



डेडीकेटेड फ्रेट कोरीडोर

Dedicated Freight Corridor Corporation of India Ltd
(A Government of India Enterprise)

Tender No.: HQ/EL/HVAC/T/2019-20/1
(participation through www.tenderwizard.com/DFCCIL only)
(Tender wizard helpdesk: 011-49424365)

TENDER DOCUMENT
[Open Tender – Single Packet System]

Name of Work:

Replacement of VRF based old existing HVAC ODU's of MDV make by new inverter technology based VRF ODU's (compatible with existing IDU's) and Heat Recovery Units along with associated fittings with Comprehensive AMC at DFCCIL, Corporate Office, Pragati Maidan Metro Station Building Complex, New Delhi.

*approved
pages 1 to 99
Rai
31/10/19*

Corporate Office

Dedicated Freight Corridor Corporation of India Limited,
5th Floor, Pragati Maidan Metro Station Building Complex
New Delhi-110001

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CHECK LIST

List of documents to be uploaded during submission of Tenders online on www.tenderwizard.com/DFCCIL	
1	Demand Draft against 'Cost of Bid document' (para 3.4.4).
2	Demand Draft against 'Bid Security' (para 3.15).
3	Filled up Annexure – I & II and documents in support of Eligibility Criteria as per clause 4.1.1 & 4.1.2 respectively (mandatory).
4	The Covering Letter as per format given in the Section 2 (mandatory).
5	Corrigendum(s), if any.(mandatory)
6	Certified Copy of Registration of Firm/Company, Partnership deed/Memorandum and Articles of Association of the firm, as applicable. (mandatory)
7	Power of Attorney of the person whose digital signature has been used for online submission of tender photocopy duly attested by Notary Public as per para 3.4.1, 3.7.2 & 3.9 (mandatory).
8	Copy of GST no. (Mandatory) in the name of tenderer.
9	Annexure-V, VI, VII, X duly filled in, signed and stamped (mandatory)
10	PAN of Tenderer/Company/Proprietor/Partner(s), as applicable.
11	NEFT mandate form/bank details.
12	Affidavit declaring Tenderers status of non-performance or debarment (Para 3.23.3)
13	Certificate from OEM that VRF/VRV ODU's are compatible with the existing IDU's as specified in Technical Specifications.
14	Filled up Financial offer ('financial_offer.xls') to be uploaded in e-tender portal i.e, www.tenderwizard.com/DFCCIL (mandatory)

Note:

- (i) Sr.No.1-13: Scan copy of the original documents should be uploaded in 'Document Library'.
- (ii) Sr.No.14: Only the downloaded 'financial_offer.xls' file (do not change file name) should be uploaded after filling and saving. Do not upload scanned copy of 'financial_offer.xls' in 'Document Library'.



SECTION - 1
NOTICE INVITING TENDER NO. 01/2019

1.	Tender no.	: HQ/EL/HVAC/T/2019-20/1
2.	Name of Work	: Replacement of VRF based old existing HVAC ODU's of MDV make by new inverter technology base VRF ODU's (compatible with existing IDU's) and Heat Recovery Units along with associated fittings with Comprehensive AMC at DFCCIL, Corporate Office, Pragati Maidan Metro Station Building Complex, New Delhi.
3.	Completion Period	: 90 days from the date of issue of Letter of Acceptance.
4.	Estimated cost of work	: Rs. 2,55,08,784/- only. Estimated cost of the work is inclusive of all taxes(GST etc.), duties, transit insurance, freight, loading-unloading and shifting etc.
5.	Cost of Bid Document	: Rs. 11,800.00 (Rs. Eleven Thousand Eight Hundred Only). (Cost of Bid Document Rs. 10,000/- + GST@ 18% Rs. 1,800/-, non-refundable), tender offer without cost of bid document will be rejected) (para 3.4.4)
6.	E-Tender processing fee	: 0.1% of the estimated cost of work. Minimum – INR 750/- (plus GST) Maximum – INR 7,500/- (plus GST), payable to M/s ITIL, online. (Non- Refundable).
7.	Bid Security (E.M.D)	: Rs. 5,10,175/- (Rs. Five Lakhs ten thousand one hundred and seventy five only) – (2% of the estimated cost of work upto Rs. 20 Cr.) (tender document clause no. 3.15)
8.	Performance Security/ Guarantee (P.G)	: 5% of the Contract Agreement value (tender document clause no. 4.2)
9.	Security Deposit/ Retention Money	: 5% of the Contract Agreement value (tender document Clause no. 4.3)
10.	Validity of Offer	: 120 days from the date of opening of tender
11.	Address for communication	: GM/EL/TS, Dedicated Freight Corridor Corporation of India Ltd., Room No. 404,4th floor, Pragati Maidan Metro Station Building Complex, New Delhi-110001. Phone: 23454743; Mobile: 9717636893 Centralised Fax: 23454701
12.	e-tendering website:	: www.tenderwizard.com/DFCCIL
13.	Uploading of NIT & tender document	: On 31/10/2019.
14.	Last date & time of tender submission	: 22/11/2019 at 15.00 hrs.
15.	Date & time of tender opening	: 22/11/2019 at 15.30 hrs.
16.	Last date of submission of original documents viz. Bid Security (E.M.D) & Cost of bid document in the tender box.	: 22/11/2019 at 15.00 hrs.

Ravi
31/10/19
(Ravi Bhushan)
GM/EL/TS/CO
DFCCIL

001

FORMAT FOR SUBMISSION OF TENDER OFFER

Tender No.: _____

Name of Work: _____

To

The General Manager/Electrical/Technical Services/DFCCIL,
Acting through the Managing Director/DFCCIL, New Delhi.

Ref: This office NOTICE INVITING TENDER NO. HQ/EL/HVAC/T/2019-20/1

1. I/We _____ have read the various conditions to tender attached hereto and agree to abide by the said conditions. I/We also agree to keep this tender open for acceptance for a period of **120 days** from the date fixed for opening the same and in default thereof, I/We will be liable for forfeiture of my/our 'Bid Security'. I/We offer to do the work for DFCCIL, New Delhi, at the rates quoted in the attached schedule (Schedule of Rate and Quantities) and hereby bind myself/ourselves to complete the work in all respects within **90 days** from the date of issue of Letter of Acceptance of the tender.
2. I/We also hereby agree to abide by the **Indian DFCCILs/ DFCCIL Standard General Conditions of Contract**, with all correction slips up-to-date and to carry out the work according to the Special Conditions of Contract and Specifications of materials and works as laid down by DFCCIL/DFCCIL in the annexed Special Conditions/Specifications, Schedule of Rate & Quantities with all correction slips up-to-date for the present contract.
3. A sum of Rs. _____ is forwarded herewith as Bid Security. Full value of the Bid Security shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if:
 - (a) I/We do not submit all the requisite Performance Guarantee within the time specified in the Tender document; or
 - (b) Does not execute the Contract Agreement within 30 (thirty) days from the date of Issue of Letter of Acceptance or Sign the Agreement; or
 - (c) I/We do not execute the contract documents within seven days after receipt of notice issued by the DFCCIL that such documents are ready; or
 - (d) I/We do not commence the work within fifteen days after receipt of orders to that effect; or
 - (e) if the bidder withdraws his bid during the period of bid validity; or
 - (f) if, the bidder does not accept the correction of his bid price; and
 - (g) When any of the information furnished by the tenderer not found true.
4. I/We am/are a Startup firm registered by Department of Industrial Policy and Promotion (DIPP) and my registration number is valid upto (Copy enclosed) and hence exempted from submission of Bid Security.
5. Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

Signature of Witnesses:

Signature of Tenderer(s)

1)

Date:

2)

Address of Tenderer(s)

SECTION - 3
INSTRUCTIONS TO TENDERER(S)

3.1 General

Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL), a Govt. of India (Ministry of DFCCIL) Enterprise, invites **online open tenders** for execution of the subject work.

3.2 DFCCIL Bank Details:
Not used.

3.3 Submission of E-Tender:

3.3.1 NIT/Tender documents can be viewed on through www.tenderwizard.com/DFCCIL and www.dfccil.gov.in.

3.3.2 DFCCIL may issue addendum(s)/corrigendum(s) to the tender document. In such case, same shall be issued and placed on the above website at least **three days in advance** of due date of tender opening. Tenderer(s) must visit www.tenderwizard.com/DFCCIL before due date & time and ensure that their tender offer is in compliance of such addendum (s)/corrigendum(s).

3.3.3 Tender offer shall be **submitted through online mode only** at www.tenderwizard.com/DFCCIL. Tender offer submitted by any other mode will not be accepted.

3.3.4 E-Tenders shall be opened online at the address given below at the time and date given in Section-1 (Notice Inviting Tender) in the presence of Tenderer(s) or their authorized representatives, if any, who choose to attend the online tender opening.

Address: (online opening of tenders)
Dedicated Freight Corridor Corporation of India Ltd.,
4th Floor, Pragati Maidan Metro Station Building Complex,
New Delhi – 110 001.

3.3.5 While submitting the tender, all the pages of the tender document including annexures and attachments etc should be stamped and signed as a token of acceptance of terms and conditions therein.

3.4 Tender Document obtaining process:

3.4.1 It is mandatory for all Tenderer(s) to have class-III digital signature certificate (**in the name of person who will submit the online tender and have power of attorney to do so**) from any of the licensed certifying agency ("CA") [Tenderer(s) can see the list of licensed CAs from the link www.cca.gov.in] to participate in e-tendering of DFCCIL].

3.4.2 To participate in e-tender, it is mandatory for Tenderer(s) to get themselves registered with www.tenderwizard.com/DFCCIL and to have user ID & password. Payment of Registration fee and Tender Processing Fee to M/s ITI Ltd. can be done through www.tenderwizard.com/DFCCIL.

3.4.3 www.tenderwizard.com/DFCCIL, is the ONLY website for submission of tender offer. 'Vendor Manual' containing the detailed guidelines for e-tendering system is available on www.tenderwizard.com/DFCCIL.

- 3.4.4 Cost of Bid document shall be paid in favor of 'DFCCIL'. Mode of payment shall be Demand Draft, payable at 'New Delhi', executed by State Bank of India or any of the Nationalized Banks or by a Scheduled Bank.
- 3.4.5 E-Tender processing fees shall be paid online to M/s ITI Limited through www.tenderwizard.com/DFCCIL.
- 3.4.6 With the payment of processing fee, Tenderer(s) can download the 'Tender Document' and related documents and 'financial offer' file (Microsoft Excel file 'financial_offer.xls').
- 3.5 Tender submission process:**
- 3.5.1 At first Tenderer(s) are advised to upload scan copy of the documents mentioned in '**Check List**' in 'Document Library' at www.tenderwizard.com/DFCCIL. On-line tender offers not accompanied with mandatory documents as per the checklist will be summarily rejected.
- 3.5.2 After uploading above documents, Tenderer(s) should download 'financial_offer.xls' file, quote their rates in the applicable field and save it. After saving, Tenderer(s) can upload the filled up 'financial_offer.xls' file. **Name of the downloaded 'financial_offer.xls' file must not be changed.**
- 3.5.3 Tenderer(s) must submit the original document of 'Cost of Bid Document' and 'Bid Security' in tender box kept for the purpose at the address mentioned in NIT (Section-1) before tender closing date & time. Tender offer of those Tenderer(s) who fails to comply with the same will be rejected.
- 3.6 Modification / Substitution/ Withdrawal of Tender document:**
- 3.6.1 Tenderer(s) may modify, substitute or withdraw their tender offer after submission prior to tender closing date & time. No Bid shall be modified, substituted or withdrawn by tenderer(s) after tender closing date & time.
- 3.6.2 Any alteration/modification in the tender offer or additional information supplied subsequent to tender closing date & time, unless the same has been expressly sought for by DFCCIL, shall be disregarded.
- 3.6.3 For modification of financial offer, tenderer(s) has to detach its previous offer from www.tenderwizard.com/DFCCIL and then upload/resubmit digitally signed modified tender offer.
- 3.6.4 For withdrawal of tender offer, tenderer(s) has to click on withdrawal icon at www.tenderwizard.com/DFCCIL.
- 3.6.5 Before withdrawal, it may specifically be noted that after withdrawal of a tender offer, for any reason, tenderer(s) cannot re-submit their tender again.
- 3.7 Signing of tender and completing Financial offer:**
- 3.7.1 This tender being E-tender, the digital signature obtained from approved Controller of Certificate Authorities (CCA) shall only be considered as authentic for submission of technical as well as financial offer.
- 3.7.2 For participating in the tender, the **authorized signatory holding Power of Attorney shall be the Digital Signatory**. In case the authorized signatory holding Power of Attorney and Digital Signatory are not the same, the bid shall be considered non-responsive and will be rejected.

3.8 Deadline for submission of tender:

Tenderer(s) must ensure to complete the tender submission process in time as www.tenderwizard.com/DFCCIL will stop accepting any online tender offer after tender closing due date & time.

3.9 Partnership Deeds, Power Of Attorney etc:

- (i) The tenderer shall clearly specify whether the tender is submitted on his own (Proprietary Firm) or on behalf of a Partnership Firm / company / Joint Venture (JV) / Registered Society / Registered Trust etc. The tenderer(s) shall enclose the attested copies of the constitution of their concern, and copy of PAN Card along with their tender. Tender Documents in such cases are to be signed by such persons as may be legally competent to sign them on behalf of the firm, company, association, trust or society, as the case may be.
- (ii) In case tenderer is other than sole proprietorship firm, following documents shall be submitted by the tenderer:
 - (a) Partnership Firm: The tenderer shall submit (i) a copy of Partnership Deed and (ii) a copy of Power of Attorney (duly registered as per prevailing law) in favor of an individual to sign the tender documents and create liability against the Firm.
 - (b) Joint Venture (JV): Not applicable.
 - (c) Company registered under Companies Act-2013: The tenderer shall submit (i) the copies of MOA (Memorandum of Association) / AOA (Articles of Association) of the company; and (ii) A copy of Authorization/Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favor of the individual to sign the tender on behalf of the company and create liability against the company.
 - (d) LLP (Limited Liability Partnership) Firm: If the tender is submitted on behalf of a LLP Firm registered under LLP Act-2008, the tenderer shall submit along with the tender- (i) a copy of LLP Agreement, (ii) a copy of Certificate of Incorporation; and (iii) a copy of Power of Attorney/Authorization issued by the LLP Firm in favor of the individual to sign the tender on behalf of the LLP Firm and create liability against the Firm.
 - (e) Registered Society & Registered Trust: The tenderer shall submit (i) a copy of the Certificate of Registration, (ii) Deed of Formation; and (iii) a copy of Power of Attorney in favor of the individual to sign the tender documents and create liability against the Society/Trust.
- (iii) If it is NOT mentioned in the submitted tender that tender is being submitted on behalf of a Sole Proprietorship firm / Partnership firm / Joint Venture / Registered Company etc., then the tender shall be treated as having been submitted by the individual who has signed the tender.
- (iv) After opening of the tender, any document pertaining to the constitution of Sole Proprietorship Firm / Partnership Firm / Registered Company/ Registered Trust / Registered Society etc. shall be neither asked nor considered, if submitted.
- (v) A tender from JV / Partnership firm etc. shall be considered only where permissible as per the tender conditions.
- (vi) DFCCIL will not be bound by any change in the composition of the firm made subsequent to the submission of tender. DFCCIL may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Contractor.

- (f) The tenderer whether sole proprietor, a company or a partnership firm / joint venture (JV) / registered society / registered trust etc if they want to act through agent or individual partner(s), should submit along with the tender, a copy of power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person specifically authorizing him/them to submit the tender, sign the agreement, receive money, co-ordinate measurements through contractor's authorized engineer, witness measurements, sign measurement books, compromise, settle, relinquish any claim(s) preferred by the firm and sign "No Claim Certificate" and refer all or any disputes to arbitration.

3.10 The work is proposed to be executed under the following relationship:

3.10.1 **Employer:** 'DFCCIL' with its address as given in the Notice Inviting Tender.

3.10.2 **Contractor:** The successful Tenderer(s) to whom the work is awarded shall become the 'Contractor' for the execution of this work.

3.10.3 Throughout these Tender documents, the terms "Tender document and tender form" and their derivatives ("Tender"/ "Tenderer(s)", "Tender document/Tender", "Tender documents/Tendering", etc are synonymous. Day means calendar day. Singular also means plural.

3.11 Cost of Bid documenting & submission:

3.11.1 Tenderer(s) shall bear all costs associated with the preparation and submission of the online Tender document and the Employer will in no case be responsible or liable for these costs regardless of the outcome of the tender documenting/submission process.

3.11.2 Tenderer(s) are expected to examine all instructions, terms & conditions, forms, technical specifications and other information in the Tender documents. Failure to furnish all information required by the Tender documents or submission of a Tender document not substantially responsive to the Tender documents in every respect may be rejected.

3.12 Understanding Tenderer(s)'s Obligations and Liability:

3.12.1 Tenderer(s) must obtain for itself on its own responsibility and its own cost all the information including risks, contingencies & other circumstances in execution of the work. It shall also carefully read and understand all its obligations & liabilities given in the Tender document.

3.12.2 **Tenderer(s) is/are advised to visit and examine the site, before submission of tender, where the work is to be executed and its surroundings or other areas as deemed fit by Tenderer(s) and obtain for itself on its own responsibility all information that may be necessary for preparing the Tender document and execution of the contract. The cost of visiting the site and collecting relevant data shall be at the Tenderer(s) own expenses. It is a condition of the tender that Tenderer(s) is/are deemed to have visited the site and satisfied himself with all the conditions prevailing, including any difficulties for executing the work.**

3.12.3 At any time prior to the deadline for submission of tender, Employer may for any reason, whether at its own initiative or in response to any request by any prospective Tenderer(s), amend the Tender documents by issuing Corrigendum, which shall be part of the Tender documents.

3.13 Extension of Deadline for Submission of Tender document:

Employer may at its discretion extend the deadline for submission of the Tender documents at any time before the time of submission of the Tender documents. Any such change in date of submission shall be notified accordingly.

3.14 Language of Tender: The tender prepared by Tenderer(s) and all documents related to the tender shall be written in English.

3.15 Bid Security/Earnest Money:

- i) Each bidder shall furnish Bid Security as a part of his bid at the following rates:
 - a) Two percent of the estimated cost for works up to Rs. 20 crore (subject to a maximum of Rs. 30 lacs).
 - b) One and one-half percent of the estimated cost for works between Rs. 20 crore to Rs. 50 crore (subject to a maximum of Rs. 50 lacs).
 - c) One percent of the estimated cost for works above Rs. 50 crore.
- ii) The Bid Security shall be in favor of DFCCIL and may be in the following forms.
 - a) For work upto Rs. 50 crores Bankers Demand Draft/FDR from Nationalized/Indian Scheduled Commercial Bank.
 - b) For work above Rs. 50 crores
 - i) FDR/Bankers Demand Draft from Nationalized/Indian Scheduled Commercial Bank upto Rs. 2 crore.
 - ii) Bank Guarantee on approved format from Nationalized/Indian Scheduled Commercial Bank beyond Rs. 2 crore.
- iii) The bank guarantee shall be got confirmed from the bank preferably by sending a letter through bearer. The name of the bearer and the dates etc. should be clearly on record.
- iv) All such BGs and Bid Security received shall be maintained by the concerned Finance Officers in the Field or Corporate Office. It shall be the responsibility of the concerned Finance Officer to monitor the validity of the BGs (a register shall be maintained for this purpose) and ensure extension of the validity of the BGs in terms of the contract. Such BGs shall be released strictly in terms of the contract with the approval of the Competent Authority.
- v) Bank Guarantees (and other instruments having fixed validity) issued as surety for the bid shall remain valid for 90 days beyond the validity of the bid.
- vi) Dedicated Freight Corridor Corporation of India Limited (DFCCIL) reserves the right of forfeiture of Earnest Money Deposit (EMD) in case of Successful Tenderer if,
 - (h) if the bidder withdraws his bid during the period of bid validity;
 - (i) if, the bidder does not accept the correction of his bid price,
 - (j) In the case of a successful bidder, if he fails, within the specified time limit to furnish the required performance security or Sign the Agreement.
 - (k) Does not execute the Contract Agreement within 30 (thirty) days from the date of Issue of Letter of Acceptance; or
 - (l) Does not submit Performance Security in the form of Bank Guarantee of the requisite value (equal to 5 % of contract value) as per Annexure-I of Tender Document, within 15 days of issue of Letter of Acceptance; or
 - (m) Does not commence the work within 7 days after receipt of Letter of Acceptance or date as specified in the Letter of Acceptance.
 - (n) When any of the information furnished by the tenderer not found true.

The forfeiture of Earnest Money Deposit (EMD) shall be also applicable if work is terminated at any stage as per terms and conditions of the contract.

- vii) Bid Security of the unsuccessful bidders shall be discharged/ returned without interest as promptly as possible. The Bid Security of the successful bidder shall be converted to Retention Money/Security Deposit when the successful tenderer has signed the Contract Agreement and furnished the required performance security. Any Bid not accompanied by requisite Bid Security shall be summarily rejected as nonresponsive.

3.15.1 Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of MSME is followed:

- (i) Participating MSEs shall enclose with their offers, the proof of their being MSE registered with any of the agencies mentioned in the Notification of Ministry of MSME indicated below:
- a) District Industries Centers.
 - b) Khadi and Village Industries Commission.
 - c) Khadi and Village Industries Board.
 - d) Coir Board.
 - e) National Small Industries Corporation.
 - f) Directorate of Handicraft and Handloom.
 - g) Any other body specified by Ministry of MSME.
- (ii) The MSEs must also indicate the terminal validity date of their registration.
- (iii) As advised by Ministry of Finance, Government of India vide Office Memorandum No. F.5/4/2018-PPD Dated 28/02/2018 and forwarded by Ministry of DFCCILs vide Letter No. 2016/PL/56/1 Dated 19/03/2018, the MSE Bidders must declare their Udyog Aadhar Memorandum (UAM) Number issued by Ministry of MSME on Central Public Procurement Page **20** of **46** Portal (CPPP), in order to identify themselves as MSE Vendors, failing which they will not be able to enjoy the benefits as per Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 Dated 23.03.2012, issued by Ministry of MSME. The MSE Bidders shall enclose Documentary Proof for the same.

Failing Clauses 11.0 (i), 11.0 (ii) and 11.0 (iii) above, such offers will not be liable for consideration of benefits detailed in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 Dated 23.03.2012 issued by Ministry of MSME.

3.15.2 In pursuance of the Public procurement policy on MSE:

- (i) Tender document will be provided free of cost to MSEs registered with any of the agencies mentioned in Clause 3.15.1 above for the item tendered.
- (ii) MSEs registered with the agencies mentioned in Clause 3.15.1 above for the item tendered will be exempted from payment of Earnest Money Deposit (EMD).
- (iii) MSEs owned by Scheduled Castes or Scheduled Tribes (SC/ST) Entrepreneurs and Women may be indicated and proof of same may be enclosed.

3.16 **Validity of tender offer:**

- 3.16.1 The tender shall remain valid for the period of **120 days** after the date of the opening of the tender. If Tenderer(s) gives validity period less than that fixed/prescribed by Employer, the tender shall be liable to be rejected.

3.16.2 Notwithstanding the above clause, Employer may solicit Tenderer(s)'s consent to an extension of the validity period of the tender. The request and the response shall be made in writing.

3.17 Acceptance/Rejection of Tender:

3.17.1 DFCCIL reserves the right to accept/reject any or all tenders without assigning any reasons thereof. DFCCIL's assessment of suitability as per eligibility criteria shall be final and binding.

3.17.2 Tenderer(s) may note that they are liable to be disqualified at any time during tendering process in case any of the information furnished by them is not found to be true. Bid Security of such Tenderer(s) shall be forfeited. The decision of DFCCIL in this regard shall be final and binding.

3.17.3 The transfer of tender documents issued to a Tenderer(s) to another Tenderer(s) is/are not admissible.

3.18 Withdrawal of tender:

No tender can be withdrawn after submission and during tender validity period.

3.19 Canvassing

No Tenderer(s) is/are permitted to canvass to Employer on any matter relating to this tender. Any Tenderer(s) found doing so may be disqualified and his Tender document may be rejected.

3.20 Right to accept/split or reject any or all tenders:

The complete tender will be dealt in single package, however, Employer/Engineer reserves the right to accept, split, divide, negotiate, cancel or reject any tender or to annul and reject all tenders at any time prior to the award of the contract without incurring any liability to the affected Tenderer(s) or any obligation to inform affected Tenderer(s), the grounds of such action.

3.21 Award of contract

3.21.1 Employer/Engineer shall notify the successful Tenderer(s) in writing through Letter of Acceptance (LoA) by email/Registered Letter/Courier/Speed Post or per bearer that his tender has been accepted.

