall monitor all the blocks panel connected with each other. The software shall be capable of monitoring 100 Nodes with 100 MB baud transmission rate on Fibre Optics network and 12 MB baud transmission on cable or more. The software shall provide the facility to monitor, control all the 2 way communication from main control room using voice signals over Fire Network along with the Fire detection signal.	ZD.1.2	1.00	NUM		0.00 INR Zero Only
1100	Supply, Installation, Testing & commissioning of Bacnet/Modbus Card for integration of 8 Loop panel with BMS system etc. As required. (compile with UL listed 9th Edition).	ZD.1.3	8.00	NUM		0.00 INR Zero Only
1101	Supplying, installation testing and commissioning of Repeater Panel/Annunciators with suitable character LCD display. The annunciator shall have Four Status Queues with selector switches and LEDs for Alarm, Supervisory, Trouble and Monitor to sort events etc. as required. Mounting options include an annunciator box, and blank modules are required for mounting etc. as required. (UL Listed).	ZD.1.4	7.00	NUM		0.00 INR Zero Only
1102	Supplying, installation, testing & commissioning of intelligent analog addressable Photothermal/Multicriteria Detector detector complete with mounting base complete as required.	ZD.1.5	573.00	NUM		0.00 INR Zero Only
1103	Supplying, installation, testing & commissioning of intelligent addressable Thermal/Heat Detector with rate of rise cum fixed temperature thermistor complete with base as required.	ZD.1.6	7.00	NUM		0.00 INR Zero Only
1104	Supplying, installation, testing & commissioning of addressable manual call point complete as required.	ZD.1.7	16.00	NUM		0.00 INR Zero Only
1105	Supplying, installation, testing & commissioning of addressable horn cum strobe complete as required.	ZD.1.8	16.00	NUM		0.00 INR Zero Only
1106	Supplying, installation, testing & commissioning of addressable Beam Detector complete as required.	ZD.1.9	12.00	NUM		0.00 INR Zero Only
1107	Supplying, installation, testing & commissioning of fire fighter phone jack complete as required.	ZD.1.10	16.00	NUM		0.00 INR Zero Only
1108	Supplying, installation, testing & commissioning of fire fighter telephone handset complete as required.	ZD.1.11	7.00	NUM		0.00 INR Zero Only
1109	Supplying, installation, testing & commissioning of addressable fire control module complete as required. (For AHU, Ventilation and pressurization fans)	ZD.1.12	39.00	NUM		0.00 INR Zero Only
1110	Supplying, installation, testing & commissioning of addressable fire Control/Monitor module complete as required.	ZD.1.13	28.00	NUM		0.00 INR Zero Only
1111	Supplying, installation, testing & commissioning of Response indicator on surface/recessed MS Box having two LED, metallic cover complete with all connections etc as required.	ZD.1.14	289.00	NUM		0.00 INR Zero Only
1112	Supplying, installation, testing & commissioning of fault isolator complete with base as required.	ZD.1.15	50.00	NUM		0.00 INR Zero Only
1113	Supplying and installation of photo luminescent safety signage made up of LED based exit signage with 90 min. battery backup as per NBC including arrangement for fixing on wall / ceiling etc. complete as required (single sided) (size 150 mm x 300 mm) Exit Sign and Internal Hydrant illuminated Sign.	ZD.1.16	22.00	NUM		0.00 INR Zero Only
1114	Supply, Installation, Testing and Commissioning of UL Listed Fire Alarm Hooter (sound output of minimum 90 dB upto a distance of 30 meters) cum Strobe (Selectable 15, 30, 75, or 110 cd), made Addressable with the help of Intelligent Addressable Signal Module (cost of the Module to be included), capable of being addressed electronically. Manual Addressing (Dip/ Rotary Switches) not acceptable, with separate power supply arrangement complete as required. Approved Makes : Ansul/ Edwards/Notifier/Wissenschaftler/Rux	ZD.1.17	2.00	EA		0.00 INR Zero Only
1115	PUBLIC ADDRESS SYSTEM	ZD.2				
1116	Supplying, installation, testing & commissioning of 6 zone, voice alarm controller with USB, MP3 player (including 6 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required	ZD.2.1	1.00	SET		0.00 INR Zero Only
1117	Supplying, installation, testing & commissioning of Voice command keypad 6 zone , with microphone assembly complete as required	ZD.2.2	1.00	SET		0.00 INR Zero Only
1118	Supplying, installation, testing & commissioning of 5/3/6W ceiling speaker complete as required	ZD.2.3	266.00	NUM		0.00 INR Zero Only
1119	Supplying, installation, testing & commissioning of 10W wall mount speaker complete as required	ZD.2.4	11.00	NUM		0.00 INR Zero Only
1120	Supplying, installation, testing & commissioning of digital audio amplifier 240Watt, 25V rms operating at 240 Volt AC Supply complete as required	ZD.2.5	7.00	NUM		0.00 INR Zero Only
1121	SITC of 2x1.5sqmm speaker cable	ZD.2.6	1500.00	M		0.00 INR Zero Only
1122	SITC of cat6 cable for Microphone	ZD.2.7	50.00	M		0.00 INR Zero Only
1123	SITC of 19-inch Equipment Rack with standardized frame or enclosure for mounting multiple PA controllers, CD player, FM sources, Amplifiers etc modules. Size 24U	ZD.2.8	1.00	NUM		0.00 INR Zero Only
1124	CONDUITS AND CABLES	ZD.3				
1125	Supplying & laying of 2x1.5 sqmm fire survival armoured cable 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer sheath complete as required 2 x 1.5 sq.mm	ZD.3.1	8500.00	M		0.00 INR Zero Only

1126	Supplying and fixing 25 mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc. as required.	ZD.3.2	1500.00	M		0.00	INR Zero Only
1127	ACCESS CONTROL SYSTEM	ZE					
1128	Supply, Installation, testing and commissioning of Surface mounted Networkable multiprocessor controlled 4 reader controller capable of controlling multiple readers (IN/OUT) alongwith TCP/IP connectivity complete as per specifications. Control panel housed in MS Powder Coated Cabinet with Tamper Switch, Complete with power supply unit for Controllers & Magnetic Locks as per specification Make-DDS/SoftwareHouse/Continuum	ZE.1	10.00	NUM		0.00	INR Zero Only
1129	Supply, Installation, testing and commissioning of Surface mounted Networkable multiprocessor controlled 2 reader controller capable of controlling multiple readers (IN/OUT) alongwith TCP/IP connectivity complete as per specifications. Control panel housed in MS Powder Coated Cabinet with Tamper Switch, Complete with power supply unit for Controllers & Magnetic Locks as per specification Make-DDS/SoftwareHouse/Continuum	ZE.2	4.00	NUM		0.00	INR Zero Only
1130	Supply, installation, testing and commissioning of UL Listed Smart Card Reader fwth compatible support of weigand output, 13.56 MHz technology platform and complies with the ISO 15693 / 14443A standard for contact less smart card technology. Card reader must be configurable to read encrypted ISO14443A sectors using standard or custom read keys for Sign OUT Terminal. should be compatible with HID format cards. Encryption, All RF data transmission between the card and reader should be encrypted using a secure algorithm. Industry-standard encryption techniques and advanced key management systems should be used to avoid the risk of compromised data or duplicated cards. The reader should have audio transducer to provide various tone sequences to signify access granted, access denied, power up and diagnostics. Visually impaired cardholders can easily distinguish between access granted and access denied. High-intensity light bar should provide a clear visual status indication in red, green or amber, even in bright sunlight. Make-HID/Morpho/Tyco	ZE.3	45.00	NUM		0.00	INR Zero Only
1131	Supply Installation testing and Commissioning of Biometric Attendance Device fingerprint technology inside 1:10,000 user identification in 1 second, Anti-fraud features, Fake finger detection, duress finger, timed anti-pass back, Tough design, CPU: ARM@ Cortex™-A9 core 1GHz, Linux Operating System, 1:N mode: 10,000 user (*3 templates each, including 1 duress), 1:1 mode: 250,000 user IDs, 1 Million transaction logs. Inputs/outputs: Wiegand In & Out, as per technical specification. Make-Morpho/HID/Tyco	ZE.4	2.00	NUM		0.00	INR Zero Only
1132	Supply, installation, testing and commissioning of biometric USB devices High performance sensor: 500 dpi, 256 grey levels , Biometric Feature Extraction to generate templates Feature Extractor is MNEX/FIPS 201 compliant Proprietary, ISO 19794-2 or ANSI 378 template formats available Templates can be stored in the internal database (up to 10 000 templates)	ZE.5	1.00	NUM		0.00	INR Zero Only
1133	Supply, testing and commissioning of 16K chip memory Read/Write contact less non-proprietary smart card. Make-HID/Morpho/Tyco	ZE.6	500.00	NUM		0.00	INR Zero Only
1134	Supply, installation, testing and commissioning of Access Control Application Software for 128 Reader Capacity, and 5000 Card Holder Capacity, Basic GUI , TA Module with Alarm Module, T+Module for using SQL DB , -MULTI Site Module. Make-DDS/SoftwareHouse/Continuum	ZE.7	1.00	NUM		0.00	INR Zero Only
1135	Supply, installation, testing and commissioning of Access Control client workstation license Make-DDS/ SoftwareHouse/ Continuum .	ZE.8	2.00	NUM		0.00	INR Zero Only
1136	Supply, installation, testing and commissioning of Visitor Management system Software with required hardware.	ZE.9	1.00	NUM		0.00	INR Zero Only
1137	Supply, installation, testing and commissioning of Server with minimum specification of Mount Intel® Xeon® processor/ equivalent / latest generation, 2 X 8 core 2.6GHz or heigher CPUs , Support to at least 30 VM, Memory : 64 GB ECC DDR4 upgradable to 100 GB, Graphics NVIDIA (4 GB dedicated) With 2-DVI/HMI output with Dual Screen card & associate Software of operation, Internal Storage of 2TB 7.5K or heigher rpm SATA hard disk along with Dual 10G-Gigabit Ethernet ports, PS/2 / USP Compatible, High -Efficiency, Hot-plug, redundant power supplied, hot-plug drives bays; dual internal SD support; hot-plug, redundant fan. Cost should be With Life time license for Operating System : Microsoft® Windows Server® latest software, & SQL Database . The software & Workstation should be FCC & UL listed	ZE.10	1.00	NUM		0.00	INR Zero Only
1138	Supply, installation, testing and commissioning of Intel Core i5 Quad Core @ 3.3 GHz or Latest, 8GB dual channel DDR3 1333/1600, Graphics NVIDIA (2 GB dedicated) With 2-DVI/HMI output with Dual/Quad Screen card & associate Software of operation., 2TB 7.5K rpm SATA hard disk, PS/2 Compatible, Dual Gigabit Ethernet, power supply provisions Cost should be With Life time license for Windows 8 enterprise/professional or latest software compatible MacAfee /Symantec Anti virus & All other related software such MS office with liscenced. The required operation & CCTV remote software etc. & Workstation should be FCC & UL listed	ZE.11	2.00	NUM		0.00	INR Zero Only
1139	Supply, installation, testing and commissioning of Single Leaf Electro Magnetic Lock of Suitable Capacity (Min 600 lbs). Make-Bel/Ncom/Algatech	ZE.12	40.00	EA		0.00	INR Zero Only
1140	Supply, installation, testing and commissioning of Double Leaf Electro Magnetic Lock of Suitable Capacity (Min 1200 lbs). Make-Bel/Ncom/Algatech	ZE.13	3.00	EA		0.00	INR Zero Only
1141	Supply and Fixing of "U/L" Bracket with Accessories. Make-Bel/Ncom/Algatech	ZE.14	43.00	EA		0.00	INR Zero Only
1142	Supply and Fixing of Door Positioning sensor with Accessories. Make-Bel/Algatech/Honeywell	ZE.15	43.00	EA		0.00	INR Zero Only
1143	Supply, Fixing and Laying of 8 Core multi strand, copper, unarmoured Cable (between the every readers & the access controllers). Make-Vimco/Finolex/Polycab	ZE.16	3000.00	M		0.00	INR Zero Only
1144	Supply, Fixing and Laying of 2 Core x 1.5 Sq mm, multi strand, copper, unarmoured cable (between the controller and EM Lock/Request to exit button). Make-Vimco/Finolex/Polycab	ZE.17	3000.00	M		0.00	INR Zero Only

1145	Enclosure: 42 U Floor Standing Rack & Modular Construction of the rack made of 4 vertical, 4 horizontal & 4 depth aluminum/MS bolted and joined together with Links and Corner Block. Enough support channel to equate the load evenly and castor provision at bottom side, Degree of Protection: The unit should have a minimum of IP 20, Compliance with standards: UL, IEC, Earthing: All cabinet components (doors, side panels, top panels, 19" rails, pdu brackets) shall be grounded directly to the frame using Dual Copper plated earth stud of suitable rating on main Metal parts for better electrical continuity, Weight Capacity: Load Capacity of minimum 1200 Kg, Coating: Powder coated black with fine texture – 60 to 80 uM, Corrosion Resistance: Salt spray test resist upto 500 Hrs, Top and Bottom: Top cover consist of Fire Retardant Brushes and Fire retardant ABS plastic / MS frame for cable and fiber entry to rack from fiber runner and copper cable pathway system. This consists of Brush with 2 line of brush system UL Certified Fire Retardant Brushes and Fire retardant ABS plastic / MS frame, Mounting Angle: 19"Upright adjustable in depth, equipment mounting angles with square slots to accommodate M6 cage nuts, powder coated texture finish. It contains U printing pattern which can be read from down to up and vice versa, Mounting Angle: 19"Upright adjustable in depth, equipment mounting angles with square slots to accommodate M6 cage nuts, powder coated texture finish. It contains U printing pattern which can be read from down to up and vice versa, Castor: Set of 4 castors with levelling feet, 2 brakes on front side and 2 without brakes, Mounting Hardware Packets with set of M 6 screw, Cage Nuts and Washer set of 10 or 20, Network Rack: 42U 800W x 1200D (Height x Width x Depth) ,Single Honeycomb/ Perforated door (Front Side), Double Honeycomb/ Perforated door (Rear Side), Zero U tool-less mounting PDU. 2 no PDU, 230 V AC-2 no. for each PDU , 18 no of 6 AMP socket(c13 type);6 no of 16Amp socket(c19 type) with 2 no of MCB 16/32 Amp. PDU of standard make like APC, Schneider, 4 no of cooling fan. Make: APW/Wellrack/Rittle	ZE.18	2.00	NUM		0.00	INR Zero Only
1146	DATA AND TELEPHONE NETWORK	ZF					
1147	Supply, Installation, testing and commissioning of Cat6A Tool less Information outlet for Data & Voice. Cat6A U/UTP built in crimping mechanism with capability of retermination without refreshing the wires. LCS2 Toolless RJ45 Information outlet with insertion cycle (in & out) should be 2500 times (I/O) along with front side Label holder and transparent shutter. The Information Outlet connector shall be of gold/nickel, thickness of gold > 0.8 µm.The connectors shall be compatible as per IEEE 802.3af standard for POE application. Make-Siemon/Panduit/Legrand/ Schneider/AMP	ZF.1	1010.00	NUM		0.00	INR Zero Only
1148	SITC of Double port Face Plate : Polycarbonate Hi-Grade Plastic FR Grade & UV Resistant 850 degree C/ Glow Wire Test. The face plate should be compatible for Cat5e, Cat6 range of RJ45 and AV connectors.The face plate Size should be of minimum 86x86mm. Make-Siemon/Panduit/Legrand	ZF.2	350.00	NUM		0.00	INR Zero Only
1149	SITC of Quad port Face Plate : Polycarbonate Hi-Grade Plastic FR Grade & UV Resistant 850 degree C/ Glow Wire Test. The face plate should be compatible for Cat5e, Cat6 range of RJ45 and AV connectors.The face plate Size should be of minimum 86x86mm Make-Siemon/Panduit/Legrand	ZF.3	245.00	NUM		0.00	INR Zero Only
1150	Supply, Installation, testing and commissioning of 24 port Cat 6A 19" Modular Toolless Patch Panel (loaded) enable all possible combinations of the various types of cable. mounted on the same panel by using various toolless connector blocks/modules. Have a metal structure enabling them to be durably fixed to the uprights of the 19" chassis and assuring automatic grounding between toolless RJ-45 connectors, the panel, and the 19" uprights of the enclosure. Include rear cable support with plastic cable guides to hold cable without need for cable ties. Include quick mounting system to mount the panel into the 19" rails without use of cage-nuts. Front Removal IO's option for maintenance and trouble shooting with 6 Different Colours Labels for Labelling & Identification of Individual Ports. Tested and guaranteed under dual circuit IEEE PoE+ up to 50W for up to 2500 on-load connections / disconnections. Make-Siemon/Panduit/Legrand	ZF.4	44.00	NUM		0.00	INR Zero Only
1151	Supply and drawing of UTP 4 pair 23 AWG CAT 6A LSZH Cable in the existing surface/ recessed steel/ PVC conduit as required conforming to the following standards like ANSI/TIA 568 C.2, IEC 60332-1, IEC 60754-1. Cable Dia 8.0 mm with beneding radius -4 X Cable Diameter Operates at frequency of 500 Mhz . Make-Siemon/Panduit/Legrand	ZF.5	54300.00	M		0.00	INR Zero Only
1152	Supply, Installation, testing and commissioning of CAT6A UTP 24 AWG Patch Cord - 1 mtr with cross separator , Manufactured from stranded wires for longer flex-life , Minimum length of 1m, and maximum length of 5m Conforming to the following standards like EN 50173, ISO/IEC 60603-7 & 11801/IEC 60332-1, UL VW-1 Make-Siemon/Panduit/Legrand	ZF.6	1010.00	NUM		0.00	INR Zero Only
1153	Supply, Installation, testing and commissioning of CAT6A UTP 24 AWG Patch Cord - 2 mtr with cross separator , Manufactured from stranded wires for longer flex-life , Minimum length of 1m, and maximum length of 5m Conforming to the following standards like EN 50173, ISO/IEC 60603-7 & 11801/IEC 60332-1, UL VW-1 Make-Siemon/Panduit/Legrand	ZF.7	500.00	NUM		0.00	INR Zero Only
1154	Supplying & Fixing of Fiber Optic LC style fully loaded Patch Panel (FOPP), 19" Rack Mount ,Shall have all accessories including coupler plates pre loaded with 24 Nos of LC couplers (OM3) with all accessories complete in all respect. Pigtails Should Comlie to ITU-G657.B-Bend insensitive fiber. Make-Siemon/Panduit/Legrand	ZF.8	4.00	NUM		0.00	INR Zero Only
1155	Supplying & Fixing of Fiber Optic LC style fully loaded Patch Panel (FOPP), 19" Rack Mount ,Shall have all accessories including coupler plates pre loaded with 12 Nos of LC couplers (OM3) with all accessories complete in all respect. Pigtails Should Comlie to ITU-G657.B-Bend insensitive fiber. Make-Siemon/Panduit/Legrand	ZF.9	7.00	NUM		0.00	INR Zero Only
1156	Supplying & Fixing of Fiber Optic Patch Cable (LC-LC), 3 Mtrs. Long, ISO/IEC-11801-OM3 50µ Duplex, LSZH .All patch cords shall conform to EIA/TIA-568C.3 and ISO/IEC-11801.Shall be Duplex Multi Mode Fiber Optic Patch Cords OM3 50µ,Shall support network line speeds up to 10 Gbps.Shall have LC-LC Connector connectors at the ends complete in all respect. Make-Siemon/Panduit/Legrand	ZF.10	56.00	NUM		0.00	INR Zero Only
1157	Supply & Fixing of OM3 50/125µ Type Pigtails of ISO/IEC-11801-OM3 Pigtails with LC Type Connectors ,pigtails for terminating fibers on the FOPP complete in all respect. Make-Siemon/Panduit/Legrand	ZF.11	336.00	NUM		0.00	INR Zero Only

1158	Supplying, Installation, Testing & Commissioning of 50µ, 6-core Multi mode OM3 metallic armored Fiber cable as per ISO/IEC-11801, Shall be able to meet Gigabit & 10 Gigabit Ethernet performance up to 300 meters requirement specified by IEEE 802.3z (1000 Base-X) & IEEE 802.3ae (10G Base-X) Tensile load should be 4000 Newton or higher and crush resistance should be 4000 Newton or higher, The attenuation @ 850 nm should be ≤ 2.7 (Max) db/Km and @ 1300 nm should be ≤ 0.7 (Max) dB/Km, the fiber construction can be unitube or multitube, but tensile and crush resistance parameters should be matched, the jacket shall be FRLSZH complete in all respect. Make-Siemon/Panduit/Legrand	ZF.12	2000.00	M		0.00	INR Zero Only
1159	Supplying, Installation, Testing & Commissioning of 24 port 10/100/1000BASE-T PoE+ ports and four GbE/10GbE SFP/SFP+ uplink ports layer3 and layer 2 from day1 having static & RIP , should support at least 8 switches stack, should support redundant power supply and fan , 3 Year OEM On site NBD warranty. Please refer tender for detailed Tech Specifications. Make: Juniper/Cisco/Extreme	ZF.13	32.00	NUM		0.00	INR Zero Only
1160	Supplying, Installation, Testing & Commissioning of 24 port 10/100/1000BASE-T ports and four GbE/10GbE SFP/SFP+ uplink ports layer3 and layer 2 from day1 having static & RIP , should support at least 8 switches stack, should support redundant power supply and fan , 3 Year OEM On site NBD warranty. Please refer tender for detailed Tech Specifications. Make: Juniper/Cisco/Extreme	ZF.14	16.00	NUM		0.00	INR Zero Only
1161	Supplying Installation testing and Commissioning of Small Form Factor Pluggable 1 Gigabit Ethernet (SFP+) SR Optics 3 Year OEM On site warranty. Make: Juniper/Cisco/Extreme	ZF.15	56.00	NUM		0.00	INR Zero Only
1162	Supply, installation, testing & commissioning of 10 GBase-T Gigabit Ethernet Transceiver SFP 3 Year OEM On site warranty - Make: Juniper/Cisco/Extreme	ZF.16	4.00	NUM		0.00	INR Zero Only
1163	Supplying Installation testing and Commissioning of SFP+ 10 Gigabit Ethernet Direct Attach Copper (twinax copper cable) 1m in length complete in all 3 Year OEM On site warranty respect. Make: Juniper/Cisco/Extreme	ZF.17	43.00	NUM		0.00	INR Zero Only
1164	Supplying Installation testing and Commissioning of 2 Port Fiber Switch 10/100/1000BASE-T ports, with up to 4X 10GbE uplinks and 2X 40GbE uplinks. Switch should support stacking bandwidth of minimum 160gbps, Modular operating system, 32 1 Gig SFP port with additional 4 no. of 10g SFP+PORT, redundant power supply, layer3 switch, each switch should be provided with stacking port/cable complete in all respect. Make-Juniper/Cisco/Extreme	ZF.18	2.00	NUM		0.00	INR Zero Only
1165	Enclosure: 24 U Floor Standing Rack & Modular Construction of the rack made of 4 vertical, 4 horizontal & 4 depth aluminum/MS bolted and joined together with Links and Corner Block. Enough support channel to equate the load evenly and castor provision at bottom side, Degree of Protection: The unit should have a minimum of IP 20, Compliance with standards: UL, IEC, Earthing: All cabinet components (doors, side panels, top panels, 19" rails, pdu brackets) shall be grounded directly to the frame using Dual Copper plated earth stud of suitable rating on main Metal parts for better electrical continuity, Weight Capacity: Load Capacity of minimum 1200 Kg, Coating: Powder coated black with fine texture – 60 to 80 µM, Corrosion Resistance: Salt spray test resist upto 500 Hrs, Top and Bottom: Top cover consist of Fire Retardant Brushes and Fire retardant ABS plastic / MS frame for cable and fiber entry to rack from fiber runner and copper cable pathway system. This consists of Brush with 2 line of brush system UL Certified Fire Retardant Brushes and Fire retardant ABS plastic / MS frame, Mounting Angle: 19"Upright adjustable in depth, equipment mounting angles with square slots to accommodate M6 cage nuts, powder coated texture finish. It contains U printing pattern which can be read from down to up and vice versa, Mounting Angle: 19"Upright adjustable in depth, equipment mounting angles with square slots to accommodate M6 cage nuts, powder coated texture finish. It contains U printing pattern which can be read from down to up and vice versa, Castor: Set of 4 castors with levelling feet, 2 brakes on front side and 2 without brakes, Mounting Hardware Packets with set of M 6 screw, Cage Nuts and Washer set of 10 or 20, Network Rack: 24U 800W x 1200D (Height x Width x Depth) ,Single Honeycomb/ Perforated door (Front Side), Double Honeycomb/ Perforated door (Rear Side), Zero U tool-less mounting PDU. 2 no PDU, 230 V AC-2 no. for each PDU, 18 no of 6 AMP socket(c13 type);6 no of 16Amp socket(c19 type) with 2 no of MCB 16/32 Amp. PDU of standard make like APC, Schneider, 4 no of cooling fan. Make: APW/Wellrack/Rittle	ZF.19	7.00	NUM		0.00	INR Zero Only
1166	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required. 25 mm dia.- ISI MARK	ZF.20	300.00	M		0.00	INR Zero Only
1167	Supply , Installtion , Testing and comissioning of 1, 2 and 4 port face plate white for I/O fixing at user side For Data ,Voice Make: Legrand/Siemon/Panduit	ZF.21	25.00	NUM		0.00	INR Zero Only
1168	SITC of 50 Pair Krone Module	ZF.22	2.00	NUM		0.00	INR Zero Only
1169	Supplying, installing, testing and commissioning of Cat 6 RJ45 Modular Jack, Min. 600Mhz ETL Tested (Enclose Test Report), Encapsulated Lead Frame technology (Without PCB), 1000 Front Mating Cycles, 4.8 Gbps Supported for Wave 2 Devies for 100MT Channel, 25 Years Performance Warranty, UL Listed, RoHS Certified, UL 1863, IEC 60603-7, FCC part 68-F, Storage Temperature -40°C to +70°C, Without Spring Shutter as it malfunctioned, Technical Datasheet should have Worst Case Performance Values of IL <=0.31dB, NEXT Min. 44 dB, FEXT Min. 37 dB, RL Min. 18 dB & Balanced TCL Min. 22 dB @ 300 Mhz. Safety Listing of ACA and Bi-national standard listed, Cable Pairs Crimped & Cut together via Tool to avoid manual termination issues. Make: Legrand/Siemon/Panduit	ZF.23	50.00	NUM		0.00	INR Zero Only
1170	WiFi System	ZG					
1171	Supply, installation, testing & commissioning of Dual-band 802.11abgn/ac Wireless Access Point, 2x2:2 streams, 1 ports, 802.3af PoE support. Does not include power adapter or PoE injector. should Includes Limited Lifetime Warranty and Mounting Kit complet in all respect. Make-Aruba/Ruckus/Juniper	ZG.1	14.00	NUM		0.00	INR Zero Only
1172	Supply, installation, testing & commissioning of Wi-Fi Controller with 4 Gig Ports, with 100 APs license, Power Supply and HA mode alongwith 3 year support. Make-Aruba/Ruckus/Juniper	ZG.2	1.00	NUM		0.00	INR Zero Only
1173	IP EPABX System	ZH					

