Tender No. CGM/DFCCIL/NOIDA UNIT/INTERIOR & SERVICES/RENOVATION/DFCCIL H. Q. BUILDING/PRAGATI MAIDAN/2019/04

For

Name of Work: Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi

E-TENDER DOCUMENT
TECHNICAL BID
(PACKET-A)
DECEMBER -2019

Employer:
DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
Under
MINISTRY OF RAILWAYS

NOIDA OFFICE: -
Chief General Manager/Noida/DFCCIL
D-89, 1st Floor, Sector-2, Noida- 201301

INDEX

PART-I

CHAPTER-I

CHECK LIST OF DOCUMENTS TO BE UPLOADED IN E-TENDER

PART-I

CHAPTER-I

CHECK LIST

Check List of items/documents pertaining to Bid to be uploaded by the bidder in E-Tender portal on or before the last Date & Time of Bid Submission	
Item No.	**Items**
Technical Bid (Packet-A)	
1	EMD of **Rs. 7,90,680/-** *(Rupees Seven Lakh Ninety Thousand Six Hundred and Eighty Only)* is to be paid in the form of Demand Draft or Banker's Cheque or FDR made in favor of DFCCIL payable at Delhi/Noida from any Nationalized or Indian Scheduled Commercial Bank on or before schedule date & time of submission of bid. The proof of submission of EMD should also be uploaded / attached along with Bid/offer document.
2	Cost of Bid Document of **Rs. 11,800/-** *(Rupees Eleven Thousand & Eight Hundred Only)* is to be paid in the form of Demand Draft or Banker's Cheque made in favor of DFCCIL payable at Delhi/Noida from any Nationalized or Indian Scheduled Commercial Bank on or before schedule date & time of submission of bid. The proof of submission of Cost of Bid Document should also be uploaded/attached along with Bid/offer document.
3	A declaration from the person having PoA *(Power of Attorney) o*n the Letter Head of the Applicant/Bidder that they agree and abide by the bid documents and amendments thereof *(if any)* and would execute the work accordingly. (***Form No. 1A).***
4	Structure and Organisation details (***Form No. 1B).***
5	Power of Attorney of the person authorized for signing/submitting the Tender ***(Form No. 5)***.
6	Copy of Memorandum and Articles of Association, if the applicant/bidder is a body corporate, and if a partnership firm then, a copy of its partnership deed or documentary evidence in support of proprietorship in case of Sole Proprietor firm.
7	Pre-Integrity Pact duly signed by the bidder ***(Form No.6)***. The bidders are required to download the Integrity Pact as uploaded on the tender document & sign the same put rubber stamp seal and upload the signed copy on E-Tendering website.
8	Submission of Tenderer's Credentials in accordance with Para-1.3.13 (i) & (ii) of Preamble & General Instructions to Tenderer in prescribed forms. ***(Form No.2A, 2B & 2C)***
9	Valid GST registration/EPF registration/PAN No.
10	No Deviation Certificate ***(Form No. 7).***

11	The entire Tender document should first be downloaded & then, upload the same through digital signature by the Authorized signatory of the bidder.
12	All pages of all the Corrigendum/Addendum/Clarification *(if any)* should first be downloaded then, upload the same through digital signature by the Authorized signatory of the bidder.
Financial Bid *(Packet-B)*	
13	Financial Bid *(Microsoft Excel file)* to be filled, saved and uploaded in E-Tender Portal.

Note: All the uploaded documents should be in readable, printable & legible form.

IMPORTANT NOTES:

i. ***Document mentioned at S.no. 1 to 10*** above of the Check list *[Technical Bid (Packet-A)]* should be scanned and uploaded at website in ***'Document Library'*** of the E-Tender Portal (***www.tenderwizard.com/DFCCIL)*** through digital signature and after that, attach all above documents in particular tender.

ii. Similarly, the ***document mentioned at S.No. 11 & 12*** of the Check list [Technical Bid (Packet-A)] should first be downloaded from E-Tender Portal *(in PDF Format)* and thereafter upload them to E-Tender Portal, through digital signature in document library & after that, attach the same in particular tender.

iii. ***For Document No. 13*** of the Check list *[Financial Bid (Packet-B)]*, only the downloaded 'Financial Bid' file should be uploaded after filling, saving and digitally signed. ***Do not upload scanned copy of 'Financial Bid' in 'Document Library'***. The financial bid *(after filling the rates)* should neither be scanned & uploaded, nor, the hard copy of the same should be submitted to the office of CGM/DFCCIL/Noida.