3.21.2 The Contractor shall sign the Office copy of the LoA in token of his acceptance and then it shall constitute a legal and binding contract between Employer/Engineer and the contractor till such time a formal contract agreement is signed.

3.22 Ineligibility to participate in re-tenders/future cases

Notwithstanding anything contained above, if a Tenderer(s) withdraws from an offer after having been declared a preferred Tenderer(s) or after Notification of award or does not sign the contract agreement pursuant to the Letter of Acceptance or does not submit an acceptable Performance Security which results in tender being annulled then such Tenderer(s) shall be treated as ineligibility for participation in re-tendering of this particular work & also for any other work for a period of 6 months. A repeat incident of similar type within a year of 2(two) years will render Tenderer(s) ineligible for participation in all future tenders for a further period of 2 (two) years.

3.23 Declaration of non-performance or ban status.

Tenderer(s) are not eligible to participate in the tender process under the following conditions:

- 3.23.1 They have been declared a non-performer by Central Government/State Government or a CPSU during the preceding 2 years.
- 3.23.2 They are currently debarred from contract work by Central or State Government of CPSU.
- 3.23.3 Accordingly, Tenderer(s)'s are required to submit an affidavit declaring their status of non-performance or debarment.

3.24 Details of disputed status of ban/non-performance

Tenderer(s)'s will clearly state the status of dispute in the cases of ban/non-performance pending in court against them as on the date of opening of tender. Merely, pending appeal with the Departments concerned & Courts will not merit change of status. Grant of stay order by a Competent Court will be taken into account while considering the status of ban/non-performance.

3.25 Non-Eligibility of Bidders:

- 3.25.1 A firm that has been engaged by DFCCIL to provide consulting services for the preparation or implementation of a project, and any of its affiliates (Associates, Subsidiary, JV Partner), shall not be eligible for subsequently providing goods or works (other than a continuation of the firm's earlier consulting services) for the same project.
- 3.25.2 Government-owned enterprises may participate in DFCCIL funded projects. For others the rules of Lending Agencies have to be followed.
- 3.25.3 A firm declared ineligible by DFCCIL or DFCCILs for indulging in corrupt or fraudulent practices shall be ineligible to bid for DFCCIL's project during the period determined.
- 3.25.4 A firm determined non-performing by DFCCIL shall not be eligible to bid during the period so determined.

3.26 Tenderer(s) to be fully responsible for consequences of misrepresentation.

- 3.26.1 Any suppression of information & misrepresentation will render Tenderer(s) ineligible for the tender along with the forfeiture of Bid Security. Tenderer(s) will also be liable for disqualification for future tenders of DFCCIL for a period of 2 years.
- 3.26.2 If any suppression of information & misrepresentation is found after the award of Contract, the Contract will also be terminated with forfeiture of Bid Security, Performance Security & Retention Money (if any). The Contractor will also be disqualified for future tenders of DFCCIL for a period of 2 years.
- 3.26.3 The Contractor shall fulfill the requirements of Clause no. 29 of Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010.

3.27 GST Applicability:

GST shall be paid as per applicability and based on Documentary Proof. As per GST Act, Anti Profiteering Measures shall be taken. Successful Agency shall pass Input Tax Credit to the DFCCIL and shall give Declaration within 3 days from the date of issue of Letter of Acceptance.



SECTION -4
SPECIAL CONDITIONS OF CONTRACT

4.1 ELIGIBILITY CRITERIA

4.1.1. Technical Eligibility Criteria:

- a) The tenderer must have successfully completed any of the following during last 07 (seven) years, ending last day of month previous to the one in which tender is invited:
- Three similar works costing not less than the amount equal to 30% of estimated cost of work/tender, or
- Two similar works costing not less than the amount equal to 40% of estimated cost of work/tender, or
- One similar work costing not less than the amount equal to 60% of estimated cost of work/tender.
- b) In such cases, what constitutes a component in a composite work shall be clearly pre-defined with estimated tender cost of it, as part of the tender documents without any ambiguity. Any work or set of works shall be considered to be a separate component, only when cost of the component is more than Rs. 2 crore each.

Note for Item 4.1.1:

Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organization, work experience certificate issued by Public listed company having average annual turnover of Rs 500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, incorporated/registered atleast 5 years prior to the date of opening of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed company to issue such certificates.

In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

Similar Nature of Work:

Work of Supply, Installation, Testing and Commissioning of VRV/VRF (Variable Refrigerant Flow) based HVAC Air Conditioning system shall be counted as work of Similar Nature for the tendered work.

4.1.2 Financial Eligibility Criteria:

The tenderer must have received contractual payments in the previous three financial years and the current financial year up to the date of opening of tender, at least 150% of the advertised value of the tender. The tenderers shall submit Certificates to this effect which may be an attested Certificate from the concerned department / client and/or Audited Balance Sheet duly certified by the Chartered Accountant etc.

4.1.4 Bid capacity:

Not applicable for the subject work (For works costing more than Rs. 20 Cr. or as prescribed by DFCCIL through instruction/NIT issued for the work).



4.2 PERFORMANCE SECURITY/GUARANTEE (P.G)

4.2.1 The successful bidder shall be required to furnish to DFCCIL a performance security within 15 days of the receipt of Letter of Acceptance, in an amount equivalent to 5% (five percent) of the total contract price. The Performance Security to be provided by the successful bidder in the form of a bank guarantee as per prescribed format (Annex. III) shall be issued from any Nationalized/ Indian Scheduled Commercial Bank. In case of Joint Venture (JV), the Bank Guarantee towards performance security shall be provided by JV.

4.2.2 The Bank Guarantee for performance security shall remain valid until a date 60 days (or as specified in the Contract) after expiry of Defects Liability Period. The performance security shall be returned to the contractor subject to issue of completion certificate by Engineer in-charge and furnishing of performance security /PG for reduced value equivalent to 5% of the contract cost of CAMC of the system for the period specified in technical specifications of contract. This performance security shall be released after successful completion of CAMC period as per conditions of the contract.

4.2.3 The Bank Guarantee for performance security shall be submitted invariably in the format given in the Bidding Document.

4.2.4 The performance security shall be released 21 days after issue of performance certificate.

4.3 SECURITY DEPOSIT/RETENTION MONEY

4.3.1 The Bid Security/EMD of successful bidder shall be retained by DFCCIL as part of Security for the faithful fulfillment of the contract by the contractor. In addition, a retention amount equal to 10% of each bill shall be retained till the total security available is 5% of contract amount.

4.3.2 The Bidder may, at his option, replace the retention amount with an unconditional bank guarantee from the bank acceptable to DFCCIL at the following stage:

After the amount reaches the maximum limit of retention money.

4.3.3 Retention money (or bank guarantee, which replaced retention money) shall be released upon

- i) Expiration of Defects liability period and entire CAMC period of the Works;
and
- ii) On certification by the Engineer that DFCCIL has no claim on contractor;
and
- iii) After final payment of the Contract.



4.4 PRIORITY OF DOCUMENTS

Where there is any conflict between the various documents in the Contract, the following order of priority shall be followed i.e. a document appearing earlier shall override the document appearing subsequently:

- 4.4.1 Contract Agreement
- 4.4.2 Letter of Acceptance.
- 4.4.3 Special Conditions of Contract.
- 4.4.4 Schedule of Rates & Quantities, Section-7.
- 4.4.5 Technical Specifications, Section-6.
- 4.4.6 ASHRAE Standard On HVAC
- 4.4.7 National Building Code 2016 and relevant Code & Standards.
- 4.4.8 Indian DFCCILs General Conditions of Contract

4.5 INDEMNITY BY THE CONTRACTOR

4.5.1 Indemnity against all actions of Contractor

The Contractor shall hold and save harmless and indemnify the Client/Employer/Engineer and their employees, from all actions, suits, proceedings, loss, costs, damages, charges, claims and demands of every nature and description brought against or recovered from the Client/Employer/Engineer and their employees by reason of any act or omission of the Contractor and/or his representative and/or his Employees and/or his sub-contractors in the execution of the works or in the guarding of the same. All the sums payable by Client/Employer/ Engineer by way of compensation under any of these conditions shall be recovered from the dues of the Contractor, without reference to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

4.5.2 Indemnity against all Claims of Patent rights and Royalties

The Contractor shall hold and save harmless and indemnify the Client/Employer/Engineer, his officers and Employees from and against all claims and proceedings for or on account of infringement by the Contractor of copyright, any patent rights, design, trademark or name, secret process, patented or un-patented invention, articles or appliances manufactured or used for or in connection with the works and from and against all claims, proceedings, costs, damages, charges, and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall pay all royalties, taxes, rent and other payments or compensation, if any, for getting the materials required for the works and due fulfillment of the contract and indemnify Client/Employer/Engineer against any claims in this regard.

4.5.3 Damage to Life and Property

The Contractor shall be responsible for all risks to works, nearby existing structures and life of his supervisors and workmen as also those of Employer/Client or any trespassers from whatever cause in connection with the works until these are taken over by Client/Employer/Engineer. The Contractor shall make good at his own expenses all loss or damages to life and property.

4.6 SUPPLY OF WATER AND ELECTRIC POWER

Water and Power supply required for the work shall be given only at one point. The cost of making necessary arrangements to the Engineer's distribution system, laying of cable & circuit protection, in case of electric power shall be borne by the Contractor, the rates for which shall be determined and notified by the Engineer.

4.7 PRICES

4.7.1 Rate quoted in the financial offer (financial_offer.xls) shall be firm and fixed. No cost escalation will be allowed on any account during the entire period of Contract.

4.7.2 Rates quoted shall be firm & inclusive of all taxes (GST etc.) and duties leviable. Rates shall also include transportation of material, transit insurance, e-way bill, loading, unloading, lifting/handling of material, insurance of material at site & workers, liaisoning with any other department, banker charges and other incidental charges.

4.8 PERIOD OF COMPLETION OF WORK:

Period of completion shall be **90 days** from the date of issue of Letter of Acceptance.

4.9 MEASUREMENTS

The Contractor shall be paid for the works at rates in the accepted Schedule of Rate & Quantities. The measurement shall be taken by the Engineer or his representative in the presence of the Contractor or his authorized representative.

4.10 WARRANTY (Defect Liability Period):

Warranty (Defect Liability Period) of material and works shall be 12 months from the date of commissioning of each outdoor system and taken over by DFCCIL as certified by DFCCIL. During this period, any failure of HVAC system shall be attended free of cost by the Contractor.

4.11 TERMS OF PAYMENT

Payment of 'On Account' bills shall be arranged as follows:

4.11.1 Payment for Replacement of HAVC system and other associated works (Schedule 1):

Supply: **60%** of the item price shall be paid on receipt of material at site after successful inspection and due certification by Engineer-In-Charge.

Installation: **20%** of the item price shall be paid after successful installation of the delivered items and after successful Pressure Testing of the connected Indoor & Outdoor unit circuit (Including ODU's for F.A.H.U's) and due certification by the Engineer-In-Charge.

Commissioning: **20%** of the item price shall be paid for successful testing & commissioning of the works and on issue of provisional acceptance letter and due certification by the Engineer-In-Charge. This includes achieving desired parameters as mentioned in Technical Specifications/ Standard specifications of the tender document. The commissioned system shall sustain the desired parameters & shall give trouble free performance at least for 03 (three) days or 72hrs of normal office hours working.

4.11.2 Payment for Schedule III , CAMC shall be made as under:

Quarterly payment shall be made on prorata basis after successful completion of each quarter (03 months) and duly certified by the Engineer-in-Charge.

4.12 Letter of Credit:

(i) The tenders having advertised cost of Rs 10 Lakhs and above, the contractor shall have the option to take payment from DFCCIL through a letter of credit (LC) arrangement.

(ii) This option of taking payment through LC arrangement has to be accepted by the tenderer at the time of bidding itself, and the tenderer shall affirm having read over and agreed to the terms and conditions of the LC option.

(iii) The option so exercised, shall be an integral part of the bidder's offer.

- (iv) The above option of taking payment through LC arrangement, once exercised by tenderer at the time of bidding, shall be final and no change shall be permitted, thereafter, during execution of contract.
- (v) In case tenderer opts for payment through LC, following shall be the procedure to release payment through LC:
- a) The LC may be a sight LC.
 - b) The contractor shall select his Advising/Negotiating bank for LC. The incidental cost towards issue of LC and its operation thereof shall be borne by the contractor.
 - c) DFCCIL's Delhi Bank will be the nodal Bank for issue of LCs based on online requests received from DFCCIL HQ. The Bank shall remain same for this tender till completion of contract. The incidental cost per annum of LC value, towards issue of LC and operation thereof shall be borne by the contractor and shall be recovered from his bills.
 - d) The LC shall be opened initially for a suitable duration as per Contract requirement in consultation with contractor and Banker. The LC shall be extended time to time as per the progress of the contract, on the request of the contractor. The value of LC to be opened initially as well as extended thereafter shall be finalized by the Engineer/CGM in consultation with the contractor on the basis of expected progress of work.
 - e) The LC terms and conditions shall inter-alia indemnify and save harmless the DFCCIL from and against all losses, claims and demands of every nature and description brought or recovered against the DFCCIL by reason of any act or omission of the contractor, his agents or employees, in relation to the Letter of Credit (LC). All sums payable/borne by DFCCIL on this account shall be considered as reasonable compensation and paid by contractor.
 - f) The LC terms and conditions shall inter-alia provide that DFCCIL will issue a Document of Authorization, here after will be termed as "DOA" after passing the bill for completed work, to enable contractor to claim the authorized amount from their bank.
 - g) The acceptable, agreed upon document for payments to be released under the LC shall be the DOA.
 - h) The DOA shall be issued by Finance against each bill passed by DFCCIL.
 - i) The contractor shall present his claim to his bank (advising Bank) for necessary payments as per LC terms and conditions. The claim shall comprise of copy of DOA and other documents as specified in the contract.
 - j) The payment against LC shall be subject to verification from DFCCIL's Bank (Local Bank Branch).
 - k) The contractor's bank (advising bank) shall submit the documents to the DFCCIL's Bank (Local Bank Branch)
 - l) The DFCCIL's bank (issuing bank) shall, after verifying the claim so received w.r.t. the digitally/physically signed DOA along with other documents received from DFCCIL, release the payment to contractor's bank (advising bank) for crediting the same to contractor's account.
 - m) Any number of bills can be dealt within one L.C, provided the sum total of payments to contractor is within the amount for which LC has been opened.
 - n) The LC shall be closed after the release of final payment including PVC amount, if any, to the contractor.
 - o) The release of performance guarantee or security deposit shall be dealt directly by DFCCIL with the contractor i.e., not through LC.

4.13 DETERMINATION OF CONTRACT

- 4.13.1 Right of DFCCIL to Determine the Contract:** The DFCCIL shall be entitled to determine and terminate the contract at any time should, in the DFCCIL's opinion, the cessation of work becomes necessary owing to paucity of funds or from any other cause whatever, in which case the value of approved materials at site and of work done to date by the Contractor will be paid for in full at the rate specified in the contract. Notice in writing from the DFCCIL of such determination and the reasons therefor shall be conclusive evidence thereof.
- 4.13.2 Payment on Determination of Contract:** Should the contract be determined under sub clause (1) of this clause and the Contractor claims payment for expenditure incurred by him in the expectation of completing the whole of the work, the DFCCILs shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfaction of the Engineer. The DFCCIL's decision on the necessity and propriety of such expenditure shall be final and conclusive.
- 4.13.3** The Contractor shall have no claim to any payment of compensation or otherwise, howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of determination of contract.
- 4.13.4 Determination of Contract owing to Default of Contractor:** If the Contractor should:
- (i) Becomes bankrupt or insolvent, or
 - (ii) Make an arrangement for assignment in favour of his creditors, or agree to carry out the contract under a Committee of Inspection of his creditors, or
 - (iii) Being a Company or Corporation, go into liquidation (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or
 - (iv) Have an execution levied on his goods or property on the works, or
 - (v) Abandon the contract, or
 - (vi) Persistently disregard the instructions of the Engineer, or contravene any provision of the contract, or
 - (vii) Fail to adhere to the agreed programme of work by a margin of 10% of the stipulated period, or
 - (viii) Fail to Execute the contract documents.
 - (ix) Fails to submit the documents pertaining to identity of JV and PAN.
 - (x) Fail to remove materials from the site or to pull down and replace work after receiving from the Engineer notice to the effect that the said materials or works have been condemned or rejected, or
 - (xi) Fail to take steps to employ competent or additional staff and labor as required, or
 - (xii) Fail to afford the Engineer or Engineer's representative proper facilities for inspecting the works or any part thereof as required, or
 - (xiii) Promise, offer or give any bribe, commission, gift or advantage either himself or through his partner, agent or servant to any officer or employee of the DFCCIL or to any person on his or on their behalf in relation to the execution of this or any other contract with this DFCCIL.
 - (xiv) (A) At any time after the tender relating to the contract, has been signed and submitted by the Contractor, being a partnership firm admit as one of its partners or employee under it or being an incorporated company elect or nominate or allow to act as one of its directors or employee under it in any capacity whatsoever any retired Engineer of the gazetted rank or any other retired gazetted officer working before his retirement, whether in the executive or administrative capacity, or whether holding any pensionable post or not, in the DFCCILs for the time being owned and administered by the President of India before the expiry of one year from the date of retirement from the said service of such Engineer or Officer unless such

- Engineer or Officer has obtained permission from the President of India or any officer duly authorized by him in this behalf to become a partner or a director or to take employment under the contract as the case may be, or
- (B) Fail to give at the time of submitting the said tender:
- (a) The correct information as to the date of retirement of such retired Engineer or retired officer from the said service, or as to whether any such retired Engineer or retired officer was under the employment of the Contractor at the time of submitting the said tender, or
 - (b) The correct information as to such Engineers or officers obtaining permission to take employment under the Contractor, or
 - (c) Being a partnership firm, the correct information as to, whether any of its partners was such a retired Engineer or a retired officer, or
 - (d) Being in incorporated company, correct information as to whether any of its directors was such a retired Engineer or a retired officer, or
 - (e) Being such a retired Engineer or retired officer suppress and not disclose at the time of submitting the said tender the fact of his being such a retired Engineer or a retired officer or make at the time of submitting the said tender a wrong statement in relation to his obtaining permission to take the contract or if the Contractor be a partnership firm or an incorporated company to be a partner or director of such firm or company as the case may be or to seek employment under the Contractor.
 - (f) Submits copy of fake documents / certificates in support of credentials, submitted by the tenderer. Then and in any of the **said Clause**, the Engineer on behalf of the DFCCIL may serve the Contractor with a notice in writing to that effect and if the Contractor does not within seven days after the delivery to him of such notice proceed to make good his default in so far as the same is capable of being made good and carry on the work or comply with such directions as aforesaid of the entire satisfaction of the Engineer, the DFCCIL shall be entitled after giving 48 hours' notice in writing under the hand of the Engineer to rescind the contract as a whole or in part or parts (as may be specified in such notice) and after expiry of 48 hours' notice, a final termination notice may be issued. Note: Engineer at his discretion may resort to the part termination of contract with notices only in cases where progress of work is more than or equal to 80% of the original scope of work.

4.13.5 Right of DFCCIL after Rescission of Contract owing to Default of Contractor:

- (a) The Contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any commitments or made any advances on account of or with a view to the execution of the works or the performance of the contract and Contractor shall not be entitled to recover or be paid any sum for any work thereto for actually performed under the contract unless and until the Engineer shall have certified the performance of such work and the value payable in respect thereof and the Contractor shall only be entitled to be paid the value so certified.
- (b) In the contract which has been rescinded as a whole, the Security Deposit already with DFCCILs under the contract shall be encashed/ forfeited and the Performance Guarantee already submitted for the contract shall be encashed. The balance work shall be got done independently without risk & cost of the failed Contractor. The failed Contractor shall be debarred from participating in the tender for executing the balance work. If the failed Contractor is a JV or a Partnership firm, then every member/partner of

such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV /partnership firm. Further the authorized representative of failed Contractor cannot be accepted as authorized representative in new contract.

- (c) In the contract rescinded in part or parts,
- (i) The full Performance Guarantee for the contract shall be recovered. No additional Performance Guarantee shall be required for balance of work being executed through the part terminated contract. The contract value of part terminated contract stands reduced to the balance value of work under the contract.
 - (iii) The defaulting Contractor shall not be issued any completion certificate for the contract.
 - (iv) The balance work shall be got done independently without risk & cost of the failed Contractor. The failed Contractor shall be debarred from participating in the tender for executing the balance work. If the failed Contractor is a JV or a Partnership firm, then every member/partner of such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV /partnership firm.
 - (v) Further the authorized representative of failed Contractor will not be accepted as authorized representative in new contract.
- (d) The Engineer or the Engineer's Representative shall be entitled to take possession of any materials, tools, implements, machinery and buildings on the works or on the property on which these are being or ought to have been executed, and to retain and employ the same in the further execution of the works or any part thereof until the completion of the works without the Contractor being entitled to any compensation for the use and employment thereof or for wear and tear or destruction thereof.
- (e) The Engineer shall as soon as may be practicable after removal of the Contractor fix and determine ex-parte or by or after reference to the parties or after such investigation or enquiries as he may consider fit to make or institute and shall certify what amount (if any) had at the time of rescission of the contract been reasonably earned by or would reasonably accrue to the Contractor in respect of the work then actually done by him under the contract and what was the value of any unused, or partially used materials, any constructional plant and any temporary works upon the site. The legitimate amount due to the Contractor after making necessary deductions and certified by the Engineer should be released expeditiously.



SECTION – 5

GENERAL CONDITIONS OF CONTRACT

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GENERAL CONDITIONS OF CONTRACT

5.1 DEFINITIONS

In the Contract, as herein after defined, the following word expressions shall have the meanings hereby assigned to them, except where the context requires otherwise.

- 5.1.1 **"Client or Principal Employer or Owner"** means the Department, Organization, individual, firm, company, J.V. or Consortium who awarded the work to Dedicated Freight Corridor Corporation of India Limited for execution of the project of which the works is a part, and shall include its heirs, executors, legal representatives etc.
- 5.1.2 **"Employer"** means the Dedicated Freight Corridor Corporation of India Limited, A Govt. of India (Ministry of DFCCIL) Enterprise (DFCCIL in abbreviation) acting through its Managing Director or any other authorized officer and shall include their legal successors in title and permitted assignees.
- 5.1.3 **"Engineer or Engineer in Charge"** means 'General Manager/Electrical/Technical Services' or 'GM/EL/TS' to act on behalf of 'Employer' for the purpose of operating the contract.
- 5.1.4 **"Engineer's Representative"** means any official nominated from time to time by the Engineer to act on his behalf.
- 5.1.5 **"Contractor"** means the individual, firm, Company, Corporation, Joint Venture, or Consortium whether incorporated or not, who enters into the Contract with the Employer/Engineer, and shall include its heirs, executors, administrators, successors, legal representatives, as the case may be.
- 5.1.6 **"Contractor's Representative"** shall mean the person responsible for execution of the contract who shall be so declared by the Contractor and who shall be authorized under a duly executed power of attorney to comply the instructions and to use, receive materials issued by the Engineer to the Contractor for works. He shall be capable of taking responsibility for proper execution of works.
- 5.1.7 **"Sub-Contractor"** means the individual, firm, Company, Corporation, Joint Venture or Consortium, having direct Contract with the Contractor and to whom any part of the work has been sublet by the Contractor and shall include his heirs, his executors, administrators, successors, legal representatives, as the case may be.
- 5.1.8 **"Other Contractors"** means the individual, firm, Company, Corporation, Joint Venture or Consortium employed by or having a Contract directly or indirectly with the Client/Employer/Engineer other than the Contractor.
- 5.1.9 **"Tenderer(s)" or "Tender"** means the individual, firm, Company, Corporation, Joint Venture or Consortium submitting a Tender document/tender.
- 5.1.10 **"Scheduled Bank"** means a bank included in the second schedule to the Reserve Bank of India Act, 1934, or modification thereto.
- 5.1.11 **"Contract"** shall mean and include the Agreement or Letter of Acceptance, the accepted Schedule of Rate & Quantities and Rates, the General Conditions of Contract, Special Conditions of Contract, Appendix to Tender, Form of Tender document, Instructions to Tenderer(s), Drawings, Specifications and other Tender Documents.
- 5.1.12 **"Tender or Tender document"** means the offer (Technical and/or Financial) made by individual, firm, Company, corporation, Joint Venture or Consortium for the execution of the works.