1174	Supply Installation, Testing and Commissioning of Server Based EPABX Fully Computerized IP System, SIP Compliant. Multi slot 19: U Rack Mountable 2U Rack Expandable upto 900 Ports Presently Configuration as Below CO Line 08 Nos. PRI(30 Channel) 04 Nos. SIP Extension 64 Nos. IP Extension Circuits 375 Nos. Analog Extension Circuits 64 Nos. Make-Cisco/Alcatel/Progrility(Seimens)	ZH.1	1.00	SET		0.00	INR Zero Only
1175	Supply Installation and Commissioning of centralized Operator Console with all dignostic Software of IP EPABX System Make-Cisco/Alcatel/Progrility(Seimens)	ZH.2	1.00	SET		0.00	INR Zero Only
1176	Supply Installation, Testing and Commissioning of 4 Level IVR software with 6 different languages and 4 time schedule	ZH.3	1.00	SET		0.00	INR Zero Only
1177	Supply Installation Testing and Commissioning of Call Billing Software with PC	ZH.4	1.00	SET		0.00	INR Zero Only
1178	Supply Installation Testing and Commissioning of IP Phone (24Key) Backlit keypad Hands-free, full duplex ,Headset support Easy to use soft keys/LCD prompts,Directory dialling,Navigation wheel,Call history,Wall mountable,Backlit LCD screen,Security lock key open interface complete in all respect Make-Cisco/Alcatel/Progrility(Seimens)	ZH.5	25.00	EA		0.00	INR Zero Only
1179	Supply Installation Testing and Commissioning of IP Phone (12Key)Backlit keypad Hands-free, full duplex Headset support Easy to use soft keys/LCD prompts Directory dialling Navigation wheel Call history Wall mountable Backlit LCD screen Security lock key XML open interface complete in all respect. Make-Cisco/Alcatel/Progrility(Seimens)	ZH.6	50.00	EA		0.00	INR Zero Only
1180	Supply Installation Testing and Commissioning of IP Phone (6Key)Backlit keypad Hands-free, full duplex Headset support Easy to use soft keys/LCD prompts Directory dialling Navigation wheel Call history Wall mountable Backlit LCD screen Security lock key XML open interface complete in all respect Make-Cisco/Alcatel/Progrility(Seimens)	ZH.7	100.00	EA		0.00	INR Zero Only
1181	Supply Installation Testing and Commissioning of Analog Speaker phone With CLI and handset	ZH.8	50.00	EA		0.00	INR Zero Only
1182	Video Surveillance System(IP CCTV)	ZI					
1183	Supplying, installation, testing and commissioning of 2 megapixels resolution Network Dome Camera for true HD quality images,2.8 – 12 mm varifocal lens,True Day/Night (TDN) functionality for true color image ,Motion Detection 4 Zones, Multi-Level Sensitivity Privacy Zones 4 Zones,Snapshot Support JPEG format Password Protection Support Character Display Support(Channel /Date) ONVIF Yes,IR Illumination20-30M IR illuminators for clear images in low light conditions Wide Dynamic Range 3D noise reduction for sharper images and lower bandwidth use in low light ONVIF compliant complete in all respect. Make-Hanwha/Mobotix/Pelco/Tyco	ZI.1	10.00	EA		0.00	INR Zero Only
1184	Supply, installation, testing and commissioning of 2 megapixels resolution Network Bullet camera camera,Imager 1/2.8"SONY 2.43 mega low illumination CMOS,Video Compression .H.264/MJPEG,Day/Night .Mechanical ICR,Minimum Illumination-0Lux/F1.4(IR ON) IR Illumination-40-50M,,Electronic Shutter-Auto/Manual(1/25-1/10000) Lens 2.8 – 12 mm varifocal lens,Resolution Main-stream:D1/Q1080P(960*540)/HD720P/ HD1080P 1-25/30fps,Digital Noise Reduction-3D,Wide Dynamic Range-Digital WDR Motion Detection -4 Zones, Multi- Level Sensitivity,Privacy Zones-4 Zones,Snapshot-Support JPEG format>Password Protection-Support,Character Display-Support(Channel /Date).Regulatory Emissions-FCC Part 15 CE: EN55022,Immunity -CE: EN50130-4,IP Rating- IP66 rated enclosure to protect against dust and water damage ONVIF compliant. Make-Hanwha/Mobotix/Pelco/Tyco	ZI.2	10.00	EA		0.00	INR Zero Only
1185	Supplying of 1/2.8" Progressive Scan CMOS PTZ Dome Camera with laser IR,Compression-H.264/MJPEG/MPEG4,Focal Length - 4.3-129mm, Optical zoom 30x and digital zoom 16x,Max. Image Resolution-1920x1080,Frame Rate 50Hz: 25fps(1920x1080) 360° endless pan range and -2°-90° tilt range,240°/s Pan Preset Speed and 200°/s Tilt Preset Speed,0.1°-160°/s Manual Pan Speed and 1°- 120°/s Manual Tilt Speed,256 presets programmable; preset image freezing capability ,8 patrols, up to 32 presets per patrol 4 patterns, with the recording time not less than 10 minutes per pattern,SD/SDHC card local storage Support up to 8 NAS storage; Edge recording (transmit the videos from SD card to the NAS after network resumed) High performance Laser IR LED covering up to 150m (IR) distance 3D intelligent positioning function,3D DNR,Protection Level-IP66 standard,TVS 6,000V lightning protection, surge protection and voltage transient protection. Make-Hanwha/Mobotix/Pelco/Tyco	ZI.3	2.00	EA		0.00	INR Zero Only
1186	Supply, installation, testing and commissioning of 2U Rack mount single chassis Network Video Recorder with dual Gb NIC, 1 DVI-I + HDMI + 1 Display Port, max 2 simultaneous monitors, RS-232/485 serial port, DVD, Server Operating System-Windows 10,Ubuntu Linux 16.04, Processor-Gen 4 Intel Core i3, Local Client Display Rate (FPS)Windows – 700 FPS (HD)Linux – 900 FPS (HD),High Performance, High Reliability IP Recorder. — Continuously records 300Mbps (Windows) & 450 Mbps (Linux)of video while hosting a local client, multiple remote clients and the web server on a single server,RAM-4 GB, 8 GB, 12 GB (Optional)solid-state operating system drive,USB-6 x USB 2.0, 2 x USB 3.0 high air flow cooling and hardware monitoring features ensure maximum uptime. keyboard and mouse, Professional Grade client and server software pre-installed and software updates. Access live and recorded video on multiple client PCs with free Windows, Mac or Linux client application web server application is pre-installed on the server to access video through a web browser or free Mobile iPhone / iPad and Android apps. Maximum Storage Capacity 30TB & Maximum Hard Drive 3 Slot(Up to 10TB) Support Up to 64 IP Camera. Make-Tyco/Mobotix/Pelco/Tyco	ZI.4	1.00	EA		0.00	INR Zero Only
1187	Supply, installation, testing and commissioning of 10TB HDD. Make-WD/Seagate	ZI.5	3.00	EA		0.00	INR Zero Only

1188	Supply, installation, testing and commissioning of Video Management System (VMS) software shall be used to view live and recorded video from capture cards and IP devices connected to local and wide area networks. The VMS software shall have a client/server-based architecture that can be configured as a standalone VMS system with the client software running on the server hardware and/or the client running on any network-connected TCP/IP workstation. Multiple client workstations shall be capable of simultaneously viewing live and/or recorded video from one or more servers. Multiple servers shall also be able to simultaneously provide live and/or recorded video to one or more workstations. The VMS server software shall also have the ability to be installed on an IP edge device—such as an IP camera or encoder that allows for 3rd party applications—allowing the device to serve as both a server and IP video recording device. The VMS shall not charge for the number of concurrent clients (min. 50 thick clients and 16 mobile clients to be provided along with VMS). Make-Tyco/Mobotix/Pelco	ZI.6	32.00	EA			0.00	INR Zero Only
1189	Supply, Installation, Testing and Commissioning of Workstation PC: Intel(R) Core(TM) i7-3770 Processor (8M Cache, up to 3.90 GHz); Memory: 4GB, NON-ECC, 1600MHz; RAM: 4GB (1x4GB) Non-ECC DDR3 1600MHz SDRAM Memory; Keyboard: 12 function keys; Chassis: Tower/Workstation; DVD: 8X Slimline DVD+-RW, Data Only; 20" TFT Monitor; Dual Graphics Card; Network interface card: Integrated Intel(R) 82579LM Gigabit Ethernet LAN 10/100/1000; Hard disk: 250GB, 7200 RPM 3.5" SATA 6Gb/s Hard Drive; Operating system: Windows 7 Professional 64 Bit. Make: HP/DELL/ASUS	ZI.7	2.00	EA			0.00	INR Zero Only
1190	Supply, Installation, testing and commissioning of 55" LED TV- LED TV should be Professional and HDMI Ports - 55 inches UHD 3840 x 2160 (16:9) Direct-lit LED Display with brightness of 500 nits, viewing angle of 178° h/v. Display should be supplied with necessary mounting bracket as required. Make: Sony, LG, Samsung	ZI.8	2.00	NUM			0.00	INR Zero Only
1191	Audio Visual System in Board Room	ZJ						
1192	Supply Installation Testing and commissioning of 20" LED TV Ultra HD LED Full array (Direct LED) Audio Codec - Dolby Digital / DTS, IP Control, Input Terminals - DisplayPort 1.2 in x 1, DisplayPort out, HDMI 2.0 x 2 (HDCP 2.2), HDMI 1.4 x 2, OPS x 1, USB X 1, Component x 1, Composite x 2, D-Sub x 1, Output Terminals-Optical, RCA L/R, Wake on LAN, Input/Output Terminals-RS232C X 1, LAN X 1, Public Mode / Hotel Mode, MediaPlex Plus Processing, Bezel Size-10-20mm, Power Consumption 300-450 W, Viewing Angle (H/V)- 176°/176° (CR≥ 10) complete in all respects. Make-Sony/LG/Samsung	ZJ.1	1.00	EA			0.00	INR Zero Only
1193	Supply, Installation, testing and commissioning of two-way, thin edge ceiling speaker with back can, built in cone driver, Line Transformer Tappings : 60watt - 30watt, Sensitivity : 86dB, Sound Pressure : 106dB, Dispersion Conical : 145° or more, Frequency Response : 90 Hz - 20 kHz, Frequency range : 65 Hz - 20 kHz etc complete required as per specifications. Make: OSL/OHM/ British Acoustics/ LAcoustics	ZJ.2	6.00	EA			0.00	INR Zero Only
1194	Supply, Installation, testing and commissioning of digital power amplifier, class-D, RMS power : 2 X 240watt, Frequency Response : 50 Hz - 22 kHz, Signal / Noise : > 100 dB, THD+N : < 0.3%, Crosstalk : < 80 dB, Power Supply : Switching mode, Common mode rejection ratio : 70dB, Protection : DC Short circuit; Over heating; Over load; Signal limiting, built in temperature controlled fan etc complete required as per specifications. Make: OSL/OHM/ British Acoustics/ LAcoustics	ZJ.3	1.00	EA			0.00	INR Zero Only
1195	SITC of 12x8 Audio Digital Signal Processor dante built in with minimum 9 or more channel of AEC, Matrix switching, Phantom Power supply, 20Hz to 20 KHz or Frequency response, AEC taillength: >200msec or better etc as required, A/D & D/A conversion: 24 bit, 48 kHz sampling etc as required at site. Make : Sennheiser /BSS / Xylica.	ZJ.4	1.00	EA			0.00	INR Zero Only
1196	Supply of Chairman Unit with LED screen, 4 types of operation modes-vote initiation, master mute, accepting applications, Output frequency response 40-16000Hz, Earphone load >16 Ω, Earphone volume 10 mV, Earphone output φ 3.5mm stereo jack, Max. power consumption 1.65W, Microphone Type Uni-directional electret condenser microphone, connection 7P-DIN dedicated cable with buckle. Make: OSL/Beyerdynamic/ Shure/Nuemann	ZJ.5	1.00	EA			0.00	INR Zero Only
1197	Supply of Digital Conference Control Unit - Wired, Supply voltage AC110V or AC220V (default settings), Number of connectable conference units ≤254, Frequency response 40-16000Hz, Signal-to-noise ratio >80dBA, Dynamic range >85dB, Total harmonic distortion <0.05% Original input: 6.3 mm balanced Signal strength: 0.775 V, Audio crosstalk >70dB Make: OSL/Beyerdynamic/ Shure/Nuemann	ZJ.6	1.00	EA			0.00	INR Zero Only
1198	Supply & fixing of Molded CAT-5/6 Patch Cords for loop in loop out 3 mtr length. Make: OSL/Beyerdynamic/ Shure/Nuemann	ZJ.7	31.00	EA			0.00	INR Zero Only
1199	Supply & fixing of Molded CAT-5/6 Patch Cords for loop in loop out 20 mtr length. Make: OSL/Beyerdynamic/ Shure/Nuemann	ZJ.8	2.00	EA			0.00	INR Zero Only
1200	SITC of Logitech Group Video Conferencing Bundle with Expansion Mics HD 1080p Camera Speakerphone of minimum dimensions (LxWxH) 24.1 x 24.1 x 6.4 Centimeters complete in all respect	ZJ.9	2.00	EA			0.00	INR Zero Only
1201	SITC of Wireless presentation device which supports video resolution upto 1080p (Full HD), with 1xHDMI / DVI/ DP output, PoE enabled Ethernet port, 1xUSB port for data sharing, Supports Windows laptops and MAC, as well as iOS, Windows and Android mobile operating systems, display minimum 2 users screen simultaneously on a single display through hardware dongle/ software app. Supports DHCP, Audio out. Support 32 or more concurrent users. Support Full HD video of 1080p @ 30fps or more etc as required at site.	ZJ.10	1.00	EA			0.00	INR Zero Only
1202	Supply, Installation, testing and commissioning of Cable Manager with 1 no. multiregion AC Power socket, 1x USB power, Black anodised /brushed aluminium finish, Tilt up lid with pass through holes for 1 HDMI, 1 VGA with audio, 1x LAN complete etc. as required. Make-Crestron/Satellier/RG Spectrum	ZJ.11	6.00	EA			0.00	INR Zero Only
1203	Supply Installation Testing & Commissioning of 8 x 8 HDMI Matrix Switcher with HDCP Compliant, HDMI and HDCP as per technical specification. Input and Output: supporting 8 signal input and 8 signal outputs simultaneously Make-Crestron/Satellier/RG Spectrum	ZJ.12	1.00	EA			0.00	INR Zero Only

1204	Supply, Installation, testing and commissioning of of HDMI & Control twisted pair Scaling receiver with 1x Twisted pair/HDBaseT input on RJ45, Output: 1x HDMI, 1x RS232/IR(Controls), supporting reception of audio,video, controls and power upto minimum 100mtrs or more. 4K resolution support & should be able to do scaling upto 4K resolution. HDCP 2.2 compliant & EDID. as per specifications & Compatible to the Modular Digital Matrix Switcher complete etc. as required. Make-Crestron/Satellier/RG Spectrum	ZJ.13	2.00	EA		0.00	INR Zero Only
1205	Supply, Installation, testing and commissioning of of HDMI & Control twisted pair Transmitter with Input: 1x HDMI, 1x RS232/IR(Controls) , Output: 1x Twisted pair/HD base T input on RJ45, supporting transmission of audio,video, controls and power upto minimum 70 mtrs or more. Upto 4K resolution support at various distance, remote powering feature, HDCP 2.2 compliant & EDID as per specifications complete etc. as required. Make-Crestron/Satellier/RG Spectrum	ZJ.14	2.00	EA		0.00	INR Zero Only
1206	Supply, Installation, testing and commissioning of HDMI & Control twisted pair Receiver with Input:1x Twisted pair/HDBaseT input on RJ45, Output:1x HDMI, 1x RS232/IR(Controls) , supporting reception of audio,video, controls and power upto minimum 70mtrs or more. Upto 4K resolution support at various distance ,remote powering feature,HDCP 2.2 compliant & EDID. as per specifications complete etc. as required. Make-Crestron/Satellier/RG Spectrum	ZJ.15	1.00	EA		0.00	INR Zero Only
1207	Supply, Installation, testing and commissioning of Touch Panel Control System should be equipped with at least 8 bidirectional RS-232 serial ports (Internal /external module acceptable), at least 8 IR/Serial ports, at least 4or more Digital I/O ports, at least 4 or more low voltage relays for controlling room functions, at least 1 Ethernet monitoring and control port, Memory: 512MB SDRAM, 4 GB Flash or more etc.as required.	ZJ.16	1.00	EA		0.00	INR Zero Only
1208	Supply, Installation, testing and commissioning o 9.7" Wireless Touch panel, screen resolution 2048x1536 pixels, 32 GB with Should have appropriate app for controlling the Devices etc.as required.	ZJ.17	1.00	EA		0.00	INR Zero Only
1209	Supply, Installation, testing and commissioning of Wifi router with 8 port Switch etc complete as required.	ZJ.18	1.00	EA		0.00	INR Zero Only
1210	Supply and Laying of 2.5 Metres HDMI patch cord with connectors in existing conduit i/c testing etc. as required. Make-Crestron/Satellier/RG Spectrum	ZJ.19	2.00	EA		0.00	INR Zero Only
1211	Supply and Laying of 1.5 Metres HDMI patch cord with connectors in existing conduit i/c testing etc. as required. Make-Crestron/Satellier/RG Spectrum	ZJ.20	16.00	EA		0.00	INR Zero Only
1212	Supply and Laying of 16 AWG 2 core speaker cable with connectors in existing conduit i/c testing etc. as required.	ZJ.21	150.00	M		0.00	INR Zero Only
1213	Supply and Laying of 24 AWG or better shielded CAT 6 cable with suitable connectors in existing conduit i/c testing etc. as required.	ZJ.22	500.00	M		0.00	INR Zero Only
1214	S/F of network rack of size 19"having 42U for supporting equipments pertaining to sound system with front/rear lockable doors i/c providing caster wheels and all other accessories for easy storatation and movement etc. complete as required.	ZJ.23	1.00	EA		0.00	INR Zero Only
1215	SITC of Soundstation SIP-based IP conference phone of tentative dimensions - 36.8 x 31.1 x 6.4 cm (L x W x H) with two (2) Number of microphone of cisco make or equivalent with power of IEEE 802.3af Power over Ethernet (built in), Optional external universal AC power supply: 100-240V, 0.4A, 48V/19W. Display of Size (pixels): 248 x 68 (W x H), White LED backlight with custom intensity control. Keypad - Standard 12-key keypad, Context-dependent soft keys: 3, On-hook/Off-hook, redial, mute, volume up/ down. Audio features Loudspeaker Frequency: 220-14,000 Hz Volume: Adjustable to 86 dB at 1/2 meter peak volume Individual volume settings with visual feedback for each audio path Voice activity detection Comfort noise fill DTMF tone generation / DTMF event RTP payload Low-delay audio packet transmission Adaptive jitter buffers Packet loss concealment Acoustic echo cancellation Background noise suppression Supported Codecs G.711 (A-law and Mu-law) G.729a (Annex B) G.722, G.722.1 G.722.1C Siren 14 complete in all rpsect and as directed by Engineer-In-Charge.	ZJ.24	3.00	NUM		0.00	INR Zero Only
1216	Supplying and laying of RG6 Cable in the existing surface/ recessed steel/ PVC conduit as required.	ZJ.25	100.00	M		0.00	INR Zero Only
1217	Audio Visual System in Meeting Room	ZK					
1218	Supply Installation Testing and commissioning o 85" LED TV Ultra HD LED Full array (Direct LED) Audio Codec - Dolby Digital / DTS, IP Control,Input Terminals - DisplayPort 1.2 in x 1, DisplayPort out, HDMI 2.0 x 2 (HDCP 2.2), HDMI 1.4 x 2, OPS x 1, USB X 1, Component x 1, Composite x 2, D-Sub x 1 ,Output Terminals-Optical, RCA L/R,Wake on LAN,Input/Output Terminals-RS232C X 1 , LAN X 1,Public Mode / Hotel Mode,MediaPlex Plus Processing,Bezel Size-10-20mm, Power Consumption 300-450 W.Viewing Angle (H/V)- 176°/176° (CR≥ 10) complete in all respects. Make-Sony/LG/Samsung	ZK.1	6.00	EA		0.00	INR Zero Only
1219	Supply, Installation, testing and commissioning of wo-way, thin edge ceiling speaker with back can , built in cone driver, Line Transformer Tappings : 60watt - 30watt, Sensitivity : 86dB, Sound Pressure : 106dB, Dispersion Conical : 145° or more, Frequency Response : 90 Hz - 20 kHz, Frequency range : 65 Hz - 20 kHz etc complete required as per specifications. Make: OSL/OHM/ British Acoustics/ LAcoustics	ZK.2	22.00	EA		0.00	INR Zero Only
1220	Supply, Installation, testing and commissioning o digital power amplifier, class-D, RMS power : 2 X 120watt, Frequency Response : 50 Hz - 22 kHz, Signal / Noise : > 100 dB, THD+N : < 0.3%, Crosstalk : < 80 dB, Power Supply : Switching mode, Common mode rejection ratio : 70dB, Protection : DC Short circuit; Over heating; Over load; Signal limiting, built in temperature controlled fan etc complete required as per specifications. Make: OSL/OHM/ British Acoustics/ LAcoustics	ZK.3	5.00	EA		0.00	INR Zero Only
1221	Supply of Digital 2 in 6 out Installation Controller. Spyder Software DSP control via USB. 10-PEQ, peak limiting, 2 sec delay, matrix and crossover. Make: OHM/ British Acoustics/ OSL/ LAcoustics/ D&B	ZK.4	5.00	EA		0.00	INR Zero Only
1222	Supply, Installation, testing and commissioning o Cable Manager with 1 no. multiregion AC Power socket, 1x USB power, Black anodised /brushed aluminium finish,Tilt up lid with pass through holes for 1 HDMI, 1 VGA with audio, 1x LAN complete etc. as required. Make-Crestron/Satellier/RG Spectrum	ZK.5	10.00	EA		0.00	INR Zero Only
1223	Supply and Laying of 2.5 Metres HDMI patch cord with connectors in existing conduit i/c testing etc. as required.Make-Crestron/Satellier/RG Spectrum	ZK.6	10.00	EA		0.00	INR Zero Only