PART-I

CHAPTER-II

NOTICE INVITING E-TENDER

PART – I

Chapter II

DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)

Tender No: CGM/DFCCIL/NOIDA UNIT/INTERIOR & SERVICES/RENOVATION/DFCCIL H. Q. BUILDING/PRAGATI MAIDAN/2019/04

NOTICE INVITING E-TENDER
National Competitive Bidding

Dear Sirs,

Name of Work: Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi

1.2.1 Chief General Manager/Noida, Dedicated Freight Corridor Corporation of India Limited, D-89, 1st Floor, Sector-2, Noida-201301, India, invites **E-Tenders** in **single stage two packet system** on prescribed forms from firms / Companies meeting requisite experience and financial capacity for execution of the following work:

Tender No.	**CGM/DFCCIL/NOIDA UNIT/INTERIOR & SERVICES / RENOVATION/ DFCCIL H. Q. BUILDING/PRAGATI MAIDAN/2019/04**
Name of Work	Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi.
Employer/Client/Owner	Dedicated Freight Corridor Corporation of India Ltd. *(DFCCIL)*, A Govt. of India *(Ministry of Railways)* Enterprises through Chief General Manager/Noida, D-89, 1st Floor, Sector-2, Noida-201301.
Type of Tender	**Open E-Tender** *(Single stage two packet system)*
Type of Contract	Works Contract
Total Estimated Cost	Rs. **3,95,34,026/-** *(Rs. 3,35,03,412 + GST @ 18%)*
Period of Contract	**06 Months**
Defect liability period	**06 Months** from the date of issue of completion certificate of the work by the DFCCIL
Earnest Money Deposit	**Rs 7,90,680/-** *(Rupees Seven Lakhs Ninety Thousand Six Hundred and Eighty Only)* to be submitted in the form of Demand Draft *(DD)* or

	Bankers Cheque or FDR in favour of DFCCIL payable at Delhi/Noida from any Nationalized or Indian Scheduled Commercial Bank.
Cost of Tender Document *(Non-Refundable)*	**Rs. 11,800/-** *(Rs. 10,000/-+GST @ 18%) (Rs. Eleven Thousand & Eight Hundred only)* to be submitted in the form of Demand Draft *(DD)* or Bankers Cheque in favour of DFCCIL payable at Delhi/Noida from any Nationalized or Indian Scheduled Commercial Bank.
Tender processing fee *(Non-Refundable)*	**Rs. 7500/- + 18% GST** to be paid to M/s ITI Ltd. directly online through E-Tender website.
Validity of Offer	120 days
Retention Money	5% of Contract value *(as per Clause No. 16 (1) of GCC)*
Performance Bank Guarantee	Performance Guarantee *(PG)* has to be submitted within 21 *(Twenty-One)* days from the date of issue of Letter of Acceptance *(LOA)*, amounting to 5% of the contract value *(as per clause 16.(4) of GCC).*
E-tendering website	**www.tenderwizard.com/DFCCIL** For any help in connection with E-Tendering, please contact at www.tenderwizard.com Helpdesk No: 011-49424365 or Mob: 9599653865.
Date & Time Schedule	
Date of uploading of NIT *(Online)*	On Date **20.12.2019**
Date of document upload download/Sale *(Online)*	From Date **23.12.2019**
Pre-Bid meeting with the prospective bidders	**03.01.2020** at 11:00 Hrs.
Issue of Corrigendum, if any	On or before three days from date of submission of Tender *(on www.tenderwizard.com/DFCCIL)*
Date & Time of Submission of Tender	On or before **21.01.2020** and time upto **15:00 hrs**
Last date & time of submission of EMD & tender document cost	On or before **21.01.2020** upto **15:00 hrs** in the office of Chief General Manager/DFCCIL/Noida Unit: Address: D-89, First Floor, Sector-2, Noida-201301 (U.P.)
Date & Time of Opening of Technical Bid *(Online)*	On date **21.01.2020** and time **15:30 hrs**
Date & Time of opening of Financial Bid *(online)*	**To be communicated later** to only those bidders who are found technically qualified after closure of Technical Evaluation.
Representative/ Contact Person of DFCCIL/Noida Unit	Shri Madhup Kumar Upadhayay Dy. Project Manager/Civil-I Dedicated Freight Corridor Corporation of India Ltd. *(Noida Unit)* D-89, 1st Floor, Sector-2, Noida- 201301 Mobile No: 8826818484 Telephone: 0120-2542889 E-MAIL ID: *mkupadhayay@dfcc.co.in*
Address for Pre-Bid meeting & opening of Tender	Chief General Manager Office Dedicated Freight Corridor Corporation of India Ltd. *(Noida Unit)* D-89, 1st Floor, Sector-2, Noida- 201301 Mobile No: 8826818484 Telephone: 0120-2542889