- 5.1.13 **"Specifications"** means the specifications referred to in the Contract and any modification thereof or addition thereto, or as may from time to time be furnished or approved in writing by the Engineer.
- 5.1.14 **"Drawings"** means the Drawings annexed to the Contract or referred in it and shall include any modifications of such Drawings and further Drawings as may be issued or approved by the Engineer.
- 5.1.15 **"Schedule of Rate & Quantities (BOQ)"** means list of items of work, their quantities and rates.
- 5.1.16 **"Original Contract Value"** means the sum stated in the letter of Acceptance/Contract Agreement.
- 5.1.17 **"Contract Value"** means the original contract value subject to the adjustments in accordance with the provisions of the Contract.
- 5.1.18 **"Temporary Works"** means all enabling works of every kind required for the execution of the works.
- 5.1.19 **"Permanent Work(s)/ Work(s)"** means the works (other than temporary works) to be executed in accordance with the Contract or part/s thereof as the case may be and shall include extra or additional, altered or substituted items of work as required for performance of the Contract.
- 5.1.20 **"Construction Plant"** means all machinery, appliances or things of whatsoever nature required for the execution, completion and maintenance of the works, but does not include material or other things intended to form or forming part of the permanent works.
- 5.1.21 **"Site"** means the land and/or other places on, under, in or through which the works are to be carried out, and any other lands or places provided by the Client/Employer/Engineer for the purpose of the Contract.
- 5.1.22 **"Material/s"** means all equipment, components, fittings and other materials including raw materials, which form part of the permanent works.
- 5.1.23 **"Test"** means such tests as prescribed in the Contract or by the Engineer or Engineer's Representatives, whether performed by the Contractor or by the Engineer or his Representative, or any agency approved by the Engineer.
- 5.1.24 **"Approval or Approved"** means approval in writing including subsequent written confirmation of previous verbal approval.
- 5.1.25 **"Defect Liability Period"** means the specified period of defects liability from the date of completion of the work as certified by the Engineer.
- 5.1.26 **"Letter of Acceptance"** means the letter from the Employer or the Engineer to the Contractor, conveying acceptance of the Tender.
- 5.1.27 **"Month"** means the Gregorian calendar month.
- 5.1.28 **"Day"** means the calendar day.
- 5.1.29 **"Time"** expressed by hours of the clock shall be according to the Indian Standard time.
- 5.1.30 **"Tender Date"** means closing date fixed for receipt of tenders as per notice inviting tender or extended by subsequent notification.
- 5.1.31 **"Rupees"** (or Rs. in abbreviation) shall mean Rupees in Indian currency.
- 5.2 HEADING AND MARGINAL NOTES**
- 5.2.1 The headings and marginal headings in these Standard General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part



thereof or be taken into consideration in the interpretation or construction thereof the contract.

5.2.2 Notices, Consents, Approvals, Certificates and Determination.

Wherever in the Contract provision is made for giving or issue of any notice, consent, approval certificate or determination, it shall be in writing and the words notify, certify or determine shall be construed accordingly.

5.2.3 Singular, Plural and General

Words importing the singular only also include the plural and vice versa where the context requires. Similarly, words importing masculine gender also include the feminine gender.

5.3 COMMUNICATION AND LANGUAGE OF CONTRACT

5.3.1 Communication to be in writing

All notices, communications, reference and complaints made by the DFCCIL or its Representative or the Contractor inter-se concerning the works shall be in writing or e-mail on registered e-mail IDs and no notice, communication, reference or complaint not in writing or through e-mail, shall be recognized.

5.3.2 Language of Contract

The Contract document shall be drawn up in English

5.3.3 Laws Governing the Contract

The Contract shall be governed by the laws in force in India.

5.3.4 Inspection of site and site data:

5.3.4.1 The Employer/Engineer shall make available with Tender Documents such data if any. The tender shall be deemed to have been based on such data, if provided, but the Contractor shall be responsible for his own interpretation of all such data.

5.3.4.2 The Contractor shall be deemed to have inspected and examined the site and information available in connection therewith and to have satisfied himself fully before submitting his Tender document about the sub-surface conditions, the hydrological and climatic conditions, the extent and nature of work and materials necessary for the completion of the works, the means of access to the site and accommodation he may require. He shall also be deemed to have obtained all necessary information regarding risks, contingencies and all other circumstances which may influence or affect the contract.

5.4 CONTRACTOR'S UNDERSTANDING

It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the progress of the works, the general and local conditions, the labour conditions prevailing therein and all other matters which can in any way affect the works under the contract.

5.5 INSURANCE

5.5.1 Depending on the nature of work, Contractor's All Risk (CAR) shall be obtained by Employer/Engineer at his own cost as per the requirement. Employer/Engineer may take necessary add on covers and voluntary excess specified elsewhere in the contract, which shall be binding on the Contractor. At the time of taking policy, possible time over-run, if any, may be taken into account in deciding the

period/validity of the policy. The above insurance shall cover the risks normally covered under the CAR policy. Any item not covered under the above policy shall be the responsibility of the Contractor.

- 5.5.2 Contractor's claims, if any, shall be entertained within the scope of Insurance policy taken by Employer/Engineer. This will be subject to:
 - 5.5.2.1 Risk covered and voluntary excess selected by Employer/Engineer.
 - 5.5.2.2 Claims on realization shall be passed to the Contractor according to value of the claims accepted by the insurance company for his damaged portion of work after deducting 15% towards services rendered by Employer/Engineer for processing the claim(s). The amount so disbursed to the Contractor(s) shall be limited to the amount calculated on the basis of his accepted rates in the contract with the Employer/Engineer.
- 5.5.3 Before commencing of works, it shall be obligatory for the Contractor to obtain, at his own cost, insurance cover in the joint name of the Contractor and Employer from reputed companies under the following requirements:
 - 5.5.3.1 Liability for death of or injury to any person or loss of or damage to any property (other than the work) arising out the performance of the Contract.
 - 5.5.3.2 Construction Plant, Machinery and Equipment brought to site by the Contractor.
 - 5.5.3.3 Any other insurance cover as may be required by the law of the land.
- 5.5.4 The Contractor shall provide evidence to the Employer/Engineer before start of work at site that the insurances required under the contract have been affected and shall within 60 days of the commencement date, provide the insurance policies to the Employer/Engineer. The Contractor shall, whenever, called upon, produce to the Engineer or his representative the evidence of payment of premiums paid by him to ensure that the policies indeed continue to be in force.
- 5.5.5 The Contractor shall also obtain any additional insurance cover as per the requirements of the Contract.
- 5.5.6 The Employer/Engineer shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or his sub-contractor or petty contractor. The Contractor shall indemnify and keep indemnified the Employer/Engineer against all such damages and compensation for which the Contractor is liable.
- 5.5.7 The Policies of the Contractor shall remain in force throughout the period of execution of the works and till the expiry of the defect liability period except for any specific insurance covers necessary for shorter period.
- 5.5.8 If the Contractor fails to effect or keep in force or provide adequate cover as acceptable to the Engineer in the insurance policies mentioned above, then in such cases, the Engineer may effect and keep in force any such insurance or further insurance on behalf of the Contractor. The recovery shall be made at the rate of 1.5 times the premium/premiums paid by the Engineer in this regard from the payment due to the Contractor or from the Contractor's Performance Security. However, the Contractor shall not be absolved from his responsibility and/or liability in this regard.

5.6 COMMUNICATION BETWEEN EMPLOYER/ENGINEER AND CONTRACTOR

5.6.1 Instructions in writing:

Instructions given by the Engineer shall be in writing, provided that if for any reason the Engineer considers it necessary to give any instructions orally, the Contractor shall comply with such instructions. Confirmation in writing of such oral instruction given by the Engineer, whether before or after carrying out of the instructions shall be deemed to be instructions within the meaning of this sub-clause. The Contractor



shall also be bound to carry out any instructions issued by Client as confirmed in writing by the Engineer.

All certificates, notices, written orders or letters, to be given by the Employer or the Engineer to the Contractor, shall be deemed to have been served, if the same are delivered to the Contractor or his authorised representative, or delivered or left at or posted to the given address of the Contractor or Contractor's registered office or principal place of business. Such documents shall be deemed to have been received on the day they are left or delivered, or in the case of postal transmission, on the day they would ordinarily have reached but not exceeding 7 days from the date of posting inclusive of day of posting, in any case.

5.6.2 Notices to Employer and Engineer:

All notices to be given to the Employer or to the Engineer, under the terms of the contract, shall be served by sending by Speed/Registered post or registered e-mail or by delivering the same, to the respective nominated addresses.

5.6.3 Change of Address:

Either party may change the nominated address by prior written notice to the other party.

5.6.4 Change in constitution of Firm:

In case of any change in the constitution of Contractor's firm, the same shall forthwith be notified by the Contractor to the Employer.

5.7 GENERAL OBLIGATIONS OF THE CONTRACTOR

5.7.1 The Contractor shall design (to the extent specified in the Contract), execute and complete the Works wholly in accordance with the Contract and fit for the purposes for which they are intended, as defined in the Contract. The Works shall include any work which is necessary to satisfy the Employer's requirements, the Contractor's proposal and schedules or is implied by the Contract, or arises from any obligation of the Contractor and all works not mentioned specifically in the Contract but which may be inferred to be necessary for stability or completion or safe, reliable and efficient operation of the Works. The Contractor shall remedy any defects in the Works, as directed by the Engineer.

5.7.2 The Contractor shall design, manufacture, procure, supply, execute, install, complete, test (including Integrated Testing) and commission the Works, including providing Construction and/or Manufacture Documents within the Time for Completion and shall remedy the defects within the Contract Period. The Contractor shall provide all superintendence, labour, Plant, Materials, Contractor's Equipment and Temporary Works etc. required.

5.7.3 Before commencing design, the Contractor shall satisfy himself regarding the Employer's Requirements (including design, criteria and calculations etc.) and the items of reference mentioned in the contract. The Contractor shall give notice to Engineer of any error, fault, or other defect in the Employer's requirements or such items of reference. After receipt of such notice, the Engineer shall determine whether Contract Clause shall be applied and shall notify the Contractor accordingly.

5.7.4 The Contractor shall be responsible for the adequacy, stability and safety of all site operations and of all methods of construction, manufacture and all Works irrespective of any approval or consent of the Engineer. The Contractor shall, whenever required by the Engineer, submit details of the arrangement and methods which the contractor proposes to adopt for the execution of the works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.



- 5.7.5 If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless stated in Special Conditions of contract:
- 5.7.5.1 The Contractor shall submit to the Engineer the Contractor's document for the part in accordance with the procedures specified in the Contract;
- 5.7.5.2 These Contractor's Documents shall be in accordance with the specifications and Drawings, shall be written in the language for communications defined in and shall include additional information required by the Engineer to add to the Drawings for coordination of each party's designs;
- 5.7.5.3 The Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and prior to the commencement of the Tests on completion, the Contractor shall submit to the Engineer the "as-built" documents and operation and maintenance manuals without any extra cost in accordance with the Specifications and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works.
- 5.7.5.4 Such part shall not be considered to be completed for the purposes of issue of Completion Certificate until these documents and manuals have been submitted to the Engineer.
- 5.7.6 The Contractor is responsible for ascertaining and securing at his own cost.
- 5.7.6.1 Conditions affecting the proper transportation, disposal, handling and storage of materials (including but not limited to hazardous toxic substances and excavated materials).
- 5.7.6.2 Availability and costs of electricity, water and gas
- 5.7.6.3 Availability and rates of employment of skilled and unskilled manpower
- 5.7.6.4 The character and quantum of equipment and facilities needed preliminary to and during the design, procurement, manufacture, installation, execution, testing (including Integrated Testing) and commissioning of the Works and remedying of any defect.
- 5.7.6.5 The protection of the environment and adjacent structures which will be necessary preliminary to and during the design, procurement, manufacture, installation, execution, testing (including Integrated Testing) and commissioning of the Works and remedying of any defect.
- 5.7.6.6 The location of and the authorization required for and the means of diversion and facilities required for the purposes of the Works.
- 5.7.7. Delay and Extension of Time: In the opinion of the Engineer in charge the work be delayed:
- a) By force majeure.
 - b) By reasons of civil commotion, location combination of workers on strike or lockout affecting any of the building trades.
 - c) In consequence of the contractor for not having received in due time necessary instructions from DFCCIL Administration for which he shall have specifically applied in writing.
 - d) Engineer in charge shall make fair and reasonable extension of time for completion of the contract works based upon the genuine reasons for the same.

5.8 COMMENCEMENT OF WORK

The Contractor shall commence the works within **15 days** after the receipt by him of an order in writing to this effect from the Engineer and shall proceed with the same with due expedition and without delay.

5.9 ACCESS TO SITE OF WORK

5.9.1 Access to Engineer:

The Engineer or the Engineer's Representative, shall at all times have access to the works and to all workshops and places, where work is being performed and

from where materials, manufactured articles or machinery are being obtained for the works, and the Contractor shall afford every facility and every assistance in obtaining the right to such access.

5.9.2 **SETTING OUT**

The Contractor shall be responsible for the correct setting out of all works in relation to original points, lines and levels of reference at his cost. The Contractor shall execute the work true to alignment, grade, levels and dimensions as shown in the drawing and as directed by the Engineer's representative and shall check these at frequent intervals. The Contractor shall provide all facilities like labour and instruments and shall co-operate with the Engineer's representative to check all alignment, grades, levels and dimensions.

If, at any time, during the progress of the works any error shall appear or arise in any part of the work, the Contractor, on being required so to do by the Engineer's representative shall, at his own cost rectify such errors, to the satisfaction of the Engineer's representative. Such checking shall not absolve the Contractor of his own responsibility of maintaining accuracy in the work. The Contractor shall carefully protect and preserve all bench marks, sight rails, pegs and other things used in setting out the work.

5.9.3 **BARRICADING & PROTECTION OF WORK**

The works are to be protected with the help of barricading or otherwise as necessary or asked by the Engineer in charge for upkeep of environmental conditions. Protection is required for all hazardous works. The cost of such provision shall be deemed to be included in the cost & nothing extra shall be paid for the same

5.9.4 **TEMPORARY WORKS**

All temporary works necessary for the proper execution of the works shall be provided and maintained by the Contractor and subject to the consent of the Engineer shall be removed by him at his expenses when they are no longer required and in such manner as the Engineer shall direct. In the event of failure on the part of the Contractor to remove the temporary works, the Engineer will cause them to be removed and cost as increased by supervision and other incidental charges shall be recovered from the Contractor. If temporary huts are provided by the Contractor on the DFCCIL land for labour engaged by him for the execution of works, the contractor shall arrange for handing over vacant possession of the said land after the work is completed; if the contractor's labour refuse to vacate, and have to be rejected by the DFCCIL, necessary expenses incurred by the DFCCIL in connection therewith shall be borne by the Contractor.

5.9.5 **EMERGENCY WORKS**

In the event of any accident or failure occurring in or about the work or arising out of or in connection with the construction, completion or maintenance of the work which in the opinion of the Engineer require immediate attention the DFCCIL may be its own workmen or other agency execute or partly execute the necessary work or carryout repairs if the Engineer considers that the successful Tenderer(s) is/are not in a position to do so in time and charge the cost thereof, as to be determined by the DFCCIL, to the successful renderer.

5.9.6 **MODIFICATION**

The Engineer on behalf of the DFCCIL shall be entitled by order in writing to enlarge or diminish or reduce the work or make any alteration in their design, character position, site, quantities, dimensions or in the method of their execution or in the combination and use of material for the execution thereof or order any additional works to be done or any work not be done and the successful Tenderer(s) will not be entitled to any compensation for any increase /reduction in

the quantities of works but will be paid for the actual amount of work done and for approved materials supplied against a specific order.

5.9.7 COMPLETENESS OF WORK

5.9.7.1 Tenderer(s) should be a total solution provider and shall cover the total scope of the Contract. Tenderer(s) shall ensure availability of all technical expertise, manpower resources, availability of spare parts, logistics support etc. and all the expenses incurred for the same will be borne by Tenderer(s).

5.9.7.2 Completeness of the EQUIPMENT/SERVICES shall also be the responsibility of Tenderer(s). Any equipment, fittings and accessories which may not be specifically mentioned in the specifications or drawings, but which are usual or necessary for the satisfactory functioning of the equipment (successful operation and functioning of the EQUIPMENT being Tenderer(s)'s responsibility) shall be provided by Tenderer(s) without any extra cost.

5.9.7.3 Tenderer(s) must nominate a senior level Manager for entire project execution, management and regular liaison / discussions with DFCCIL.

5.10 SPECIFICATIONS AND DRAWINGS

5.10.1 Whenever, a reference to any IS or BS specification or any standard or any regulation appears in these Tender Papers, the same shall be taken as a reference to the latest version of the said reference

5.10.2 The Contractor shall keep at site in good condition one copy of latest approved Specifications and Drawings and also such other Contract documents as may be necessary and make them available to the Client/Employer/Engineer or his Representative at all reasonable times. Any specification & drawing shall not be used on any other work or communicated to a third party by the Contractor.

5.10.3 In case of any conflict between various specifications or statutory regulations, the most stringent conditions will prevail.

5.10.4 Adherence to Specifications and Drawings:

The work shall be executed in perfect conformity with the specifications and drawings of the Contract issued to the Contractor by the Engineer from time to time. If the Contractor does any work or part of work in a manner contrary to the specifications or drawings without the approval of the Engineer, he shall bear all the costs arising there from including dismantling and reconstruction strictly in accordance with the specifications and drawings and shall be responsible for all the losses/delays to the Employer/Engineer. The term drawings in this sub-clause also includes the drawings prepared by the Contractor and approved by the Engineer.

5.10.5 Meaning & Intent of Specifications and Drawings:

If any ambiguity arises as to the meaning and intent of any portion of the specifications and drawings or as to execution or quality of any work or material or as to the measurement of the works, the decision of the Engineer thereon shall be final and binding.

5.11 SAFETY PROVISIONS

5.11.1 Safety of Labour and others:

The Contractor shall, at his own expense, arrange for the safety provisions as required by any law in force, in respect of the labour employed directly or indirectly for performance of the works, and shall provide all facilities in connection therewith.

5.11.2 The successful Tenderer(s) shall comply with the provision of all laws including Labor laws, rules, regulations and notifications issued there under from time to time. All safety and labor laws enforced by statutory agencies and by DFCCIL shall be applicable in the performance of this Contract and the Contractor by these laws.

5.11.3 The Successful Tenderer(s) shall ensure regular and effective supervision / control of the personnel deployed by him and gives suitable direction for undertaking the contractual obligations.

5.11.4 The Successful Tenderer(s) shall take all necessary measures to protect the personnel, work and facilities and shall observe all reasonable safety rules and instructions.

5.11.5 **Safety of works:**

The Contractor shall provide and maintain at his own cost, all lights, guards, signage, signalmen, fencing and watching arrangements when and where necessary, or as required by the Engineer for the protection of the works or for safety and convenience of those employed on works or of the public.

Mere observance of these precautions shall not absolve the Contractor of his liability in case of loss or damage to property, or injury to or death of any employee/labour of Contractor, Client or Employer/Engineer or any member of the public.

5.11.6 **Recovery of the cost from the Contractor:**

Should the Contractor fail to implement the provisions as required in the preceding sub-clauses, the Engineer may provide necessary arrangements and the cost of the same shall be recovered from the Contractor's payments/dues.

5.11.7 **Care of Works**

From the start of the work until completion, acceptance and final takeover of the works by the Engineer, the Contractor shall take full responsibility for the care of all works including temporary works. In case any damage, loss or injury happens to the work or to any temporary works from any cause whatsoever, the Contractor shall at his own cost repair and make good the same so that on completion and at the time of final take over, the work shall be in good condition and in conformity in every respect with the requirements of the contract and the Engineer's instructions.

5.11.8 **Use of Explosives**

Explosives shall not be used on the works or site by the Contractor without the written permission of the Engineer and only in the manner and to the extent such permission is given. When explosives are required for works they shall be stored in a special magazine, to be provided by the Contractor at his own cost, in accordance with the provisions of law on Explosives. The Contractor shall take all precautions in using the explosives and prevent damage to nearby properties and utilities. The Contractor shall also obtain necessary license for the storage and the use of explosives from the concerned authorities. All operations in which or for which explosives are used shall be at the risk and responsibility of the Contractor and the Contractor shall indemnify the Client/Employer/ Engineer and their employees in respect thereof.

5.11.9 **Excavated materials**

The Contractor shall not use, sell or otherwise dispose off, or remove, except for the purpose of this Contract, the sand, stone, clay, ballast, earth, rock or any other substance or materials, which may be obtained from any excavation made. All such items shall be the property of the Client. The Contractor may be permitted by the Engineer to use the same for the purpose of works on mutually agreed payment terms.

5.11.10 Works during Night

Work may be done at night with the prior permission of the Engineer. No increase in rates or extra payment shall be admissible for the night work. The Contractor itself shall make adequate lighting and safety arrangements for night working. He shall also be responsible for any claim on account of any injury to or loss of life, of any one, arising out of inadequate lighting, safety arrangements or due to any other failure of the Contractor.

5.12 TOOLS, PLANT AND EQUIPMENT

Except for any specific item mentioned in the contract, the Contractor shall have to make his own arrangements, at his own cost, Plant, Machinery and Equipment required for execution and completion of all works to the entire satisfaction of the Engineer. This shall also include all other associated equipment, tools/tackles, spare parts, POL, consumables, stores, manpower as required for the execution of works.

5.12.1 PLANT AND MATERIALS OF THE CONTRACTOR

5.12.1.1 Contractor's plant/materials at site to be exclusive to the work:

All constructional plant and materials brought on the site by the Contractor be deemed to be exclusively intended for the execution of the work or part of the work and the Contractor shall not remove the same without the permission of the Engineer till completion of work or part of work.

5.12.1.2 Removal of constructional plant/materials from site:

Upon completion of the works, the Contractor shall remove from the site all the said constructional plant remaining thereon and unused materials belonging to the Contractor.

5.12.1.3 Loss or damage to constructional plant/materials:

The Employer/Engineer shall not at any time be liable for the loss of or damage to any of the said constructional plant, temporary works or materials.

5.12.1.4 Assistance to Contractor for re-exports of plant:

In respect of any constructional plant which the Contractor shall have imported for the purposes of the works, the Employer/Engineer may assist the Contractor, where required in procuring any necessary government consent for re-export of such constructional plant by the Contractor after the completion of the works.

5.12.1.5 Assistance to Contractor for customs clearance:

The Employer/Engineer may assist the Contractor, where required, in obtaining clearance through the customs of constructional plant, material and other things required for the works. This shall not dilute in any way the Contractors' obligations and responsibilities under the contract.

5.12.2 CONTRACTOR TO KEEP SITE CLEAR

During the progress of works, the Contractor shall keep the site reasonably clean and free from obstructions and shall store neatly construction plant and materials.

5.13 HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS

5.13.1 Provision of Accommodations:

No quarters shall be provided by the Employer/Engineer for the accommodation of Contractor or any of his staff employed on works.

5.13.2 Provision of labour Camp:

The Contractor, shall, at his own expense, make adequate arrangements for the housing, supply of drinking water, electricity, canteen and provision of latrines and urinals, for his staff and workmen employed on the work, directly or through petty

Contractors or sub-Contractors and for temporary crèche (Bal-mandir) where 50 or more women are employed at a time. All camp sites shall be maintained in clean and good sanitary conditions, by the Contractor, at his own cost.

5.13.3 Compliance with Rules for employment of labour:

The Contractor shall comply with all laws, bye-laws, rules and regulations in force, pertaining to employment of local or imported labour, and shall take all necessary precautions to ensure and preserve the health and safety of all staff/workmen, employed on the works directly or through petty Contractors or sub-Contractors.

5.13.4 ENGAGEMENT OF LABOUR

The Contractor shall make his own arrangements for the engagement of all labor, except as provided otherwise in the contract.

The Contractor shall not employ any labor below the age prescribed in any labor legislation, directly or through petty Contractors or sub-Contractors, for execution of the work.

5.14 WAGES OF LABOUR

5.14.1 Wages under relevant laws:

In dealing with labour and employees, the Contractor and his subcontractors (including piece rate and petty Contractors) shall comply fully with all laws and statutory regulations such as

- 5.14.1.1 Workmen's Compensation Act, 1923
 - 5.14.1.2 Payment of Gratuity Act, 1972
 - 5.14.1.3 Employees Provident Funds and Miscellaneous Provisions Act, 1952
 - 5.14.1.4 Maternity Benefits Act, 1951
 - 5.14.1.5 Contract Labour (Regulations and Abolition) Act, 1970.
 - 5.14.1.6 Minimum Wages Act 1948
 - 5.14.1.7 Payment of Wages Act 1936
 - 5.14.1.8 Equal Remuneration Act 1979
 - 5.14.1.9 Payment of Bonus Act 1965
 - 5.14.1.10 Industrial Dispute Act 1947
 - 5.14.1.11 Industrial Employment (Standing Orders) Act 1946
 - 5.14.1.12 Trade Union Act 1926
 - 5.14.1.13 Child Labour (Prohibition and Regulation) Act 1986
 - 5.14.1.14 Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act 1979
 - 5.14.1.15 The Buildings and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996.
 - 5.14.1.16 The Factories Act 1948, and other laws or Regulations framed by competent legislative authorities from time to time as may be applicable.
- 5.14.2 In accordance with the various Acts and Regulations with all up to date amendments, the Contractor shall ensure that he and his subcontractors (including petty and piece rate Contractors) observe strictly inter-alia the following:
- 5.14.2.1 Wages paid are not less than those prescribed.
 - 5.14.2.2 Wages and other dues are paid regularly and in time.
 - 5.14.2.3 Liens/licenses are obtained as required under any of the acts or regulations.