1224	Supply and Laying of 1.5 Metres HDMI patch cord with connectors in existing conduit i/c testing etc. as required. Make-Crestron/Satelier/RG Spectrum	ZK.7	20.00	EA		0.00	INR Zero Only
1225	Supply and Laying of 16 AWG 2 core speaker cable with connectors in existing conduit i/c testing etc. as required. Make-Kramer/Polycab/Beldon	ZK.8	250.00	M		0.00	INR Zero Only
1226	Supply and Laying of 24 AWG or better shielded CAT 6 cable with suitable connectors in existing conduit i/c testing etc. as required. Make-Panduit/Legrand/Corning	ZK.9	500.00	M		0.00	INR Zero Only
1227	S/F of network rack of size 19"having 24U for supporting equipments pertaining to sound system with front/rear lockable doors i/c providing castor wheels and all other accessories for easy storation and movement etc. complete as required. Make-VALRACK/APW/RITTAL	ZK.10	5.00	EA		0.00	INR Zero Only
1228	SITC of Soundstation SIP-based IP conference phone of tentative dimensions - 36.8 x 31.1 x 6.4 cm (L x W x H) with two (2) Number of microphone of cisco make or equivalent with power of IEEE 802.3af Power over Ethernet (built in), Optional external universal AC power supply: 100-240V, 0.4A, 48V/19W. Display of Size (pixels): 248 x 68 (W x H), White LED backlight with custom intensity control. Keypad - Standard 12-key keypad, Context-dependent soft keys: 3, On-hook/Off-hook, redial, mute, volume up/ down. Audio features Loudspeaker Frequency: 220-14,000 Hz Volume: Adjustable to 86 dB at 1/2 meter peak volume Individual volume settings with visual feedback for each audio path Voice activity detection Comfort noise fill DTMF tone generation / DTMF event RTP payload Low-delay audio packet transmission Adaptive jitter buffers Packet loss concealment Acoustic echo cancellation Background noise suppression Supported Codecs G.711 (A-law and Mu-law) G.729a (Annex B) G.722, G.722.1 G.722.1C Siren 14 complete in all repsect and as directed by Engineer-In-Charge.	ZK.11	6.00	NUM		0.00	INR Zero Only
1229	SITC of Motorize Floor box enclosure with 2Nos power sockets,1Nos HDMI & 1Nos Network Port. Make-Bestnet/MK/Legrand	ZK.12	12.00	EA		0.00	INR Zero Only
1230	SITC of Logitech Group Video Conferencing Bundle with Expansion Mics HD 1080p Camera Speakerphone of minimum dimensions(LxWxH) 24.1 x 24.1 x 6.4 Centimeters complete in all respect	ZK.13	6.00	EA		0.00	INR Zero Only
1231	Supplying and laying of RG6 Cable in the existing surface/ recessed steel/ PVC conduit as required.	ZK.14	100.00	M		0.00	INR Zero Only
1232	SITC of L2 10/100/1000 MBPS Switch 24 port Non PoE Switch with 2 SFP port,L2 switch with dedicated 24x10/100/1000BaseT PoE RJ45 Ports and 4 SFP Slots of Make Netgear	ZK.15	2.00	EA		0.00	INR Zero Only
1233	SITC of 10 m HDMI Cable	ZK.16	3.00	EA		0.00	INR Zero Only
1234	SITC of SM SFP Module	ZK.17	4.00	EA		0.00	INR Zero Only
1235	Building Management System (BMS)	ZL					
1236	Software and Operator Workstation	ZL.1					
1237	Supply, installation, testing and commissioning of core i7-4790k or Xeon E5-1650 v3 processor , Memory of 32 GB, Hard disk size (2x 800 GB Professional/Enterprise SSD with SATA or SAS), Giga speed Network card with 2 GB Graphic card of Resolution 2.560 x 1600 with Onboard Intel 4600 HD Windows 8.1, 64 bit Edition or Windows Server 2008 R2 and original anti virus software.	ZL.1.1	1.00	NUM		0.00	INR Zero Only
1238	32 Inch HD Color LED Monitor.	ZL.1.2	1.00	NUM		0.00	INR Zero Only
1239	Laser jet Printer (A4 size, Colour)	ZL.1.3	1.00	NUM		0.00	INR Zero Only
1240	BUILDING MANAGEMENT SYSTEM WEB-BASED SERVER SOFTWARE	ZL.2					
1241	Supply, Installation, Testing & Commissioning of Software for Building Management Software with features like 3D vector dynamic graphics with Autocad import of plan with Zoom In & Zoom Out facility, Graphic Builder, Plant Viewer, Trend Viewer, Object Viewer, Report Viewer, Alarm router, Log Viewer. The Web-Based Server software shall permit use of Standard Web-Browsers such as Microsoft Internet Explorer, Netscape Navigator, etc. The software shall be capable of integartion third-party systems and should supports latest IP technology (IP V4/V6). The Management Stations shall match the BACnet Profile B-AWS (Advanced workstation) as per the BTL Listing. The Web based software shall include 1 Client License for remote viewing. The same includes the necessary dongles as required for each of the workstation. Number of IO points shall be considered as per the IO summary considering 15% spares. Make:- Siemens/Carrier ALC/Honeywell EBI	ZL.2.1	1.00	SET		0.00	INR Zero Only
1242	Supply, Installation, Testing & Commissioning of High-quality CAPACTIVE touch 7.0" panels for technical on-site operation of plants as well as room operation. The Touch Panel shall have integrated web server and a BACnet/ IP web interface to connect a HTML5 browser to a device on the network. Generic operation and monitoring of plant functions (alarms, schedulers, calendars, set point changes, display of actual values, etc.)	ZL.2.2	1.00	NUM		0.00	INR Zero Only
1243	PROGRAMMABLE & APPLICATION SPECIFIC CONTROLLER (DDC) - UL LISTED/BTL certified.	ZL.3					
1244	Supply, Installation, Testing & Commissioning of True IP Based Standalone 32 Bit Intelligent, BTL Listed & UL certified interoperable DDC as per the specification. Each DDC Controller shall have inbuilt IP port & shall directly connect to the Network switches (Supervisory Controller/Router/MSTP Controller shall not be acceptable). The DDC shall be Programmable and Application specific with Real Time clock.The Controller shall have minimum 18 onboard points and can be expandable. The DDC must support trending at Controller level. All trend data must be created and saved to the automation station to achieve gap-free trend documentation during communication failure. Make:- Siemens/Carrier ALC/Honeywell Comfort Point	ZL.3.1					
1245	The above shall be housed in IP 55 vandal proof, lockable & secure MS Cabinets to be supplied along with all necessary switchgear protections as required. Number of controllers shall have spare capacity of 15% for future expansion.						
1246	Note: 1. System architecture shall be submitted along with submittal. 2. Provision of integration with any BMS system conforming to ASHRAE BACnet/IP Protocol. 3. Additional supervisory/ MSTP/ Router shall not be acceptable.						
1247	DDC for Chilled Plant Room	ZL.3.1.1	1.00	SET		0.00	INR Zero Only
1248	DDC for Air Handling Units (Max 2 AHU per DDC)	ZL.3.1.2	1.00	SET		0.00	INR Zero Only
1249	DDC for Ventilations Fans (Max 5 Fan per DDC)	ZL.3.1.3	1.00	SET		0.00	INR Zero Only
1250	DDC for Air Washer & Scrubber Units (Max 2 per DDC)	ZL.3.1.4	1.00	SET		0.00	INR Zero Only
1251	DDC for DG system/Transformer/HT/LT	ZL.3.1.5	1.00	SET		0.00	INR Zero Only
1252	DDC for Lifts & Escalators	ZL.3.1.6	1.00	SET		0.00	INR Zero Only
1253	DDC for Pumps (Max 5 pumps per DDC)	ZL.3.1.7	1.00	SET		0.00	INR Zero Only

1254	DDC for UG&OH Tanks	ZL.3.1.8	1.00	SET		0.00	INR Zero Only
1255	DDC for Fire Fighting System	ZL.3.1.9	1.00	SET		0.00	INR Zero Only
1256	SYSTEM INTEGRATION UNITS for 3rd party integrations - UL listed Controllers & BTL label	ZL.4					
1257	Supply, Installation, Testing & Commissioning of True IP Based System Integration unit consisting of microprocessor based controller units BTL & UL Listed for third party integration. The same should support operations/ monitoring via portable operator terminal. The controller shall be Native BACnet type with communication via BACnet/LonTalk, Integration platforms and system controllers for third-party devices and systems via KNX, Modbus, M-Bus and other protocols into the automation level via BACnet. The same shall Support operation via local or network-compatible operator units. It should store trend logs and event buffer for a typical duration of up to 30 Days. All the Integrators shall be separate. Note: 3rd party make integrator shall not be accepted. Make:- Siemens/Carrier ALC/Honeywell Comfort Point	ZL.4.1					
1258	Integration of Chillers on Modbus Protocol - 20 Points per Chiller	ZL.4.1.1	1.00	SET		0.00	INR Zero Only
1259	Integration of Sec. Pumps & Cooling Tower VFDs on Modbus/RS485 - 6 Nos	ZL.4.1.2	1.00	SET		0.00	INR Zero Only
1260	Integration of AHU VFD on Modbus/RS485 - 46 Nos	ZL.4.1.3	1.00	SET		0.00	INR Zero Only
1261	Integration of IAQ Monitor on Modbus/RS485(5 Points per device) - 46 Nos	ZL.4.1.4	1.00	SET		0.00	INR Zero Only
1262	Integration of UPS on Modbus/RS485 or Bacnet/IP Protocol - 15 Points	ZL.4.1.5	1.00	SET		0.00	INR Zero Only
1263	Integration of DG on Modbus/RS 485 Communication Port - 20 Points per DG	ZL.4.1.6	1.00	SET		0.00	INR Zero Only
1264	Integration of MFM, Energy Meters to be on Modbus RTU with RS 485 Communication Port - 10 Points per Meter (25 Nos Meters)	ZL.4.1.7	1.00	SET		0.00	INR Zero Only
1265	Integration of HT Panel Demand Power Meter to be on Modbus RTU with RS 485 Communication Port	ZL.4.1.8	1.00	SET		0.00	INR Zero Only
1266	Integrations of Lifts on Modbus or Bacnet/IP Protocol - 16 Nos	ZL.4.1.9	1.00	SET		0.00	INR Zero Only
1267	Integration of Plumbing PLC on Modbus RTU with RS 485 Communication Port - 100 Points	ZL.4.1.10	1.00	SET		0.00	INR Zero Only
1268	Field instruments	ZL.5					
1269	Supplying, installing, testing and commissioning of the following sensors / transducers / transmitters.	ZL.5.1					
1270	Supply, Installation, Testing & Commissioning of Immersion temperature sensor 100 mm Pt1000 with Brass Thermowell.	ZL.5.1.1	8.00	NUM		0.00	INR Zero Only
1271	Supply, Installation, Testing & Commissioning of Outside air temperature + humidity sensors for measuring outside air temperature. It should be provided with sun shield and rain protection.	ZL.5.1.2	1.00	NUM		0.00	INR Zero Only
1272	Supply, Installation, Testing & Commissioning of In line Type Electromagnetic Water Flow Meter - Dia Size 350 mm	ZL.5.1.3	1.00	NUM		0.00	INR Zero Only
1273	Supply, Installation, Testing & Commissioning of Differential Pressure Switch Water	ZL.5.1.4	4.00	NUM		0.00	INR Zero Only
1274	Supply, Installation, Testing & Commissioning of Single Level Switch	ZL.5.1.5	3.00	NUM		0.00	INR Zero Only
1275	Supply, Installation, Testing & Commissioning of PH Analyser	ZL.5.1.6	1.00	NUM		0.00	INR Zero Only
1276	Supply, Installation, Testing & Commissioning of TDS Analyser	ZL.5.1.7	1.00	NUM		0.00	INR Zero Only
1277	Supply, Installation, Testing & Commissioning of Current Relay for Run Status	ZL.5.1.8	38.00	NUM		0.00	INR Zero Only
1278	Supply, Installation, Testing & Commissioning of Differential pressure switch Filter Status (Pa Range 50...500 Pa)	ZL.5.1.9	12.00	NUM		0.00	INR Zero Only
1279	Supply, Installation, Testing & Commissioning of Duct sensor for humidity (0...10 V) and temperature (Ni1000).	ZL.5.1.10	12.00	NUM		0.00	INR Zero Only
1280	Supply, Installation, Testing & Commissioning of IAQ Monitor PM2.5, CO2, TVOC,Temp, Humidity Level	ZL.5.1.11	46.00	NUM		0.00	INR Zero Only
1281	Supply, Installation, Testing & Commissioning of Carbon Monoxide Sensor for Basement. (Range 0 to 300 ppm)	ZL.5.1.12	12.00	NUM		0.00	INR Zero Only
1282	Supply, Installation, Testing & Commissioning of Flameproof Level Sensor	ZL.5.1.13	6.00	NUM		0.00	INR Zero Only
1283	Supply, Installation, Testing & Commissioning of Voltage Transducer	ZL.5.1.14	2.00	NUM		0.00	INR Zero Only
1284	Supply, Installation, Testing & Commissioning of Bi Level Switch	ZL.5.1.15	10.00	NUM		0.00	INR Zero Only
1285	Supply, Installation, Testing & Commissioning of Pressure sensor for neutral and slightly aggressive liquids.	ZL.5.1.16	2.00	NUM		0.00	INR Zero Only
1286	Cabling and Conduiting	ZL.6					
1287	Supplying, laying, termination, testing and commissioning of 2 Core x 1.0 sq mm PVC insulated, Annealed Tinned Copper, twisted, shielded, unarmoured FRLS cable.	ZL.6.1	6500.00	M		0.00	INR Zero Only
1288	Supplying, laying, termination, testing and commissioning of 3 Core 1.5 Sqmm, unarmoured ATC conductor multistranded, FRLS cable for Powering DDC , Actuators.	ZL.6.2	1500.00	M		0.00	INR Zero Only
1289	Fire Suppression System (FSS)	ZM					
1290	FIRE SUPPRESSION SYSTEM						
1291	For Electrical Panels & Transformer Suppression. Make-Siemens/Supremex/Tyco						
1292	Supply, Installation, Testing and commissioning of 10 LB capacity Novec 1230, DLP Assembly with automatic valve, push in connector for tube, 10 LB Novec 1230 gas mounting bracket, End of Line adopter and low pressure switch for monitoring system activation.	ZM.1	4.00	EA		0.00	INR Zero Only
1293	Supply, Installation, Testing and commissioning of 14 LB capacity Novec 1230, DLP Assembly with automatic valve, push in connector for tube, 14 LB Novec 1230 gas mounting bracket, End of Line adopter and low pressure switch for monitoring system activation.	ZM.2	3.00	EA		0.00	INR Zero Only
1294	Supply, Installation, Testing and commissioning of Fire Liner pneumatic heat Detection Tube with all necessary fitting & Supports	ZM.3	338.00	M		0.00	INR Zero Only
1295	Supply, Installation, Testing and commissioning of Master Control Unit for controlling each system complete with pressure Swithes, buzzers and electronic hooters, Audio Visual Alarm including all necessary accessories + electrical wiring to make each entire system functional.	ZM.4	7.00	EA		0.00	INR Zero Only
1296	Supply, Installation, Testing and commissioning of Discharge Hose With Two nozzle Kit.	ZM.5	7.00	EA		0.00	INR Zero Only
1297	HIGH PRESSURE CYLINDER OF NOVEC 1230 AGENT COMPLETE WITH VALVE ASSEMBLY, STANDARD ACCESSORIES CAPACITY - 80 LTR	ZM.6	1.00	NUM		0.00	INR Zero Only
1298	NOVEC 1230 GAS	ZM.7	68.00	KG		0.00	INR Zero Only
1299	Solenoid Actuator Assembly 24 v DC	ZM.8	1.00	NUM		0.00	INR Zero Only
1300	Manually operated actuator	ZM.9	1.00	NUM		0.00	INR Zero Only
1301	High pressure flexible rubber discharge hose	ZM.10	1.00	NUM		0.00	INR Zero Only
1302	Cylinder Straps	ZM.11	2.00	NUM		0.00	INR Zero Only
1303	Pressure Gauge	ZM.12	1.00	NUM		0.00	INR Zero Only
1304	Manual gas release Switch	ZM.13	1.00	NUM		0.00	INR Zero Only

1305	Manual gas abort Switch	ZM.14	1.00	NUM		0.00	INR Zero Only
1306	Conventional Hooter cum Flasher	ZM.15	1.00	NUM		0.00	INR Zero Only
1307	Discharge Nozzle	ZM.16	2.00	NUM		0.00	INR Zero Only
1308	Discharge Pressure switch	ZM.17	1.00	NUM		0.00	INR Zero Only
1309	Hydraulic Flow calculation	ZM.18	1.00	NUM		0.00	INR Zero Only
1310	Multisensor Detector	ZM.19	4.00	NUM		0.00	INR Zero Only
1311	Warning Sign Sticker	ZM.20	1.00	NUM		0.00	INR Zero Only
1312	2 Zone Single Area Gas Release Panel .	ZM.21	1.00	NUM		0.00	INR Zero Only
1313	Supply of M.S. Seamless pipes as per ASTM A 106 Gr. B, schedule 40 with necessary fittings	ZM.22	1.00	SET		0.00	INR Zero Only
1314	Supply of PVC insulated , PVC sheathed, FRLS Fire survival Copper armoured aluminium conductor of cable as per IS 1554- Part- I of size 2x1.5 sq. mm .	ZM.23	60.00	M		0.00	INR Zero Only
1315	HVAC WORK	7					
1316	All technical data of capacity, head, RPM, etc. are indicative and should be compatible with the HVAC Chiller system to achieve the required capacity. Bidders may take the note of the same while quoting.						
1317	SUB-HEAD-I: EQUIPMENT	ZN					
1318	Water Cooled Screw Water Chilling Machine	ZN.1	3.00	NUM		0.00	INR Zero Only
1319	Supply, installation, testing & commissioning of water cooled Screw type Single/ Multiple number Compressor chilling machines of Actual capacity at below mentioned operating tender conditions, comprising of direct driven screw type helical rotary compressor and refrigerant circuit/s, having soft/star-delta starter, insulated shell and tube flooded chiller, Shell & tube condenser, ribbed rubber pads for vibration isolation, integral refrigerant piping and wiring, factory charged ozone friendly R-134a refrigerant and compressor oil charge, grooved Victaulic Couplings with spool piece for condenser and chilled water IN/OUT connections, flow switch at chiller & condenser, accessories as required and as called for , automatic and safety controls mounted in central micro-processor based console panel and all mounted on a steel frame complete as per specifications. The motor shall be suitable for 415 + 10% Volts, 50 Hz, 3 Phase, AC power supply. Chiller shall be factory tested at design conditions at 100%, 75%, 50% and 25% load. Chiller shall have Minimum COP of 5.2 as per AHRI conditions.						
1320	General notes for compliance:						
1321	Minimum Unloading step : 10%						
1322	Evaluation of power consumption shall be done on the basis of NPLV.						
1323	Machine shall be equipped with screw single/multiple compressors and Single/Multiple Circuits.						
1324	Shell and tube water cooled condenser having max. two passes and constructed of M.S. shell and both side integrally finned copper tubes and pressure drop 5.5 mtr max						
1325	Shell & tube flooded type chiller having max. two passes and constructed of MS shell and both side integrally finned copper tubes and pressure drop 5.5 mtr max.						
1326	Microprocessor based control panel with graphical/ alphanumeric touch screen display shall have suitable hardware, software and BMS Card so that it can be integrated directly to with standard communication open protocol using Backnet or Modbus IP.						
1327	Flow Switches for condenser & chiller, water drain & air purge valves wherever required.						
1328	Lot- Initial/ first charge of refrigerant gas & compressor oil duly charged at manufacturing facility.						
1329	Software selection sheet in accordance with AHRI 550-590 std rated at site parameters shall be submitted along with the offer.						
1330	Only one no. INPUT power supply (Aluminium conductor Armoured cable of suitable run/s) shall be provided at each chiller from HVAC main panel. Chiller vendor to include the cost of adopter box (including output cables from the adopter box to chiller control panel) for bifurcation of power supply in case of dual power input chillers OR for termination of flexible copper conductor cables from the adopter box to their microprocessor panel.						
1331	Performance shall be guaranteed for the following parameters:						
1332	Condenser:						
1333	Condenser water Leaving Temp: 36.1° C (97° F)						
1334	Condenser water Entering Temp : 30.6° C (87° F)						
1335	Condenser fouling factor : 0.001 (FPS units)						
1336	Flow rate: 375 USGPM- 390 US GPM						
1337	Chiller:						
1338	Chilled water Leaving Temp: 7° C (44.6° F)						
1339	Chilled water Entering Temp : 12° C (53.6° F)						
1340	Chiller fouling factor : 0.0005 (FPS units)						
1341	Flow rate: 300 USGPM- 312 US GPM						
1342	Water cooled Screw chilling machine as described above having a actual capacity of 125TR-130TR at above duty conditions. (Quantity Includes 1 No. standby)						
1343	Note: Preferably, 130 TR capacity machine shall be equipped with screw (Twin Type) multiple compressors having independent refrigerant Circuits.						
1344	The price quoted for Rotary Screw Water Chilling Unit shall be inclusive of all duties & taxes, insurance, transportation / shipment cost from works to site, loading / unloading, shifting the chillers and placing them on the foundations/designated place, port clearance charges etc. as required in INR.						
1345	Water Circulation Chilled & Condenser Pumps	ZN.2					
1346	Condenser Water Pumps Set (Constant speed)	ZN.2.1	3.00	NUM		0.00	INR Zero Only

1347	Supply, installation, testing and commissioning of single stage centrifugal split close coupled Vertical Inline condenser water pump sets having in-line suction and discharge ports of identical diameter OR single stage centrifugal split casing long coupled end suction condenser water pumps, made of CI casing with bronze impeller & SS shaft for condenser water recirculation complete with TEFC Sq. Cage induction IE-2 motor with class "F" insulation, coupling guard, factory fitted mechanical seal, conforming to technical specifications as called for. Vertical Pump shall be of top pull out design and Horizontal pump shall be of back pull out design and its motor shall be suitable for operating on adjustable frequency drive. Pump shall be suitable for 415 ± 10% volts, 50 cycles, 3 phase power supply and shall run on 1400 RPM. Performance characteristics shall be as given below.					
1348	Capacity of Each Pump : 375 US GPM - 390 US GPM (Each)					
1349	Pump Head : 27.5 M (90 ft)					
1350	Motor : 11.0 KW (15 HP)					
1351	Pumps shall have efficiency above 70% and close to 75%					
1352	Quantity indicated include one stand by					
1353	Primary Chilled Water Pumps (Constant speed)	ZN.2.2	3.00	NUM		0.00 INR Zero Only
1354	Supply, installation, testing and commissioning of single stage centrifugal split close coupled Vertical Inline chilled water pump sets having in-line suction and discharge ports of identical diameter OR single stage centrifugal split casing long coupled end suction chilled water pumps, made of CI casing with bronze impeller & SS shaft for chilled water recirculation complete with TEFC Sq. Cage induction IE-2 motor with class "F" insulation, coupling guard, factory fitted mechanical seal, conforming to technical specifications as called for. Vertical Pump shall be of top pull out design and Horizontal pump shall be of back pull out design and its motor shall be suitable for operating on adjustable frequency drive. Pump motor shall be suitable for 415 ± 10% volts, 50 cycles, 3 phase power supply and shall run on 1400 RPM-1500 RPM. The quoted price shall include cost of thermal insulation and cladding. Performance characteristics shall be as given below.					
1355	Capacity of Each Pump : 300 US GPM-325 USGPM (Each)					
1356	Pump Head : 12.2 M (40 ft)					
1357	Motor : 5.5 KW (7.5 HP)					
1358	Pumps shall have efficiency above 70% and close to 75%					
1359	Quantity indicated include one stand by					
1360	Secondary Chilled Water Pumps	ZN.2.3	3.00	NUM		0.00 INR Zero Only
1361	Supply, installation, testing and commissioning of single stage centrifugal split close coupled Vertical Inline chilled water pump sets having in-line suction and discharge ports of identical diameter OR single stage centrifugal split casing long coupled end suction chilled water pumps, made of CI casing with bronze impeller & SS shaft for chilled water recirculation complete with TEFC Sq. Cage induction IE-2 motor with class "F" insulation, coupling guard, factory fitted mechanical seal, conforming to technical specifications as called for. Vertical Pump shall be of top pull out design and Horizontal pump shall be of back pull out design and its motor shall be suitable for operating on adjustable frequency drive and conforming to the specifications of variable pumping system. VFD for secondary pumps shall preferably be mounted on the body of the pump itself. Pump motor shall be suitable for 415 ± 10% volts, 50 cycles, 3 phase power supply and shall run on 1400 RPM -1500 RPM. The quoted price shall include cost of thermal insulation and cladding. Performance characteristics shall be as given below.					
1362	Single Zone (Office building)					
1363	Capacity of Each Pump : 320 US GPM (Each)					
1364	Pump Head : (110 ft) 33.5 M					
1365	Motor : (15.0 HP) 11.0 KW					
1366	Pumps shall have efficiency above 70% and close to 75%					
1367	Quantity indicated include one stand by					
1368	Variable Speed Pumping System (Secondary Chilled Water Pumps)	ZN.2.4	1.00	SET		0.00 INR Zero Only
1369	Supply, installation, testing and commissioning of Variable Speed Pumping system consisting of adjustable frequency drive (AFD) for each pump suitably interfaced with other system components, hand / auto macro designed for pumping application, 1 no. dedicated microprocessor based pump logic controller per zone, parallel pumping software duly downloaded, single/multiple differential pressure sensor /transmitters as per the site requirement, interfacing amongst all components and compatibility of I/O signals etc complete with other accessories as required. The entire system along with secondary pumps to be sourced from single manufacturer only, to ensure unit responsibility. Necessary factory test certificates for entire system shall be submitted along with the equipment. System shall be BMS compatible with open protocol communication port, so that complete data can be transported to remote IBMS console. Vendor to include cost of panel/enclosure to house the VFDs (if supplied separately) and logic controller with necessary set of ON/OFF indicating lights, input MCCBs and adequate arrangement of ventilation including all related control/communication wiring between logic controller, VFDs and differential pressure sensors.					
1370	The system shall be complete in all respects and suitable for following motor ratings :					
1371	Supply of AFD , Pump controller & Sensor transmitters					
1372	Single Zone (Office building), Motor KW : 11.0 KW (15.0 HP) (2W+1SB)...3nos.					
1373	Note: There will be 1no. of independent enclosure for above set of VFDs & Logic controllers.					
1374	FRP Induced Draft Cooling Tower	ZN.3	3.00	NUM		0.00 INR Zero Only