1.2.2 Eligibility shall be assessed on applicants, fulfilling the technical capability and competence as well as for financial and organizational resources as specified in clause no. 1.3.13 (i) A & B of Preamble and General Instruction to tenders *(Part -I, Chapter-III).*

1.2.3 Tender document can be viewed & downloaded from DFCCIL's website www.dfccil.gov.in, www.tenderwizard.com/DFCCIL & Central Procurement portal eprocure.gov.in. Tenderers are advised not to make any corrections, additions or alterations in the downloaded tender documents. In case, any corrections additions or alterations in the downloaded tender documents are made, such tender shall be ***summarily rejected***.

1.2.4 DFCCIL may issue addendum(s) / corrigendum(s) to the tender documents. In such cases the addendum(s) / corrigendum(s) shall be issued and placed on www.tenderwizard.com/DFCCIL only at least three days in advance of date of submission of tender. The tenderers who have downloaded the tender documents from the website before issue of addendum(s)/ corrigendum(s) must visit the website and ensure that such addendum(s) / corrigendum (s) (if any) is also downloaded by them. Such addendum(s) / corrigendum (s) (if any) shall also be uploaded along with the submission of tender. Any tender submitted without addendum(s) / corrigendum(s) *(if any)* is ***liable to be rejected***.

1.2.5 The tender documents shall be submitted in online mode only through website www.tenderwizard.com/DFCCIL in two packets only viz Packet-A containing TECHNICAL BID and Packet B containing FINANACIAL BID.

Bidder shall submit the **EMD** & **Tender documents cost** *(as mentioned in clause 1.3.8 & 1.3.4.3 of preamble & general instructions to tenderer, Part I, Chapter III)* on or before schedule date & time of submission of bid.

The proof of submission of EMD & Tender documents cost should also be uploaded/ attached along with Bid/offer document online.

Financial Bid *(as specified in "Financial Bid" in Tender Document)* duly filled in is to be uploaded in "Financial packet". The rates must be filled after downloading the financial bid document in the prescribed format from the website www.tenderwizard.com/DFCCIL. The financial bid should be downloaded & then filled up, saved and uploaded on the E-tendering website using digital signature for signing the document.

1.2.6 To participate in the E-Bid submission, it is mandatory for the bidders to have user ID & password which has to be obtained by submitting an annual registration charges of INR 2000/- + GST @ 18% to M/s ITI through e-payment. Bidders have to pay the Tender Processing Fee to ITI through e-payment at the time of submission of bid. Already registered vendors with M/S ITI need not to pay registration charges.

Obtain Class-III Digital Signature Certificate from ITI Ltd. or any other digital signature issuing authority. In case, bidders wish to obtain the digital signature certificate from ITI Ltd., they may contact Mobile No. 09599653865 *(Mr. Suraj Singh)*.

1.2.7 Tenders shall be opened at the address given below on scheduled date & time in the presence of the tenderers or their authorized representatives intending to attend the opening.

Address of Office of the Chief General Manager/ Noida *(for opening of tenders)*: -
Chief General Manager/Noida, D-89, 1st Floor, Sector-2, Noida-201301, U.P.

All the Bids received shall be opened on the date and time mentioned above in the tender notice. Bid of the bidders shall be opened through process of e-tendering. The sequence of opening shall be:

i) Earnest Money Deposit *(EMD)*
ii) Technical offer.
iii) Financial offer *(at a later stage after scrutiny & finalization of acceptable Technical Bid)*

Tender shall be submitted as per "General Instructions to Tenderers" forming as part of the complete tender documents.