- 5.14.2.4 Maintain prescribed records, submit necessary statements to authorities concerned and display required notices.
- 5.14.2.5 Take prompt action on any instructions / directions from the authorities under various labour laws.

5.14.3 Claims on account of violation of labour laws:

If any moneys shall as a result of any instructions, directions or decisions from the authorities or claim or application made under any of the labour laws or regulations be directed to be paid by the Engineer because of any failure of the Contractor, such moneys shall be deemed to be moneys payable to the Engineer by the Contractor and on failure of the Contractor to repay the Engineer any moneys paid or to be paid as aforesaid within seven days after the same shall have been demanded, the Engineer shall be entitled to recover the amount from any moneys due or becoming due to the Contractor under this or any other contract with the Employer. The Engineer shall not be bound to contest any such claim or demand unless the Contractor makes a written request for it, and Contractor's reasons for contesting are considered reasonable by the Engineer and the Contractor deposits the full cost that the Engineer may have to incur in contesting the case.

5.14.4 REPORTING OF ACCIDENTS INVOLVING LABOUR

The Contractor shall be responsible for safety of all employees/labour employed by him on works, directly or through petty Contractors or sub-Contractors and shall report accidents, occurring on works to the Engineer or the Engineer's representative, and shall make every arrangement to render all possible assistance and to provide prompt and proper medical attention. In case of fatal accident, it will be Contractor's responsibility to report accident to police keeping the Engineer advised of the same. The compensation for affected workers or their relatives shall be paid by the Contractor in such cases with utmost expedition in accordance with the Workmen's Compensation Act.

5.15 REPAIRS TO DAMAGES

The Contractor shall be responsible for rebuilding/repairs of any damage by any reasons not attributable to the design defect (where design is supplied by Engineer/Client) during execution of works or Defect Liability Period. In case the Contractor is unable or unwilling to execute such repair works promptly, the Engineer may get the same done by engaging another agency or using labour, materials and resources as may be considered necessary and the cost of such remedial works shall be recovered from the Contractor's dues. The decision of the Engineer regarding reasons of the damage shall be final and binding.

5.16 IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEM

- 5.16.1 The Contractor shall follow and implement Quality Management System as per IS/ISO-9001-2008.
- 5.16.2 The Contractor shall execute the work following the safety policy of DFCCIL which shall include providing safety equipment, safety shoes and helmets to all workers, erecting of safety barricades and displaying safety posters and instructions about awareness for safety.
- 5.16.3 The Contractor shall arrange timely calibration of all his measuring and testing equipment at his own cost from reputed laboratory and supply of calibration certificates to the Engineer.
- 5.16.4 The Contractor shall ensure maintenance and overhauling of all his plant and machinery to satisfy the requirements of IS/ISO-9001-2008.
- 5.16.5 The Contractor shall arrange to provide test certificates issued by manufacturers for materials supplied by him or arrange to test the materials at his own cost in a reputed laboratory and supply test certificates to the Engineer. The Contractor shall



implement full process control by issue of work instructions and check lists and maintaining latest drawings, specifications and codes.

5.1.7 **MATERIALS AND WORKMANSHIP**

5.17.1 **Material and workmanship as per Specifications:**

5.17.1.1 All materials and workmanship shall be as per the contract and in accordance with the Engineer's instructions and shall be subjected to such tests as the Engineer may direct. The Contractor shall provide all such assistance, instruments, machines, labour and materials required for examining, measuring and testing any work and materials used. The Contractor shall supply samples of material before incorporating in the works for testing as may be selected and required by the Engineer.

5.17.1.2 The sources of materials to be used in the works shall be intimated to the Engineer and are subject to his approval.

5.17.2 **Supply of sample:**

All samples shall be supplied by the Contractor at his own cost.

5.17.3 **Cost of tests of Materials and Workmanship:**

The cost of carrying out any tests in a reputed laboratory as acceptable to the Engineer shall be borne by the Contractor except for the materials to be supplied by the Engineer.

5.17.4 **REMOVAL OF IMPROPER MATERIALS AND WORKS**

The Engineer shall have the authority to order in writing from time to time:

5.17.4.1 The removal from site within specified time, of any material, which in the opinion of the Engineer, is not in accordance with the Specifications and Conditions of the Contract.

5.17.4.2 The substitution of defective material by approved quality material; and

5.17.4.3 The removal and proper re-execution, notwithstanding any previous decision or interim payment thereof, of any work which in respect of materials or workmanship is not, in the opinion of the Engineer, in accordance with the contract.

5.17.4.4 In case of default on the part of the Contractor in carrying out such order, the Engineer shall be entitled to get the same done by engaging another agency or by deploying labour, materials and other resources. All such cost shall be recovered from the Contractor's dues.

5.17.5 **EXAMINATION OF WORK BEFORE COVERING UP**

The Contractor shall give 7 days' notice to the Engineer or the Engineer's Representative whenever any work or materials are intended to be covered up in the earth, in bodies or walls or otherwise to be placed beyond the reach of measurements in order that the work may be inspected or that correct dimensions may be taken before being so covered, placed beyond the reach of measurement in default whereof, the same shall at the option of the Engineer or the Engineer's Representative be uncovered and measured at the Contractor's expense or no allowance shall be made for such work or materials.

5.17.6 **SUSPENSION OF WORKS ORDERED BY THE ENGINEER**

The Contractor shall, on the order of the Engineer, suspend the works or any part thereof, for such time, and in such manner, as the Engineer may consider necessary, and shall during such suspension, properly protect and secure the works so far as it is necessary in the opinion of the Engineer.

The Contractor shall not be entitled to extra cost, if any, incurred by him during such suspension if such suspension is on account of weather conditions or requirement for execution of works or provided for in the Contract or for less than

30 days at a time for any other reason. The Contractor shall, however, be entitled for extension of time for completion of work as the Engineer may consider proper having regard to the period of suspension. However, if the suspension is ordered by the Engineer due to any default of the Contractor such as defective materials, workmanship etc., the Contractor shall not be entitled to any extension or extra cost incurred.

5.18 RATES FOR ITEMS OF WORK TO BE ALL INCLUSIVE

- 5.18.1 The rates entered in the accepted Schedule of Rate & Quantities of the Contract, shall be all-inclusive and provide for works duly and properly completed in accordance with terms and conditions of the Contract and processes as mentioned in specifications and drawings (including revised drawings), relevant codes whether mentioned or not in the nomenclature of the item in Schedule of Rate & Quantities. All rates quoted in the tender shall also deemed to include except specifically provided otherwise in the Contract:
- 5.18.1.1 All materials, labour, tools and plant, stores, centering, shuttering, etc.
 - 5.18.1.2 Construction/Erection, maintenance and removal of all temporary works.
 - 5.18.1.3 All watching, lighting, pumping and draining unless otherwise provided for.
 - 5.18.1.4 All barriers and arrangements for safety of the property, utilities, public or employees/workers during the execution of works.
 - 5.18.1.5 All sanitary and medical arrangements for labour camps.
 - 5.18.1.6 The setting out of all works of construction, repair and up-keep of all center lines, benchmarks, reference pillars etc.
 - 5.18.1.7 Site clearance except specifically provided otherwise in the Contract.
- 5.18.2 Nothing extra shall be payable over the quoted rates, except as specifically provided in the Contract.
- 5.18.3 All rates quoted in the Schedule of Rate & Quantities shall be deemed to be inclusive of all types of direct and indirect taxes imposed by Central/State Govt. and local bodies such as excise duty, sales tax, value added tax (VAT), Works contract tax, Service tax, royalties, duties, Cess, Octroi and other levies as applicable and also include all import duties. The rates shall also be inclusive of all taxes, duties and other charges imposed outside the country on the production, manufacture, sale and transport of the Contractor's equipment, plant, materials and supplies to be used on or furnished under the contract and on the services performed under the contract. No additional amount shall be paid or claim be entertained on this account by Employer/Engineer. The Contractor shall get registered with the Sales tax Department immediately after award of work and submit a copy of the same to the Employer/Engineer. He shall be responsible for filing sales tax returns and assessments, as necessary as per prevalent Laws, Rules and Regulations and shall also furnish necessary certificates to Employer/Engineer from time to time. The Contractor shall bear the cost of all royalties, fees and other payments in respect of patents, patents right and license(s) which may be payable to patentee, licensee or other person or corporation and shall obtain all necessary licenses/ permissions. In case of any breach (whether willfully or inadvertently) by the Contractor of this provision, the Contractor shall indemnify Employer, Engineer and their employees against all claims, proceedings, damages, costs, charges, loss and liability which they or any of them may sustain, incur or be put to by reason or in consequence directly or indirectly of such breach and against payment of any royalties, damages or other money which the Employer/Engineer may have to make to any persons or pay in total to the patent rights in respect of the users of any machine, instruments, process, articles matter or thing constructed, manufactured, supplied or delivered by the Contractor under this contract.

5.19 ACCEPTED RATE APPLICABLE TILL THE COMPLETION OF WORK

The rates as per the accepted Schedule of Rate & Quantities, shall be firm and hold good till the completion of the works, and no additional claim or amount shall be admissible on account of fluctuations in market rates, increase in taxes, levies, fees royalties etc. unless specifically provided for in the Contract.

5.20 ITEMS NOT INCLUDED IN THE SCHEDULE OF RATE & QUANTITIES

5.20.1 If any item of work not provided for in the accepted Schedule of Rate & Quantities and required to be executed for completion of work, the Contractor on receipt of instructions from the Engineer, shall be bound to carry out such items of work at the rates to be decided.

5.20.2 The rate for such extra items shall be derived from rate for similar items available in the accepted Schedule of Rate & Quantities.

5.20.3 In case rates cannot be derived from the accepted Schedule of Rate & Quantities, the rate may be worked out on the following basis:

5.20.3.1 Cost of materials and consumables at current market rates, as actually utilized in the final finished permanent work, including a reasonable percentage for wastage and cost of loading, unloading and transportation.

5.20.3.2 Cost of labour required for the work.

5.20.3.3 Hire charges for plant and machinery, scaffolding, shuttering, forms, etc. required to be used at the site of the work.

5.20.3.4 An amount of 10% of items to allow for Contractor's overheads, profits and other contingencies.

5.20.4 In all cases where extra items of work are involved, for which there are no rates in the accepted Schedule of Rate & Quantities, the Contractor shall give a notice to the Engineer, of at least 7 days before the need for their execution arises.

Such a notice shall not however be necessary if the Engineer has already instructed in writing to take up such an item of work. To decide the rate, the Contractor shall furnish detailed analysis of the rates and attend a meeting with Engineer to settle the rate as and when called for. The Contractor shall be bound to furnish the requisite details and to attend the meeting.

5.20.5 Provisional payment for extra item:

In case mutually agreeable settlement of rates is not arrived at between the Engineer and the Contractor, the Contractor shall be bound to carry out the works at rates to be decided by the Engineer. In the absence of a finalized rate for a new item, the Engineer shall be entitled to certify payment to the Contractor based on a provisional rate fixed by the Engineer for the work done under the new item. This shall be subject to upward or downward adjustment after the rate is finalized by the Engineer for that item. The decision of the Engineer under this clause shall be final and binding.

5.20.6 Lien in respect of claims in other Contracts

5.20.6.1 Any sum of money due and payable to the contractor (including the Security Deposit returnable to him) under the contract may be withheld or retained by way of lien by the DFCCIL, against any claim of this or any other DFCCIL or any other Department of the Central Government in respect of payment of a sum of money arising out of or under any other contract made by the contractor with this or any other Department of the Central Government.

5.20.6.2 However, recovery of claims of DFCCIL in regard to terminated contracts may be made from the Final Bills, Security Deposits and Performance Guarantees of other contract or contracts, executed by the contractor. The Performance Guarantees submitted by the Contractor against other contracts, if required, may be withheld

and encashed. In addition, 10% of each subsequent 'on-account bill' may be withheld, if required, for recovery of DFCCIL's dues against the terminated contract.

- 5.20.6.3 It is an agreed term of the contract that the sum of money so withheld or retained under this Clause by the DFCCIL will be kept withheld or retained as such by the DFCCIL till the claim arising out of or under any other contract is either mutually settled or determined by arbitration, if the other contract is governed by Arbitration Clause or by the competent court as the case may be and contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this Clause and duly notified as such to the contractor.

5.21 **MEASUREMENT OF WORK AT REGULAR INTERVALS**

The measurements of the work shall be taken in accordance with the contract during progress of work and at such intervals, as in the opinion of the Engineer or Engineer's Representative shall be proper, having regard to the progress of the work. On an agreed date and time, the Engineer or his Representative shall take the on account or final measurements in the presence of the Contractor or his authorized representative. The Engineer or his authorized representative shall sign the measurements, which shall also be signed by the Contractor or his authorized representative as an acceptance of the measurements. If the Contractor or his representative fails to turn-up at the time of taking measurements in spite of notice to do so, the Engineer or his representative shall be entitled to record the measurements ex-parte and these shall be final and binding on the Contractor.

5.22 **MEASUREMENT OF WORKS AS PER RECORDS AND DRAWINGS**

For the purpose of measuring such permanent works, as are to be measured by records and drawings, the Contractor shall prepare records and drawings at regular intervals and submit to the Engineer or Engineer's representative for his scrutiny.

In case, there is a discrepancy in the measurements of work done and the measurements as per drawings, measurements for the minimum of the two shall only be accounted for, provided the executed work is acceptable to the Engineer.

The Engineer or the Engineer's representative shall have the right to rectify any incorrect measurements and delete/correct any measurements if it is found at a later stage that the work is incomplete, defective and/or not conforming to the specifications.

5.23 **ON ACCOUNT PAYMENTS**

- 5.23.1 The Contractor shall be entitled to be paid from time to time, by way of "On-account" bills, only for such works, as in the opinion of the Engineer, the Contractor has executed in terms of the contract. Such payments shall be made at intervals to be decided by the Engineer depending upon the progress of work. Payment shall be made only on submission of bills along with measurements and necessary documents by the Contractor for scrutiny of the Engineer. The amount certified shall account for all deductions, including statutory deductions as for sales tax, income tax, etc., recoveries for advances and any amounts due from the Contractor. Such payments made by the Engineer shall not constitute any final acceptance of the measurements. In case of any discrepancy, the Engineer shall have the right to alter, modify, reduce or diminish the quantities or classification entered in the Measurement Books. In such cases, the Engineer shall have the right to recover any amount paid in an earlier bill/bills from any subsequent bill/bills and should the amount to be recovered be more than the amount of the subsequent bills, the Contractor shall on demand from the Engineer immediately refund the amount to the Engineer within 7 days, failing which he shall have to pay interest @1% per month till the said extra amount is paid back by him.

- 5.23.2 No payment under the contract shall be made to the Contractor before receipt of performance security. The Engineer shall also be entitled to withhold payments under the above sub-clauses in case the Contractor fails to get himself registered under sales tax/labour laws or fails to fulfill his obligation under the contract.

5.24 FINAL MEASUREMENTS AND PAYMENTS

As soon as possible after completion of work, the Contractor shall submit the final bill along with detailed measurements of work done, account of the materials, plant and machinery issued by the Engineer and all other statements, supporting documents required for finalization of the bill. The final bill, measurements and documents submitted by the Contractor shall be scrutinized by the Engineer or his representative and in case the same are found not in order, the Engineer shall direct the Contractor to re-submit the final bill along with all details. On receipt of all requisite details and final bill from the Contractor, the Engineer shall have the final measurements taken, recorded and signed jointly. An account of any plant, equipment and materials issued by the Engineer to the Contractor, shall also be prepared and signed jointly.

Based on the final measurements and materials and plant and equipment account statements, the Engineer shall prepare the final bill.

The Contractor shall sign the Engineer's copy of the Final Bill Account in token of acceptance of the full and final value of the works performed under the contract, and submit a "No Claim Certificate" on the prescribed proforma along with a list of unsettled claims, if any. The Engineer shall then arrange to make payment against the final bill. The Contractor shall not be entitled to make any claim whatsoever against Engineer under or arising out of this contract, nor shall Engineer entertain or consider any such claim, if made by the Contractor after he shall have signed a "No Claim certificate" in favor of the Engineer.

In case, the Contractor submits a list of unsettled claims along with the "No Claim Certificate", he shall not be entitled to submit any additional claims other than those submitted along with "No Claim Certificate".

5.25 MODE OF PAYMENT AND TAX DEDUCTION AT SOURCE

5.25.1 Mode of payment:

5.25.1.1 All payments to the Contractor shall be made through Electronic Clearing System (ECS). The contractor shall furnish his Banker's details in addition to his own bank account details. All amounts payable to the contractor shall be directly credited to his bank account.

5.25.1.2 In case, the contractor is having his account with a bank not having Electronic Clearing System (ECS), the contractor may open a bank account with the bank having this facility.

5.25.1.3 All payments to the contractor shall be made by above means only unless specifically otherwise agreed by the Engineer in special circumstances for petty payments.

5.25.2 Tax deduction at source:

Income tax and Works tax shall be deducted from the payments credited/released by Employer/Engineer to the Contractor against execution of work as per law of the land. The deductions shall be made as per prescribed rates prevalent from time to time unless a tax exemption certificate is produced by the Contractor. Amount of tax deduction shall be deposited with the concerned authorities and tax deduction certificate shall be issued by Employer/Engineer. The Employer/Engineer shall deduct at source taxes/duties under any other law/statute as may be applicable at the time of making payments. The Contractor shall furnish to the Engineer registration No. under works tax and PAN (for TDS), as applicable.

5.26 COMPLETION CERTIFICATE

5.26.1 As soon as the work is completed, the Contractor shall give notice of such completion, whether of the whole of the works, or of any part of the work, for which a separate date of completion is stipulated in the contract, to the Engineer, and the Engineer, within 30 days of receipt of such notice, shall inspect the work and also arrange for carrying out of such tests as may be prescribed under the contract or ordered by the Engineer. If the Engineer notices any incomplete item of work or any defect, which is to be rectified by the Contractor, or if any part or whole of the work fails to pass the specified tests, the Engineer shall furnish to the Contractor, the list of all such incomplete items of work, deficiencies, defects, failure to pass tests, etc., and may refuse to issue a Certificate of Completion to the Contractor. If in the opinion of the Engineer the work has been satisfactorily completed and has satisfactorily passed final test or tests that may be prescribed, the Engineer shall issue a certificate of completion showing the date of completion in respect of the work. The defect liability period, if any, shall commence from the date of completion indicated in such certificate. Provided that the Engineer may issue such a certificate with respect to any part of the works, before the completion of the whole of the works, which has been so completed and/or used by the Client/Employer/Engineer.

When any such certificate is given in respect of a part of the work, such part shall be considered as completed and the defect liability period of such part shall commence from the date of completion indicated in such certificate.

5.26.2 Completion certificate not to absolve the Contractor from his Responsibilities:

The Certificate of Completion of Works referred to in sub-clause 5.26.1 shall not absolve the Contractor from his liability to make good defects, imperfections and shrinkages or faults, which may appear during the defect liability period specified in the contract, arising in the opinion of the Engineer from materials or workmanship being not in accordance with the Contract. These shall be rectified and made good by the Contractor at his own cost. In case of the default on the part of the Contractor, to so make good the defects or deficiencies, the Engineer may employ labor, plant and machinery and materials or appoint another agency or Contractor, to make good such defects, imperfections, shrinkages and faults, and all expenses consequent and incidental thereto, shall be recovered from any money due to the Contractor under the contract including the Performance Security amount or from any money payable to the Contractor by the Employer/Engineer, under any other contract.

5.26.3 Clearance of site on completion

On completion of works, the Contractor shall clear and remove from site all constructional plant, surplus materials, rubbish and temporary works of every kind, and leave the whole of the site of work clean, tidy and in a workman like condition to the satisfaction of the Engineer. This will be one of the pre-conditions for making the final payment to the Contractor. Such clearance may be made by the Engineer through any other agency at the expense of the Contractor in the event of the Contractor's failure to comply with this provision within 7 (seven) days after receiving notice to that effect from the Engineer.

5.27 POST PAYMENT AUDIT

It is an agreed term of the contract that the Employer reserves to himself the right to carry out a post payment audit or technical examination of the works, and the final bill including all supporting vouchers, abstracts, etc. If as a result of such examination, any over payment to the Contractor is discovered to have been made in respect of any work done, the Contractor will be bound to refund the same to the Engineer or may be adjusted against any dues of the Contractor. If any under



payment is discovered, the same shall be paid by the Engineer to the Contractor. Such payments or recoveries, however, shall not carry any interest.

5.28 UNFULFILLED OBLIGATIONS

Notwithstanding the issue of Defect Liability Certificate, the Contractor and the Engineer shall remain liable for the fulfillment of any unfulfilled obligations under the provision of the contract, prior to the issue of the Defect Liability Certificate, and for the purpose of determination of the nature and extent of any such obligation, the contract shall be deemed to remain in force between the parties thereto.

5.29. PRODUCTION OF VOUCHERS

5.29.1 The Contractor, whenever required, shall produce for examination by the Engineer, any Tender, invoice, cost or other account books, vouchers, receipts, letters, memoranda or any copy of or extract from any such documents and also furnish information and returns, as may be required, relating to the execution of this contract. The Engineer's decision on the question of relevancy of any documents, information or returns shall be final and binding on the Contractor.

5.29.2 If any part or item of the work is allowed to be carried out by a sub-Contractor, the Engineer shall have power to secure the books of such sub-Contractor, through the Contractor, and shall have power to examine and inspect the same.

5.30 FORCE MAJEURE

5.30.1 If, at any time during the currency of the contract, the performance of any obligation (in whole or in part) by the Employer or the Contractor shall be prevented or delayed by reason of any war, hostilities, invasion, acts of public or foreign enemies, rebellion, revolution, insurrection, civil commotion, sabotage, large scale arson, floods, earthquake or any other act of God, large scale epidemics, nuclear accidents, any other catastrophic unforeseeable circumstances, quarantine restrictions, any statutory, rules, regulations, orders or requisitions issued by a Government department or competent authority (hereinafter referred to as "event") then, provided notice of the happening of such an event is given by either party to the other within 21 (twenty one) days of the occurrence thereof.

5.30.2 Neither party by reason of such event be entitled to terminate the contract or have claim for damages against the other in respect of such non-performance or delay in performance.

5.30.3 The obligations under the contract shall be resumed as soon as practicable after the event has come to an end or ceased to exist.

5.30.4 If the performance in whole or part of any obligation under the contract is prevented or delayed by reason of the event beyond a period of 90 days, the contract may be force-closed with mutual consent by giving a notice of 30 days without any repercussions on either side.

5.30.5 In case of doubt or dispute, whether a particular occurrence should be considered an "event" as defined under this clause, the decision of the Engineer shall be final and binding.

5.30.6 Works that have already been measured shall be paid for by the Engineer even if the same is subsequently destroyed or damaged as a result of the event. The cost of rebuilding or replacing any work that has been measured shall be borne by the Employer/Engineer.

5.30.7 If the contract is fore-closed under this clause, the Contractor shall be paid fully for the work done under the contract, but not for any defective work or work done which has been destroyed or damaged before its measurement. The Engineer shall have the option to take over any plant and material lying at site, at rates provided for in the contract, failing that, as per rates which are determined to be fair and reasonable by the Engineer.

5.30.8 If no notice is issued by either party regarding the event within 21 days of occurrence, the said event shall be deemed not to have occurred and the contract will continue to have effect as such.

5.31 VARIATION IN EXTENT OF CONTRACT

5.31.1 Modification to Contract to be in Writing

In the event of any of the provisions of the contract required to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the DFCCIL and the Contractor and no work shall proceed under such modifications until this has been done. Any verbal or written arrangement abandoning, modifying, extending, reducing or supplementing the contract or any of the terms thereof shall be deemed conditional and shall not be binding on the DFCCIL unless and until the same is incorporated in a formal instrument and signed by the DFCCIL and the Contractor, and till then the DFCCIL shall have the right to repudiate such arrangements.