1375	Supply, installation, testing and commissioning of FRP construction induced draft Single cell cross/counter flow type Cooling towers for Airconditioning system. Each tower shall be complete with FRP cold water basin, honeycomb design PVC fill, Casing, Hot water distribution system, Intake louvers,ladder, Axial flow fan with statically/dynamically balanced belt & pulley drive/directly coupled with TEFC, EFF-1 Class F Insulation, IP65 induction motor suitable for 415±10% volts, 50 Hz, 3 phase power supply, Weather proof Isolator panel with MCCB at cooling tower and earthing.Cooling tower motor/s shall be suitable for operating on adjustable frequency drive.Basin shall be provided with accessories like quickfill, makeup & drain, brass construction float valve, overflow pipe etc. Separate motor shall be provided in each cell of multi cell towers. It shall have non-corrosive structure and casing for longer life of all components.Tower shall be selected on the basis detailed in the schedule. Tower shall be suitable for outdoor installation next to occupied areas and shall be low noise. Cooling tower shall be CTI certified.Vendor to include the cost of Variable frequency drive(DANFOSS FC-102/Equivalent) of 5.5 KW X 1 no. rating, considering Single cell cooling tower OR as per the motor kw suggested by the tower manufacturer.VFD shall be BMS compatible .IP-20 rating and shall have in built choke to cater for the longer length of power cabling (Approx. 60 Rmt for each CT fan motor) without deration in the performance of the VFD.					
1376	Duty Parameters					
1377	Cooling tower capacity shall be suitable for 125TR-130 TR capacity chillers heat rejection.					
1378	Water Flow - 375 USGPM - 390 USGPM					
1379	Designed Wet Bulb Temperature - 80 °F					
1380	Approach : 7 °F					
1381	Water Inlet Temperature - 97 °F (36.1 Deg C)					
1382	Water Outlet Temperature - 87 °F (30.5 DegC)					
1383	Quantity indicated include one stand by					
1384	Pressurized Closed Expansion Tank with Air Separator	ZN.4	1.00	NUM		0.00 INR Zero Only
1385	Supply,Installation, Testing & Commissioning of pressurised expansion tank in chilled water circuits along with necessary accessories such as centrifugal air separator, pumps(including one standby) piping, valves, strainers etc. in order to keep chilled water system under pressure and to prevent entrapment of air in the system. The tank shall be precharged steel expansion tank with replaceable heavy duty butyl rubber bladder. The tank shall have suitably sized system connection, PN 16 rated, drain and charging valve connection to facilitate the on site charging of the tank to meet system requirement. The tank and air separator must be constructed in accordance with section VIII of the ASME Boiler and pressure vessel code. The complete system shall be sourced from single manufacturer and supplied and installed with all accessories and safety fixtures required for proper functioning of the complete hydronic system.					
1386	Supply, Installation, Testing & Commissioning of above tank, air separator and all accessories as required					
1387	Approximate system volume 20000 ltr at Max ambient temp 40Deg C and total Static height above the expansion tank 30 M. MinimumTank capacity shall be 500 litres.Vendor to include cost of thermal insulation with 44mm thick closed cell elastomeric insulation and finally finished with 24G Aluminium cladding for the expansion tank & Air separator both.					
1388	Supply, Installation, Testing & Commissioning of above tank, and all accessories as required. Tank shall be common i.e suitable for either cooling during summer OR heating during winters.					
1389	NOTE:Air separator selected shall be suitable to 150mm dia pipe connection at Inlet & out let with inbuilt strainer/sediment separator.					
1390	The contractor shall submit calculations for the total system volume and tank sizing calculations along with their offer.					
1391	AHU's AND THEIR CONTROLS	ZN.5				
1392	Double Skin Floor/Ceiling Mounted AHU With Pre Filters + Fine filters (2 pipe system)	ZN.5.1				
1393	Supply, installation, testing and commissioning of double skin construction Horizontal/Vertical Floor/Ceiling mounted(as per approved shop drawing and specifications) draw/blow through type chilled water Air handling units fabricated out of extruded aluminium section with 0.6 mm pre-plasticized / pre-coated Galvanised steel sheet outside & 0.6 mm plain Galvanised steel sheet inside; each complete with 600mm deep mixing box wherever specified, low leakage aluminium aerofoil gear driven VCD & fire resistant neoprene flexible connection at outlet, pre-filter section with 50mm thick filters of non woven synthetic media (efficiency 90% down to 10 microns MERV-8) , fine filter section with 300mm thick fine filters of non woven synthetic media (efficiency 95% down to 3 microns MERV-13),coil section having min 6 Row Deep (8 Row Deep in case of TFA) chilled water coil of copper tube & aluminium fins construction alongwith di- electric union of suitable size (Coil shall have copper header),polished SS 304 drain pan made out of 20G sheet duly insulated, complete with squirrel cage induction VFD Compatible motor.					
1394	Belt driven DIDWcentrifugal Backward curved fan(or equivalent performance direct driven plug fan) with vibration isolators. Coil size shall be selected for a maximum face velocity of 500 feet/minute and fan outlet velocity shall be limited to 1800 FPM. Motor shall be atleast IE 2 rated suitable for 415±10% volts, 50 cycles, 3 phase AC supply, meeting criterion as per ASHRAE standard 90.1-2010 & high efficiency. The AHU panels shall be insulated with minimum 23 mm thick (for recirculated AHU) & 46mm thick for (TFA AHU) & 40± 2 Kg/m³ density PU foam & shall have thermal break. The motor & blower assembly shall be mounted on Aluminium extruded section only.Total static pressure shall be checked by vendor. Change in static pressure will not attract any price implication.Fan capacities shall be based on minimum 60mm static pressure for ceiling mounted AHUs as mentioned below.The AHUs shall be complete in all respects along with accessories as per specifications. The capacity of Air-handlers shall be as follows:					
1395	Floor GF-01 Area Office Block Type Horizontal FM Fan Dia in mm 630 Air qty CFM 10250 SP in mm 60 Motor kW 5.5 Coil Row 6 TR 17 Mixing Box 1 No.	ZN.5.1.1	1.00	NUM		0.00 INR Zero Only
1396	Floor GF-02 Area Staff cafeteria Type Horizontal FM Fan Dia in mm 450 Air qty CFM 5000 SP in mm 60 Motor kW 2.2 Coil Row 6 TR 10 Mixing Box 1 No.	ZN.5.1.2	1.00	NUM		0.00 INR Zero Only

1397	Floor 1F-03 Area Office Block Type Horizontal FM Fan Dia in mm 630 Air qty CFM 10500 SP in mm 60 Motor kW 5.5 Coil Row 6 TR 18 Mixing Box 1 No.	ZN.5.1.3	1.00	NUM			0.00	INR Zero Only
1398	Floor 1F-04 Area Office Block Type Horizontal FM Fan Dia in mm 450 Air qty CFM 5500 SP in mm 60 Motor kW 3.7 Coil Row 6 TR 10.5 Mixing Box 1 No.	ZN.5.1.4	1.00	NUM			0.00	INR Zero Only
1399	Floor 2F-05 Area Office Block Type Horizontal FM Fan Dia in mm 560 Air qty CFM 10000 SP in mm 60 Motor kW 5.5 Coil Row 6 TR 17 Mixing Box 1 No.	ZN.5.1.5	1.00	NUM			0.00	INR Zero Only
1400	Floor 2F-06 Area Office Block Type Horizontal FM Fan Dia in mm 450 Air qty CFM 5800 SP in mm 60 Motor kW 3.7 Coil Row 6 TR 10.2 Mixing Box 1 No.	ZN.5.1.6	1.00	NUM			0.00	INR Zero Only
1401	Floor 3F-07 Area Office Block Type Horizontal FM Fan Dia in mm 560 Air qty CFM 10000 SP in mm 60 Motor kW 5.5 Coil Row 6 TR 17 Mixing Box 1 No.	ZN.5.1.7	1.00	NUM			0.00	INR Zero Only
1402	Floor 3F-08 Area Office Block Type Horizontal FM Fan Dia in mm 450 Air qty CFM 5800 SP in mm 60 Motor kW 3.7 Coil Row 6 TR 10.2 Mixing Box 1 No.	ZN.5.1.8	1.00	NUM			0.00	INR Zero Only
1403	Floor 4F-09 Area Office Block Type Horizontal FM Fan Dia in mm 630 Air qty CFM 10500 SP in mm 60 Motor kW 5.5 Coil Row 6 TR 18 Mixing Box 1 No.	ZN.5.1.9	1.00	NUM			0.00	INR Zero Only
1404	Floor 4F-10 Area Office Block Type Horizontal FM Fan Dia in mm 450 Air qty CFM 5800 SP in mm 60 Motor kW 3.7 Coil Row 6 TR 10.2 Mixing Box 1 No.	ZN.5.1.10	1.00	NUM			0.00	INR Zero Only
1405	Floor 5F-11 Area Office Block Type Horizontal FM Fan Dia in mm 560 Air qty CFM 10000 SP in mm 60 Motor kW 5.5 Coil Row 6 TR 17 Mixing Box 1 No.	ZN.5.1.11	1.00	NUM			0.00	INR Zero Only
1406	Floor 5F-12 Area Office Block Type Horizontal FM Fan Dia in mm 450 Air qty CFM 6300 SP in mm 60 Motor kW 3.7 Coil Row 6 TR 11.5 Mixing Box 1 No.	ZN.5.1.12	1.00	NUM			0.00	INR Zero Only
1407	Floor 6F-13 Area Office Block Type Horizontal FM Fan Dia in mm 560 Air qty CFM 8000 SP in mm 60 Motor kW 3.7 Coil Row 6 TR 13.5 Mixing Box 1 No.	ZN.5.1.13	1.00	NUM			0.00	INR Zero Only
1408	Floor 6F-14 Area Office Block Type Horizontal FM Fan Dia in mm 355 Air qty CFM 4000 SP in mm 60 Motor kW 2.2 Coil Row 6 TR 7.5 Mixing Box 1 No.	ZN.5.1.14	1.00	NUM			0.00	INR Zero Only
1409	Double Skin Floor/Ceiling Mounted AHU With Pre Filters only (2 pipe system)	ZN.5.2						
1410	Supply, installation, testing and commissioning of double skin construction Horizontal/Vertical Floor/Ceiling mounted(as per approved shop drawing and specifications) draw/blow through type chilled water Air handling units fabricated out of extruded aluminium section with 0.6 mm pre-plasticized / pre-coated Galvanised steel sheet outside & 0.6 mm plain Galvanised steel sheet inside; each complete with 600 mm deep mixing box wherever specified, low leakage aluminium aerofoil gear driven VCD & fire resistant neoprene flexible connection at outlet, pre-filter section with 50mm thick filters of non woven synthetic media (efficiency 90% down to 10 microns MERV-8) ,coil section having min 6 Row Deep (8 Row Deep in case of TFA) chilled water coil of copper tube & aluminium fins construction alongwith di- electric union of suitable size (Coil shall have copper header),polished SS 304 drain pan made out of 20G sheet duly insulated, complete with squirrel cage induction VFD Compatible motor.							
1411	Belt driven DIDW centrifugal Backward curved fan (or Equivalent performance direct driven plug fan) with vibration isolators. Coil size shall be selected for a maximum face velocity of 500 feet/minute and fan outlet velocity shall be limited to 1800 FPM. Motor shall be atleast IE 2 rated suitable for 415±10% volts, 50 cycles, 3 phase AC supply, meeting criterion as per ASHRAE standard 90.1-2010 & high efficiency. The AHU panels shall be insulated with minimum 23 mm thick (for recirculated AHU) & 46mm thick for (TFA AHU) & 40± 2 Kg/m ³ density PU foam & shall have thermal break. The motor & blower assembly shall be mounted on Aluminium extruded section only.Total static pressure shall be checked by vendor. Change in static pressure will not attract any price implication.Fan capacities shall be based on minimum 40mm static pressure for floor mounted AHUs and minimum 35mm static pressure for ceiling mounted AHUs as mentioned below.The AHUs shall be complete in all respects along with accessories as per specifications. The capacity of Air-handlers shall be as follows:							
1412	Note - Vertical floor mounted AHU for UPS & Server room shall have Inbuilt discharge plenum of 600mm height of same foot print of AHU along with 450mm wide openable plenum for Valve station (To conceal the CHW valves & piping) in double skin construction. Vendor to include the cost of the same.							
1413	Floor 1F-15 Area UPS Room Type CSU Fan Dia in mm 315 Air qty CFM 3200 SP in mm 35 Motor kW 1.1 Coil Row 6 TR 5.5 Mixing Box 1 No.	ZN.5.2.1	1.00	NUM			0.00	INR Zero Only
1414	Floor 1F-16 Area UPS Room Type Vertical floor mounted Fan Dia in mm 315 Air qty CFM 3200 SP in mm 32 Motor kW 1.1 Coil Row 6 TR 5.5 Mixing Box 1 No.	ZN.5.2.2	1.00	NUM			0.00	INR Zero Only
1415	Floor 1F-17 Area Server Room Type CSU Fan Dia in mm 355 Air qty CFM 3500 SP in mm 35 Motor kW 1.1 Coil Row 6 TR 6 Mixing Box 1 No.	ZN.5.2.3	1.00	NUM			0.00	INR Zero Only
1416	Floor 1F-18 Area Server Room Type Vertical floor mounted Fan Dia in mm 355 Air qty CFM 3500 SP in mm 32 Motor kW 1.1 Coil Row 6 TR 6 Mixing Box 1 No.	ZN.5.2.4	1.00	NUM			0.00	INR Zero Only
1417	Floor 6F-19&20 Area Conference Room Type CSU Fan Dia in mm 280 Air qty CFM 2500 SP in mm 32 Motor kW 1.1 Coil Row 6 TR 5 Mixing Box 2 No.	ZN.5.2.5	1.00	NUM			0.00	INR Zero Only
1418	Floor UB-21 Area LT Panel Room Type Horizontal FM Fan Dia in mm 250 Air qty CFM 2000 SP in mm 40 Motor kW 1.1 Coil Row 6 TR 5 Mixing Box 1 No.	ZN.5.2.6	1.00	NUM			0.00	INR Zero Only
1419	Fan Coil Unit (High Static) Suitable for 2 pipe system for BOH & Public areas	ZN.6						
1420	Supply,installation,testing and commissioning of Horizontal blow through type fan coil units (having 5 mm external static pressure) each complete with fan section having one or more centrifugal fans,minimum 3 row deep chilled water coil, normal three speed motor, washable fabric filters, sandwitched insulated extended drain pan,25mm dia flexible braided drain pipe of 300mm length with clamps, copper pipe connections with brass fittings, wiring with 3 pin switch,socket and plug mounted on M.S. box, wiring in MS rigid/GI flexible conduits as required including wall chasing & finishing upto the thermostat boxes, fire retardant flexible duct connections made of silicon/neoprene rubber with extruded aluminium frame, fan coil unit shall be suitable for 240 ± 10% volts, 50 Hz cycle single phase power supply, maximum RPM of motor shall be 960. The price shall include rubber in shear supporting arrangement and rubber gromets as required. Fan coil units shall be of following refrigeration capacities :							

1421	Note: Internal Fan speed connections shall be factory wired from motor upto a connector box installed on the FCU body.					
1422	1.0 TR nominal capacity --- 400 CFM	ZN.6.1	7.00	NUM		0.00 INR Zero Only
1423	1.5 TR nominal capacity ---- 600 CFM	ZN.6.2	24.00	NUM		0.00 INR Zero Only
1424	2.0 TR nominal capacity ---- 800 CFM	ZN.6.3	10.00	NUM		0.00 INR Zero Only
1425	2.5 TR nominal capacity ---- 1000 CFM	ZN.6.4	15.00	NUM		0.00 INR Zero Only
1426	3.0 TR nominal capacity ---- 1200 CFM	ZN.6.5	4.00	NUM		0.00 INR Zero Only
1427	Chilled water Cassette units	ZN.7				
1428	Supply, installation, testing & commissioning of 4 way Chilled Water Cassette Unit with copper tube and aluminium finned cooling coil, extended tray for valve assembly, low noise fan and motor with ON/OFF and 3 speed control and suitable for 1 phase, 220 ± 10%V, 50 Hz electric supply, with cordless remote control, fabric filter, and decorative front grille.					
1429	2.5 TR nominal capacity --- 1000 CFM	ZN.7.1	2.00	NUM		0.00 INR Zero Only
1430	3.0 TR nominal capacity --- 1200 CFM	ZN.7.2	5.00	NUM		0.00 INR Zero Only
1431	4.0 TR nominal capacity --- 1400 CFM	ZN.7.3	2.00	NUM		0.00 INR Zero Only
1432	Pressure Independent Balancing Cum Two Way Control Valve	ZN.8				
1433	(Automatic control for Fan coil unit)					
1434	Supply, installation, testing and commissioning of Pressure Independent Balancing Cum Two Way Control Valve in a single body equipped with electronic ON/OFF actuator working on 230V AC. The minimum close off Pressure of actuator must be 1.5 times shut off head of pump as per specifications of following sizes. Valve should come to close position if the power supply to the actuator is cut off. The valve actuator shall be compatible with digital snap acting type Heating/Cooling thermostat. Valve sizes shall be as follows:					
1435	25mm dia	ZN.8.1	58.00	NUM		0.00 INR Zero Only
1436	32mm dia	ZN.8.2	11.00	NUM		0.00 INR Zero Only
1437	Snap acting type Thermostat suitable for 2 pipe system (Automatic control for Fan coil unit)	ZN.9	60.00	NUM		0.00 INR Zero Only
1438	Supply, installation, testing and commissioning of ON/OFF type Digital display thermostat for heating(during winters) and cooling(during summers) in fan coil units as described above. The Heating & cooling thermostat shall be compatible with the above mentioned 2 way PIBC valves and will have provision of setting of room temperature, setting of fan speed (High, Medium, Low), capable of providing individual space temperature control for heating/cooling application. The thermostat shall produce a output to cooling OR heating in response to load change in rooms. The valve system shall be complete with necessary control cabling between control transformer (mounted in MS powder coated box with connector, to be included in cost if required), valve, standalone thermostat and the power supply near the FCU.					
1439	Providing and fixing in position the following ball valves with strainer & without strainer for the FCU's (PN-16) suitable for following pipe diameter. Ball valves shall have 50mm high extended stem.	ZN.10				
1440	25mm dia	ZN.10.1	58.00	SET		0.00 INR Zero Only
1441	32mm dia	ZN.10.2	11.00	SET		0.00 INR Zero Only
1442	Two Way High Rangeability Control Valve/Pressure Independent Balancing cum Control Valve	ZN.11				
1443	(Automatic control for AHU)					
1444	Supply, installation, testing and commissioning of complete set of Self Balancing 2 way High Rangeability (>300)/ Pressure Independent valve with integrated Two Way modulating control valve in a single body. Valves shall be of Brass construction rotary / linear type for DN15 to DN32 of PN25 rating with screwed connections and shall be C.I body linear type for DN40- DN200 of PN16 rating with flanged connections.					
1445	Valves shall be complete with electronic motorised modulating actuator of operating on 24V AC, and 0-10V DC or 4-20mA control signal. The actuator shall provide similar transduced feedback output. The linear actuator shall have a stroke of minimum 15 mm. It shall be possible to operate the valve manually also and the actuator shall switch back to auto mode when power supply is restored. Valve should come to close position, if the power supply to the actuator is cut off OR AHU fan is shut off. The valve actuator housing shall have IP54 protection. The actuator shall be suitable for a valve close up pressure of 1.5 times the pump head or a minimum of 4bar.					
1446	The valve size shall be suitable for the following pipe sizes.					
1447	32 mm Dia pipe	ZN.11.1	7.00	NUM		0.00 INR Zero Only
1448	40 mm Dia pipe	ZN.11.2	1.00	NUM		0.00 INR Zero Only
1449	50 mm Dia pipe	ZN.11.3	13.00	NUM		0.00 INR Zero Only
1450	Modulating type Digital controller/Thermostat suitable for 2 pipe system for Airhandling units	ZN.12	21.00	NUM		0.00 INR Zero Only
1451	Supply, installation, testing and commissioning of modulating type Digital display thermostat (with NTC sensors) for heating & cooling mode in Airhandling units. The thermostat shall be compatible with above mentioned 2way Hi-rangeability valves (in Sr.No.13) and will have provision of setting of room temperature, capable of providing space temperature control for Heating & cooling application.					
1452	The temperature controller shall be electronic microprocessor based with LCD display working on 24 VAC with 0-10Vdc output, 3nos.NTC sensors as required for 2 pipe system with complete wiring within AHU room, brass thermowells (as per the no. of sensors) and power supply unit (SMPS) for 240V AC input to 24V AC output, 300mA/1000mA. Temperature controller shall be capable of accepting inputs from minimum 3 temperature sensors. One temperature sensor for space temperature measurement and the other two temperature sensors for coil inlet and outlet water temperature measurements. The controller shall be capable of comparing the signals and selecting the lower output to prevent excessive water flow through coil. The digital controller shall be also capable of accepting 0-10Vdc signal from BAS. It shall also have RS-485 port for the soft integration with the BAS. One controller shall be suitable to work with either heating OR cooling mode.					
1453	A transparent control box of IP55 construction for housing the Digital controller and power supply unit shall be provided & mounted in AHU room.					
1454	ELECTRO-CHEMICAL TREATMENT SYSTEM FOR COOLING TOWERS	ZN.13	1.00	SET		0.00 INR Zero Only