5.31.2 The Engineer on behalf of the DFCCIL shall be entitled by order in writing to enlarge or extend, diminish or reduce the works or make any alterations in their design, character position, site, quantities, dimensions or in the method of their execution or in the combination and use of materials for the execution thereof or to order any additional work to be done or any works not to be done and the Contractor will not be entitled, to any compensation for any increase/reduction in the quantities of work but will be paid only for the actual amount of work done and for approved materials supplied against a specific order.

5.31.3 **Valuation of Variations:** The enlargements, extensions, diminution, reduction, alterations or additions referred to in Clause 5.31.2 shall in no degree affect the validity of the contract; but shall be performed by the Contractor as provided therein and be subject to the same conditions, stipulations and obligations as if they had been originally and expressively included and provided for in the Specifications and Drawings.

5.31.4 The aspect of vitiation of tender with respect to variation in quantities should be checked and avoided. In case of vitiation of the tender (both for increase as well as decrease of value of contract agreement), sanction of the competent authority as per single tender should be obtained.

5.31.5 **Variation due to introduction of New non-Schedule Items/Schedule Items not covered in contract:** Variation Upto 100% of total contract value is permissible subject to approval of Competent Authority of DFCCIL.

5.31.6 **Variation in the Contract Value due to Variation in Quantity of any Items(s) of Contract:** Variation in each Item of Schedule of Rates and Quantities (both positive & negative) or as a whole (both positive & negative) is permissible under this contract. No vitiation will be permitted.

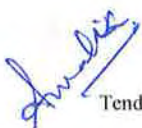
- (i) The Contractor shall be bound to carry out the work at the agreed rates and shall not be entitled to any claim or any compensation whatsoever upto the limit of 25% variation in quantity of individual item of works.
- (ii) In case an increase in quantity of an individual item by more than 25% of the agreement quantity is considered unavoidable, then same shall be executed at following rates:
 - (a) Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender;
 - (b) Quantities operated in excess of 140% but upto 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender;



- (c) Variation in quantities of individual items beyond 150% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.
- (d) Variation to quantities of Minor Value Item:
The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1 % of the total original agreement value.
- d.(i) Quantities operated upto and including 100% of the agreement quantity of the concerned minor value item, shall be paid at the rate awarded for that item in that particular tender;
- d.(ii) Quantities operated in excess of 100% but upto 200% of the agreement quantity of the concerned minor value item, shall be paid at 98% of the rate awarded for that item in that particular tender;
- d.(iii) Variation in quantities of individual minor value item beyond 200% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.

5.32 SETTLEMENT OF DISPUTES

- 5.32.1 There shall be provisions for the settlement of disputes in bid documents. The disputes shall be settled in accordance with provisions of The Indian Arbitration and Conciliation Act, 1996. As a first stage, attempt shall be made to resolve disputes through conciliation. In case conciliation does not work, matter shall be referred for Arbitration.
- 5.32.2 Procedure/Provisions of Arbitration have been brought out in Chapter 8 of DFC Works Manual.



SECTION - 6

TECHNICAL SPECIFICATION

Tender No.: HQ/EL/HVAC/T/2019-20/1

Name of Work: Replacement of existing old VRF ODU's with new ODU's (compatible to existing old HVAC IDU's) and Heat Recovery Units along with associated fittings at DFCCIL, Corporate Office, Pragati Maidan Metro Station Building Complex, New Delhi.

SCHEDULE – I:

6.1 Scope of Work:

The VRF system was installed in Year 2008. Details of the existing outdoor circuits which needs replacement are as follows:

S.No.	Circuit Name	Capacity	Area Served	No of IDU's
1	Red	48 hp	3 rd Floor Rly. Bd. Offices, PED Health/EDs	31
2	Black	48 hp	3 rd Floor Rly. Bd. Offices, DGH.	27
3	Sky Blue	48 hp	3 rd Floor Rly. Bd., DGH/reception	16
4	Sky Blue	32hp	4 th Floor DFCCIL, Chairman Room, GMs Cabin	17
5	Green	16 hp	4 th Floor DFCCIL, GMs Cabin	9
6	Blue	32 hp	4 th Floor DFCCIL, Dy. PD/PMC-II, Conference Room	15
7	Pink	32 hp	3 rd Floor PMC-II side	15
8	Orange	32hp	4 th Floor DFC, Canteen, Conference Room, Reception	12
9	Black	48 hp	5 th Floor GM Cabins	23
10	Black	16hp	4 th Floor DFC, Canteen, AGM Cabins	7
11	Pink	16hp	4 th Floor DFC, GM Cabins	9
12	Blue	32hp	5 th Floor DFC, Dir. Infra, GM cabins	22
13	Black	48 hp	3 rd Floor GGM cabin & WS area	30
14	Blue	32 hp	4 th Floor PMC-I hall	26
	Total	480hp		259

All the ODU's which needs replacement are of 16hp. This scope shall include removal of all existing Outdoor units along with requisite refrigerant piping and accessories including requisite control wiring , double earthing of units following industry standard for removal and disposal processes with due attention to safety of DFCCIL and contractor employees and infrastructure. The work requires replacement of existing 480HP ODU's consisting of 14 HVAC circuits by inverter technology based **Top Throw** ODU's which are compatible with existing IDU's of GD Midea/Midea make with model no. MDV-D36Q4/N1-C, MDV-D56Q4/N1-C, MDV-D112Q4/N1-C & MDV-D280T1/N1-C, MDV-D56Q4/N1-C, MDV-D71Q4/N1-C, MDV-D90Q4/N1-C, MDV-D140Q4/N1-C, MDV-D140T1/N1-C which are almost 10 years old. This work will require supply, erection of total equivalent HP capacity inverter based ODU's along with all requisite accessories (including double earthing of units) at site i.e DFCCIL Corporate office, Pragati Maidan Metro station building, New Delhi. All Outdoor units shall be installed on the roof top Refrigerant piping, all electrical wiring and control wiring shall be suitably protected from weather hazards and aging due to exposure to solar radiation, rain and dust during the life of the units. The Tenderer shall factor in

the foot print of outdoor units offered to suit space available on the roof. This available space shall include the roof area freed up after old outdoor units identified for replacement are removed. The new units shall be selected based on the compatibility with the existing indoor units installed at DFCCIL Corporate Office. The ODU's to be provided must have both cooling as well as heating facility.

The Fresh Air System was installed in Year 2008. The System will be replaced by new four FAHUs, two of capacity 2300 CFM and two of capacity 4500 CFM.

Replacement of copper piping at requisite places for HVAC ODU's as per site conditions shall be a part of scope of work.

Replacement of existing PVC pipes (above the false ceiling) provided for drainage of released water from IDU's (low side) shall be a part of scope of work.

Replacement of existing Power and Control Cables for HVAC system wherever required along with provision of all necessary Electrical items for successful commissioning of four nos. F.A.H.U's shall also be a part of scope of work under this Contract.

- 6.1.1 To execute all incidental work at site including material supply at site associated with HVAC asked in the technical specifications. Nature of such work will include sheet metal duct/grill work, refrigerant piping and drain etc., foundation of equipment's, making opening in walls and slabs and making them good, incidental electrical engineering work, cables, control panels etc. erection work at site for all manufactured items at work and also items fabricated at site.
- 6.1.2 The works, performance testing and handing over shall be done as per technical specifications in Schedule-I of Section-6. Further in case schedule-I does not specify relevant details the provisions of NBC 2016 shall be applicable.
- 6.1.3 All components shall conform to relevant Indian Standard Specifications, wherever existing amended to date.
- 6.1.4 The Contractor shall work from 6.30 pm to 8.00am during office days for work related to Office Indoor area. Round the clock on Saturday, Sunday and Holidays. Being a 05 day working office, work related to Indoor units may also be carried out in day time of Saturday, Sunday and any Holiday with prior permission from Engineer in Charge in writing.
- 6.1.5 Contractor should ensure that DFCCILs working hours shall not get affected due to the work. Safety and security of all the office belongings shall be maintained. Contractor shall make own arrangements for supervision of the work and material.
- 6.1.6 Responsibility of all the equipment/system related to the work shall be with the Contractor until the system is taken over by DFCCIL.
- 6.1.7 During brazing work, good quality drop sheet of fire-retardant properties shall be used. Contractor shall take all fire safety measures during the work and maintain portable fire extinguishers at all times at site.
- 6.1.8 Electricity and water will be provided to the contractor at single point.
- 6.1.9 All new outdoor units shall be installed within the space available on terrace of the DFCCIL Corporate office Building Complex, New Delhi.
- 6.1.10 Drawings referred in the technical specifications are for reference only; contractor should verify the drawings with actual site conditions.
- 6.1.11 Nitrogen Flushing in the HVAC circuit ODU's and in related pipelines including that for F.A.H.U shall be carried out promptly so as to clean the refrigerant line before refrigerant charging.

- 6.1.12 Earthing of Outdoor units and F.A.H.U's : All the replaced & installed HVAC Out door units (including that for F.A.H.U's) shall be provided with 8 SWG GI wire visible double earthing nut bolted in the body of ODU's and F.A.H.U's. The same double earthing wires shall be connected to already available earthing grid mesh.

6.2 Schedule I, Item – I

Technical Specifications for Replacement of VRF based HVAC system at DFCCIL, Corporate Office, New Delhi.

Standard Technical specifications of the **VARIABLE REFRIGERANT VOLUME / FLOW SYSTEM OUTDOOR UNIT** should be as follows:

- 1.0 The specifications under this section covers the supply, installation, testing and commissioning of the **VARIABLE REFRIGERANT VOLUME / FLOW SYSTEM** conforming to these specifications and in accordance with the **Detailed Bill of Quantities** given in the tender.
- 2.0 For the subject project minimal brazing shall be done; and shall be limited only to outside building area i.e. non air-conditioned area. Further distribution shall be with PPM/ header kits and using fire/ brazing free connection joints as required. This is to minimize the fire risk in the operational building.

6.2.1 General

Each VRV / VRF Unit shall be air cooled, split type multi-system air conditioner consisting of outdoor units and multiple number of indoor units, each refrigerant circuit having capability to either cool or heat for the requirements of the individual area to be air-conditioned. The VRV / VRF unit should be capable of connecting minimum ten different type of indoor units to one refrigerant circuit and controlled individually.

Each VRV / VRF unit shall have all scroll compressor/ Rotary shall be inverter Compressor (With inverter controller) capable of changing the rotating speed to follow variations in cooling loads. Each indoor units having capability to cool or heat for the requirement of the rooms (either heating or cooling, one at a time).

Compressor shall be inverter controlled Compressor installed in each outdoor module unit shall be equipped with all inverter for higher reliability, improved life, better backup and duty cycling purpose. The system shall be capable of changing the rotating speed of inverter compressor by inverter controller to follow variations in cooling and heating load.

- 6.2.1.1 Only the best manufacturing practices i.e. the units with better Integrated Energy Efficiency ratio (IEER) of more than 18 as per ISHRAE Guidelines will be accepted. The contractor shall study the best available designs and offer VRF with best IEER available in industry. Bidders shall furnish the following information :

Sr. No	Parameters of VRF system	COP data as per ISHRAE
1	COP at 100% Loading	
2	COP at 75% Loading	
3	COP at 50% Loading	




4	COP at 25% Loading	
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Separate data is to be provided for different VRF models such as 16 HP, 24 HP etc.

The formula used for the calculation of IEER shall be as follows:

$$\text{IEER} = [(0.04 * \text{COP at 100\% loading}) + (0.4 * \text{COP at 75\% loading}) + (0.39 * \text{COP at 50\% loading}) + (0.17 * \text{COP at 25\% loading})] * 3.41$$

The COP values as indicated are required to be furnished in Original by the tenderer directly from the original equipment Manufacturer (OEM).

6.2.1.2 **The contractor shall be required to submit certificate from the OEM that the HVAC ODU's being provided are compatible with the existing Indoor units and the same will be able to communicate with the existing system including existing BMS system.**

6.2.2 OUTDOOR UNIT

- i. The outdoor unit shall be factory assembled, weather proof casing (Material of construction of casing shall be vendor's standard design), constructed from heavy gauge GI sheets steel panels and coated with baked enamel finish. The outdoor unit shall be completely factory wired, tested with all necessary controls & filled with first charge of refrigerant before delivering at site.
- ii. All the outdoor units comprising of multiple modules should have 100% inverter type compressor in each module. Outdoor units shall be factory assembled, tested and filled with first charge of refrigerant before delivering at site. These being very hi-tech in construction with lots of factory checks being conducted, hence no sub assembly should be done at site preferably. The proposed system shall be able to operate up to outside ambient temperature up of 48 °C.
- iii. The outdoor unit shall be factory tested and filled with first charge of refrigerant R-410A before delivering at site.
- iv. It should also be provided with duty cycling for D.C inverter Rotary/ Scroll compressors capable of changing the rotating speed of compressor by inverter controller to follow variation in cooling & heating loads & switching starting sequence for better stability and prolonging equipment life or similar features if available in Rotary / Scroll will also be accepted.
- v. The machine must have a sub cool feature to use coil surface more effectively through proper circuit/ bridge so that it prevents the flushing of refrigerant from long piping due to this effect thereby achieving energy savings. The unit shall provide at least 10 % higher heating capacity than cooling capacity at nominal conditions.
- vi. The outdoor unit should be fitted with low noise level and should not be more than 67 db (A) at normal operation when measured at a point 1 mtr. In front of the unit at a height of 1.5 mtrs. The Tenderer shall ensure that outdoor units are mounted on the roof using anti-vibration mounts to prevent transfer of noise and vibration to the roof.
- vii. The outdoor unit should be fitted with low noise aero spiral design fan with aero fitting grill for spiral discharge airflow to reduce pressure loss and should be fixed with DC/AC fan motor for better efficiency.

- viii. In case of trouble occurs in an indoor units (s), the continuous operation of system should be possible after taking corrective bypass action.
- ix. The unit shall be designed in such as way that cleaning of drain Pan should be easy & inspection/ replacement of compressor should be easy.
- x. The condensing unit shall be designed to operate safely when connected to multiple fan coil units.
- xi. The outdoor unit shall have suitable cooling mechanism for better operation at high ambient temperature.
- xii. The outdoor unit shall have feature to change the evaporative temperature with respect to load for better comfort.
- xiii. The systems shall have free phase technology & operation shall be continuous in case of phase reverse in supply electricity. In case the same is not provided automatic phase corrector shall be provided without any additional charge.
- xiv. The system shall have automatic refrigerant charge function is preferred for optimal charging for additional refrigerant.
- xv. The fan static pressure of the outdoor unit shall be minimum 60-75 Pa to avoid hot air recirculation.
- xvi. Outdoor unit control:
 - a) The controls must ensure duty rotation between connected outdoor units for run time equalization.
 - b) In case of multiple compressors in an outdoor unit, the electronics must have an algorithm to rotate the compressor cycling for run time equalization.
 - c) All necessary safety devices shall be provided to ensure safe operation of the system. Following safety devices shall be part of outdoor unit: High pressure switch, High Discharge Gas temperature switch, Fan motor overload protection, Inverter drive overload protection, Inverter Temperature monitoring and safety cut off, Over load protection for compressor motor.
 - d) Controlling of all the replaced & installed HVAC Out door units (including that for F.A.H.U's) shall be made possible through incorporating the same in existing working BMS system.
- xvii. The compressors, inverters and all electronics in outdoor units must withstand reliable operation in high ambient temperatures. The units must operate reliably without any safety device tripping.

6.2.3 Compressor

- i. The compressor shall be inverter based Rotary / Scroll technology based and shall be highly efficient. The system should respond efficiently in accordance to the variation in cooling or heating load requirement. If multiple compressors are used in one outdoor unit then all compressors shall be variable speed DC motor driven compressors.
- ii. All outdoor units shall have step less capacity control from **15-100%** to




meet load fluctuation and indoor unit individual control. All parts of compressor shall be sufficiently lubricated stock. Forced lubrication may also be employed.

- iii. In case of failure of one of the compressor, rest compressor of the same ODU module and of the same HVAC shall not get affected and shall continue to work by bypassing the defective compressor.

6.2.4 Oil Recovery system

- i. Unit shall be equipped with an oil recovery system to ensure stable operation with long refrigeration piping lengths. The system shall have oil recovery cycle of 8 or more hours.
- ii. ~~The system must be provided with oil balancing circuit to avoid poor lubrication.~~
- iii. The outdoor unit must include an oil recovery device to limit the oil flowing with refrigerant to the indoor units. The device shall separate oil from compressor discharge gas and return it back to compressor
- iv. The system should have inbuilt oil balancing circuit to avoid poor lubrication.

6.2.5 Refrigerant Circuit

- i. The refrigerant circuit shall include liquid and gas shut-off valves and a solenoid valves at condenser end.
- ii. The equipment must have inbuilt refrigerant stabilization control for proper refrigerant distribution.
- iii. All necessary safety devices shall be provided to ensure the safe operation of the system.
- iv. The system should be able to generate an alarm in case of refrigerant leak.
- v. Unit shall be equipped with an oil recovery and oil management system to ensure reliable operation of the system for its useful life.

6.2.6 Heat Exchange

- i. The heat exchanger shall be air cooled type constructed with copper tubes mechanically bonded to aluminum fins to form a cross fin coil. It shall be a cross flow type heat exchanger with refrigerant in tube and air over fins.
- ii. The aluminum fins shall be covered by anti-corrosion resin film. Further to this all the condensing coil shall be have special spray anti corrosion treatment site based.
- iii. The unit shall be provided with necessary number of direct driven low noise level propeller type fans arranged for vertical discharge. Each fan shall have a safety guard.
- iv. The heat exchanger shall be made out of seamless copper tubes and have continuous aluminum fins. The fins shall be spaced by extruded collars forming an integral part of fins. The tubes shall be staggered in the direction of airflow. The tubes shall be mechanically expanded for thermal bonding with fins. Each coil shall be factory tested for leaks using dry nitrogen at a pressure at least 1.5 times the maximum working pressure. The aluminum fins shall have an anti-corrosion coating.

6.2.7 Safety Devices

- i. All necessary safety devices shall be provided to ensure safe operation of the system.
- ii. Whatever safety devices are required shall be part of outdoor unit:- high pressure switch, fuse, fan drive overload protector, fusible plug, crankcase heater, over load relay, overload protection for inverter based technology.

Note: As this office is functional, hence majority of the work has to be done on holidays (i.e Friday 19:00Hrs to Monday 08:00Hrs of any weekend).

The firm carrying out this work shall provide certificate from OEM that ODU model to be used for replacement is compatible with existing IDU's installed at DFCCIL-CO (GD Midea/Midea make with model no. MDV-D36Q4/N1-C, MDV-D56Q4/N1-C, MDV-D112Q4/N1-C & MDV-D280T1/N1-C, MDV-D56Q4/N1-C, MDV-D71Q4/N1-C, MDV-D90Q4/N1-C, MDV-D140Q4/N1-C, MDV-D140T1/N1-C.

The outdoor roof mounted units shall be provided in such a fashion that these do not affect the overall aesthetics and ambience of the building. If required these units shall be suitably camouflaged to give good aesthetic look. These provisions, however, shall be discussed, if required, at a later date and the prices for the same shall be worked out separately as extra item.

6.3 Schedule –I, Item-2: SITC of 13600CFM Fresh Air Handling units with ducting accessories as per technical specifications along with SITC of HVAC ODU's Model (having all inverter technology based compressors) including Electrical and any other related work to be done for AHU unit.

The AHU system was installed in Year 2008. The System will be replaced by four FAHUs (with DX coil and HVAC ODU's), two of capacity 2300 CFM and two of capacity 4500 CFM.

The technical specifications for the ODU for F.A.H.U is same as that specified in section 6.2 (i.e Tech. specs of Schedule I, Item 1). However in this case its compatibility with existing IDU's mentioned in section 6.2 is not required. Incorporation of control system of HVAC ODU (for DX coil of F.A.H.U) and F.A.H.U in the existing BMS system is also a part of the scope of work. 48HP circuit must consist of 2 or more modules. 24HP circuit shall consist of either 02 (two) or more modules or shall have 02 or more compressors. ODU's must have minimum IEER of 18 as specified in the technical specifications.

For 4500 CFM new AHU system it should be 4500 CFM Supply Blower, 6 Row CC 75 mm Static Pressure for Supply Fan , 4050 CFM Ex. Blower , 60 mm Static Pressure for return air fan and for 2300 AHU System it should be 2300 CFM Supply Blower, 6 Row CC 75 mm Static Pressure for Supply Fan , 2070 CFM Ex. Blower , 60 mm Static Pressure for Return air fan.

6.3.1 DOUBLE SKINNED CASING for AHU: The casing shall be self-supporting type, factory fabricated & assembled made of extruded anodised aluminum hollow sections to make a rigid frame structure. The frame shall be assembled using pressure die cast aluminum joints. The self-supporting unit shall consist of



sandwiched panel made out of 0.8mm thick pre-plasticide / pre-coated GI sheet outside & 0.8mm GI sheet inside duly factory fabricated & insulated with 25 mm thick injected PU foam insulation of 36 Kg/m³ density in between. The insulated panels shall be bolted to main frame with neoprene rubber gaskets held captive in the framed extrusion to make it leak proof. Suitable air tight access doors / panels with pressure die cast aluminum hinges & nylon handles and locks shall be provided for access to various sections for maintenance. The Entire housing shall be mounted on Extruded Aluminum channel frame work having pressure die cast aluminum jointers or the frame work shall be joined together with corner plates. Condensate Drain Pan shall be constructed of 18 gauge polished stainless steel sheet with all corners welded with uniform slope from all sides leading to drain pan ensuring no stagnation of condensate water. Drain Pan shall be sandwich type insulated with 10 mm thick nitrile foam.

- 6.3.1.2 MOTOR & DRIVE FOR AIR HANDLING UNITS:** The fan motors shall be 415 ± 10% volts, 50 ± 5 % HZ, 3 phase TEFC SQ. Cage induction motor. The motor shall be specially designed for quiet operation & motor speed shall not exceed 1440 RPM. Drive to fan shall be provided through belt drive arrangement. Belts shall be of the resistant type only.
- 6.3.1.3 FAN OF AIRHANDLING UNITS :** The casing shall have heavy gauge GI construction forward curved DIDW imported fan statically & dynamically balanced mounted on EN8 solid shaft or C 40 carbon steel. The supply air DIDW fan shall be forward curved. The fan impeller shall be supported to housing with angle iron frame & pillow block heavy duty ball bearing. The fan shall be selected for a fan outlet velocity below 10.2 meter / sec. The fan housing with TEFC Sq. Cage motor shall be mounted on a common adjustable base frame on vibration isolators in case the impeller diameter is exceeding 450 mm & rubber turret mounts vibration isolators for fan diameter up to 450mm diameter. The fan motor shall be installed inside the housing of air handling unit to keep low noise level. The fan & motor assembly shall be of aluminum extruded section only.
- 6.3.1.4 REFRIGERANT COIL :** The Refrigerant Coil shall be made of aluminum fins and copper tubes of Ø3/8" coil is with Inner Grooved Tube material (IGT). The minimum no. of fins / cm for cooling coils shall be 4.72. The bonding of aluminum fins with copper should be done hydraulically. The tube thickness shall be 0.50 mm & fin thickness shall be 0.15 mm the cooling coil should be tested for leaks at a hydraulic pressure of at least 10 Kg / sq.cm. for a minimum period of 3 hours at works. The velocity across face should be limited to 152 meter / minute. In case of chilled water coils the design should be such to limit water velocity to maximum of 2.5 m / sec.
- 6.3.1.5 FILTERS:** Each unit shall be provided with a factory assembled filter section containing washable synthetic tube air filters having extruded aluminum frame having filtration capacity of 10 micron particle size with an efficiency of 90% efficiency. Filters shall fit so as to prevent by pass. Holding frames shall be provided for installing a number of filters cells in banks. These cells shall be held within the frames by sliding the cells between guiding channels. Face velocity across filters shall not exceed 152 MPM



Sr. No.	AIR-FILTER TECHNICAL	
(A)	Pre Filter (3 Micron)	
	Efficiency	99% down to 3 Micron
	IPD	8 - 9 mm WG
	FPD	20 - 21 mm WG
	Casing	Aluminium Frame
	Media	Non Woven Synthetic Media Supported by Al. Mesh on one side and finished with HDPE mesh on the other side
	Eurovent Class	EU – 7
	Filter Class	F – 7
	MERV Rating	MERV -13
	Temperature	Ambient
	Gasket	Food Grade

6.3.2 HEAT RECOVERY SECTION

- 6.3.2.1 The Heat Recovery section shall include enthalpy wheels and shall have minimum recovery of 75 % of total heat, i.e both sensible and latent (each being 75 %). Necessary computerized selection of the wheel should be provided along with the bid to justify the same. The wheel shall be made of pure aluminium foil coated with molecular sieve desiccant with pore diameter of 3^oA. The cross contamination between the two air streams shall be nil and leakage less than 0.04%. The vertical and radial run of the wheel shall be less than 1 mm per meter of diameter. The wheels shall have non-contact labyrinth seals for effective sealing between the two air streams.