1455	SITC of Electro-Chemical Treatment System for Cooling Tower (Non-Chemical) for Cooling Tower Treatment. The system should be equipped with Automatic Self Cleaning Mechanism & Automatic Blowdown Control. The proposed system should be manufactured and complied with ISO 14001:2015, ISO 9001:2015. The system must be CE + RoHS compliant and in accordance with UL standards. The proposed system should minimize blow down water consumption up to 50%. No/Zero Chemicals uses for cooling tower circuit, technology must fall under green technology initiatives, the system must avoid algae and micro-bacterial formation in water or surface of Pipe/ CT/ fills. The system must have components like - Electrolytic Reactor, Automated Scraper mechanism for reactor cleaning, Automatic Blowdown control, Side Screen Filter, Automatic Back wash Feature, Control Panel, Skid with Pumps & Valves. Note: Above system shall be suitable for 125TR x 3nos. Cooling Towers						
1456	INTELLIGENT ANTI FOULING CONDENSER SYSTEM / SMART AUTOMATIC TUBE CLEANING SYSTEM	ZN.14	1.00	SET			0.00 INR Zero Only
1457	SITC of INTELLIGENT ANTI FOULING CONDENSER SYSTEM/SMART AUTOMATIC TUBE CLEANING SYSTEM with Anti Fouling arrangement on chiller by automatic condenser cleaning Upto 4# Chillers Max, with a Common Skid for the required number of chillers in the plantroom. The system shall include IoT Ready, Industry 4.0 complaint device. The Panel should have minimum 7" Touch Screen Graphical HMI which will log the real time data related to chiller energy (KWH), capacity (TR), Chiller Water Flow monitoring, Water Temperature profile on evaporator and condenser both and graphical representation of historic summary which shall be displayed on the Mobile Application with unlimited user access on cloud based system. The data can also be retrieved in XL or PDF Format. The system shall have one Injection/Collection pump, Motorized Valves, Energy Meter, Flow Meter, Temp. Sensors and complete with all accessories and Low side activities of piping connections of Ball traps & Ball collectors on the Chillers. The Common Skid piping, Ball Trap Size to suit chiller capacity requirement for the project. Note: Above system shall be suitable for 125TR x 3nos. Chillers						
1458	SUB-HEAD- II: VENTILATION SYSTEM	ZO					
1459	Inline Fans Supply, installation, testing and commissioning of duct mounted Cabinet/Circular Inline fans complete with direct driven centrifugal blower/impeller, motor, rubber isolation mounts & other accessories including wiring & conduiting complete in all respects. The casing shall be double skin, internally acoustically lined and constructed of galvanized steel. The inline fans shall be selected for lower noise level. Single phase Inline fans motor shall have inbuilt speed controller & three phase inline fan motor shall be compatible with VFD and shall be provided with suitable starter, power/control cabling and earthing. NC level 3M away from source should be less than 50db. The fans shall be of following capacity:	ZO.1					
1460	Ground floor	ZO.1.1					
1461	200 CFM (20mm static pressure) for Male & Female Toilet Exhaust	ZO.1.1.1	1.00	NUM			0.00 INR Zero Only
1462	900 CFM (30mm static pressure) for Male & Female Toilet Exhaust	ZO.1.1.2	1.00	NUM			0.00 INR Zero Only
1463	First floor	ZO.1.2					
1464	300 CFM (20mm static pressure) for Pantry Exhaust	ZO.1.2.1	1.00	NUM			0.00 INR Zero Only
1465	900 CFM (30mm static pressure) for Male & Female Toilet Exhaust	ZO.1.2.2	1.00	NUM			0.00 INR Zero Only
1466	Second floor	ZO.1.3					
1467	300 CFM (20mm static pressure) for Pantry Exhaust	ZO.1.3.1	1.00	NUM			0.00 INR Zero Only
1468	900 CFM (30mm static pressure) for Male & Female Toilet Exhaust	ZO.1.3.2	1.00	NUM			0.00 INR Zero Only
1469	Third floor	ZO.1.4					
1470	300 CFM (20mm static pressure) for Pantry Exhaust	ZO.1.4.1	1.00	NUM			0.00 INR Zero Only
1471	900 CFM (30mm static pressure) for Male & Female Toilet Exhaust	ZO.1.4.2	1.00	NUM			0.00 INR Zero Only
1472	Fourth floor	ZO.1.5					
1473	300 CFM (20mm static pressure) for Pantry Exhaust	ZO.1.5.1	1.00	NUM			0.00 INR Zero Only
1474	900 CFM (30mm static pressure) for Male & Female Toilet Exhaust	ZO.1.5.2	1.00	NUM			0.00 INR Zero Only
1475	Fifth floor	ZO.1.6					
1476	300 CFM (20mm static pressure) for Pantry Exhaust	ZO.1.6.1	1.00	NUM			0.00 INR Zero Only
1477	900 CFM (30mm static pressure) for Male & Female Toilet Exhaust	ZO.1.6.2	1.00	NUM			0.00 INR Zero Only
1478	Sixth floor	ZO.1.7					
1479	300 CFM (20mm static pressure) for Pantry Exhaust	ZO.1.7.1	1.00	NUM			0.00 INR Zero Only
1480	900 CFM (30mm static pressure) for Male & Female Toilet Exhaust	ZO.1.7.2	1.00	NUM			0.00 INR Zero Only
1481	Propeller Fans Supplying, installing, testing and commissioning of direct driven PROPELLER FANS for exhaust/fresh air as shown in drawings. Each fan shall be complete with permanent split capacitor or shaded pole motor, mounting plate, accessories like wire guard, bird screen and fixed louvers for weather protection as required. Fan shall be provided with speed regulator and NC level 3M away from source shall be less than 60db. Fan selection arrangement and Electrical characteristics shall be as follows :	ZO.2					
1482	250 mm dia 1400 RPM fan suitable for 240± 10% volts 50 cycles, 1 phase AC supply. (For Toilet exhaust) Plastic Body Designer fan.	ZO.2.1	13.00	NUM			0.00 INR Zero Only
1483	225 mm dia 1400 RPM fan suitable for 240± 10% volts 50 cycles, 1 phase AC supply. (For electrical Room) in metal construction as per description above.	ZO.2.2	7.00	NUM			0.00 INR Zero Only
1484	AXIAL FLOW FANS (NORMAL MODE & PRESSURIZATION)	ZO.3					
1485	Supply, Installation testing and commissioning of Vane Axial Fans with impeller having adjustable pitch angle blades and complete with suitable TEFC motor and drive assembly. The fan shall be suitable for ceiling/floor installation along with spring isolators or as recommended by the manufacturer. Fan motor shall be VFD compatible & shall be of high efficiency Class EFF-1 (Only for normal working fans). Motor shall be suitable for 415 ± 10% V, 3 Phase, 50 ± 3%Hz electrical supply. Fan & motor shall be selected for minimum 30mm Static pressure. Total static pressure shall be checked by vendor. Change in static pressure will not attract any price implication. The fan motor shall have class 'F' insulation. The fan shall be selected for low noise level and low RPM as per technical specifications. Fans shall be AMCA Certified. Price shall also include double sleeve fire retardant flexible connection on both sides of the fan. The fan duty shall be as follows: (Normal mode)						

1486	Floor GF AF-01,02,03 Area Served AC Plant Room Application Exhaust Air Air qty CFM 4500 SP in mm 10 Motor kW 1.1	ZO.3.1	3.00	NUM		0.00	INR Zero Only
1487	Floor BF AF-04 Area Served Pump Room Application Fresh Air Air qty CFM 3600 SP in mm 30 Motor kW 1.5	ZO.3.2	1.00	NUM		0.00	INR Zero Only
1488	Floor BF AF-05 Area Served Pump Room Application Exhaust Air Air qty CFM 4000 SP in mm 30 Motor kW 1.5	ZO.3.3	1.00	NUM		0.00	INR Zero Only
1489	Floor BF AF-06 Area Served STP Plant Room Application Fresh Air Air qty CFM 5400 SP in mm 30 Motor kW 2.2	ZO.3.4	1.00	NUM		0.00	INR Zero Only
1490	Floor BF AF-07 Area Served STP Plant Room Application Exhaust Air Air qty CFM 6000 SP in mm 40 Motor kW 3.7	ZO.3.5	1.00	NUM		0.00	INR Zero Only
1491	Floor BF Terrace AF-08 ,09,10 Area Served Lift well pressurization Application Fresh Air Air qty CFM 13000 SP in mm 30 Motor kW 5.5	ZO.3.6	3.00	NUM		0.00	INR Zero Only
1492	Floor BF Terrace AF-11 Area Served Lift lobby pressurization Application Fresh Air Air qty CFM 13000 SP in mm 30 Motor kW 5.5	ZO.3.7	1.00	NUM		0.00	INR Zero Only
1493	Floor BF Terrace AF-12 Area Served Staircase pressurization Application Fresh Air Air qty CFM 15000 SP in mm 30 Motor kW 5.5	ZO.3.8	1.00	NUM		0.00	INR Zero Only
1494	Floor BF Terrace AF-13 Area Served Corridor Makeup air Application Fresh Air Air qty CFM 21000 SP in mm 30 Motor kW 7.5	ZO.3.9	1.00	NUM		0.00	INR Zero Only
1495	Floor BF Terrace AF-14 Area Served Corridor Makeup air Application Fresh Air Air qty CFM 25000 SP in mm 30 Motor kW 11	ZO.3.10	1.00	NUM		0.00	INR Zero Only
1496	AXIAL FLOW FANS (FIRE MODE) Supply ,Installation testing and commissioning of Vane Axial Fans with impeller having adjustable pitch angle blades and complete with suitable TEFC motor and drive assembly. The fan shall be suitable for ceiling/floor installation along with spring isolators or as recommended by the manufacturer. Fan motor shall be VFD compatible & shall be of high efficiency Class EFF-1(Only for normal working fans). Motor shall be suitable for 415 ± 10% V, 3 Phase, 50 ± 3%Hz electrical supply.Fan & motor shall be selected for minimum 30mm Static pressure.Total static pressure shall be checked by vendor. Change in static pressure will not attract any price implication. The complete fan assembly alongwith the motor & drive assembly shall be fire rated i.e. suitable to operate upto 250°C for 2 hours and meet the duty parameters.The fan shall be selected for low noise level and low RPM as per technical specifications. Fans shall be AMCA Certified. Price shall also include double sleeve fire retardant flexible connection on both sides of the fan.The fan duty shall be as follows: (Smoke Extraction Mode)	ZO.4					
1497	Floor GF AF-15 Area Served Corridor Application Smoke Exhaust Air qty CFM 9400 SP in mm 30 Motor kW 3.7	ZO.4.1	1.00	NUM		0.00	INR Zero Only
1498	Floor GF AF-16 Area Served Corridor Application Smoke Exhaust Air qty CFM 3600 SP in mm 30 Motor kW 1.5	ZO.4.2	1.00	NUM		0.00	INR Zero Only
1499	Floor 1F AF-17 Area Served Corridor Application Smoke Exhaust Air qty CFM 5500 SP in mm 30 Motor kW 2.2	ZO.4.3	1.00	NUM		0.00	INR Zero Only
1500	Floor 1F AF-18 Area Served Corridor Application Smoke Exhaust Air qty CFM 2000 SP in mm 30 Motor kW 0.75	ZO.4.4	1.00	NUM		0.00	INR Zero Only
1501	Floor 2F AF-19 Area Served Corridor Application Smoke Exhaust Air qty CFM 5000 SP in mm 30 Motor kW 2.2	ZO.4.5	1.00	NUM		0.00	INR Zero Only
1502	Floor 2F AF-20 Area Served Corridor Application Smoke Exhaust Air qty CFM 3600 SP in mm 30 Motor kW 1.5	ZO.4.6	1.00	NUM		0.00	INR Zero Only
1503	Floor 3F AF-21 Area Served Corridor Application Smoke Exhaust Air qty CFM 5300 SP in mm 30 Motor kW 2.2	ZO.4.7	1.00	NUM		0.00	INR Zero Only
1504	Floor 3F AF-22 Area Served Corridor Application Smoke Exhaust Air qty CFM 3000 SP in mm 30 Motor kW 1.5	ZO.4.8	1.00	NUM		0.00	INR Zero Only
1505	Floor 4F AF-23 Area Served Corridor Application Smoke Exhaust Air qty CFM 4800 SP in mm 30 Motor kW 2.2	ZO.4.9	1.00	NUM		0.00	INR Zero Only
1506	Floor 4F AF-24 Area Served Corridor Application Smoke Exhaust Air qty CFM 5800 SP in mm 30 Motor kW 2.2	ZO.4.10	1.00	NUM		0.00	INR Zero Only
1507	Floor 5F AF-25 Area Served Corridor Application Smoke Exhaust Air qty CFM 4800 SP in mm 30 Motor kW 2.2	ZO.4.11	1.00	NUM		0.00	INR Zero Only
1508	Floor 5F AF-26 Area Served Corridor Application Smoke Exhaust Air qty CFM 5500 SP in mm 30 Motor kW 2.2	ZO.4.12	1.00	NUM		0.00	INR Zero Only
1509	Floor 6F AF-27 Area Served Corridor Application Smoke Exhaust Air qty CFM 2500 SP in mm 30 Motor kW 1.1	ZO.4.13	1.00	NUM		0.00	INR Zero Only
1510	Floor 6F AF-28 Area Served Corridor Application Smoke Exhaust Air qty CFM 3600 SP in mm 30 Motor kW 1.5	ZO.4.14	1.00	NUM		0.00	INR Zero Only
1511	PACKAGED AIRWASHER Supply, installation, testing and commissioning of factory fabricated Outdoor type Double Skinned package floor mounted type evaporating air cooling unit fabricated out of extruded aluminium section with 0.6 mm pre-plasticized /pre-coated Galvanised steel sheet outside & 0.6 mm plain stainless steel (SS -304) sheet inside with blower section having DIDW backward curved blower (or equivalent performance direct driven plug fan) and EFF-1 blower motor (VFD Compatible) TEFC type suitable for operating on 415 ± 10% volts, 50 Hz ± 5% AC supply,1400 RPM, belt driven package, manual type aluminium aerofoil gear driven VCD & fire retardant double sleeve flexible connections made of silicon/neoprene rubber at outlet, wet section & tank shall be made of 18 G stainless steel (SS 304) having depth not less than 300mm. The Air-washer shall be complete with Celdek fill of depth 200 mm ,built-in drift PVC eliminators & with 50mm thick HDPE MERV-8 pre filters.The face velocity across the fill shall be limited to 500 FPM maximum.The Air-washer shall have minimum saturation efficiency of 90% & shall be complete with suitable capacity water circulation pump (including standby) GI B Class/CPVC interconnecting piping including valves ,y strainer & distribution header, , The airwasher panels shall be insulated with minimum 23mm thick & 40 ± 2Kg/m³ density PU foam..Fan & motor shall be selected for minimum 45mm Static pressure as required.Total static pressure shall be checked by vendor. Change in static pressure will not attract any price implication. The Airwasher shall conform to specifications given in the tender & shall be of following capacity.	ZO.5					
1512	For AC Plant Room at Ground floor AWS/01 - 11500 CFM, 1 x 630mm DIDW Backward curved Fan,1 x 5.5 KW Fan Motor, 45 mm St. Pressure, 2 x 0.5 HP Water Circulation Monoblock Pumps (1W +1S)	ZO.5.1	2.00	NUM		0.00	INR Zero Only
1513	For Cafeteria kitchen at Ground floor AWS/02 - 4500 CFM, 1 x 400 mm DIDW Backward curved Fan, 1 x 2.2 KW Fan Motor, 45 mm St. Pressure, 2 x 0.5 HP Water Circulation Monoblock Pumps (1W +1S)	ZO.5.2	2.00	NUM		0.00	INR Zero Only
1514	KITCHEN EXTRACT FAN SECTION INTEGRATED WITH DRY SCRUBBER	ZO.6	1.00	NUM		0.00	INR Zero Only

1515	Supply, Installation, Testing and Commissioning of Airhandling units comprising of fan section, section for accommodating dry type scrubber unit (specifications as detailed below) and air intake section of minimum 900mm depth for extract air complete with floor standing backward curved DIDW centrifugal fan (or equivalent plug fan) GI/Extruded aluminium base frame,TEFC squirrel cage induction high efficiency EFF-1 motor (VFD Compatible) with class "H" insulation ,drive package and vibration isolation arrangement including spring isolators or as recommended by manufacturer.Complete unit casing shall be fabricated out of double skin panels with minimum 23mm thick injected puff of density not less than 40Kg/Cum as specified. Fan motor shall be suitable for operating on 415± 10% volts, 50 Hz, 3 phase AC power supply. The kitchen fan motor shall be outside hot air stream. Fan outlet velocity shall not exceed 1800 FPM.Fan & motor shall be selected for minimum 75mm Static pressure as required.Total static pressure shall be checked by vendor. Change in static pressure will not attract any price implication.						
1516	Scrubber shall comprise of electrostatic precipitator, dry type air cleaner to remove oil, smoke and fumes from exhaust air, as per the Specifications. Electrostatic section shall be made of 18 gauge galvanised sheet, high bake epoxy powder coated, washable type aluminium mesh pre filters, Ionizing-Collecting cell(s) shall be of one-piece construction minimum 13.38" inches deep in direction of airflow, to work as magnet for charged smoke & oil particles.Average efficiency shall be 90-95% in single pass as per DOP test method. Electrostatic Precipitator shall be able to charge particles from 0.01 micron to 10 microns through solid state power supply. Collector cell shall be of permanent type and incorporate slide out facility for easy removal for cleaning.Ionizing electrodes shall be heavy duty tungsten wire rigidly supported both vertically and laterally. High voltage support insulators shall be made of Teflon, including center hole, glazed to enhance dielectric strength and retard tracking. Insulators shall be mounted out of the airstream, to reduce contaminant buildup. All high voltage electrical connections within each tier of cells, shall facilitate automatic connection when cells are installed. Power supplies shall be 100% solid state CE Listed, Module shall be equipped with Pulse width modulating (PWM).The system shall be fitted with interlock switch for safety . The system shall allow connection to a fan section to achieve 500 FPM velocity across the air cleaner. All units shall have Arc Supression & Auto Restart and shall have BMS (Building Management System) compatibility, Performance Indicator Lightsshall be part of the system to indicate the status of the air cleaning system. Power Consumption shall not be more than 50 watts per ESP cell.						
1517	Operating Voltage : 220V, 50 Hz						
1518	Ionizing Voltage : 12.5 to 13 KVDC						
1519	Collector Cell Voltage : 6 to 6.5 KVDC						
1520	Power Consumption : 50 Watts						
1521	Note:Scrubber supplied at site shall be factory fitted with in the fan section as an integral part of the airhandling unit with necessary air intake section.The fan characteristics shall be as follows :						
1522	EFS-1/Terrace floor/ Cafe kitchen - 5000 CFM, 90 mm St. Pr, DIDW Backward curved Fan 1 x 400 mm dia, 1 x 3.7 Kw Fan Motor with class H insulation.(Horizontal floor mounted unit) Dry scrubber module shall have 2500 cfm x 2 filter modules						
1523	SUB-HEAD-III : CHILLED & CONDENSER WATER PIPING	ZP					
1524	Chilled / Condenser Water Piping	ZP.1					
1525	Supply, Installation, testing & Commissioning of MS "C" class ERW Chilled water piping conforming to IS1239/IS3589 cut to required lengths & complete with fittings such as bends, elbows, tees, reducers, rubber gaskets, factory fabricated GI piping supports & vibration isolators, companion flanges,thermowells for sensors/thermometers & socket for BAS, painting etc. Price shall also include pressure testing.						
1526	The wall thickness of pipes for 200NB shall be 6.0mm & for 250NB & above shall be 8.0mm.						
1527	Chilled water piping	ZP.1.1					
1528	25 mm dia pipe	ZP.1.1.1	500.00	M			0.00 INR Zero Only
1529	32 mm dia pipe	ZP.1.1.2	525.00	M			0.00 INR Zero Only
1530	40 mm dia pipe	ZP.1.1.3	500.00	M			0.00 INR Zero Only
1531	50 mm dia pipe	ZP.1.1.4	250.00	M			0.00 INR Zero Only
1532	65 mm dia pipe	ZP.1.1.5	50.00	M			0.00 INR Zero Only
1533	80 mm dia pipe	ZP.1.1.6	40.00	M			0.00 INR Zero Only
1534	100 mm dia pipe	ZP.1.1.7	85.00	M			0.00 INR Zero Only
1535	125 mm dia pipe	ZP.1.1.8	150.00	M			0.00 INR Zero Only
1536	150 mm dia pipe	ZP.1.1.9	220.00	M			0.00 INR Zero Only
1537	Condenser water piping	ZP.1.2					
1538	125 mm dia pipe	ZP.1.2.1	90.00	M			0.00 INR Zero Only
1539	200 mm dia pipe	ZP.1.2.2	95.00	M			0.00 INR Zero Only
1540	Manual Balancing Valves Providing and fixing in position the following specified make Manual balancing valves complete with companion flanges, nuts, bolts, gaskets etc. as required. Balancing valves shall conform to PN-16 rating as per the specifications. Quoted price shall be inclusive of insulation for chilled & hot water as per the specifications.	ZP.2					
1541	32 mm dia (Insulated)	ZP.2.1	1.00	NUM			0.00 INR Zero Only
1542	40 mm dia (Insulated)	ZP.2.2	1.00	NUM			0.00 INR Zero Only
1543	50 mm dia (Insulated)	ZP.2.3	1.00	NUM			0.00 INR Zero Only
1544	65 mm dia (Insulated)	ZP.2.4	1.00	NUM			0.00 INR Zero Only
1545	80mm dia (Insulated)	ZP.2.5	3.00	NUM			0.00 INR Zero Only
1546	100 mm dia (Insulated)	ZP.2.6	4.00	NUM			0.00 INR Zero Only
1547	125 mm dia (Insulated)	ZP.2.7	7.00	NUM			0.00 INR Zero Only
1548	125 mm dia (Uninsulated)	ZP.2.8	6.00	NUM			0.00 INR Zero Only
1549	Butterfly Valves (Manual) Providing and fixing in position the following wafer type Butterfly Valves complete with companion flanges, nuts, bolts, gaskets etc. as required. Butterfly valves shall conform to PN -16 rating as per specifications. Quoted price shall be inclusive of insulation for chilled & hot water as per the specifications.	ZP.3					

1550	50 mm dia (Insulated)	ZP.3.1	32.00	NUM		0.00	INR Zero Only
1551	65 mm dia (Insulated)	ZP.3.2	3.00	NUM		0.00	INR Zero Only
1552	80mm dia (Insulated)	ZP.3.3	10.00	NUM		0.00	INR Zero Only
1553	100 mm dia (Insulated)	ZP.3.4	8.00	NUM		0.00	INR Zero Only
1554	125 mm dia (Insulated)	ZP.3.5	28.00	NUM		0.00	INR Zero Only
1555	125 mm dia (Uninsulated)	ZP.3.6	18.00	NUM		0.00	INR Zero Only
1556	150 mm dia (Insulated)	ZP.3.7	6.00	NUM		0.00	INR Zero Only
1557	200 mm dia (Gear driven) (Insulated)	ZP.3.8	3.00	NUM		0.00	INR Zero Only
1558	Butterfly Valves (Motorised) Providing and fixing in position the following Motorised Butterfly Valves with necessary ON/OFF type actuator and control wiring.The valve shall be with extended neck & complete with companion flanges, hot dip galvanised nuts & bolts, gaskets etc. as required. Butterfly valves shall conform to PN-16 rating as per the specifications. Quoted price shall be inclusive of insulation as per the specifications. The valve shall be BMS compatible.	ZP.4					
1559	125 mm dia (Insulated)	ZP.4.1	3.00	NUM		0.00	INR Zero Only
1560	125 mm dia (Uninsulated)	ZP.4.2	6.00	NUM		0.00	INR Zero Only
1561	Suction Guides Providing and fixing in position the following suction guides as per specifications (PN - 16). Suction guide shall be complete with companion flanges, nuts, bolts, gaskets etc. as required.Quoted price shall be inclusive of insulation as per the specifications. 125 mm dia	ZP.5	9.00	NUM		0.00	INR Zero Only
1562	Expansion Bellows Supply & Installation of neoprene single arch rubber expansion bellows with integral reinforced rubber flanges, guide rods on both sides at inlet and outlet of water chilling machines and circulation water pumps, of approved make.(Rating PN-16) 125 mm dia	ZP.6	30.00	NUM		0.00	INR Zero Only
1563	Ball Valves (For AHU, in Cast steel construction three piece design with screwed end)	ZP.7					
1564	Providing and fixing in position the following Ball Valves as per the specifications. Ball valves shall be complete with companion flanges, nuts, bolts, gaskets etc. as required. Quoted price shall be inclusive of insulation for chilled & hot water as per the specifications and of PN-16 rating.						
1565	32 mm dia	ZP.7.1	16.00	NUM		0.00	INR Zero Only
1566	40 mm dia	ZP.7.2	2.00	NUM		0.00	INR Zero Only
1567	Ball Valves (For Drain purpose in forged brass/Gun metal construction with screwed end)	ZP.8					
1568	Providing and fixing in position the following ball Valves as per the specifications. Quoted price shall be inclusive of insulation as per the specifications and of PN-16 rating.						
1569	40 mm dia	ZP.8.1	4.00	NUM		0.00	INR Zero Only
1570	32 mm dia	ZP.8.2	2.00	NUM		0.00	INR Zero Only
1571	25 mm dia	ZP.8.3	10.00	NUM		0.00	INR Zero Only
1572	20 mm dia	ZP.8.4	6.00	NUM		0.00	INR Zero Only
1573	15 mm dia	ZP.8.5	42.00	NUM		0.00	INR Zero Only
1574	Check Valves	ZP.9					
1575	Providing and fixing in position the following wafer type dual plate check valves. Check valves shall conform to PN-16 rating as per the specifications.Check valves shall be complete with companion flanges, nuts, bolts, gaskets etc. as required. Quoted price shall be inclusive of insulation as per the specifications.						
1576	125 mm dia (Insulated)	ZP.9.1	6.00	NUM		0.00	INR Zero Only
1577	125 mm dia (Uninsulated)	ZP.9.2	3.00	NUM		0.00	INR Zero Only
1578	Y-strainer	ZP.10					
1579	Providing and fixing in position the following Y-strainers as per specifications (PN - 16). Y strainers shall be complete with companion flanges, nuts, bolts, gaskets etc. as required.Quoted price shall be inclusive of insulation as per the specifications.						
1580	32 mm dia	ZP.10.1	8.00	NUM		0.00	INR Zero Only
1581	40 mm dia	ZP.10.2	5.00	NUM		0.00	INR Zero Only
1582	50 mm dia	ZP.10.3	8.00	NUM		0.00	INR Zero Only
1583	Pot Strainer	ZP.11					
1584	Supply, installation, testing and commissioning of Pot - Strainer of the following sizes confirming to tender specification.						
1585	200 mm dia (Uninsulated) CDW	ZP.11.1	1.00	NUM		0.00	INR Zero Only
1586	150 mm dia (Insulated) CHW	ZP.11.2	1.00	NUM		0.00	INR Zero Only
1587	Flow switches	ZP.12	6.00	NUM		0.00	INR Zero Only
1588	Providing and fixing in position approved make pedal type flow switches complete with copper control wiring between inlet and outlet of each chiller. These shall be BMS compatible.						
1589	Thermometer	ZP.13	60.00	NUM		0.00	INR Zero Only
1590	Supply, installation, testing and commissioning of Glycerine filled Dial type temperature gauge of approved make of dia 100 mm constructed out of SS 304 material.SS siphon shall be factory insulated with closed cell nitrile rubber in tubing form. Pressure gauges shall be fitted with a ball valve at the tube. (For Floor Mounted AHU, Chiller, Condenser & All Pumps)						
1591	Pressure Gauges	ZP.14	76.00	NUM		0.00	INR Zero Only
1592	Supply, installation, testing and commissioning of Glycerine filled industrial type pressure gauge of approved make of dia 100 mm constructed out of SS 304 material.SS siphon shall be factory insulated with closed cell nitrile rubber in tubing form. Pressure gauges shall be fitted with a ball valve at the tube. (For Floor Mounted AHU, Chiller, Condenser & All Pumps)						
1593	Auto air Purge	ZP.15					
1594	Providing and fixing in position the following automatic purge valve with ball valve.						
1595	15mm dia	ZP.15.1	42.00	NUM		0.00	INR Zero Only
1596	20mm dia	ZP.15.2	8.00	NUM		0.00	INR Zero Only
1597	25mm dia	ZP.15.3	4.00	NUM		0.00	INR Zero Only