Heat Recovery Wheel specifications:

Rotor/wheel matrix shall have following Matrix —

The substrate: The substrate or wheel matrix should be made of pure aluminum foil so as to allow.

- quick and efficient uptake of thermal energy.
- sufficient mass for optimum heat transfer
- maximum sensible heat recovery at a relatively low rotational speed of 20 to 25 rpm.

The substrate shall not be made from any material which is combustible or supports combustion like synthetic fibrous media.

The wheel shall have minimum 75% both Sensible and Latent Balanced Effectiveness as per AHRI 1060.




The wheel has to be certified as per DIN EN ISO 846 with 0% fungal and bacterial growth at 95% Relative humidity and above.

Fire rating: NFPA - 90A certification with 0% for Flame spread classification should be confirmed by manufacturer.

The Wheel shall be AHRI/Eurovent certified in accordance with standard 1060 and carry the AHRI/Eurovent certification stamp.

The product shall be produced in an ISO certified facility

Necessary software selection of the wheel has to be enclosed to justify the pressure drop and efficiency calculations. The selection software shall show hrw performance in summer, monsoon & winter.

6.3.2.2 **The Desiccant:** The desiccant should be water molecule selective and non-migratory.

The desiccant should be molecular sieve 3Å, (certified by a third party lab to have an internal pore diameter of 3Å), so as to keep the cross contamination to absolute minimum and also ensure the exclusion of contaminants from the air streams, while transferring the water vapour molecules.

The desiccant, of sufficient mass which should not be less than 5 kg per 1000 cfm of air, should be coated with non-masking porous binder adhesive on the aluminum substrate so as to allow quick and easy uptake and release of water vapour. A confirmation has to be provided by manufacturer of wheel to this effect. A matrix with desiccants impregnated in nonmetallic substrates, such as synthetic fibre, glass fibre, etc. will not be accepted.

The rotor/wheel matrix shall have equal sensible and latent recovery.

The weight of desiccant coating and the mass of aluminum foil shall be in a ratio so as to ensure equal recovery of both sensible and latent heat over the operating range. Accordingly, a rotor matrix which has an etched or oxidised surface to make a desiccant on a metal foil and results in insufficient latent recovery and hence unequal recovery, or a rotor matrix made from desiccant integrated in a synthetic fibre matrix which result in insufficient sensible recovery, high rotation speed, and unequal recovery, will not be accepted.

6.3.2.3 **Rotor** : With optimum heat and mass through matrix formed by desiccant, of sufficient mass, coated on an aluminum foil, the rotor should rotate at lower than 20 to 25 RPM, thereby also ensuring long life of belts and reduced wear and tear of seals.

The rotor shall be made of alternate flat and corrugated aluminum foil of uniform width.

The rotor honeycomb matrix foil should be so wound and adhered (full node line adhesive to be provided) so as to make a structurally very strong and rigid media which shall not get cracked, deformed etc. due to change of temperature or humidity.

The rotor having a diameter upto 2400 mm shall have spokes to reinforce the matrix. The internal threaded rod type spokes shall not be acceptable as it weakens the wheel structural strength thereby reducing the service life. From 2000 mm diameter upwards, the option of a special wing structure, to prevent the rotors from wobbling or deforming due to the successive pressure differentials, will be available.



Sectioned wheels, with pie segments, capable of being assembled in the field, shall be available as an option, above 2600 mm in diameter.

Wheels above 3400 mm in diameter shall be segmented and provided with wing structures spokes and flanged rim. The segmented wheels shall be provided with field rotation adjustment mechanism.

The HRW hub shall be fabricated out of heavy duty steel in order to have high mechanical strength. Light duty Aluminum hub shall not be accepted.

The surface of the wheel/rotor should be highly polished (FACED) to ensure that the vertical run out does not exceed ± 1 mm for every 1 meter diameter, thereby ensuring, negligible leakage, if labyrinth non-contact seals are provided, and minimal drag, if contact wiper seals are provided.

The radial run out also shall not exceed ± 1 mm for every 1 meter diameter, thereby minimising the leakage/drag on the radial seals, and minimise the fluctuation in the tension of the drive belt.

The number of wraps (of alternative corrugated and flat foil) for every inch of rotor radii shall be very consistent so as to ensure uniform air flow and performance over the entire face in the air stream. Flute height and pitch will be consistent to a very tight tolerance to ensure uniform pressure drop and uniform airflows across the rotor face.

The rotor shall be a non clogging aluminum media, having a multitude of narrow aluminum foil channels, thus ensuring a laminar flow, and will allow particles upto 800 microns to pass through it.

The media shall be cleanable with compressed air, or low pressure steam or light detergent, without degrading the latent recovery.

6.3.2.4 The Cassette / casing

The recovery wheel cassette/casing shall be manufactured from tubular / sheet metal structure to provide a self supporting rigid structure, complete with access panels, purge sector, rotor, bearings, seals, drive mechanism complete with belt. The sheet metal should be coated with a special corrosion inhibitor coating and a certificate for the same should be provided.

The rotor/wheel should have a field adjustable purge mechanism to provide definite separation of airflow minimising the carryover of bacteria, dust and other pollutants, from the exhaust air to the supply air. It shall be possible, with proper adjustment, to limit cross contamination to less than 0.04% of that of the exhaust air concentration.

The face and radial seals shall be four (4) pass non contact labyrinth seals / brush seals for effective sealing between the two air streams, and also for a minimum wear and tear ensuring long life of the seals.

6.3.2.5 PERFORMANCE TESTING

The HRW manufacturer shall have test facilities for performance testing of HRWs. If required the manufacturer shall be able to offer type testing of HRWs at their works and submit a type test report.

The manufacturer shall have test facilities for carry over testing at the same facilities where HRWs are manufactured.

6.3.3

MATERIAL FOR DUCTING: This section deals with supply, erection, testing & balancing of GI sheet metal duct work and air registers conforming to specifications as given below:

The duct shall be fabricated out of galvanized sheet, class VIII (Zinc coating 120 gm/m²) as per the parameters given below which are conforming to IS 655-1963.

MAXIMUM SIDE	THICKNESS	TYPE OF TRANSVERSE OF GI SHEET JOINT	BRACING CONNECTION
(1)	(2)	(3)	(4)
mm	mm		
Up to 300	0.63	S-drive, pocket or bar Slips, on 2.5m centers	None
301 to 600	0.63	S-drive, pocket or bar slips, on 2.5m centers	None
601 to 750		S-drive, 25mm pocket or 25 mm bar slips on 2.5m centers.	25 x 25 x 3 mm angles, 1.2m from joint
751 to 1000	0.80	Drive, 25-mm pocket or 25mm bar slips, on 2.5 m centers 40 x 40 mm angle connections,	25 x 25 x 3 mm angles, 1.2 m from joint
1001 to 1500		or 40-mm bar slips, with 35 x 3 mm bar reinforcing on 2.5 m centers.	40 x 40 x 3 mm angles, 1.2 m from joints
1501 to 2250	1.00	40 x 40 mm angle connections, or 40-mm bar slips, 1 m maximum centers with 35 x 3 mm bar reinforcing .	40 x 40 x 3 mm diagonol angles, or 40 x 40 x 3 mm angle 60 cm from joint.
2250 to above*	1.25	50 x 50 mm angle connections, or 40 mm pocket or 40 mm bar slips, 1 m max. centers with 35 x 3 mm bar reinforcing.	40 x 40 x 4 mm diagonol angles, or 40 x 40 x 3 mm angles, 60 cm From joint.




- * Ducts 2250 mm and larger require special field study for hanging and supporting methods.

In addition to above the following points should be also taken into account while fabrication of ducts.

- a) All ducts of size larger than 450mm shall be cross broken.
- b) All ducts shall be supported from the ceiling / slab by means of wire hanger system. Wire Hangers should consist of a pre-formed wire rope sling with a range of end fixings to fit various substrates and service fixings, these include a ferruled loop, permanently fixed threaded M6 (or M8, M10) stud, at one end or hook or eyebolt anchor or any other end fixture type or size as per manufacturers recommendation and design. The system should be secured and tensioned with a Hanger self-locking grip (double channel lock) at the other end. The correct specification of wire hanger should be as per manufacturer's recommendation.
- c) Wire Hangers should have been independently tested by Lloyds Register, APAVE, TUV, CSA, Chiltern International fire, ADCAS, Intertek, ECA, and SMACNA, approved by ULC and CSA and comply with the requirements of DW/144 and BSRIA – wire Rope Suspension systems. Wire rope should be manufactured to BSEN 12385: 2002.
- d) The vanes shall be provided wherever required and shall be securely fastened to prevent noise & vibration.
- e) The rubber gasket shall be installed between duct flanges in all connections and joints.
- f) All flanges and supports should be primer coated.
- g) The flexible joints shall be fitted to the delivery side of AHU fans with Fire Retardant Double canvass. The length of flexible joints should not be less than 150 mm and not more than 300 mm between faces.
- h) The ducting work can be modified if deemed necessary in consultation with the Engineer in Charge to suit actual site conditions in the building.

6.3.4 FRESH AIR INTAKE LOUVERS WITH BIRD SCREEN

The fresh air intake louvers at least 50mm deep will be made of powder coated extruded aluminum construction. Bird / insect screen will be provided with the intake louvers. The blades shall be inclined at 45 degree on a 40mm blade pitch to minimize water ingress. The lowest blade of the assembly shall be extended out slightly to facilitate disposal of rain water without falling on door / wall on which it is mounted.

The intake louvers shall be provided with factory fitted aluminum construction volume control dampers in black anodized finish.

6.3.5 PAINTING

All ducts collar / shoot behind the grills / diffuser shall be given at least two coats oil black enamel paints. To protect Nitrile rubber insulation of outdoor installed copper piping from degradation due to ultra violet rays and atmospheric condition, it shall be covered with a protective coating of at least two coats of resin and hardener (poly bond make or equivalent). Fibre glass tape shall be

helically wound with adequate overlap & coated with two coats of resin with hardener to give smooth & plain finish.

6.3.6 TESTING

The complete duct system shall be tested for air leakage & complete air distribution system shall be balanced in accordance with air quantities indicated on the approved drawing.

6.3.7 NOISE AND VIBRATION CONTROLS

The air conditioning contractor must take all necessary precautions to have minimum noise generation and its transmission. Minimum vibration as permitted by IS relevant code shall be ensured. A few points for guidance only are given below:

- a) Double fire retardant flexible connections shall be provided from air discharge to outlet of air-handler to the duct.
- b) Vibration isolation pads of suitable thickness commensurate to loading for isolation of vibration shall be provided under all VRV systems. in consultation with manufacturer for proper selection of vibration isolators
- c) Flexible conduit connections of minimum diameter of 50mm to motors shall be provided. All loops should be large enough to allow connections to remain flexible.
- d) All conduit connection where conduits are 60mm or larger shall be made of 1.2 meters minimum length conduit installed in the shape of U and grossly slack to provide maximum vibration isolation.
- e) Operating clearance of 40mm shall be kept between the base and the inertia base.
- f) All items suspended from false ceiling shall be isolated on separate hangers.
- g) In case of ducts, conduits, pipes & tubes the annular space between construction and penetrating element shall be sealed with sand cement plaster.
- h) The air-conditioning contractor shall take all other precautions or shall make his own arrangements even if not specified in the tender documents for eliminating high noise levels & shall minimize vibrations in all mechanical equipment's without any additional cost.

6.3.8 STANDARD SPECIFICATION OF THERMAL / ACOUSTIC INSULATION

6.3.8.1 MATERIAL – TYPES

The insulation material to be used for various applications shall be any of the following, as required:

- i) For thermal insulation of Refrigerant Piping:-
 - a) Closed Cell Class O Nitrile Rubber

Closed Cell Nitrile Rubber Class O shall be used for pipe insulation like inside the A.C. plant room, exposed to outside or buried in ground. The insulation shall be in tube form for nominal dia of pipes up to 80mm and above 80mm dia pipes,

sheets shall be used. Nitrile Rubber tubes shall be fully factory (machine) slit along each length with 2 strips of double sided tape self - adhesive tape pre-applied to each open. Both the Nitrile Rubber Sheets and Tubes shall be factory laminated with chemically treated fiber glass cloth of 7 Mill / 0.18mm Thickness tested for UV protection as per EN ISO 4892-2 Method - A.

The pipe supports to be used shall be Insulated pipe supports, shall be single piece with self-adhesive closure, with special plastic load bearing Inserts, embedded in Elastomeric Nitrile Rubber (Armaflex) *insulation for HVAC applications.*

- ii) For thermal insulation of duct work :-
a) Closed Cell Class O Nitrile Rubber

Closed Cell Class O Nitrile Rubber Sheets shall be used for duct work insulation. Special Rubber based contact Adhesive free from benzene; specially formulated for the Duct insulation application and supplied by insulation manufacturer shall be used.

For Non-Exposed Ducts, the above Nitrile Rubber shall be factory laminated with Aluminum Foil of minimum 60 Micron Thickness, having weight of 193 gsm as per EN ISO 2286-2, tensile strength shall be 90N/15mm as per EN ISO 527-3 with elongation > 10% as per EN ISO 527-3.

For Ducts exposed to outside areas, the above nitrile rubber shall be factory laminated with 3 Layered composite non-metallic cladding of 230 Microns thickness and of metallic finish having aluminum as an intermediate layer and UV protection as per EN ISO 4892-2 Method A.

- iii) For acoustic lining of duct work:-
a) Open Cell Nitrile Rubber Engineered Foam with built-in antimicrobial and antifungal properties.

Open Cell Nitrile Rubber Engineered Foam with built-in antimicrobial and antifungal properties shall be used for acoustic lining inside the duct. Special Rubber based contact Adhesive free from benzene; specially formulated for the Duct insulation application and supplied by insulation manufacturer shall be used.

- iv) For Under-Deck Thermal Insulation:-
b) Closed Cell Class O Nitrile Rubber.

Closed Cell Class O Nitrile Rubber Sheets shall be used for under-deck thermal insulation. Special Rubber based contact Adhesive free from benzene; specially formulated and supplied by insulation manufacturer shall be used. The above Nitrile Rubber shall be factory laminated with Aluminum Foil of minimum 60 Micron Thickness with a weight of 193 gsm as per EN ISO 2286-2, tensile strength shall be 90N/15mm as per EN ISO 527-3 with elongation > 10% as per EN ISO 527-3.

6.3.8.2 MATERIAL SPECIFICATIONS

The insulation material shall satisfy the following requirements:-

- i) For thermal application on pipes.

Material vapour	Density (kg/cu.m)	Maximum Thermal conductivity (W/mk at 20 deg C mean temp.)	Minimum Water diffusion resistance
Closed Cell Class O 7000 Nitrile Rubber	40 – 55	0.037	

- ii) For thermal insulation on ducts:

Material vapour	Density (kg/cu.m)	Maximum Thermal conductivity (W/mk at 20 deg C mean temp.)	Minimum Water diffusion resistance
Closed Cell Class O Nitrile Rubber	40 – 55	0.037	7000

INSULATION THICKNESS

The thickness of insulation shall be as indicated below unless specified otherwise in tender specifications.

- i) For pipes Drain Water pipes:

- a) For Non Coastal Areas

Pipe Size Nominal Dia (mm)	Nitrile Rubber Thickness (mm)
50mm and below	9mm
Above 50mm	13mm

- b) For Coastal Areas

Pipe Size Nominal Dia (mm)	Nitrile Rubber Thickness (mm)
50mm and below	13mm

Ande

DDT

Above 50mm	19mm
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- ii) For Duct Thermal Insulation:
Supply Air Ducts (Non Coastal Areas) 19mm
Supply Air Ducts (Coastal Areas) 25mm
Return Air Duct (Non Coastal Areas) 09mm
Return Air Ducts (Coastal Areas) 13mm
- iii) For Acoustic Insulation:
For Duct Acoustic Lining 15mm
For AHU Rooms 25mm

6.3.8.3 APPLICATION OF INSULATION (THERMAL) ON DUCT - APPLICATION PROCEDURE:

External thermal insulation shall be provided as follow:

The thickness of the nitrile rubber shall be as shown on drawing or identified in the schedule of quantity. Following installation procedure should be adopted:

- a) Duct surfaces shall be cleaned to remove all grease, oil, dirt, etc. prior to carrying out insulation work.
- b) Measurement of surface dimensions shall be taken properly to cut closed cell elastomeric rubbers sheets to size with sufficient allowance in dimension.
- c) Install the insulation material to the top surface of the ductwork.
- d) After installing the insulation material to the top sections, proceed to install the 2 sides.
- e) Finally install the insulation material sheet to the bottoms of the ductwork.
- f) After completing 1.2.3 above, install bracket covers around all 4 sides.
- g) Install additional section of sheet under and around the load support hanger type brackets.
- h) Ductwork load support fixing brackets and procedures for the covering of metal protruding joints:
 - a) All above types shall be installed with insulation material sheet equal to the thickness of the main ductwork installation as a minimum.
 - b) The insulation strip covers shall be applied to all the 4 sides, with minimum joints being present.
 - c) The width of the covers shall be 150mm on all ductwork sizes.
 - d) Ensure where possible, the covers are installed "in-line and straight", (check this before sealing with the adhesive).
 - e) Ensure all the covers are sealed, with adhesive applied to both of the insulation material surfaces.
 - f) Apply pressure to the covers when fixing, particularly at the 900 corners of the covers.
 - g) The adhesive vapor seal shall be as a minimum, equal to the thickness of the insulation material.
 - h) Keep a equal and clean run of adhesive on the edges of the insulation covers, remember if it looks a "mess" people will think it's a bad and unprofessional job.
 - i) Load support brackets should be removed from the underside of the duct to allow the complete coverage of the material to the ductworks surfaces.
 - j) After fixing the insulation sheet to the underside of the ductwork, insert an additional 150mm wide insulation strip under the load bearing bracket support. Line up the strip and bracket and re-fix the support and seal all the insulation strips with adhesive. Ensure the length of the insulation strip is in equal size to the width of the ductwork .




- k) 90% heavy-duty metal type support brackets shall follow the procedure as above. The size of the insulation additional strips shall be a minimum of 150mm wide x 300mm in length.
- i) Material shall be fitted under compression and no stretching of material should be allowed.
- j) A thin film of adhesive shall be applied on the back of the insulating material sheet and then on to the metal surface. Adhesive shall be in compliance with Indian Green Building requirement, having VOC content less than 850 g/l.
- k) When adhesive is tack dry, insulating material sheet shall be placed in position and pressed firmly to achieve a good bond.
- l) All longitudinal and transverse joints shall be sealed.
- m) The adhesive shall be strictly as recommended per manufacturer.

6.3.8.4 APPLICATION OF DUCT LINING (ACOUSTIC INSULATION)

- a) The inside surface for the ducts shall be covered with adhesive recommended by the manufacturer.
- b) Cut Foamed sheets into required sizes apply adhesive on the foam and stick it to the duct surfaces.
- c) Install the insulation material to the inside surface of the ductwork.
- d) After installing the insulation material to the top section, proceed to install the 2 sides.
- e) Finally install the insulation material sheet to the bottoms of the ductwork.

6.3.8.5 MEASUREMENT OF INSULATION

- a) Pipe Insulation shall be measured in units of length along the center line of the insulated pipe. The linear measurements shall be taken before the application of the insulation. For piping measurements, all valves, orifice plates and strainers shall be considered strictly by linear measurement along the center line of the pipes, and no special rate shall be applicable for insulation of any accessories, fixtures or fittings whatsoever.
- b) Duct Insulation and acoustic lining shall be measured on the basis of surface area along the center line of insulation thickness. Thus the surface area of externally thermal insulated or acoustically lined duct shall be based on the perimeter at the center of thickness of insulation, multiplied by the center-line length of ducting including tapered pieces, bends, tees, branches, etc. as measured for bare ducting. In the case of tapering pieces, their average perimeter shall be considered.
- c) All duct insulation shall be measured on the basis of the duct prime surface area and excluding all openings for grilles, diffusers but including all flanges, dampers etc.
- d) In case of bends, tapers etc. the duct prime surface shall be determined on the basis of average dimensions.
- e) All pipe insulation shall be linear measure along the centerline of the pipe, over all fittings, excluding flanges and valves.
- f) Each independent flange insulation shall be measured as 300mm equivalent length of piping.
- g) Insulation of flanges associated with equipment (equipment and mating flange) and valves (flanged or screw-ended valves with flanged tail pipes) shall form part of the valve or equipment.




6.4 Schedule I, Item 3 : Piping for HVAC Outdoor Units

STANDARD SPECIFICATION ON REFRIGERANT PIPING WORK:

This section deals with supply, installation, testing & commissioning of refrigerant piping as detailed below in specifications.

- 6.4.1 **REFRIGERANT PIPING:** All refrigerant piping for the air conditioning system shall be constructed from soft seamless up-to 19.1mm and hard drawn copper refrigerant pipes for above 19.1mm with copper fittings and silver-soldered joints. The refrigerant piping arrangements shall be in accordance with good practice within the air conditioning industry, and are to include charging connections, suction line insulation and all other items normally forming part of proper refrigerant circuits.
- 6.4.2 All joints in copper piping shall be sweat joints using low temperature brazing and or silver solder. Before joining any copper pipe or fittings, its interiors shall be thoroughly cleaned by passing a clean cloth via wire or cable through its entire length. The piping shall be continuously kept clean of dirt etc. while constructing the joints. Subsequently, it shall be thoroughly blown out using nitrogen.
- 6.4.3 After the refrigerant piping installation has been completed, the refrigerant piping system shall be pressure tested using nitrogen at pressure of 20Kg per sq.cm and 10 Kg per sq.cm (low side). Pressure shall be maintained in the system for 24 hours. The system shall then be evacuated to minimum vacuum if 700mm hg and held for 24 hours.
- 6.4.4 The air-conditioning system supplier shall be design sizes and erect proper interconnections of the complete refrigerant circuit.
- 6.4.5 The thickness of copper piping shall not be less than 20 gauge for pipes up to 19.1mm and 18 gauge for bigger size.
- 6.4.6 The suction line pipe size and the liquid line pipe size shall be selected according to the manufacturers specified outside diameter. All refrigerant pipes shall be properly supported and anchored to the building structure using steel hangers, anchors, brackets and supports which shall be fixed to the building structure by means of inserts or expansion shields of adequate size and number to support the load imposed thereon.

6.5 Schedule I, Item 4: UPVC Drain water pipe replacement:

Providing and fixing in position UPVC plumbing pipes of APPROVED Make or equivalent as per ASTM D-1785 (SCH-80) including cost of Specials as per ASTM D-2466 (SCH-80) including jointing with approved solvent cement, chase, cutting holes in walls roofs or floors etc. and making good to its original condition complete as per manufacturer's specifications and satisfaction of Engineer In-charge.

The condensate drain pipe connection of each fan coil unit to the main header should be rigid PVC pipe of heavy gauge with 25 mm dia /32mm dia as required. The header pipe should be of 50 mm dia/32 mm dia as required. The drain piping should be insulated with 9 mm thick tubular nitrile rubber insulation. For proper drainage of condensate U trap shall be provided in the drain piping wherever required. All pipe supports shall be prefabricated and pre-painted slotted angle supports, properly installed with clamps. The condensate drain pipe arrangement for disposal of condensate water be made in such a way that there should not be any leakages of condensate water inside rooms as well in the route of drain water pipe line & water should be discharged at the location jointly decided with Engineer-in-Charge of work.



INSULATION THICKNESS

The thickness of insulation shall be as indicated below unless specified otherwise in tender specifications.

iv) For pipes Drain Water pipes:

c) For Non Coastal Areas

Pipe Size Nominal Dia (mm)	Nitrile Rubber Thickness (mm)
50mm and below	9mm
Above 50mm	13mm

d) For Coastal Areas

Pipe Size Nominal Dia (mm)	Nitrile Rubber Thickness (mm)
50mm and below	13mm
Above 50mm	19mm

All associated Civil Engineering works as per requirement at site in above connection like making chase in the wall & restoring it original shape by re-plastering & repainting, etc. are included in the scope of work. The arrangement of drain- pipe shall be made in such a way that it should not affect the aesthetic of the building as well as is maintenance friendly & easily accessible.

6.6 Schedule I, Item 5: Electrical Items:

STANDARD SPECIFICATION OF MOTOR CONTROL CENTER (MV PANEL), AHU SUB-PANEL, POWER & CONTROL CABLING

This section deals with supply, installation, testing & commissioning of Motor Control Center (MV panel) & shall be manufactured by CPRI approved vendors. The power / control cabling & earthing work shall be carried out as per the specification given below:

6.6.1 SCOPE :

All work shall confirm to Indian Electricity Act (amended up to date), I.S. code of practices local rules and regulations etc. Power cabling shall be carried out with approved make of cables as indicated in the **List of approved make of equipment / materials** and shall be of grade 1100 volts, PVC insulated & sheathed, armored aluminum conductors cables. Control cabling shall be of approved make and shall be of grade 1100 volts, PVC insulated & sheathed, copper conductor armoured multicore cables as specified in B.O.Q

6.6.2 MOTOR CONTROL CENTER (MV PANEL)

Motor control center (MV Panel) floor mounted extendable type & wall mounted AHU sub-panel shall be fabricated out of 14G C.R.C.A. Sheet. These panels shall be cubical

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sectionalized type, totally enclosed dust & vermin proof. Gaskets shall be provided in all joints to prevent dust to reach the internals of the panels to make it completely dust proof. The degree of protections for panels shall be IP 52 for indoor applications and IP 55 for outdoor applications as per IS:2147.

These panel (MV) shall be suitable for voltages up to 500 volts, three phase 50 Hz, 4 wire supply capable of functioning satisfactorily in temperature ranging up to 45 to 50 degree centigrade and rupturing capacity suitable for connected load & design should be type tested for 42 KA fault level. All joints of panels shall be welded and braced as necessary to provide a rigid support for all components. The base channel provided in the floor mounted MV panel shall be 75mm high & a clear space of 200mm between the floor and the bottom most part of the unit shall be provided. The panel shall be correctly positioned. Self- threading screws shall not be used in the construction of control panels. Appropriate knock-out holes of proper sizes shall be provided for incoming and outgoing cables. The facility for bottom or top entry of cables in the panels shall be provided. Necessary cables clamps shall be provided for holding the cables in position.

All power/control wiring inside the panel shall be color coded and control wiring ferruled for identification purpose. All labeling shall be provided in engraved anodized aluminum strips on the front face of the panel.

Each circuit breaker shall be housed in separate compartments. It shall have steel sheets on top and bottom of compartment. The steel sheet hinged door shall be interlocked with the circuit breaker on the "ON" position. When the breaker is on the "ON" position, suitable preventive measures shall be provided, such as interlocks, to prevent the breaker from being drawn out. When the breaker is in "ON" position steel sheet shall be provided between the tiers in the vertical section. The door of this compartment shall not form part of the draw out arrangements.

6.6.3 BUS-BARS

The bus-bar and its connections shall be aluminum Electrolytic grade E-91 as per IS: 5082 and shall be of rectangular section. The amperage capacity of aluminium bus bar shall 1A / Sq. mm. These should be suitable for full load current for phase bus-bar and neutral bus-bar shall be of half rated current capacity. The bus-bar should have provision on either side for extension. The bus-bar should be sleeved with color coded heat shrinkable PVC sleeve. Bus-bar supports shall be of fibre glass reinforced thermosetting polyester having in built and tracking barriers to break the path of conducting dust through molded ribs.

In panels bus-bar connections shall be done by drilling holes with cadmium coated bolts and nuts. Extra cross section shall be provided to compensate drilling of the holes. Insulated aluminum strips of suitable size of full rated current capacity shall be used for interconnecting bus-bar and breaker.

A horizontal / vertical wire way shall be provided for interconnecting control wiring between different vertical sections.

The terminal blocks shall be used for outgoing terminals and neutral link at a suitable located place in the control panel. Separate compartments for outgoing and incoming cable shall be provided. The current transformers of all instruments shall be mounted with terminal blocks.

All live parts including incoming and outgoing link / terminals should be totally shrouded by means of non-hygroscopic and fire retardant material.

6.6.4 ROTARY SWITCH / SELECTOR SWITCH / SWITCHES / HRC FUSES / STARTERS / SINGLE PHASE PREVENTERS / TOGGLE SWITCH.

These shall be of approved make and conforming to relevant ISI standard. The rupturing capacity of HRC fuses should not less than 80 KA and in case of switches it should be 60 Amps maximum.

6.6.5 CURRENT TRANSFORMER

The current transformers shall have accuracy of class I and 5P10 / 10P10 and suitable VA burden for operation of the connected meters and relays.

6.6.6 OVERLOAD RELAYS

All the motors shall have overload relay protections conforming to relevant IS.

6.6.7 TIME DELAY RELAYS

These shall be adjustable type with time delay adjustments of 0-180 or as per manufacturer's standards.

6.5.8 INDICATING LAMPS AND METERING

These shall conform to BS37 & BS39. All meters shall be flush mounted and draw-out type. The indicating lamp shall be filament type and with very low burden & economy resistor.

6.5.9 VOLTMETER AND AMMETERS

Motor Control Center (MV Panel) shall have flush type voltmeter & ammeter of size 96 x 96 mm as detailed in B.O.Q.

6.5.10 PUSH BUTTON STATIONS

These shall be suitable for panel mounting and accessible from front without opening. These shall be provided for manual starting and stopping of motors/equipment as per normal practices. The contacts shall be suitable for 6AMP current capacity.

6.5.11 CONDUITS

These shall be preferable made of mild steel, stove enameled from inside and outside with minimum wall thickness of 1.6 mm for conduits up to dia of 25mm and 2 mm for conduits above 25 mm diameter.

6.5.12 CABLES

These shall be PVC insulated, pre-sheathed, aluminum conductor armored cables as per IS:694 and as per **list of approved make of equipment / materials**. Control Cables shall be multi-core PVC-insulated PVC sheathed copper conductor and armored cables of approved make only.

6.5.13 LAYING OF CABLES

These shall be laid as Indian Standard code of practice. All cables shall be laid on existing cable trays. In case more than one cable is running, then proper space in between the two cables shall be provided to avoid loss of current carrying capacity. While cables are running on walls, proper saddles must be provided. Necessary accessories like cable termination Glands, requisite size Lugs and Ferrules for proper cable connection shall be provided.

6.5.14 WIRE SIZES

Single stand PVC-copper conductor wires shall be used inside the control panel for interconnecting different components. All wires shall be neatly dressed and colored beads shall be provided for easy identification in control wiring. The minimum size of

control wiring shall be 1.5sq.mm, each HVAC ODU shall be given power supply through 16sqmmX4C copper cable (by laying new cable) and each AHU shall be provided with a newly laid 6sqmmX4C copper cable Testing of panels as per code of practice shall be done at works by AC contractor before inspection & dispatch to site.

6.5.15 DRAWINGS

Necessary drawings of all control panels and wiring of equipment etc., shall be submitted by the A.C contractor for approval of the Engineer in Charge. On final completion of job and before handing over of AC System As Built Drawings shall be submitted to the Department.

6.5.16 TESTING

The complete electrical installation shall be tested in accordance with relevant ISI codes in presence of Electrical Supervisor of the Department before commissioning of plant.

6.5.17 PAINTING OF PANELS

All sheet metal enclosures shall be powder coated only after de-rusting & hot-dip phosphate degreasing etc. at works only.

DFCCIL shall provide 3-phase 415V, 50Hz power at a single point ((ie. Sub-AC panel on terrace) for all VRF outdoor units. The tenderer shall lay all required XLPE armored cables, cable trays, necessary protection to connect all equipment on rooftop including VRF Outdoor Units from Sub AC Panel to ODUs. Electrical connections to individual IDUs shall be carried out with FRLS cables from DB on each floor.

6.5.18 CAPACITY OF RELAYS AND CONTACTS

The following capacity relays and contacts shall be used for various rating of motors:

a) 50/60 HP Motor	Star Delta Starter	65 Amp.	30 - 50 Amp.
b) 40 HP Motor	Star Delta Starter	45 Amp.	20-33 Amp.
c) 30 HP Motor	Star Delta Starter	45 Amp.	20-33 Amp.
d) 25 HP Motor	Star Delta Starter	32 Amp.	14-23 Amp.
e) 20 HP Motor	Star Delta Starter	32 Amp.	14-23 Amp.
f) 15 HP Motor	Star Delta Starter	25 Amp.	9-15 Amp.
g) 10 HP Motor	Star Delta Starter	16 Amp.	6-10 Amp.
h) 7.5 HP Motor	D.O.L. Starter	16 Amp.	9-15 Amp.
i) 5 HP Motor	D.O.L. Starter	16 Amp.	6-10 Amp.

6.5.19 EARTHING

System shall be complete with electrical panel board with cabling & earthing. The earthing of all equipments shall be carried out by Copper strips / wires. All panels / three phase motors shall be earthed with two number distinct and independent Copper strips / wires. HVAC ODU modules & AHU units shall be provided with 8 SWG GI wire for body earthing (double earthing to be provided). The earthing connections shall be connected to main earth station or main earth grid. The earth connections shall be connected to equipment's after removal of paint, grease etc.

The earthing of all equipment's shall be carried out by Copper strips / wires. All HVAC ODUS's and F.A.H.U's shall be provided with two different visible G.I Earthing wires of

8 SWG and the same wires shall be connected to the nearby earthing grid/mesh available. All panels / three phase motors shall be earthed with two number distinct and independent Copper strips / wires of the following sizes:

- | | |
|-----------------------|----------------------|
| 1. Motor upto 5.5 KW | 3 sq. mm Copper Wire |
| 2. Motor 7.5 to 12 KW | 4 sq. mm Copper Wire |
| 3. Motor 12 to 50 KW | 25x3 mm Copper Strip |
| 4. Motor 51 to 89 KW | 32x6 mm Copper Strip |

The earthing connections shall be connected to main earth station or main earth grid. The earth connections shall be connected to equipment's after removal of paint, grease etc.

6.5.20 Miscellaneous Items:

1. **All Schedule items to be supplied only after prior permission from Engineer in-charge based upon the actual requirement at site and Payment of any schedule item shall be made as per actual measurement of the work done at site.**
2. **Test data:** The complete plant shall be tested as per specifications given and complete test data shall be furnished on prescribed data sheet.
3. **Drawings:** The contractor shall submit as 3 copies of blue print as build drawings (exact dimensions layout plan) for the work carried out, which includes HVAC ODU modules and F.A.H.U location and ducting layout plan with rating, dimensions etc. The drawings shall be put up to DFCCIL authorities for scrutiny and correction before the final submission.
4. **Technical Data:** The Tenderer shall furnish complete "Technical Data" on the equipment offered by him as required under the heading "Technical Data". Incomplete Technical data may lead to the bid getting rejected.
5. **Performance Guarantee of HVAC System:**

The Tenderer shall guarantee the following:

 - a. **The air-conditioning system shall maintain the designed inside temperature within +/-1°C tolerance and the relative humidity shall not exceed 55%.**
 - b. The cooling and de-humidification capacity of the system as installed will not vary more than 5% from data submitted in the technical data. If the units are subjected to performance tests in accredited test facilities the variation in cooling and power consumption data shall not vary by more than +/-5%. The IEER in at part load and full load shall not be lower than values submitted in the bid.
 - c. Performance test shall be done **in peak summer conditions** to check adequacy of system selection **for summer conditions** to ensure comfort in the cooling mode. Tests will be conducted on mutually agreed relatively warmer days with an intent to get the highest possible outdoor air temperature at DFCCIL site which is above **42 Deg C**. During the test all indoor and outdoor units shall be switched on, temperature of indoor units set to 24 Deg C with all indoor units operating with fan speed at its highest setting. The indoor temperatures shall be measured in each zone where the air-conditioning units have been installed under the scope of this order. The measured indoor temperature and humidity using instruments calibrated from an NABL accredited lab shall be recorded in each zone. The indoor Dry Bulb Temperature (DBT) must be 24+/-1Deg C and humidity 50+/- 5%.



6.5.21 TERMS AND DEFINATIONS: The followings terms have been used in the tender specifications, drawings etc.

ISI	Bureau of Indian Standards.
ASHRAE	American Society of Heating Refrigeration & Air-conditioning Engineers, USA.
ASME	American Society of Mechanical Engineers.
ASA	American Standard Association.
B.S.	British Standards.
CMH	Cubic Meter per Hour.
US GPM	US Gallons per minute.
IGPM	Imperial Gallons per Minute.
RPM	Revolutions per Minute.
BTU/Hr.	British Thermal Unit per Hour.
Kcal/Hr.	Kilo Calories per Hour.
HZ	Hertz.
H.P.	Horse Power
Kg/Cm2	Kilo Gram per Square Centimeter.
SAG	Supply Air Grills.
SAD	Supply Air Diffuser.
SAF	Supply Air Filters.
FD	Fire Damper.
VCD	Volume Control Damper.
RAD	Return Air Damper.
FAD	Fresh Air Damper.
RH	Relative Humidity.
DB	Dry Bulb Temperature.
WB	Wet Bulb Temperature
MV	Mechanical Ventilation.
DP	Drain Point.
VRF	Variable Refrigerant Flow



The codes, regulation as detailed below shall be followed in this contract:-

- | | | |
|-----|--|---|
| 1. | Safety code for air-conditioning
(revised) amendment 1 | IS 659 : 1964 (reaffirmed 1991) |
| 2. | Safety code for mechanical
Refrigeration | IS 660 : 1963 (reaffirmed 1991) |
| 3. | Testing of refrigeration
compressors | IS 5111 : 1993 |
| 4. | Air-cooled heat exchangers
(amendment 1) | IS 10470 : 1983
(reaffirmed 1991) |
| 5. | Thermostats for use in
refrigeration etc. | IS 11338 : 1965
(reaffirmed 1991) |
| 6. | Metal Duct Work | IS 655 : 1963 (reaffirmed 1991) |
| 7. | Steel for general structural
purpose | IS 2062 : 1992 |
| 8. | Welding | IS : 3589 |
| 9. | Refrigeration | As per ASHRAE / ISI
Air-conditioning & Refrigeration
Air-conditioning institute
Standards. |
| 10. | Hot Dip Zinc Coated Steel Tubes | IS 4736 : 1968 |
| 11. | Colour code for the identification
of pipe lines | IS 2379 : 1963 |
| 12. | Specific requirements for the
direct switching of the individual
motors. | IS 4064 (Part II) 1978 |
| 13. | PVC insulated (HD) Electric
Cables for working voltage up
Including 1100 Volts. | IS : 1554 (Part I) |
| 14. | HRC Cartridge fuse links
upto 650 Volts. | IS 2208 : 1976 |
| 15. | Starter | IS 8554 (Part I) 1979 |





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|-----|---|------------------------------|
| 16. | Inspection and testing of installation | IS 732 (Part III) 1979 |
| 17. | PVC insulated (heavy duty) cables for working voltage up to 1.1. KV and up to 11 KV Grade respectively. | IS 1554 : 1981 Part I & II |
| 18. | Code for practice for electrical wiring installations. | IS 732 : 1989 |
| 19. | Code for practice for earthing | IS 3043 : 1966 |
| 20. | Wrought aluminium & aluminium alloy sheet and strip for general engineering purposes. | IS : 737 |
| 21. | Mild steel tubes, tubular and other wrought steel fittings. | IS : 1239 |
| 22. | Contactors for A.C for voltage upto 1100 V. | IS 2959 : 1975 |
| 23. | Low voltage switch gear and control gear assemblies. | IS 8623 : 1993 Part I & II |
| 24. | Code of practice for selection of starters for AC induction motors | IS 3914 |
| 25. | Specification for cables glands | IS 4821 |
| 26. | Code for selection, installation & maintenance of switch gear and control gear. | IS 10118 : 1982 Part I to IV |
| 27. | Conduits for electrical installations | IS 9537 : 1981 Part I to IV |
| 28. | Permissible limits of noise level for rotating electrical machines. | IS 12065 : 1987 |
| 29. | Code of practice for installation and maintenance of motors | IS 3106 : 1966 |
| 30. | Unbounded glass wool for thermal insulation (1st. Revision) | IS 3690 : 1974 |

6.5.22 SAFTEY CODES:

The following IS codes shall be followed:

Safety code for mechanical refrigeration	IS 660
Safety code for air conditioning	IS 659
Safety code for scaffolds & ladders	IS 3696
Code of practice for fire precaution in	IS 3016

Welding & cutting operations

Code for safety procedures and practices IS 5216

In electrical works

Code of practice for safety and health IS 3696

Requirements in electrical & gas welding

And cutting operations.

6.5.23 SPACE : All shop drawings shall be prepared by the A.C Contractor after examining the Architectural drawings, site conditions and consultants tentative layout plans.

Section C

1. TEST PRO FORMA FOR COMMISSIONING:

S.No.	Item	Unit	Test Result
1.0	<u>Operating Conditions</u>		
1.1	Ambient conditions		
	- Temp. D.B.	°C	
	- Temp. W.B.	°C	
	- R.H. (Calculated)	%	
2.0	VRF System		
2.1	Total Outdoor Unit Current (R/Y/B)	A	
2.2	Compressor Current (R/Y/B)	A	
2.2.1	Compressor speed as % of Maximum	%	
2.2.1	Discharge Gas Temperature	°C	

	Discharge Pressure	Psig	
	Suction Pressure	Psig	
2.3	Condenser		
2.2.1	Measured Average Air velocity	M/sec	
2.2.2	Air temp. –Entering	°C	
2.2.3	Air Temp. – Leaving	°C	
2.2.4	Refrigerant condensing temperature	°C	
2.2.5	Face area	M ²	
2.2.6	Condenser Air quantity	M ³ /hr	
2.2.7	Measured Heat Rejection rate	KW	
2.2.8	Noise Level (At night with Condenser Fan at min/max/medium speed)	dBA	
3.0	Indoor Conditions measured at (10am, 2pm, 4pm)		
3.1	Room Air DBT at 1.5 Metre above floor	°C	
3.2	Room Air WBT at 1.5 Metre above floor	°C	
3.3	Room RH (Calculated from 3.1&3.2)	%	
3.4	Grill Temp of Air/Supply Air Temp at max fan speed	°C	
3.5	Refrigerant Temp at indoor coil mid-point	°C	
3.6	Refrigerant Temp at indoor coil exit	°C	

Note:

Instructions:

1. All instruments for testing shall be provided by the HVAC Tenderer and shall have a calibration certificate from an NABL accredited lab. The calibration certificate must not be older than 3 months for thermometers. The anemometers and pressure gauges used during commissioning tests should be new and not used after calibration.
2. All thermometer shall have a resolution of 0.1 Deg C and accuracy +/-0.1°C.
3. Electrical parameters to be measured using digital instruments with accuracy of +/- 1%.

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2. TECHNICAL DATA SHEET FOR HAVC SYSTEM:

Outdoor Dimensions	Unit	Height (mm)		
		Length (mm)		
		Width (mm)		
Outdoor Refrigerant Connections	Unit Piping	Liquid Line Valve Size and Type		
		Suction Line Valve Type and Size		
Outdoor Unit Liquid Line Valve		Size and Connection type		
Outdoor Unit Suction Line Valve		Size and Connection type		
Compressor				
		Swept Volume per revolution		
		Min Capacity @rating conditions		
		Max Capacity@rating conditions		
		Min RPM		
		Max RPM		
		Min Current		
		Max Current		
Inverter Drive				
		Input Power		
		Drive efficiency at maximum compressor RPM		
		Drive efficiency at 75% compressor RPM		
		Drive efficiency at 50% compressor RPM		
		Max Temperature at which it operates reliably		

Amber

QDF

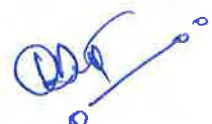
Outdoor Unit Heat Exchanger			
	Face Area		
	Tube Diameter		
	Tube arrangement (Staggered or inline)		
	Vertical Pitch		
	Horizontal Pitch		
	Fins per Inch		
	Fin Thickness		
	Fin Surface Type		
	Fin coating		
	Life of fin under saltspray test		
	Leak test Pressure of Coil		
	Burst Test Pressure of coil		
Outdoor Unit Fan	Outer Diameter		
	depth		
	Material of Fan Blades		
	Air Flow at Min Motor Speed		
	Air Flow at Max Motor Speed		
Outdoor Unit Fan Motor	Type DC/AC		
	Min RPM		
	Max RPM		
	No of Speeds		
	Power at Min RPM		
	Power at Max RPM		
	Current at Min RPM		
	Current at Max RPM		

7.0 SCHEDULE –II:

Buy back of released 16HP HVAC ODU model no. MDV-D450/CN1 of Midea/GD Midea make- Total 30 nos. (ODUs are Defective/Partially Functional)

HVAC system at DFCCIL-CO was installed in the year 2008-2010. HVAC Out door units of 16hp each were installed which are defective/partially functional at present. Direct exposure to sunlight, rain and prolonged polluted weather conditions have deteriorated the physical condition of HAVC system parts particularly outdoor units.

The tenderer has to quote for buy back of released 30 nos. of such outdoor units of 16hp each. Rates for the same are to be quoted in schedule –II of section 7.



SCHEDULE-III: COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT

8.1 The scope of comprehensive annual maintenance contract carrying out all sort of Scheduled/unscheduled maintenance of complete air-conditioning system including all items related with comprehensive maintenance of the HVAC system as per OEM specified maintenance schedule/National Building Code (NBC) 2016 guidelines. Repair & replacement of defective components, providing of spares and all other associated accessories which are not covered otherwise and attention of all types of defects, necessary for smooth operation of the HVAC system to the satisfaction of Engineer-in Charge/DFCCIL. The Contractor should also carry out any other schedule jointly decided by Engineer-in-charge/DFCCIL and the Contractor for any equipment of the HVAC system to ensure smooth and trouble-free functioning.

This work includes Comprehensive AMC for One (01) years for Low side existing equipment connected with newly replaced ODUs of VRF based HVAC system of capacity 480HP including accessories, consumable item like oil, and Refrigerant etc. and Comprehensive AMC for three (03) years for Complete VRF based HVAC system of capacity 624HP including accessories, consumable item like oil, compressor and Refrigerant etc. after completion of 12 months warranty period (defect liability period) of newly replaced FAHU's and ODU's of VRF based HVAC system of capacity 624HP.

8.2 Tenderers are advised to visit the site & acquaint themselves with the existing VRF HVAC system and quote accordingly. The comprehensive annual maintenance contract for Fresh Air Handling Units is included in scope of this contract.

8.3 **Comprehensive Annual Maintenance Contract (CAMC) for HVAC and Fresh Air Handling Units (FAHU):**

8.3.1 The Contractor shall carry out Comprehensive, Preventive & Breakdown maintenance including Daily, Weekly, Monthly, Quarterly and Yearly maintenance of the VRF HVAC system at 3rd, 4th & 5th Floor of DFCCIL Corporate office in terms of OEM guidelines & relevant NBC 2016 standards. The maintenance schedules and the work to be done in each schedule & report format shall be jointly decided by the Engineer-in-Charge/DFCCIL & the Contractor.

8.3.2 Comprehensive maintenance also includes repair of defective system with provision of spares as required. No extra payment will be made for supply/repair/replacement of spares.

8.3.3 Maintenance of complete HVAC system so that performance of the plant remains satisfactory.

8.4 **The CAMC work will interalia include the following:**

- i) Indoor Units (IDUs) of various type/size complete with electric/electronic components, wiring, power cord, remote & accessories.
- ii) Regular cleaning of IDU filters and FAHU filters (every 21 days) and replacement as prescribed by OEM. Wet cleaning of IDU's shall be done once in every 06 (Six) months and complete Dry cleaning of IDU, once in every 03 (three) month. Record of filter cleaning shall be maintained.
- iii) Outdoor Units (ODUs) of various capacities complete with, compressors, piping, electric/electronic components, consumables, supports & any other associated work for proper & specified functioning of outdoor units.
- iv) Refrigerant piping along with all joints etc. including detection/repairing of leakage, pressure testing, vacuum purging, gas recharging/ topping including supply of refrigerant.
- v) The repair work shall be carried out in a professional manner. This shall also include restoration of insulation after repair. Any other associated work for proper &

specified functioning of air conditioning system. The scope also includes supply & charging of refrigerant due to any unforeseen circumstances.

- vi) Condensate drain water pipe cleaning, detection/repairing of pipes for any leakages, insulation etc. Any other associated work for proper functioning of drain water disposal system.
- vii) All control & power wiring between indoor & outdoor units. Any other associated work for proper & specified functioning of air conditioning system.
- viii) Maintenance & upkeep of sub-AC panels on the roof including switchgear, cabling from sub-AC panel up to outdoor units, feeder pillars, consumables etc (excluding incoming cables to sub-AC panels).
- ix) Maintenance of HVAC monitoring system, including all CENTRALISED CONTROLLER's, displays, hardware & software etc. (excluding computer system) including central remote control. Any other associated work for proper & specified functioning of complete HVAC monitoring/control system.
- x) Any other item/activities associated with proper functioning of complete HVAC system deemed to have been included in the scope of work.
- xi) In order to attend breakdown of the HVAC system, minor engineering works (eg. False ceiling, any kind of structural/masonry work, opening and closing) required if any, shall be in the scope of work.