1598	Test Points	ZP.16	8.00	NUM		0.00	INR Zero Only
1599	Providing and fixing in position of approved make Test Points comprising of accessories such as adaptors, needle etc. The test points shall be installed at inlet and outlet of ceiling suspended AHUs. Test points shall be in brass construction and comprise of 1/4" BSP with neoprene sealing bushes and screwed covers.						
1600	Flow meter	ZP.17	1.00	NUM		0.00	INR Zero Only
1601	Providing Ultrasonic type flow meter to measure the flow rates in the following chilled water pipe lines. Flow meter shall be with electronic digital readout and shall be capable of receiving 4-20 mA 0-10 volt DC signal from BAS /CPM. Flow rate 625USGPM						
1602	Butterfly Valves (Motorised)	ZP.18	1.00	NUM		0.00	INR Zero Only
1603	Providing and fixing in position the following Motorised Butterfly Valves with necessary Modulating type actuator and control wiring. The valve shall be with extended neck & complete with companion flanges, hot dip galvanised nuts & bolts, gaskets etc. as required. Butterfly valves shall conform to PN-16 rating as per the specifications. Quoted price shall be inclusive of insulation as per the specifications. The valve shall be BMS compatible. 125 mm dia (Insulated)						
1604	Condensate Drain Piping	ZP.19					
1605	Supply, installation, testing and commissioning of condensate drain water piping of CPVC complete with fittings like elbows, tees, reducers, bends, U-traps, braided flexible pipe connections with GI clamps, flanges, supports, solvent etc. as required conforming to tender specifications and of following sizes.						
1606	25 mm dia pipe	ZP.19.1	560.00	M		0.00	INR Zero Only
1607	32 mm dia pipe	ZP.19.2	140.00	M		0.00	INR Zero Only
1608	40 mm dia pipe	ZP.19.3	30.00	M		0.00	INR Zero Only
1609	SUB-HEAD-IV : AIR DISTRIBUTION	ZQ					
1610	Rectangular GI Ducting (Factory Made)	ZQ.1					
1611	Supply, fabrication, Installation, testing and commissioning of factory fabricated rectangular ducts using G.I Sheets (120GSM coating). The price shall include factory fabricated TDF flanges, turning vanes, splitter dampers, supports (factory fabricated, full threaded GI rod/hangers & G.I slotted channel), sealant, neoprene gasket, access door etc. The joints shall be with least leak and shall be tested with pressure testing machine of approved vendor. Corrective action shall be taken, if the leakage is more than the permissible limit. Report shall be generated after satisfactory testing of ducts for leakage and shall be duly signed by the client's /PMC representative before giving clearance for the thermal insulation.						
1612	24 gauge galvanized sheet steel (TDF 01- 750mm)	ZQ.1.1	1800.00	M2		0.00	INR Zero Only
1613	22 gauge galvanized sheet steel (TDF 751 - 1500mm)	ZQ.1.2	2400.00	M2		0.00	INR Zero Only
1614	20 gauge galvanized sheet steel (TDF 1501- 2250mm)	ZQ.1.3	30.00	M2		0.00	INR Zero Only
1615	18 gauge galvanized sheet steel (TDF 2250mm & above)	ZQ.1.4	10.00	M2		0.00	INR Zero Only
1616	Note :- The Duct shall be manufactured as per SMACNA Standard but the minimum gauge shall be 24 G.						
1617	16 gauge (MS welded duct with angle frames duly painted with primer & fire rated paint (From outside for Kitchen exhaust)	ZQ.1.5	110.00	M2		0.00	INR Zero Only
1618	Site Fabricated GI Duct	ZQ.2					
1619	Supply, fabrication, Installation, testing and commissioning of site fabricated rectangular ducts using G.I Sheets (120GSM coating). The price shall include factory fabricated MS flanges (wherever required), turning vanes, splitter dampers, supports (factory fabricated, full threaded G.I rod/hangers & G.I slotted channel), sealant, neoprene gasket, access door etc. as required and as per ISI specifications. The joints shall be with least leak and shall be tested with pressure testing machine of approved vendor. Corrective action shall be taken, if the leakage is more than the permissible limit. Report shall be generated after satisfactory testing of ducts for leakage and shall be duly signed by the client's /PMC representative before giving clearance for the thermal insulation.						
1620	24 gauge galvanized sheet steel	ZQ.2.1	75.00	M2		0.00	INR Zero Only
1621	22 gauge galvanized sheet steel	ZQ.2.2	130.00	M2		0.00	INR Zero Only
1622	20 gauge galvanized sheet steel	ZQ.2.3	5.00	M2		0.00	INR Zero Only
1623	18 gauge galvanized sheet steel	ZQ.2.4	10.00	M2		0.00	INR Zero Only
1624	16 gauge (MS welded duct with angle frames duly painted for Kitchen exhaust)	ZQ.2.5	15.00	M2		0.00	INR Zero Only
1625	GSS VOLUME CONTROL DAMPER	ZQ.3	10.00	M2		0.00	INR Zero Only
1626	Supply, installation, testing and balancing of opposed multiblade box type GI volume control damper within ducts to be provided with suitable links, levers and quadrants for manual control of volume of air flow and for proper balancing of the air distribution system as per approved shop drawings & specifications. (All AHUs, fan sections VCD at machine outlets shall be included in the equipment cost only)						
1627	NON RETURN DAMPER	ZQ.4	7.00	M2		0.00	INR Zero Only
1628	Supply, installation, testing and commissioning of back draft dampers, gravity louver type on the supply air/ventilation ducts. The dampers shall be installed to avoid the short cycling of air w.r.t these fans/blowers installed in the same vicinity. The dampers shall be with suitable flanges. The frame shall be constructed of minimum 18 Gauge GI and blades shall be minimum of 24Gauge GI. The blades shall be provided with high class rubber/neoprene gaskets to avoid rattling noise during operation and to permit low leakage. All blades shall be fitted to a common linkage in such a manner so that all blades shall lift up and shut down simultaneously. The dampers shall open by the pressure differential generated by fan.						
1629	FIRE DAMPERS	ZQ.5					
1630	Supply, installation, testing and commissioning of multi blade sleeve type combined motorised fire & smoke dampers with spring return actuator. The damper shall be of atleast 1.5 hr. fire rating. The damper shall be as per CBRI approval. The damper shall be constructed out of 16G galvanised sheet steel. It shall be complete with control panel, spring return actuator, sensor. Cost to include control cabling between fire damper control panel, actuator and fan starter panel for necessary inter-locking / for tripping of AHU fan motor. The fire dampers shall be installed at locations shown in approved shop drawings and as per specifications.						

1631	Smoke & Fire Dampers.	ZQ.5.1	22.00	M2		0.00	INR Zero Only
1632	Control Panels with actuator suitable for 10-12 NM torque	ZQ.5.2	75.00	M2		0.00	INR Zero Only
1633	LINEAR GRILL (FIXED BAR)	ZQ.6	90.00	M2		0.00	INR Zero Only
1634	Supply, installation, testing & balancing of removable core type ,continuous, linear, fixed bar extruded aluminium powder coated Supply Air / Return Air / Exhaust Air grills, normal flow, 15° angle one way / two way deflection with all sides flanges.Blade thickness shall be minimum 5mm in front and 1.0 mm in rear side.Grills shall be supplied in accordance with specifications and approved shop drawings. 200 mm/150mm/100mm High						
1635	VCDs FOR LINEAR GRILL SUPPLY AIR COLLARS	ZQ.7	50.00	M2		0.00	INR Zero Only
1636	Supply, installation, testing & balancing of key operated extruded Aluminium volume control dampers in black mat finish for supply/return/exhaust air duct collars as per approved shop drawings and specifications.						
1637	SUPPLY/RETURN AIR SLOT DIFFUSERS	ZQ.8					
1638	Supply, installation, testing & commissioning of Extruded Aluminium powder coated Supply/Return Air linear Slot Diffusers with all side flanges with out damper.Slot diffusers shall be supplied in accordance with specifications and approved shop drawings.						
1639	2 Slot (20mm gap)	ZQ.8.1	30.00	M		0.00	INR Zero Only
1640	3 Slot (20mm gap)	ZQ.8.2	50.00	M		0.00	INR Zero Only
1641	FRESH AIR INTAKE LOUVERS	ZQ.9	5.00	M2		0.00	INR Zero Only
1642	Supply, installation, testing & balancing of Fresh air Extruded Aluminium intake louvers with bird screen and opposed blade box type GI volume control damper complete as per specification & approved shop drawings.Construction/profile of the louvers shall give a protection against the rain and suitable for fixing in the external facade of the building.						
1643	EXHAUST LOUVERS	ZQ.10	11.00	M2		0.00	INR Zero Only
1644	Supply, installation, testing & balancing of Exhaust air Extruded Aluminium intake louvers with bird screen complete as per specification & approved shop drawings.Construction/profile of the louvers shall give a protection against the rain and suitable for fixing in the external facade of the building.						
1645	SUPPLY/ RETURN AIR DIFFUSERS (Suitable for Gypsum ceiling)	ZQ.11	17.00	M2		0.00	INR Zero Only
1646	Supply, installation, testing and balancing of square, rectangular and round extruded aluminium powder coated Supply/ Return Air diffusers. Diffuser shall be with spring loaded removable core type distribution grid , key operated aluminium black matt finish dampers .Diffusers shall be supplied in accordance with specifications and approved shop drawings.						
1647	RETURN AIR / EXHAUST AIR DIFFUSERS (Suitable for Gypsum ceiling)	ZQ.12	17.00	M2		0.00	INR Zero Only
1648	Supply,installation,testing and balancing of square, rectangular and round extruded aluminium powder coated Return Air Diffusers/ Exhaust Air Diffusers. Diffuser shall be with spring loaded removable core type distribution grid and shall be without dampers.Diffusers shall be supplied in accordance with specifications and approved shop drawings.						
1649	PLAQUE TYPE SQUARE DIFFUSER - (Suitable for Grid ceiling)	ZQ.13					
1650	Supply, Installation , Testing and Balancing of powder coated square Plaque diffusers having removable core and constructed with high grade aluminium extruded alloy (without collar damper). All diffusers shall have a continuous square neck of minimum 32mm height suitable for fixing spill air box.						
1651	Neck size: 300 x 300mm., Outer size: 595 x 595mm Standard	ZQ.13.1	5.00	NUM		0.00	INR Zero Only
1652	Neck size: 375 x 375mm., Outer size: 595 x 595mm Standard	ZQ.13.2	160.00	NUM		0.00	INR Zero Only
1653	Neck size: 450 x 450mm., Outer size: 595 x 595mm Standard	ZQ.13.3	180.00	NUM		0.00	INR Zero Only
1654	SPILL AIR PLENUM BOX.	ZQ.14					
1655	The supply & installation of FACTORY FABRICATED spill air boxes made out of 0.6mm thick GI sheet with necessary spigot connection for fixing flexible duct and suitable collar for connecting to various neck diffuser.The box size shall be as mentioned below.						
1656	Box size of 300x300x400 mm(H)and equivalent required rectangular sizes. (For 300x300 neck size)	ZQ.14.1	5.00	NUM		0.00	INR Zero Only
1657	Box size of 375x375x400 mm(H) and equivalent required rectangular sizes. (For 375x375 neck size)	ZQ.14.2	160.00	NUM		0.00	INR Zero Only
1658	Box size of 450x450x400 mm(H) and equivalent required rectangular sizes. (For 450x450 neck size)	ZQ.14.3	5.00	NUM		0.00	INR Zero Only
1659	FLEXIBLE DUCTING	ZQ.15					
1660	Supply, Installation, Testing and Commissioning of factory made pre - insulated with 25mm thick glass wool having minimum density of 16 kg/cum. Flexible ducts shall have inner as well as outer skin constructed out of aluminium sheets. Duct shall be of following sizes:						
1661	200 mm dia	ZQ.15.1	70.00	M		0.00	INR Zero Only
1662	250 mm dia	ZQ.15.2	300.00	M		0.00	INR Zero Only
1663	300 mm dia	ZQ.15.3	20.00	M		0.00	INR Zero Only
1664	BUTTERFLY DAMPER	ZQ.16					
1665	Butterfly damper made of 22G GI sheet for Supply air and return grills/diffusers in grid/gypsum ceiling. Damper shall be provided with single flap, necessary stopper, flanges for fastening on to the duct surface(with gasket) and with grooves for clamping the flexible ducts securely.						
1666	200 mm dia	ZQ.16.1	5.00	NUM		0.00	INR Zero Only
1667	250 mm dia	ZQ.16.2	160.00	NUM		0.00	INR Zero Only
1668	300 mm dia	ZQ.16.3	5.00	NUM		0.00	INR Zero Only
1669	AIR TRANSFER GRILLS	ZQ.17	4.00	M2		0.00	INR Zero Only
1670	Supply,installation,testing and balancing of extruded aluminium construction duly powder coated non vision air transfer grills with two side frame to be provided in doors.						
1671	FLEXIBLE DUCT CONNECTOR	ZQ.18	1.00	M2		0.00	INR Zero Only
1672	Supply,installation and testing of double layer flexible duct connector consisting of a flame retardant fabric secured to extruded aluminium frame on both sides to provide a wear resistant airtight flexible connection. Fabric shall be mildew resistant, water proof and silicon impregnated.Flexible connector shall be supplied in accordance with the specifications and drawings. (This item shall be an integral part of the AHUs,FCUs, Axial flow fans and already captured in their specifications)						

1673	BIRD SCREEN	ZQ.19	7.00	M2		0.00	INR Zero Only
1674	Supply, installation, testing & balancing of factory made Bird screen made out of galvanized steel mesh in 20G having diamond pattern with GSS flanges and necessary cross bracings suitable for Fresh/ Exhaust air fans on terrace, complete as per specification & approved shop drawings.						
1675	Samples of grilles / diffusers will have to be submitted to the Architect for approval on size / shape / shade / colour before ordering.						
1676	SUB-HEAD-V: THERMAL INSULATION	ZR					
1677	Thermal Insulation(Internal ducting):	ZR.1	4700.00	M2		0.00	INR Zero Only
1678	Supply & installation of external thermal insulation on ducts with approved sample of Aluminium foil faced XLPE duct insulation with density 25-30 Kg/Cum for XLPE, class 'O' complete as per specifications. All longitudinal and transverse joints shall be sealed with 50mm wide and 3mm thick XLPE tape .						
1679	13mm thick (Supply air Ducts in return air path)						
1680	Acoustic lining for Ducting	ZR.2					
1681	Supply & Installation of acoustic lining within supply and return air ducting using open cell elastomeric insulation with antimicrobial protection having 140-160 Kg/cum. density.All ducts shown cross hatched on the approved shop drawings shall be provided with acoustic lining as per the specifications.						
1682	10 mm thick	ZR.2.1	250.00	M2		0.00	INR Zero Only
1683	20 mm thick	ZR.2.2	200.00	M2		0.00	INR Zero Only
1684	Acoustic lining (For AHU rooms)	ZR.3	1250.00	M2		0.00	INR Zero Only
1685	Supply and Installation of thermal/acoustic lining of walls & ceiling of AHU rooms using open cell elastomeric with 140-160 Kg/cum. density. The material should be fibre free,as per the specifications.						
1686	25mm thick						
1687	Chilled water pipe Insulation	ZR.4					
1688	Supply, Installation & Testing of below mentioned thickness of insulation with factory laminated black colour fibre glass cloth on closed cell elastomeric nitrile rubber insulation with density 40-60 Kg/ Cum, class 'O' material, in tubing form/flat sections for chilled water piping (including fittings,valves & flanges) to be installed in risers, branch piping and laid on terrace as per specifications and approved shop drawings. All longitudinal and transverse joints shall be sealed with 50mm wide and 3mm thick Nitrile rubber tape .						
1689	Quoted price shall be inclusive of adhesive and UV/mechanical protection using UV resistant paint/starbond coating spread over Glass cloth as per specifications.						
1690	25 mm thick insulation suitable for following pipe sizes	ZR.4.1					
1691	20 mm dia	ZR.4.1.1	20.00	M		0.00	INR Zero Only
1692	25 mm dia	ZR.4.1.2	500.00	M		0.00	INR Zero Only
1693	32 mm thick insulation suitable for following pipe sizes	ZR.4.2					
1694	32 mm dia	ZR.4.2.1	525.00	M		0.00	INR Zero Only
1695	38 mm thick insulation suitable for following pipe sizes	ZR.4.3					
1696	40 mm dia	ZR.4.3.1	500.00	M		0.00	INR Zero Only
1697	50 mm dia	ZR.4.3.2	250.00	M		0.00	INR Zero Only
1698	65 mm dia	ZR.4.3.3	50.00	M		0.00	INR Zero Only
1699	80 mm dia	ZR.4.3.4	40.00	M		0.00	INR Zero Only
1700	100 mm dia	ZR.4.3.5	40.00	M		0.00	INR Zero Only
1701	125 mm dia	ZR.4.3.6	40.00	M		0.00	INR Zero Only
1702	Chilled water pipe Insulation with in the AC Plant room	ZR.5					
1703	Supply, Installation & Testing of below mentioned thickness of insulation with plain closed cell elastomeric nitrile rubber with density 40-60 Kg/ Cum,class 'O' material, in tubing form/flat sections for chilled water piping (including fittings,valves & flanges) to be installed in plant room and headers running inside the plant room upto shafts as per specifications and approved shop drawings. All longitudinal and transverse joints shall be sealed with 50mm wide and 3mm thick Nitrile rubber . Pipe insulation along with valves shall be finished with 24G Aluminium cladding.Plastic sticker type water flow directions to be marked on the Aluminium sheathing.						
1704	38 mm thick insulation suitable for following pipe sizes	ZR.5.1					
1705	25 mm dia	ZR.5.1.1	5.00	M		0.00	INR Zero Only
1706	32 mm dia	ZR.5.1.2	5.00	M		0.00	INR Zero Only
1707	40 mm dia	ZR.5.1.3	5.00	M		0.00	INR Zero Only
1708	50 mm dia	ZR.5.1.4	10.00	M		0.00	INR Zero Only
1709	125 mm dia	ZR.5.1.5	90.00	M		0.00	INR Zero Only
1710	150 mm dia	ZR.5.1.6	90.00	M		0.00	INR Zero Only
1711	Chilled Water Pipe Insulation for Piping Running in Trench	ZR.6					
1712	Supply, Installation & Testing of insulation with 50mm thick PUF insulation (density of 36 ± 2kg per m3) covered with 2 layers of polystyrene sheet vapour barrier and finished with chicken wire mesh and 12mm thick sand cement plaster and 1 layer of tarfelt sheathing (STP) for chilled water piping (including fittings,valves & flanges) as per specifications and approved shop drawings.						
1713	100 mm dia pipe	ZR.6.1	50.00	M		0.00	INR Zero Only
1714	125 mm dia pipe	ZR.6.2	25.00	M		0.00	INR Zero Only
1715	150 mm dia pipe	ZR.6.3	140.00	M		0.00	INR Zero Only
1716	FCU's & AHUs Drain Pipe Insulation:	ZR.7					
1717	Supplying & installation of 6 mm thick closed cell nitrile rubber insulation with approved sample of black colour factory laminated fibre glass cloth with density 40-60 Kg/ Cum, class 'O' complete as per specifications in the form of pre-formed pipe sections and complete in all respects as per specifications and drawings on condensate drain pipes of the following sizes:						
1718	Quoted price shall be inclusive of adhesive and UV/mechanical protection using UV resistant paint/starbond coating spread over Glass cloth as per specifications.						