8.5 **Deployment of CAMC Staff:**

- i) The contractor will depute technically qualified, competent and experienced staff in adequate number for the schedule maintenance. It may however be noted that normally scheduled maintenance should be carried out on Saturday & Sunday or any Gazetted Holidays for which the contractor will give at least 24 hours advice to the Engineer-in-Charge/DFCCIL.
- ii) For health check, operational assistance, quick redressal of complaints regarding HVAC system and to maintain CAMC work record, one experienced Graduate/Diploma Supervisor along with one Technician with necessary tools shall remain present in DFCCIL-CO during all working days.
- iii) Additional staff shall be deputed to reduce the downtime for attending major breakdowns as desired by DFCCIL.
- iv) The work is to be carried out as per OEM guidelines/best industry practices and in such a manner that all premises always look Neat & Clean.

8.6 **Attending to complaints:**

- i) List of minimum spares to be available at site for smooth operation shall be prepared by the Contractor and Engineer-in-charge within 07 days of **commissioning of HAVC system (in part or full)** and accordingly all spares shall be available within **07 days**.
- ii) After award of work, the Contractor shall submit list of authorised contact person in ascending order of hierarchy (Escalation Matrix) to whom complaints can be lodged.
- iii) All defects and deficiencies should be rectified promptly after lodging of complaint. The complaint can be lodged through intercom, telephonic message or through complaint register kept in BMS Room. A Ticket would be raised for every complaint in which any/ all parts of the HVAC system is defective. The ticket will be closed when complaint is resolved to the satisfaction of the Engineer-in-Charge.
- iv) Response Time (Max) – 30 Minutes, to reach the site of complaint.
- v) Rectification Time (Max.) - 03 Hrs. If Max. 03 IDU and ODUs/per FAHUs (except leakage, compressor, condenser failure) are involved.

- vi) Rectification Time (Max.) - 12 Hrs. If 04 to 10 IDU and ODUs/per FAHUs (except leakage, compressor, condenser failure) are involved.
- vii) Rectification Time (Max.) – 48 hrs. for Leakages in refrigerant circuit, defect in compressor, condenser and IDU/ODU.
- viii) The quantum of work involved should be decoded within 30 minutes of the complaint received and recorded jointly with the representative of the Contractor and Engineer-in-charge/DFCCIL.
- ix) Status of spares shall be jointly signed on every Friday at 17.00 hrs & timeline submitted for replenishment, if required.
- x) For expeditious disposal of complaints, the contractor shall maintain following spares & consumables at site. These spares shall be replenished as soon as the designated quantity will get used:

SN	Description	Quantity
1	Refrigerant 410A	4 cylinders
2	Nitrogen Gas	02 Cylinders
3	Condenser fan motor	05
4	Condenser fan blade	05
5	PCB – ODU	05
6	PCB – IDU	02 of each type
7	IDU Motor – Ductable	01 (each type)
8	Blower Ductable	01 set each type
9	MCB 63A or as required	10
10	Contactors	05
11	Inverter/Digital compressor	02 each type
12	FAHU Motors of Different ratings	02 of each type
13	Water pump for IDU	02 each type
14	Water level sensor	02 each type
15	Capacitors ODU/IDU	05 each type
16	IDU motor (Cassette)	1% of the holding. 1 motor for each type
17	IDU display	02 each type
18	Terminal Block	02 nos
19	Thimbles	06 nos each type

- xi) The spares shall be of OEM/same make. Where the 'Make' of item is not identified/defined, it shall be of reputed make with the approval of Engineer in-charge/DFCCIL.
- xii) In case the above spares (quantities) are not maintained at site, by the Contractor, the spares may be purchased by DFCCIL and the cost of purchase shall be deducted by DFCCIL while certifying the bills for payment to the Contractors.

8.7 Maintenance of Records:

- i) The contractor shall maintain proper log sheets for recording of temperature/Relative Humidity at nominated places as decided by Engineer-in-Charge.




- ii) Separate log sheets shall be maintained for Routine/Preventive/Breakdown maintenance. Format shall be approved from Engineer-in-Charge/DFCCIL.
- iii) Joint recording of temperature & Humidity shall be done every Monday, preferably 15.00 hrs to check performance of the system.
- iv) Joint recording of compressor currents & refrigerant temperatures shall be done on fortnightly basis to cover entire circuits in a month.
- v) A record of tripping of safety devices should be maintained. The Contractor shall provide a report to the Engineer at the end of every week indicating the defect of the system and target date of rectification/replacement.
- vi) Proper record of maintenance schedule to be maintained & should be available for check anytime.
- vii) **Payment for CAMC Contract shall be made after submission of service report during the quarter jointly signed by the Contractor and signed by Engineer-In-Charge/DFCCIL. All the reports shall be got approved by Contractor in a format decided DFCCIL.**

8.8 Penalty for delay in Comprehensive Maintenance work:

- (i) As soon as any defect of technical nature is noticed by the Contractors staff, it shall be informed to the Engineer-in-Charge/DFCCIL in written with details, whether it is of minor or major fault and possible time of rectification.
A penalty will be imposed in case any complaint remains unattended after the rectification time is over, as under:
- (ii) @ Rs. 500/- per IDU, ODU and FAHU per 03 hrs, towards clause no. 6.1.3.6 (v).
- (iii) @ Rs.2,500/- per 5hp/16hp ODU and FAHU per 12 hrs, towards clause no. 6.1.3.6 (vi).
- (iv) @ Rs.5,000/- per 5hp/16hp ODU per 24 hrs, towards clause no. 6.1.3.6 (vii)
- (v) Payment to Contractor for CAMC Contract shall be certified by the Engineer-in-Charge/DFCCIL on the basis of CAMC contract condition as specified in contract document.
- (vi) After report of failure, if maintenance personnel does not start work at site & advice the action plan to attend the failure, penalty @ Rs. 500/- per hour or part thereof shall be levied to ensure that proper cooling is maintained in the entire premise & there shall be no discomfort to the occupants.
- (vii) After 7 days of non-rectification of a failure without any valid & justifiable reason, the cost of damage to HVAC system or DFCCIL property, if any due to failure of system will be sole responsibility of the contractor & the cost of damage of the same shall be borne by the contractor. After which, DFCCIL has right to carry out the work on risk & cost of contractor without further intimation.
- (viii) In case the defective HVAC systems are not rectified within a period of 7 days after expiry of rectification time mentioned in para 6.1.3.6 above, a penalty of additional amount as mentioned above equal to the 7 day period will be levied.
- (ix) The decision regarding penalty and imposition of penalty shall be solely under the discretion of the Officer In-charge of the DFCCIL. The total amount of liquidated damages under this condition shall not exceed 5% of the contract value.




SECTION-7

SCHEDULE OF RATES & QUANTITIES

Name of Work: Replacement of existing old VRF ODU's with new ODU's (compatible to existing old HVAC IDU's) and Heat Recovery Units along with associated fittings at DFCCIL, Corporate Office, Pragati Maidan Metro Station Building Complex, New Delhi.

Tender No.: HQ/EL/HVAC/T/2019-20/1

S.No. (1)	Item (2)	Unit(3)	Qty.(4)	P.U price (5)	Total Price (6)
Schedule 1					
Item 1 - Replacement of R-410A refrigerant based old ODU's of GD Midea/Midea make having model no. MDV-D450/CN1 by new ODU's. Work involves Installation, Testing and commissioning of the new VRF based HVAC ODU's including Electrical and any other related work to be done. ODU's must be compatible with existing Midea make IDU's having model no. MDV-D36Q4/N1-C, MDV-D56Q4/N1-C, MDV-D112Q4/N1-C & MDV-D280T1/N1-C, MDV-D56Q4/N1-C, MDV-D71Q4/N1-C, MDV-D90Q4/N1-C, MDV-D140Q4/N1-C, MDV-D140T1/N1-C. 32HP and 48HP circuit must consist of 2 or more modules. 16HP module shall consist of either 02 (two) modules or shall have 02 or more compressors. ODU's must have minimum IEER of 18 as specified in the technical specifications.					
1a	48HP circuit	nos.	5		
1b	32HP circuit	nos.	6		
1c	16HP circuit	nos.	3		
		Total item 1			
Item 2 - Replacement of existing old FAHU units for which work involves SITC of 13600CFM Fresh Air Handling units with ducting accessories as per technical specifications along with SITC of HVAC ODU's having all inverter technology based compressors including Electrical and any other related work to be done for AHU unit.					
2a	2300 CFM FAHU	nos.	2		
2b	4500 CFM FAHU	nos.	2		

2c	HVAC ODU circuit of 24 HP capacity as per technical specifications for 2300 CFM FAHU's	nos.	2		
2d	HVAC ODU circuit of 48 HP capacity as per technical specifications for 4500 CFM FAHU's	nos.	2		
2e	Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.	-	-		
2e - i	Thickness 0.63 mm sheet	Sqmt.	100		
2e - ii	Thickness 0.80 mm sheet	Sqmt.	100		
2e - iii	Thickness 1.00 mm sheet	Sqmt.	250		
2e - iv	Thickness 1.25 mm sheet	Sqmt.	200		
2e - v	Flexible Duct Dia 100 mm	Sqmt.	800		
2e vi	Supplying and fixing of acoustic lining of duct with Open Cell Nitrile Rubber density 140-180 Kg/m ³ . Applied by Adhesive, conforming to standard specification.	SqMtr.			
	10 mm thick open cell nitrile rubber.	SqMtr.	650		
		Total Item 2			
Item 3- Piping for HVAC Outdoor Units					
3	Supply & Fixing of Interconnecting copper refrigerant pipe work of following sizes with insulation (class O) 25 mm / 19 mm thick duly insulated with Elastomeric Nitrile Rubber Star baond cloth between indoor and outdoor units as per specifications. All piping inside the rooms (if any) shall be properly supported on MS angles and all external piping shall run in MS angle	-	-	-	
3a	41.3 mm O.D. Pipe Size with insulation of 25 mm thick	R.mt	50		
3b	34.9 mm O.D. Pipe Size with insulation of 25 mm thick	R.mt	50		
3c	28.6 mm O.D. Pipe Size with insulation of 25 mm thick	R.mt	50		

3d	22.2 mm O.D. Pipe Size with insulation of 25 mm thick	R.mt	30	
		Total Item 3		
Item 4 - PVC Drain water pipe replacement				
4	Supply and fixing of UPVC SCH 80 (10Kg/ cm sq) drain water piping complete with fittings, support as per specification and insulated with 9 mm thick insulated with Class O Nitrile Rubber insulation.	-	-	-
4a	25mm dia	Mtr	800	
4b	32mm dia	Mtr	600	
4c	50mm dia	Mtr	650	
		Total Item 4		
Item 5 - Electrical Items				
5	Electrical supply panel	Lot 4		
i)	Supply, installation, testing & commissioning of Cubical type sectionalised floor standing switch board of 31 MVA fault capacity at 415V complete with 4 strip, 100 A capacity Aluminium Bus - Bar Electrolytic grade, cable alley, switchgears of following capacity & as per specifications and as per site requirement. INCOMER 01 Set - 100 A TPN MCCB with (0-100 A) ammeter, selector switch, (0- 500 V) Voltmeter with selector switch, phase indication light with protection fuse. with protection fuse, on / off / trip indicating light with protection fuse.			
ii)	OUTGOINGS a) For Supply Fan up to 2.2 KW 01 Set - 40 A TP MCB with BIS Star delta starter , overload relay start/stop push buttons, ammeter (0 - 40A), on / off / trip indication lights with protection fuse, single phase preventer. b) For Return air Fan up to 2.2 KW			

Ran

	01 Set - 40 A TP MCB with BIS Star delta starter , overload relay start/stop push buttons, ammeter (0 - 40A), on / off / trip indication lights with protection fuse, single phase preventer, Controls & interlocking accessories as required.								
									Total Item 5
Item 6 - Cables supply & Erection etc.									
6	POWER & CONTROL CABLING								
	Supply, laying, testing and commissioning of power and control cabling, as per Standard specification including end termination as required. Power / Control Cabling (PVC insulated and PVC sheathed, armoured, Cooper Conductor of 1.1 KV grade on existing cable trays).	-	-						
i)	4C x 6 Sq mm	RMT	500						
ii)	2C x 1.5 Sq mm	RMT	1000						
iii)	3C x 2.5 Sq mm	RMT	600						
iv)	4C x 16 Sq mm	RMT	1000						
			Total Item 6						
Total amount (Rs.) for Sch. 1 (i.e item 1 + item 2 + item 3 + item 4 +item 5 + item 6) [incl. GST , Freight etc]									
Schedule 2									
Item 2.1 - Buy Back of Released items									
2.1-a	16HP HVAC ODU model no. MDV-D450/CN1 of Midea/GD Midea make (ODUs are Defective/Partially Functional)	Nos.	30						
Total of Sch. 2									
Schedule 3 - Comprehensive Annual Maintenance Contract									

3a	Comprehensive AMC for One (01) years for Low side existing equipment connected with newly replaced ODUs of VRF based HVAC system of capacity 480HP including accessories, consumable item like oil, and Refrigerant etc.	HP	480	
3b	Comprehensive AMC for three (03) years for Complete VRF based HVAC system of capacity 624HP including accessories, consumable item like oil, compressor and Refrigerant etc. after completion of 12 months warranty period (defect liability period) of newly replaced FAHU's and ODU's of VRF based HVAC system of capacity 624HP.	HP	-	
3b- i	For 1st year	FREE	-	
3b- ii	For 2nd year	HP	624	
3b- iii	For 3rd year	HP	624	
3b- iv	For 4th year	HP	624	
Total Sch. 3				
Total Amount (Rs.) = (Sch. 1) – (Sch. 2) + (Sch. 3) [including GST, Freight etc.]				

Total Cost of Work (Rs. in Words): _____

Note:

- 1 Detailed BoQ for schedule-I, II & III of Section-7 shall be provided by the Contractor after installation of new HVAC system.
- 2 Rates shall be quoted in Schedule of Rates & Quantities (Section-7) based on Technical Specifications (Section-6). In Section-7, Amount (Rs.) (for column no. 6) shall be calculated based on the Unit Rate (column 5) and Quantity (column 4).
- 3 The material released during replacement of existing 704hp HVAC system, viz. Outdoor Units, Indoor Units, Refrigerant Pipes and other associated material shall be the property of DFCCIL. Tenderer shall quote rates in schedule 2, column 5 and total amount in column 6 considering the cost of released material.

Signature

4 Rates quoted shall be firm & inclusive of all taxes (GST etc.) and duties leviable. Rates shall also include transportation of material, transit insurance, e-way bill, loading, unloading, lifting/handling of material, insurance of material at site & workers, liaisoning with any other department, banker charges and other incidental charges. Firms are advised to inspect the site before they quote their rates for the work.



ANNEXURE –I

DETAILS OF SIMILAR WORKS SUCCESSFULLY COMPLETED AS PER PARA 4.1.1 OF THE TENDER DOCUMENT

SN	Name of Work	Name of Employer	Details of Payment		For the Financial Year	Total Contract Amount received (Rs.)
			Amount received (Rs.)	Date of Amount received		
1	2	3	4	5	6	7
	Total					

Note: Authentic Certificates shall be produced by the tenderer(s) to this effect which may be an attested Certificate from the concerned department/ Client and/or Audited Balance Sheet duly certified by the Chartered Accountant etc.



ANNEXURE –II

DETAILS OF CONTRACTUAL PAYMENT RECEIVED IN THE PREVIOUS THREE YEARS AND THE CURRENT FINANCIAL YEAR UPTO THE DATE OF OPENING OF TENDER AS PER PARA 4.1.2 OF THE TENDER DOCUMENT

SN	Name of Work	Name of Employer	Details of Payment		For the Financial Year	Total Contract Amount received (Rs.)
			Amount received (Rs.)	Date of Amount received		
1	2	3	4	5	6	7
	Total					

Note: Authentic Certificates shall be produced by the tenderer(s) to this effect which may be an attested Certificate from the concerned department/ Client and/or Audited Balance Sheet duly certified by the Chartered Accountant etc.

ANNEXURE –III

PERFORMANCE BANK GUARANTEE (UNCONDITIONAL)

Bank Guarantee no.....

Date.....

To,

Dedicated Freight Corridor Corporation of India Limited,
Metro Station Building Complex 5th Floor,
Pragati Madain, New Delhi.

Reference:-Contract No....., awarded on

This deed of Guaranty made this day of _____ between _____ (name of Bank) having registered office at _____ and branch office at _____ (hereinafter referred to as "Bank") of the one part and

Dedicated Freight Corridor Corporation of India Limited (hereinafter called the Employer) of the other Part.

Whereas Dedicated Freight Corridor Corporation of India Limited has awarded the Contract no..... for (Hereinafter called "the Contract") to M/s..... its registered office at (Hereinafter called "the Contractor").

Whereas the contractor is bound by the said Contract to submit to the Employer an irrevocable performance security guarantee bond for a total amount of Rs..... (Rs. In Words).

Now, we the undersigned (Name of Bank officials), of the bank being fully authorized to sign and to incur obligations for and on behalf of the Bank hereby declare that the said Bank will guarantee the Employer the full amount of Rs..... (Rs. In Words) as stated above.

After the Contractor has signed the aforesaid contract with the Employer, the Bank further agree and promise to pay the amount due and payable under this guarantee without any demure merely on a demand from the Employer stating that the amount claimed is due by way of loss or damage cause to or would be caused or suffered by the employer by reason of any breach by the said contractor of any of the terms or conditions contained in the said agreement or by reason of the contractor failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs..... (Rs. In Words) only.

We..... (indicate the name of Bank), further undertake to pay to the Employer any money so demanded notwithstanding any dispute or dispute raised by the contractor in any suit or proceeding pending before any court or Tribunal relating to liability under this present being absolute and unequivocal.

The payment so made by us (name of Bank) under this bond shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

We..... (indicate the name of Bank), to further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said agreement have been full paid and its claims



satisfied or discharged by (Designation & Address of Contract signing authority) on behalf of Employer certify that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly discharges this guarantee.

Notwithstanding anything to the contrary contained herein the liability of the bank under this guarantee will remain in force and effect until such time as this guarantee is discharged in writing by the employer or until (date of validity/extended validity) whichever is earlier and no claim shall be valid under the guarantee unless notice in writing thereof is given by the Employer within validity/extended validity period of guarantee from the date aforesaid.

Provided always that we (Name of Bank) unconditionally undertakes to renew this guarantee or to extend the period of guarantee from year to year before the expiry of the period or the extended period of guarantee, as the case may be on being called upon to do so by the Employer. If the guarantee is not renewed or the period extended on demand, we (Name of Bank) shall pay the Employer the full amount of the guarantee on demand without demur.

We..... (indicate the name of Bank), to further agree with the Employer that the Employer shall have the fullest liberty without our consent and without effecting in any manner out of obligation hereunder to vary any of the terms and conditions of the said contract from time to time or to postpone for any time or from time to time any to power exercisable by the employer against the said contractor and to forbear or enforce any of the terms and conditions of the said agreement and we shall not be relieved from our liabilities by reason of such variation, or extension being granted to the said contractor for any bearance act or omission on the part of the Employer or any indulgence by the Employer to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties for the said reservation would relieve us from the liability.

The Guarantee hereinbefore contained shall not be affected by any change in the constitution of Bank or of the Contractor.

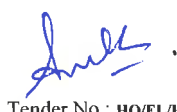
The expressions "the Employer", "the Bank "and the Contractor" hereinbefore used shall include their respective successors and assigns.

We..... (Name of the bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinbefore:

- i) Our liability under this Bank Guarantee shall not exceed and restricted to Rs.....(in words).
- ii) This Bank Guarantee shall be valid up to unless extended on demand by Employer.
- iii) The Bank is liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if Employer serve a written claim or demand on or before.....

IN WITNESS WHEREOF we of the Bank have signed and stamped this guarantee on this day of being herewith duly authorized.



Bank seal

Signature of Bank Authorize Official with seal

Name.....

Designation:

Address:

Witness:

1. Name:

Designation:

Address:

2. Name:

Designation:

Address:



ANNEXURE -IV

FORM OF CONTRACT AGREEMENT

(To be executed on requisite value of stamp papers)

CONTRACT AGREEMENT OF WORKS

CONTRACT AGREEMENT NO. _____ DATED _____

THIS AGREEMENT made on _____ day of _____ (Month/year) between Dedicated Freight Corridor Corporation of India Limited, Metro Station Building Complex, 5th Floor, Pragati Madain, New Delhi., acting through (GM/EL/TS, DFCCIL, New Delhi) (hereinafter called "Employer") of the one part and _____ (name and address of the Contractor) (hereinafter called "the Contractor") of the other part.

WHEREAS the DFCCIL is desirous that certain works should be executed by the Contractor through Contract No. _____ (hereinafter called "the works", and has accepted an Offer by the Contractor for the execution and completion of such works and the remedying of any defects therein.

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meaning as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement:
 - a) Letter of Acceptance of Tender
 - b) Instructions to the Tenderer
 - c) Special and General Conditions of the Contract
 - d) Bill of rates & quantities
3. In consideration of the payments to be made by the DFCCIL to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the DFCCIL to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.
4. The DFCCIL hereby covenant to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement executed the day and year first before written.

(Name, Designation and address of the authorized signatory)
Signed for and on behalf of the Contractor in the presence of:

(Name, Designation and address of the authorized signatory)
Signed for and on behalf of the DFCCIL in the presence of:

Witness:

- 1.
- 2.

Witness:

- 1.
- 2.

Name and address of the witnesses to be indicated.



ANNEXURE -V

LETTER OF TRANSMITTAL

(On letter head of the Tenderer)

To

The General Manager/Electrical/Technical Services,

DFCCIL,

New Delhi.

Sub.: Submission of Qualification information/documents as per checklist.

Ref: Tender No. HQ/EL/HVAC/T/2019-20/1

Sir,

I/We hereby submit the following documents in support of my/our satisfying the requirements laid down for the work:

1. Earnest Money of the requisite amount in the prescribed format/ or Demand Draft against EMD or requisite MSME documents as specified (para 3.15.1)
2. Power of Attorney of the person signing the Tender Document and documents.
3. The Covering Letter as per format given in **Section-2**.
4. Complete Tender Document, including all Annexure, Schedule of Rates & Quantities (Section-7) dully filled in, stamped & signed by the authorized signatory on each page.
5. Corrigendum(s), if any, duly stamped & signed by the authorized signatory on each page.
6. Details of similar works successfully completed in the form prescribed in **Annexure-I**. Details of Contractual payment received in the form prescribed in **Annexure-II**. Relevant documents and certificates has been enclosed.
7. Certified Copy of GST Registration Certificate.
8. Affidavit declaring Tenderer status of non-performance or debarment (para 3.23.3)
9. Certified Copy of Registration of Firm/Company, Partnership deed/Memorandum and Articles of Association of the firm.
Copy of valid Electrical Contractor's License in compliance of para no. 29 of Central Electricity Authority (measures relating to safety and electric supply) Regulations, 2010.
10. Undertaking by tenderer, if the tenderer is the authorized representative of the Manufacturer i.e OEM of the VRF equipment with DC Inverter technology in the proforma given in Annexure-VI.
11. Declaration of compliance of the tender document/Deviation Statement as per Annexure-VII.

Declaration:

1. I have furnished all the information & details necessary to prove that I satisfy all requirements laid down in this Tender enquiry letter.
2. I authorize you to approach any Bank, individual, Employer, Firm or Corporation whether mentioned in the enclosed documents or not, to verify our competence & general reputation.
3. I understand that the information provided by me with this tender, if proved false, my tender will be rejected, EMD forfeited & I shall be debarred from participating in future tenders.

Encl: as above

Yours faithfully

Signature of Tenderer

Name & seal

Date



ANNEXURE -VI

Certificate from OEM that VRF/VRV ODU's are compatible with the existing IDU's as specified in Technical Specifications and OEM shall support tenderer with spare parts during CAMC period.

Handwritten signature

Handwritten signature

ANNEXURE -VII

DECLARATION OF COMPLIANCE TO THE TENDER DOCUMENT/DEVIATION STATEMENT

We hereby agree to fully comply with all the clauses and Annexure as given in this Tender enquiry letter.

(Signature of tenderer (s) & company stamp)



ANNEXURE – VIII

Not Used



ANNEXURE -IX

Not Used


31/10/19.