1719	25 mm dia	ZR.7.1	560.00	M		0.00	INR Zero Only
1720	32 mm dia	ZR.7.2	140.00	M		0.00	INR Zero Only
1721	40 mm dia	ZR.7.3	30.00	M		0.00	INR Zero Only
1722	SUB-HEAD-VI : ELECTRICAL WORK						
1723	Preamble to BOQ for MCC , Distribution Boards & wall mounted Starter Panels						
1724	General Notes & Specifications as given below shall be applicable to all panels.The vendors shall consider the following details in their item rates, wherever required:						
1725	Supporting rigid steel framework.						
1726	Cubicle type, 14 gauge CRCA sheet steel enclosure.						
1727	Panel Complete with interconnections and distribution bus bars.						
1728	Proper bonding to earth.						
1729	Painting/lettering on Breakers and distribution boards, the location they serve, Providing on each panel its circuit diagram.						
1730	Providing cable clamps / supports within distribution boards cable alley.						
1731	TPN MCCBs shall mean 3 pole MCCBs with adequate size of neutral link.						
1732	All MCBs shall be of minimum 10 KA breaking capacity.						
1733	All motor feeders MCCBs shall be of motor duty and shall be able to carry the inrush current of motor.						
1734	Distribution panels shall be Powder Coated with Siemens gray paint shade no. RAL-7032 of IS-5.						
1735	Degree of protection for following type of distribution panel enclosure shall be as per IS:13947-1993.						
1736	IP 42 for indoor panels.						
1737	IP 55 for outdoor panels with double door enclosure.						
1738	All MCCB's shall be provided with operating mechanism for door interlock.						
1739	Current density of aluminium shall be 1 sq mm for 1.0 amps for rated current of bus bars and current density of copper shall be 1 sq.mm for 1.25 amps for rated current of bus bars.						
1740	Tinned copper earth bus shall be provided through out the length of each board.						
1741	All measuring instruments (Meters) shall be of digital electronic with LED of approved make and compatible with BAS.						
1742	All indicating lamps shall be LED type.						
1743	All current/voltage transformers shall be cast resin type.						
1744	All hinged door shall be earthed through 2.5 sq mm tinned braided copper wire.						
1745	All panels shall have provision of the following:						
1746	Pad locking of Switch board doors.						
1747	Pad locking of MCCB's handles in "OFF" Position.						
1748	Additional set of C.T.s, potential free contacts, connectors, contactors with wiring etc are to be provided for BAS including space required for various transducers in Main Switch Board sections. Only transducers shall be supplied by BAS contractor.						
1749	All MCB's used for protection of resistive and lightly inductive load shall be type "B" characteristic and inductive (motor) load shall be of type "C" characteristic and discharge lamps and UPS etc. shall be of type D characteristic.						
1750	All incoming and outgoing air circuit breakers shall be placed on middle portion of the vertical in single tier formation.						
1751	All PTs / control transformers shall be provided with centre tap earth secondary.						
1752	All DOL & Star-Delta Starters shall be provided with voltage based SPPR (single phase preventor relay) and 2 nos. of Aux.Contacts for Remote operation/monitor.						
1753	The Panel fabricator shall provide Aluminium Bus-bars link from Breakers wherever more than two nos. of cables are terminated in the breakers.						
1754	Readymade 16SWG Sheet steel Enclosure with cutout For MCBs						
1755	The breaking capacity of MCCB's shall be mentioned panel wise. All MCCB's shall be with thermal magnetic releases upto 250 amps and microprocessor based above 250 amps capacity, unless specified otherwise.						
1756	All internal control wiring shall be heat resistant type.						
1757	Bus bar chamber shall be provided at top only. Incoming and outgoing cable entry shall be from top/bottom as required.						
1758	Live parts shall not be accessible after opening the door, Transparent acrylic sheet to be provided to cover the same.						
1759	Spare contacts of ACBs / MCCBs / Relay / Contactor shall be wired upto terminal block.						
1760	All Switchgear used in Starter Circuit shall be type-2 coordinated. Contactor rating shall be selected as per the kVAR rating of the capacitor bank from capacitor duty contactor range. Vendor to furnish the type-2 coordination chart and capacitor duty contactor selection chart.						
1761	Protection Releases Microprocessor based (PRMB) & Thermal magnetic (PRTM) shall be as describe below:						
1762	Protection Release Microprocessor Based (PRMB-1)						
1763	Over-current/long time protection range 105% - 120 % with Time setting						
1764	short circuit /short time protection range 100% - 1000 % with Time setting						
1765	Instantaneous short circuit Protection range 200% - 1500 % with Time setting						
1766	Earth Fault Protection range 20% - 100 % with Time setting						
1767	Under voltage & over voltage protection						
1768	Reverse power						
1769	Current unbalance						
1770	Phase sequence						
1771	Measurements						
1772	Voltage						
1773	Current						
1774	Power (Active,Reactive & Apparent)						
1775	Energy ((Active,Reactive & Apparent)						
1776	Power factor						

1777	Frequency						
1778	Protection Release Microprocessor Based (PRMB-2)						
1779	Over-current/long time protection range 105% - 120 % with Time setting						
1780	short circuit /short time protection range 100% - 1000 % with Time setting						
1781	Instantaneous short circuit Protection range 200% - 1500 % with Time setting						
1782	Earth Fault Protection range 20% - 100 % with Time setting						
1783	Measurements						
1784	Current						
1785	Protection Release Microprocessor Based (PRMB-3)						
1786	Over-current/long time protection range 105% - 120 % with Time setting						
1787	Instantaneous short circuit Protection range 200% - 1500 % with Time setting						
1788	Protection Release Thermal-Magnetic Based (PRTM)						
1789	Over-current						
1790	Short circuit						
1791	MOTOR CONTROL CENTRES FOR AIR CONDITIONING (Suitable for Indoor Duty)						
1792	Design, fabrication, assembly, wiring and supply of front operated dead front cubicle type compartmentalised as per Form 3B, rear access free standing, dust and vermin proof main switchboards suitable for use at 415 volts, 3 phase 4 wire 50 Hertz system suitable for a symmetrical fault level of 35 kA at 415 volts, fabricated from 2 mm thick CRCA MS sheets with hinged, gasketed (metal based neoprene) and lockable doors having structural reinforcement with suitable angle/channel/T/flat sections including 3 mm thick gland plates on top and bottom and including lifting hooks and including GI earth strip of required size with 2 nos earthing terminals and including powder coated paint finish of approved shade over metal surface cleaned and treated with minimum seven tank process complete with interconnections etc as per specifications, as required and as below.						
1793	Each MCC shall include cost of power cabling/wiring with earthing requirement including control wiring on GI Cable trays and inter locking between chillers, Cooling Tower fan motors (thru isolator switches) primary & secondary chilled water pumps ,condenser pumps,motorized valves & flow switch at chillers, flow meter/two way valve installed in de-coupler by pass line in order to execute the required sequence of operation. All cables and wires shall be FRLS XLPE insulated armoured. All cables shall be of 1100 volt grade FRLS XLPE insulated PVC sheathed (Copper conductor upto 10 sqmm & above 10sqmm Aluminium conductor) armoured.						
1794	All outgoing shall be provided with Stop/Manual/ Auto/selector switch to facilitate operation through BAS. All starters shall be provided with potential free Contacts for Connections to Building Automation System.						
1795	A separate set of CTs to be provided for BAS and wiring from CT's and voltage transducers to be brought on to separate set of terminals.						
1796	Note : MCCB's shall be motor duty and suitable for 35 kA (ICS) fault current. ACB shall be suitable for 50 kA fault current.						
1797	The final breaker sizes may be changed based on final selection of Chiller. The cost shall be included in this panel and the contractor shall not charged extra cost in future.						
1798	Supply including Receiving,unloading , shifting into plant room, fixing, testing & commissioning of HVAC panel as described below	ZS.1	1.00	NUM		0.00	INR Zero Only
1799	HVAC Plant room Location : Ground Level Utility Block						
1800	Motor Control Centre for Electrical Chillers,associated pumps & Cooling Towers (415 V) consisting of						
1801	BUS SECTION						
1802	Incoming						
1803	2 No. - 630 Amps each four pole EDO ACB with fault breaking capacity 50 kA (Ics = Icu 100%), fitted with interlocked door having front operating handle, conforming to IS-13947-2 1993 as amended up-to-date complete with following accessories for each ACB.						
1804	Microprocessor releases based relay(EMI & EMC certified) for over current, earth fault & short circuit protections with trip indications for each.						
1805	0-630 amps. 1 no. BMS compatible Multifunction meter with 800/5 amps CT's and selector switch. (V, A, power factor ,KWH, Dual) 1 set						
1806	Over voltage tripping mechanism for persistent voltage exceeding 110% of the rated voltage for more than 5 minutes- 1 Set						
1807	Terminals suitable to receive XLPE insulated Aluminium cables as indicated in SLD						
1808	Following indicating lamps, toggle switch and push buttons for each ACB with back up 2A SP MCB.						
1809	3 No. Phase indicating Lamps.						
1810	Indicating Lamps for the following:						
1811	Red for ACB ON.						
1812	Green for ACB OFF.						
1813	Orange for Auto Trip.						
1814	Push buttons for the Yellow for trip alarm cancellation.						
1815	Busbar						
1816	2 nos. Electrolytic high conductivity Aluminium three phase and neutral busbars with sleeves rated at 800 amps 35 kA for 1 sec. having a maximum current density of 1 amp per sq mm suitable to with stand symmetrical fault level of 35 kA at 415 volts. The neutral busbar is to be of 50% capacity.						
1817	Bus Coupler						
1818	630 amps 4 pole ACB, EDO (Bus-coupler) with ON/OFF /TRIP indiating lamps with control Fuse, short trip, breaker, control switch etc.						
1819	Outgoing for section-1						

1820	Following rated 415V, (icu=ics 100%) 35kA MCCB's with over current and short circuit releases thermal magnetic based (if not specified below) based with ON, indications, front operating handle & door interlock along with 2A SP MCB backup protection and control terminals & wiring as required etc. complete in all respects as mentioned in specifications and as required For each outgoing:					
1821	Two (2) nos. 320 Amp. TP+N MCCB (for 2 Chillers,both working) with microprocessor based releases with integrated earth fault protection.					
1822	One (1) no.63 Amp. TP + N MCCB with ON/OFF/TRIP indication lamps, digital ammeter with CTs and selector switch (For secondary CHW pumps of 11.0 KW motor serving Single Office Zone)					
1823	Two (2) nos. 40 Amp. TP+N MCCB including Variable frequency drive (Model Danfoss FC-102 or Equivalent) having ON/OFF/TRIP indication lamps and push buttons, digital ammeter with CTs and selector switch ,potential free contacts for remote operation in each feeder and Auto Manual Selector Switch as required (For Cooling tower fan of 5.5 KW motor each) or as per motor suggested by Cooling tower manufacturer).VFD shall be BMS compatible ,IP-20 rating and shall have in built choke to cater for the longer length of power cabling (Approx. 60 Rmt for each CT fan motor) without deration in the performance of the VFD.					
1824	Two (2) Nos. 32A TP+N MCCB with fully automatic DOL starter having contactors, O/L relay with voltage based single phase preventor suitable for operating 5.5 KW motor with ON/OFF / Trip indication lamps and push buttons, Digital ammeter with CTs and selector switch, potential free contacts for BMS Compatiability and Auto Manual Selector Switch as required (for Primary chilled Water Pumps)					
1825	Two (2) Nos. 63A TP+N MCCB with fully automatic Star/Delta starter having contactors, O/L relay with voltage based single phase preventor suitable for operating 11.0 KW motor with ON/OFF / Trip indication lamps and push buttons, Digital ammeter with CTs and selector switch, potential free contacts for BMS Compatiability and Auto Manual Selector Switch as required (for Condenser Water Pumps)					
1826	20 Amp. DP MCB -1 Nos with ON/OFF/TRIP indication lamps, digital ammeter with CTs and selector switch (For Booster CHW pumps of 1.5 KW motor for closed expansion tank).					
1827	2 Nos. compartment having Spare feeder for the following:					
1828	2 Nos.63 amps TP MCCB (35 kA)					
1829	1 No.100 amps TP MCCB (35 kA)					
1830	Outgoing for section-2					
1831	Following rated 415V, (icu=ics 100%) 35kA MCCB's with over current and short circuit releases thermal magnetic based (if not specified below) based with ON, indications, front operating handle & door interlock along with 2A SP MCB backup protection and control terminals & wiring as required etc. complete in all respects as mentioned in specifications and as required For each outgoing:					
1832	One (1) no. 320 Amp. TP+N MCCB (for 1 Chiller) with microprocessor based releases with integrated earth fault protection.					
1833	Two (2) nos.63 Amp. TP + N MCCB with ON/OFF/TRIP indication lamps, digital ammeter with CTs and selector switch (For secondary CHW pumps of 11.0 KW motor serving Single Office Zone)					
1834	One (1) no. 40 Amp. TP+N MCCB including Variable frequency drive (Model Danfoss FC-102 or Equivalent) having ON/OFF/TRIP indication lamps and push buttons, digital ammeter with CTs and selector switch ,potential free contacts for remote operation in each feeder and Auto Manual Selector Switch as required (For Cooling tower fan of 5.5 KW motor each) or as per motor suggested by Cooling tower manufacturer).VFD shall be BMS compatible ,IP-20 rating and shall have in built choke to cater for the longer length of power cabling (Approx. 60 Rmt for each CT fan motor) without deration in the performance of the VFD.					
1835	One (1) No. 32A TP+N MCCB with fully automatic DOL starter having contactors, O/L relay with voltage based single phase preventor suitable for operating 5.5 KW motor with ON/OFF / Trip indication lamps and push buttons, Digital ammeter with CTs and selector switch, potential free contacts for BMS Compatiability and Auto Manual Selector Switch as required (for Primary chilled Water Pumps)					
1836	One (1) No. 63A TP+N MCCB with fully automatic Star/Delta starter having contactors, O/L relay with voltage based single phase preventor suitable for operating 11.0 KW motor with ON/OFF / Trip indication lamps and push buttons, Digital ammeter with CTs and selector switch, potential free contacts for BMS Compatiability and Auto Manual Selector Switch as required (for Condenser Water Pumps)					
1837	1 No. compartment having Spare feeder for the following:					
1838	1 No.63 amps TP MCCB (35 kA)					
1839	1 No.100 amps TP MCCB (35 kA)					
1840	NOTE: Any change in capacity of breakers or feeders if required ,shall be identified by contractor at the time of tendering.After award, no price implication on account of change in capacity of breaker or feeder shall be accepted.					
1841	AHU STARTER PANEL - VFD STARTER (Type-1)	ZS.2				
1842	Design, manufacture, supply, installation, testing and commissioning of the following cubicle type, dead front, sheet steel, wall mounted AHU starter panels including anchoring into the wall with following details:					
1843	All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through BAS. All starters shall be provided with potential free Contacts for Connections to Building Automation System.					
1844	The panel shall include the following components and accessories.					
1845	16G CRCA Powder Coated panel enclosure with earthing studs & hinged locable doors. IP52 Protection, suitable for 415V, 3 Phase, 4 wire, 50Hz system.					
1846	Incomer switch shall be TPN MCB (motor duty) of required rating & 10KA fault withstand capacity for motors upto 11.0KW rating. MCB shall be with short circuit protection.					
1847	Incomer switch shall be TP MCCB (motor duty) of required rating & 20KA fault withstand capacity for motors beyond 11.0KW rating. MCCB shall be with overload & short circuit protection.					
1848	R,Y,B LED Type Phase indication lamps with control MCB's.					
1849	ON/OFF/TRIP Indication LED Type lamp with control MCB.					
1850	ON/OFF Push Buttons					

1851	VFD (Variable Frequency Drive) with all inbuilt features like protection against over load, short circuit & single phasing. VFD shall have inbuilt auto / manual / BMS operation functions selection & shall be BMS compatible. Drive shall have ON/OFF/Trip displays & metering & display of electrical parameters. Drive shall be Danfoss Vacon-20 series /Equivalent.						
1852	View window to read VFD parameters.						
1853	For on/off/remote and local operation, 3 pole single throw switch shall be provided in each AHU panel to facilitate override of the automatic operation.						
1854	A fire detection relay module for tripping of AHU motor on receiving fire signal & fire damper interlocking. Necessary nos. of auxillary contactors & Relays shall be included in cost as required for the interlocking with smoke extraction fans & motorised fire dampers.						
1855	240/24V AC Step down transformer for powering to 2 Way / 3 Way motorized valve with control MCB and wiring & conduiting upto valve in the chilled water line. 24V AC supply shall also be used for fire module relay.						
1856	2 Nos of Single Pole MCB's Shall be provided at the incoming section of the starter panel for fire damper actuator & AHU limit switch/Bulk head lighting.						
1857	Airwasher panel shall have additional set of On/Off push button with indication ,set of contactor and overload relay for the operation of 1no. Water circulation pump (0.37 Kw) and shall be BMS compatible.						
1858	Scrubber panel shall have additional set of On/Off push button with indication ,set of contactor and overload relay for the operation of 1no. dry scrubber (0.37 Kw) and shall be BMS compatible.						
1859	Terminal block for power distribution.						
1860	Panel shall have adequate ventilation arrangement for heat dissipated by VFD.						
1861	Note: Vendor to include the cost of all related power & control cabling (for AHU door limit switch,Bulk head light etc) on GI cable tray along with copper earthing , from airhandling unit motors to VFD control panels, from Exhaust dry scrubber to control panel and from Airwasher fan motor and its pumps to control panel. (For sizes of cables ,refer to the detailed specifications of Electrical section).All cables shall be FRLS XLPE insulated armoured.						
1862	The no. of AHU control panels/VFD starters shall be as per KW ratings given below:						
1863	AHU VFD Panel for 1.1 KW Motor	ZS.2.1	7.00	NUM			0.00 INR Zero Only
1864	AHU VFD Panel for 2.2 KW Motor	ZS.2.2	2.00	NUM			0.00 INR Zero Only
1865	AHU VFD Panel for 3.7 KW Motor	ZS.2.3	6.00	NUM			0.00 INR Zero Only
1866	AHU VFD Panel for 5.5 KW Motor	ZS.2.4	6.00	NUM			0.00 INR Zero Only
1867	Airwasher VFD Panel for 2.2 KW Motor	ZS.2.5	1.00	NUM			0.00 INR Zero Only
1868	Airwasher VFD Panel for 5.5 KW Motor	ZS.2.6	1.00	NUM			0.00 INR Zero Only
1869	Exhaust scrubber VFD Panel for 2.2 KW Motor	ZS.2.7	1.00	NUM			0.00 INR Zero Only
1870	NORMAL EXHAUST/SMOKE EXTRACTION FAN STARTER PANEL - (Type-2)	ZS.3					
1871	Design, manufacture, supply, installation, testing and commissioning of the following cubicle type, dead front, sheet steel, wall mounted Fan starter panels including anchoring into the wall with following details:						
1872	All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through BAS. All starters shall be provided with potential free Contacts for Connections to Building Automation System.						
1873	The panel shall include the following components and accessories.						
1874	1GG CRCA Powder Coated panel enclosure with earthing studs & hinged locable doors. IP52 Protection, suitable for 415V, 3 Phase, 4 wire, 50Hz system.						
1875	Incomer switch shall be TPN MCB (motor duty) of required rating & 10KA fault withstand capacity for motors upto 11.0KW rating. MCB shall be with short circuit protection.						
1876	Incomer switch shall be TP MCCB (motor duty) of required rating & 20KA fault withstand capacity for motors beyond 11.0KW rating. MCCB shall be with overload & short circuit protection.						
1877	R.Y.B LED Type Phase indication lamps with control MCB's.						
1878	ON/OFF/TRIP Indication LED Type lamp with control MCB.						
1879	ON/OFF Push Buttons						
1880	Digital ammeter with in built selector switch.						
1881	DOL/Star-delta starter for the ratings given below complete with contactors, over load relay with built in single phase protection. Starter shall be BMS compatible for Remote ON/Off & status monitoring complete with Auto/manual switch.						
1882	For on/off/remote and local operation, 3 pole single throw switch shall be provided in each Fan panel to facilitate override of the automatic operation.						
1883	A fire detection relay module for switching 'ON' of Fan motor on receiving fire signal & fire damper interlocking. Necessary nos. of auxillary contactors & Relays shall be included in cost as required for the interlocking with AHU fan motor & motorised fire dampers.						
1884	240/24V AC Step down transformer for powering 24V AC auxillary relay.						
1885	2 Nos of Single Pole MCB's Shall be provided at the incoming section of the starter panel for fire damper actuator & AHU limit switch/Bulk head lighting.						
1886	Time delay relay for delayed automatic restart of fan motor.						
1887	Terminal block for power distribution.						
1888	Note: Vendor to include the cost of all related power & control cabling on GI cable tray along with copper earthing , from Axial flow fan/DIDW fan motors to control panels. (For sizes of cables ,refer to the detailed specifications of Electrical section).All cables shall be FRLS XLPE insulated armoured for Normal mode fans and fire survival insulated armoured for Smoke Extraction fans.						
1889	DOL starters upto 5.5 KW & beyond star-delta starter shall be considered.						
1890	The no. of FAN control panels/starters shall be as per KW ratings given below:						
1891	Fan starter Panel for 0.75 KW Motor	ZS.3.1	1.00	NUM			0.00 INR Zero Only
1892	Fan starter Panel for 1.1 KW Motor	ZS.3.2	4.00	NUM			0.00 INR Zero Only
1893	Fan starter Panel for 1.5 KW Motor	ZS.3.3	6.00	NUM			0.00 INR Zero Only
1894	Fan starter Panel for 2.2 KW Motor	ZS.3.4	8.00	NUM			0.00 INR Zero Only

1895	Fan starter Panel for 3.7 KW Motor	ZS.3.5	2.00	NUM		0.00	INR Zero Only
1896	Fan starter Panel for 5.5 KW Motor (Suitable for Outdoor duty)	ZS.3.6	5.00	NUM		0.00	INR Zero Only
1897	Fan starter Panel for 7.5 KW Motor (Suitable for Outdoor duty)	ZS.3.7	1.00	NUM		0.00	INR Zero Only
1898	Fan starter Panel for 11.0 KW Motor (Suitable for Outdoor duty)	ZS.3.8	1.00	NUM		0.00	INR Zero Only
1899	AIR CURTAIN	ZS.4	1.00	NUM		0.00	INR Zero Only
1900	SITC of high velocity Air Curtain of following size suitable for effective air through of 02 mtrs. and velocity 8/9 mtr./sec at maximum noise level 60-65 decibels and having casing(shell) of robust construction, elegant look with superior quality powder-coated finish, impeller with forward curved blades to minimise the air cutting noise vibration free operation, easy mounting arrangement with a flat frame which can be fixed on the wall by suitable coach screws, adjustable louvers to streamline air delivery, coupled with sturdy motors for the continuous duty operation . a) Size: 7' long.						
1901	CSS WORK	8					
1902	Sub-Head-I : Preamble to BOQ for (Compact Type Substation)	ZT					
1903	The contractor shall consider the following details in their item rates, wherever required:						
1904	Supporting rigid steel framework.						
1905	Proper bonding to earth.						
1906	All work shall be executed as per drawing specification and instruction of Engineer-in-charge and shall include supply and installation at site of all the equipments, ancillary material, which may be required to fulfill the complete installation as per IS and IE rules.						
1907	HT Metering Panel (SEB's)	ZT.1					
1908	Supplying / Receiving, Installation, Testing and Commissioning of Powder coated, 14 SWG CRCA sheet steel enclosed 11 KV H.T. Metering Panel complete with the following:						
1909	1set of 11/ √3KV / 110/ √3 Volt, 100 VA burden & accuracy class 0.5, single phase construction, dry type cast resin PT.						
1910	3 Nos. of dual core 50/5A, 15 VA burden, accuracy class CL 0.5, 11 KV cast resin CTs						
1911	One Set of Phase Indicating Lamps.						
1912	2 Sets of HRC fuses with fuse base (H.T. Fuse - 1A & LT fuse 2-6A).						
1913	2 Nos. indoor cable end box suitable for 3C x 240 sq.mm. 11 KV(E), aluminium conductor XLPE Ar. cable (Incoming & Outgoing cable).						
1914	1 No. SEB approved digital Trivector meter with MDI in KVA of accuracy class - 0.5.(Accuracy class shall be as per local board)						
1915	Note: The contractor shall get the Trivector meter, CTs' & PT tested by SEB and the charges for liasioning for the same will be paid extra.						
1916	Supply Rate for Metering Panel as described above	ZT.1.1	1.00	SET		0.00	INR Zero Only
1917	Installation & Commissioning Rate for Metering Panel as described above	ZT.1.2	1.00	SET		0.00	INR Zero Only
1918	Note: The contractor shall ensure that the above panel meets the requirement as insisted by State/Local authorities(As per SEB) for satisfactory operation and as per the Drawings						
1919	11kV Compact Sub-Station	ZT.2	1.00	SET		0.00	INR Zero Only
1920	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site and supervising the testing & commissioning of 11kV compact secondary substation suitable for Outdoor installation with natural cooling, having type tested equipments comprising of oil-type distribution transformer and SF-6 insulated compact switchgear enclosed in robotically sealed stainless steel tank, low-voltage switchboard, interconnection between HT switchgear and transformer using cables and transformer to LT-switchgear using aluminium busbars, factory built ready for connection type, internal GI earthing provided complete with other associated equipments etc. complete as required conforming to IEC 62271-202 and relevant IS or international specifications, as regards to design, manufacturing, type-testing, routine-testing and operator safety (IAC AFLR). The enclosure shall have modular construction using G.I. Sheet and shall be powder-coated from exterior. The Transformer compartment will have IP-23 ingress protection, whereas the HT/LT compartment will have IP-54 protection.(Factory test or load test as per IS 2026 & IEC 60076)						
1921	The 11kV Outdoor Compact Sub-Station shall be consisting of following .						
1922	HT SWITCHGEAR						
1923	11kV 630Amps 20kA for 3 sec. & tested for 20kA/ 1 sec internal arc , SF6 insulated Non-Extensible Compact switchgear consisting of One No. Direct Module for Incomer and one No. of Fixed Manual Vacuum Circuit Breaker in SF6 insulated Stainless steel enclosure with series trip,self powered microprocessor based numerical over current and Earth Fault (IDMT+Inst.) relay protection along with. Interconnection between HT switchgear and transformer shall be using 3Cx240 sq.mm Al. armoured XLPE Cable.....1 Set						
1924	TRANSFORMER						
1925	1no. 1000KVA 11KV/433V Dyn11 Oil filled hermetically sealed transformer without conservator type of design having corrugated tank & Top normal porcelain Bushings for HT & LT with OLTC and RTCC switch of rating +5% to -15% @2.5%. Temp Rise - Oil/Winding 40/50 deg cel, NL/FL Losses = 1.4/14 KW (Subject to IS Tol.), Impedance 5% (Subject to IS Tol.)1 Set						
1926	Oil temperature Indicator, Winding Temperature indicator with Alarm and Trip Contact.....1 Set						
1927	LVS PANEL -2000AMPS ALUMINIUM BUSBARS....1Set						
1928	INCOMER						
1929	1 Nos. 1600A, 50KA 4 pole microprocessor based EDO, ACB with integral protection						
1930	OUTGOING						
1931	Direct Cable termination Suitable for 5 nos 3.5 core 300 sqmm, 1100 V grade, XLPE insulated PVC sheathed Armoured Aluminium cables						
1932	APFC (Automatic Powerfactor control)						

1933	330 kVAR APFC with 50X4, 25X3, 15X3,5X2 KVAR MPP type capacitor with MCCB/MCB/contactors & 12 step RVC relay with 800 Amp. 3P MCCB for incomer to APFC.....1 Set						
1934	OUTDOOR ENCLOSURE						
1935	Outdoor type enclosure with slanted roof & having construction of Galvanised Sheet Steel of thickness 1.5/2mm. The enclosure shall be type tested for IAC 20 kA/ 1 sec AB class as well as impact test as per IEC 62271-202 or international standards with reports not later than 5 years. The Enclosure shall have IP54 degree of protection for HT & LT switchgear compartment & IP23 degree of protection for Transformer compartment with transformer compartment thermal class of K-20 as per latest IEC. The enclosure shall be Powder Coated (Colour Light Gray & D.A.Gray). Each compartment will be provided with the door and pad locking arrangement. The Compartment illumination lamp with door operated switch shall be provided for each compartment.....1 Set						
1936	INTERCONNECTION AND EARTHING						
1937	Interconnection Between HT switchgear & Transformer using 3Cx240Sq.mm XLPE Single core cable & Interconnection between Transformer & LT switchgear using Aluminium Busbars. Internal earthing connections by using 50x6 mm GI strips.....1 Set						
1938	Supply of 11kV Compact Substation including Receiving,unloading , shifting at designated place, fixing, testing & commissioning as per specifications described above.						
1939	11 kv 2 POLE STRUCTURE	ZT.3	1.00	SET			0.00 INR Zero Only
1940	Supply, installation, testing & commissioning of two 11Mtr. pole structure, 11KV with cross arms, suitable clamps, insulators, disc insulators, 11KV lightning arrestors, complete stay with insulator & wire, foundations, gang operated air break switch with extended handle, 11KV drop out fuses. This shall have termination arrangement for outgoing through HT XLPE cable of suitable size and necessary 6 inches dia GI pipe shall be provided for cable support complete in every way.						
1941	WATER FOUNTAIN WORK	9					
1942	Water Feature 1:- Providing, fixing, testing & commissioning of Bubbler Jet with water fall Fountain						
1943	Providing, fixing, testing & commissioning of Nozzles	ZU.1					
1944	Supply, Installation, Testing & Commissioning of Bubbler Jet 1.5" Nozzles Standard.etc., complete	ZU.1.1	20.00	NUM			0.00 INR Zero Only
1945	Supply, Installation, Testing & Commissioning of White ABS plastic bottom inlet 2" for concrete with S.S. screws and regulable .. Flow/ inlet = 4,000 l/hr.	ZU.1.2	6.00	NUM			0.00 INR Zero Only
1946	Providing, fixing, testing & commissioning of Lights	ZU.2					
1947	Supply, Installation, Testing & Commissioning of SS 316 Niche Light 12V 18Watt RGB/WW (3watt x 6Nos Led) With Niche Standard etc., complete	ZU.2.1	50.00	NUM			0.00 INR Zero Only
1948	Supply, Installation, Testing & Commissioning of Power Supply,	ZU.2.2	10.00	NUM			0.00 INR Zero Only
1949	Providing, fixing, testing & commissioning of Pump	ZU.3					
1950	Supply, installation, testing and commissioning of single stage/Horizontal Openwell submersible pump 10HP	ZU.3.1	2.00	NUM			0.00 INR Zero Only
1951	Supply, installation, testing and commissioning of single stage/Horizontal Openwell submersible pump 2HP	ZU.3.2	1.00	NUM			0.00 INR Zero Only
1952	Providing, fixing, testing & commissioning of Filter	ZU.4					
1953	Supply, Installation, Testing & Commissioning of TOTALLY ANTI- CORROSIVE Bobbin Wound filter,700mm diameter. Fitted with pressure gauge panel manual air bleeder, water drain and emptying plug.fitted with collector arms and diffuser made from unplasticizedPVC and polypropylene .etc., complete. Max.EN ISO 9001 :2000 Standard.working pressure : 2.5 kg/cm². Flow rate = 16m³/hr.	ZU.4.1	1.00	NUM			0.00 INR Zero Only
1954	Sand for Sand Filter (SIZE 16/32 Mesh)	ZU.4.2	300.00	KG			0.00 INR Zero Only
1955	Providing, fixing, testing & commissioning of Control Panel (Equipments Make-L & T, Heger, Elmex, Rishabh, FTC, Esbee, Salzer etc.)	ZU.5	1.00	LS			0.00 INR Zero Only
1956	Supply & Commissioning of control panel complete as required. MCC(L&T)Relay(L&T)Push Bottom(Surdhi)Indicator(Surdhi)Auto Mannul Switch(Selzer)Auto Timer(L&T) Contactors(L&T)as described above and below.etc., complete DOL Starter						
1957	Ammeter(Selec).Volt Meter(Selec),						
1958	Lugs, Wires, Enclosure, .						
1959	Centrifugal Pump and power supply and automation for pump						
1960	Providing & fixing of Wires/cables of various sizes including necessary accessories(Flexible Round Cable) as per Design	ZU.6	1.00	LS			0.00 INR Zero Only
1961	Wire 2.5mm Two Core (Round)						
1962	Wire 2.5mm Three Core (Flat)						
1963	Wire 4mm Three Core (Flat)						
1964	PVC Conduit 25mm						
1965	Providing and fixing of pipes (uPVC pipe- 10 kg. Pressure) & fittings (Heavy)	ZU.7	1.00	LS			0.00 INR Zero Only
1966	Providing & fixing of Valves, fittings etc of required size	ZU.8	1.00	LS			0.00 INR Zero Only
1967	FURNITURE WORKS	10					
1968	Furniture works 1. The furniture product should be from the manufacture which have BIFMA Certification, GREENGUARD/ GREENPRO, AIOTA Certification. 2. The dimensions of the furniture as given in the respective items as below are indicative and there shall be no deviation of cost on account of this. However, the dimensions mentioned below may vary in between ± 10% during execution as directed by Engineer-In-Charge.	ZV					

1969	Reception table- Providing and fixing 4000 x 1000 x 1050/ 750 made out of 25mm thk commercial board as per approved drawing. The table finish include 60% Corian 20% laminate and 10% lacquered glass as per dimension, shape, size and colour. The Corian shall be buffed/ polished as per direction by engineer in charge. Provision for LED Light as per drawing shall be provided. Additional structure for the Cable Cubbies, VC connectivity's etc. The finishes to be of the highest quality standard conforming to the best of world class workmanship. And nothing extra shall be payable on this account.	ZV.1	1.00	NUM		0.00	INR Zero Only
1970	Drawer Pedestal - : Providing & making 2 Side Units for reception table made of 18 mm thick MDF top, sides, bottom, drawers of size 400mm width, 450mm long and 600 mm height finished with 1.0 mm laminate at top & sides, and 0.8 mm laminate on the inner sides. Side Unit will have 3 nos. of drawers with central locking arrangement, running on sliding channels. Drawers will be made of 12mm thick MDF sides, front & back with 4 mm thick base ply. Also 12 mm ply will be fixed on back side of unit. All internal surfaces will be finished with 0.8 mm laminate approved colour & shade complete as per instructions/ detail drawings at site.	ZV.2	1.00	NUM		0.00	INR Zero Only
1971	Linear Workstation for Security Staff room/Working Hall/Technical room	ZV.3	22.00	NUM		0.00	INR Zero Only
1972	Dimension: 1200mm(L) x 600mm(D) x 1200mm(H)						
1973	Supplying and placing in position of sliding tile/Panel base modular Workstation as per photograph/drawing. Free standing partition height 1200mm and should be minimum of 60-70mm thick. Partition inner frame is 1.1-1.2 mm thick mild steel/Aluminium. Horizontal and vertical trims are made out of extruded aluminium of 1.mm thick. All Panels/trims shall be powder coated with 50 microns. Aluminium trims are elegantly fixed with special fixtures in the partition. The frame work shall be fitted with 9mm thick pre laminated Particle tiles of approved shade. Partition shall have provision for pin up board with fabric/ white marker/ laminated of approved shade. Partition framework shall have adequate provisions for the movement of electric data cables at desired 2 levels; one at skirting and another above / below the table top. The complete partitioning work shall be carried out as per the approved drawing. Table top for workstation made up of 25mm thick pre laminated Particle board of approved shade. The worktop shall be supported on minimum 2mm thick powder coated CRCA brackets and side panels. Side's panels should be made from 18mm thick pre laminated Particle board of approved shade. All working or non-working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. . Provision of one PVC keyboard tray and Metal CPU trolley with lockable castors for each seating. Also a provision of Mobile Pedestal Unit (size: - L-400mm x D-450mm x H-600mm) with a combination of 2 drawer & one filing drawer. The pedestal storage unit shall be made of 18 mm thick prelaminated Particle board with provision of handles & central Locking arrangement. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
1974	L-Shape Workstation for Security Staff room/ Working hall/ PS with Steno	ZV.4	125.00	NUM		0.00	INR Zero Only
1975	Dimension: 1500mm(L) x 1350mm(L) x 600mm(D) x 1200mm(H)						
1976	Supplying and placing in position of sliding tile/Panel base modular Workstation as per photograph. Free standing partition height 1200mm and should be minimum of 60-70mm thick. Partition inner frame is 1.2-1.5mm thick mild steel/Aluminium. Horizontal and vertical trims are made out of extruded aluminium of 1.2-1.5mm thick. All Panels/trims shall be powder coated with 50 micron. Aluminium trims are elegantly fixed with hidden connectors on the partition. The frame work shall be fitted with 8mm thick pre laminated Particle tiles of approved shade. Partition shall have provision for pin up board with fabric/ white marker/ laminated of approved shade. Partition framework shall have adequate provisions for the movement of electric data cables at desired 2 levels; one at skirting and another above / below the table top. The complete partitioning work shall be carried out as per the approved drawing. Table top for workstation made up of 25mm thick pre laminated Particle board of approved shade. The worktop shall be supported on minimum 2mm thick powder coated CRCA brackets and side panels. Side's panels should be made from 18mm thick pre laminated Particle board of approved shade. All working or non-working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of one PVC keyboard tray and CPU trolley for each seating. Also a provision of Pedestal Unit (size: - L-400mm x D-450mm x H-600mm) with a combination of 2 drawer & one filing drawer. The pedestal storage unit shall be made of 18 mm thick prelaminated Particle board with provision of handles & locking arrangement the product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
1977	Medium height Storage for Security Staff room/Technical Room	ZV.5					
1978	Dimension: 2700mm(L) x 450mm(D) x 1200mm(H)	ZV.5.1	1.00	NUM		0.00	INR Zero Only
1979	Dimension: 1300mm(L) x 450mm(D) x 1200mm(H)	ZV.5.2	8.00	NUM		0.00	INR Zero Only
1980	Dimension: 1400mm(L) x 450mm(D) x 1200mm(H)	ZV.5.3	16.00	NUM		0.00	INR Zero Only
1981	Dimension: 6000mm(L) x 450mm(D) x 1200mm(H)	ZV.5.4	2.00	NUM		0.00	INR Zero Only
1982	Dimension: 2000mm(L) x 450mm(D) x 1200mm(H)	ZV.5.5	20.00	NUM		0.00	INR Zero Only
1983	Dimension: 950mm(L) x 450mm(D) x 1200mm(H)	ZV.5.6	16.00	NUM		0.00	INR Zero Only
1984	Dimension: 2480mm(L) x 450mm(D) x 1200mm(H)	ZV.5.7	12.00	NUM		0.00	INR Zero Only
1985	Dimension: 2970mm(L) x 450mm(D) x 1200mm(H)	ZV.5.8	3.00	NUM		0.00	INR Zero Only
1986	Dimension: 1850mm(L) x 450mm(D) x 1200mm(H)	ZV.5.9	16.00	NUM		0.00	INR Zero Only
1987	Dimension: 1600mm(L) x 450mm(D) x 1200mm(H)	ZV.5.10	17.00	NUM		0.00	INR Zero Only
1988	Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing. Storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						

1989	Emergency Response Table	ZV.6	1.00	NUM		0.00	INR Zero Only
1990	Dimension: 4450mm(L) x 1500mm(D) x 750mm(H)						
1991	Supplying and placing in position of meeting table as per drawing. Table top made out of 25mm Thk Prelam particle board Table Top with 2mm PVC Edge Banding on all Exposed edges. The table top supported on Mild Steel 50mm x50mm Slanted Leg and 50mm x 25mm Horizontal connectors with Powder coating of 50 Micron. Wire Management : 220/350mm Flip Up with soft closure and on Metal Cable Tray, Vertical wire entry cover considered for Power and data Management. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
1992	Main Table for DGM Cabin/ CA room/Doctors Room	ZV.7	24.00	NUM		0.00	INR Zero Only
1993	Main Table Dimension: (L)2100mm X (D)900mm X (H)750mm All over Side Runner Dimension: (L)1900mm X (D)450mm X (H)750mm						
1994	Providing and placing of table as per drawing. . Table top made up of 25mm thick pre-laminated particle board and understructure shall be made of 18mm thick prelaminated particle board gable ends and modesty panels. The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of 3 drawer mobile pedestal, one CPU trolley and PVC keyboard tray attached to the table top. The table shall be provisioned with free standing. Storage Top made out of 25mm thick pre laminated particle board and rest all storage to be made out of 18 mm thick prelaminated particle board . Storage having an openable shutter with handles and central locking arrangement. All exposed edges shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
1995	Back Storage for DGM Cabin/ CA room	ZV.8	24.00	NUM		0.00	INR Zero Only
1996	Dimension: (L)3000mm X (D)450mm X (H)750mm						
1997	Supplying, and placing in position of back storage as per photograph/drawing. The complete storage unit shall be made up of 18 mm thick Prelam particle board with 2mm thk PVC edge banding. The storage shall be provisioned with one shelf and 2 nos compartments. The storage shall have openable shutters with handles and locking arrangements. All working or non-working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
1998	Main Table for Ex. Cubicle	ZV.9	60.00	NUM		0.00	INR Zero Only
1999	Main Table Dimension : 1650mm(L) X 750mm(d) x 750mm(h) Side Runner Dimension: 900mm(L) X 450mm(d) x 750mm(h)						
2000	Supplying, and placing in position of main Table as per drawing. Modular tables size 1650mm (L) x 750mm (D) x 750mm (H). The Table top made out of 25mm thk Prelam particle board with 2mm thk pvc edge banding & side panel & modesty panel made up of 18mm thick pre-laminated particle board .The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. The table have a provision of free standing Side Storage of size 900mm L x 450mm D x 750mm Ht., Storage Top made out of 25mm thick pre laminated particle board and rest all storage to be made out of 18 mm thick prelaminated particle board . All exposed edges shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. Storage having provision of 3 drawer unit, one openable shutter, one open storage with handle & central locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2001	Back Storage for Ex. Cubicle	ZV.10	60.00	NUM		0.00	INR Zero Only
2002	Dimension: (L)2100mm X (D)450mm X (H)750mm						
2003	Supplying, and placing in position of back storage as per photograph/drawing. The complete storage unit shall be made up of 18 mm thick Prelam particle board with 2mm thk PVC edge banding. The storage shall be provisioned with one shelf and 2 nos compartments .The storage shall have openable shutters with handles and locking arrangements. All working or non-working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2004	Medium height Storage for Ex. Cubicle room	ZV.11					
2005	Dimension: (L)1725mm X (D)450mm X (H)1200mm	ZV.11.1	30.00	NUM		0.00	INR Zero Only
2006	Dimension: (L)1920mm X (D)450mm X (H)1200mm	ZV.11.2	8.00	NUM		0.00	INR Zero Only
2007	Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing. Storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2008	Medium height Storage for Passage area	ZV.12					
2009	Dimension: (L)2400mm X (D)450mm X (H)1200mm	ZV.12.1	3.00	NUM		0.00	INR Zero Only
2010	Dimension: (L)1725mm X (D)450mm X (H)1200mm	ZV.12.2	2.00	NUM		0.00	INR Zero Only
2011	Dimension: (L)1350mm X (D)450mm X (H)1200mm	ZV.12.3	1.00	NUM		0.00	INR Zero Only

2012	Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing. Storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2013	Conference / Meeting table - : Diamond Shaped : providing and fixing of the following as per design, Using Action Tesa High Gloss/Matt finish 18mm Pre Laminated Board, Fixed on 25 mm pre laminated MDF base TOP, with support structure of BSL MDF of matching design, Complete with SS T strip on the edge, Additional structure for the Cable Cubbies, VC connectivity's etc. The finishes to be of the highest quality standard conforming to the best of world class workmanship.	ZV.13					
2014	TABLE-1 4600 X 1500	ZV.13.1	1.00	NUM		0.00	INR Zero Only
2015	TABLE-2 6000 X 1500	ZV.13.2	1.00	NUM		0.00	INR Zero Only
2016	TABLE-3 7000 X 1500	ZV.13.3	1.00	NUM		0.00	INR Zero Only
2017	TABLE-4 6000 X 1500	ZV.13.4	1.00	NUM		0.00	INR Zero Only
2018	TABLE-5 6000 X 1500	ZV.13.5	1.00	NUM		0.00	INR Zero Only
2019	TABLE-6 11000 X 2000	ZV.13.6	1.00	NUM		0.00	INR Zero Only
2020	Back storage for GM Cabin-01.02/ CGM Cabin	ZV.14	7.00	NUM		0.00	INR Zero Only
2021	Dimension:(L)3800mm X (D)450mm X (H)750mm						
2022	Supplying, and placing in position of back storage as per photograph/drawing. The complete storage unit shall be made up of 18 mm thick Prelam particle board with 2mm thk PVC edge banding. The storage shall be provisioned with one shelf and 2 nos compartments. The storage shall have openable shutters with handles and locking arrangements. All working or non-working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2023	Main Table for PS to GM Cabin/ PS with Steno	ZV.15	6.00	NUM		0.00	INR Zero Only
2024	Main Table Dimension: 1650mm(L) X 750mm(h) Side Runner Dimension: 900mm(L) X 450mm(d) x 750mm(h)						
2025	Providing and placing of table as per drawing. Modular tables size 1650mm (L) x 750mm (D) x 750mm (H). Table top made up of 25mm thick pre-laminated particle board and understructure shall be made of 18mm thick pre-laminated particle board gable ends and modesty panels. The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of 3 drawer mobile pedestal, one CPU trolley and PVC keyboard tray attached to the table top. The table shall be provisioned with free standing Side Storage of size 900mm L x 400mm D x 750mm Ht., Storage Top made out of 25mm thick pre laminated particle board and rest all storage to be made out of 18 mm thick pre-laminated particle board. Storage having an openable shutter with handles and central locking arrangement. All exposed edges shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2026	Back Storage for PS to GM Cabin/ PS with Steno/ CGM Cabin/ED Cabin-01	ZV.16	6.00	NUM		0.00	INR Zero Only
2027	Dimension: 2480mm(L) X 450mm(d) x 750mm(h)						
2028	Supplying, and placing in position of medium height storage @ 750mm height as per photograph/drawing. Storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. Each unit to have openable shutters with handles & locking provision. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2029	INCHARGE TABLE- providing and fixing 4000 x 900 x 750 made out of 25mm thk commercial board as per approved drawing. The table finish include veneer wherever required as per dimension, shape, size and colour. The Corian shall be buffed/polished as per direction by engineer in charge. Provision for LED Light as per drawing shall be provided. Additional structure for the Cable Cubbies, VC connectivity's etc. The finishes to be of the highest quality standard conforming to the best of world class workmanship. And nothing extra shall be payable on this account.	ZV.17	2.00	NUM		0.00	INR Zero Only
2030	Back Storage for INCHARGE	ZV.18	4.00	NUM		0.00	INR Zero Only
2031	Dimension:(L)3500mm X (D)450mm X (H)750mm						
2032	Supplying and placing in position of 18mm thick plywood with laminate finish back storage as per image. A well-built bookcase with the looks this is the complete package. A compartmentalized shelving system with adequate space ensures any book will fit in the shelf. This Bookshelf is built using plywood with laminate with 2mm thick PVC edges.. The lower cabinets provide an alcoved space to ensure your books don't yellow with age. The lower area to be provisioned with openable shutters with handles and locking arrangements. The upper area to have open shelves for display. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2033	Main table for BMS room/Fire control room/ CCTV Control room/ Dispatch room/RGMC/CGD Control room	ZV.19	8.00	NUM		0.00	INR Zero Only
2034	Dimension: 1200mm(L) X 600mm(D) X 750mm(H)						

2035	Supplying, and placing in position of free standing table as per Image/drawing. The table top are made up of 25mm thick pre-laminated particle board with 2mm thk PVC edge banding. The Table supported with 18mm thk Prelam Particle board side panel & Modesty panel. The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of one fixed Pedestal storage unit (combination of two drawers and one filing drawer). Pedestal Unit made of 18mm thk prelaminated particle board with 2mm thk PVC edge banding. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2036	Medium Height storage for Dispatch room	ZV.20	1.00	NUM			0.00 INR Zero Only
2037	Dimension: 1800mm(L) X 450mm(D) x 1200mm(H)						
2038	Supplying, and placing in position of medium height storage @ 1200mm height as per photograph/drawing. The storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. The storage unit having openable shutters with D shape handles & locking arrangement. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2039	Full Height storage fort Record room	ZV.21	12.00	NUM			0.00 INR Zero Only
2040	Dimension : 900mm(L) X 450mm(D) X 1800mm(H)						
2041	Supplying, and placing in position of full height storage @ 1800mm height as per photograph/drawing. The storage unit having Openable shutters with shelf in it. The modular storage unit top shall be made from 18 mm thick pre-laminated particle board and rest of the sides as well as shelves and shutter to be made up of 18 mm thick pre-laminated particle board while back to be made of 8 mm thick pre-laminated particle board. All edges to be provided with 2 mm thick PVC lipping. The modular storage have openable shutters with Dshape handles and locking arrangement. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2042	Medium height partition	ZV.22	460.00	M2			0.00 INR Zero Only
2043	Supplying and placing in position of sliding tile/Panel base medium ht partition as per photograph/drawing. Free standing partition height 1200mm and should be minimum of 65-67mm thick. Partition inner frame is 1.1-1.2 mm thick mild steel/Aluminium. Horizontal and vertical trims are made out of extruded aluminium of 1.mm thick. All Panels/trims shall be powder coated with 50 microns. Aluminium trims are elegantly fixed with special fixtures in the partition. The frame work shall be fitted with 9mm thick pre laminated Particle tiles of approved shade. Partition shall have provision for pin up board with fabric/ white marker/ laminated of approved shade. Partition framework shall have adequate provisions for the movement of electric data cables at desired 2 levels; one at skirting and another above / below the table top. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2044	Main Table for GM Cabin-01.02/ CGM Cabin	ZV.23	7.00	NUM			0.00 INR Zero Only
2045	Main Table Dimension:(L)2400mm X (D)1130mm X (H)770mm Side Runner Dimension: (L)1200mm X (D)600mm X (H)770mm						
2046	Providing and placing of table as per drawing. Table top made up of 25mm thick pre-laminated particle board and understructure shall be made of 18mm thick prelaminated particle board gable ends and modesty panels. The working edges shall be provided with machine pressed 2mm thick PVC edging using special hot melt glue at hot temperature. Provision of 3 drawer mobile pedestal, one CPU trolley and PVC keyboard tray attached to the table top. The table shall be provisioned with free standing, Storage Top made out of 25mm thick pre laminated particle board and rest all storage to be made out of 18 mm thick prelaminated particle board . Storage having a openable shutter with handles and central locking arrangement. All exposed edges shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The product should be same as per the specification as above & ref image under the guidance of project architect and Engineer in charge. Make: Godrej, HNI, Spacewood Office Solutions (SOS), Herman Miller, Geeken						
2047	Total Amount of all items (SI No. 1 to SI No. 2046) excluding GST						0.00 INR Zero Only
2048	GST (CGST&SGST/UTGST or IGST) in percentage (%) on Total Amount of all items (i.e. GST on SI No. 2047 above)	1		percentage			0.00 INR Zero Only
Total in Figures							0.00 INR Zero Only