1.2.8 Any tender received without Earnest money and cost of tender documents in the form as specified in the tender documents shall ***not be considered*** and shall be ***summarily rejected.***

1.2.9 DFCCIL reserves right to cancel the tender before submission/opening of tender, postpone the tender submission / opening date and to accept / reject any or all tenders without assigning any reason thereof. DFCCIL's assessment of suitability as per eligibility criteria shall be final and binding.

1.2.10 Tenderers 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. EMD of such tenderers shall be **forfeited** & the decision of DFCCIL in this regard shall be final and binding.

1.2.11 DFCCIL reserves the right to pre-qualify the bidder(s) provisionally based on the documents submitted by them in technical bid. Financial bids of only those bidders would be opened, whose technical offers are found acceptable. In the event of any document being found false *(at a later stage)*, the provisional qualification shall stand withdrawn, and the next lower bidder shall automatically come to the position of such disqualified bidder. Also, action against such disqualified tenderer shall be taken as per above Clause No. 1.2.11 of Notice Inviting Tender.

1.2.12 Information as required as per various Forms to tender document should be submitted by the tenderers without fail strictly as per formats.

1.2.13 The validity of offer shall be **120 days** from the date of opening of the tender.

1.2.14 Transfer of the tender document purchased by intending tenderer to another tenderer is not admissible.

1.2.15 Tenderers must read all instructions regarding e-tendering process as mentioned in PREAMBLE & GENERAL INSTRUCTION TO TENDERERS Part I, Chapter III.

1.2.16 Tenderers are advised to regularly visit the E-Tender Portal *(www.tenderwizard.com/DFCCIL)* for information regarding tender, corrigendum, addendum (if any) etc.

1.2.17 Joint Venture and Consortium of any kind will not be permitted for this tender.

1.2.18 The rates quoted by the contractor are deemed to be inclusive of site clearance, setting out work, profile, setting lay out on ground, establishment of reference bench mark(s), installing various signage, taking spot levels, survey with total station, construction of all safety and protection devices, compulsory use of helmet and safety shoes, and other appropriate safety gadgets by workers, imparting continuous training for all the workers, barriers, preparatory works, construction of clean, hygienic and well ventilated workers housings in sufficient numbers working during monsoon or odd season, working beyond normal hours, working at all depths, height, lead, lift, levels and location etc. and any other unforeseen but essential incidental works required to complete this work. ***Nothing extra shall be payable*** on this account and ***no extension of time*** for completion of work shall be granted on these accounts.

The rates quoted by the tenderer shall be inclusive of all taxes and levies but excluding GST. The GST as legally leviable and payable by the Bidder under the provisions of applicable law/act shall be paid extra by DFCCIL.

Therefore, the Bidders should quote their rates after considering the Input Tax Credits on their input materials and services. Hence, Bidders should ensure that, full benefit of Input Tax Credit (ITC) likely to be availed by them is duly considered while quoting their rates.

1.2.19 ***Price variation will not be applicable under this tender.***

Chief General Manager/Noida
For & on behalf of DFCCIL

PART-I

CHAPTER-III

PREAMBLE & GENERAL INSTRUCTIONS TO TENDERERS

PART-I

Chapter- III

PREAMBLE & GENERAL INSTRUCTIONS TO TENDERERS

1.3.1 Introduction

(i) General

Ministry of Railways (MoR) established the Dedicated Freight Corridor Corporation of India Limited (DFCCIL), a Schedule "A" Public Sector Undertaking wholly owned by Ministry of Railways, Govt. of India to undertake planning & development, mobilization of financial resources, construction, maintenance and operation of the Dedicated Freight Corridor project. DFCCIL was incorporated as a company under the Companies Act 1956 on 30th October 2006.

This company is now actively engaged in the implementation of Computerized Multi Modal High Axle Load Dedicated Freight Corridor Project between Delhi-Mumbai under the Western DFC Corridor and Ludhiana-Delhi-Kolkata under the Eastern DFC Corridor.

The DFC project will also restore the Indian Railway's competitive strength in the freight transportation market and emerge as the ***major low carbon and energy efficient transport system in the country***. It will drive the establishment of industrial corridors and logistic parks along its alignment and play a crucial role in supporting India's growing economy.

(ii) General Instructions *(for only tendering system)*:

Submission of Online Bids is mandatory for this Notice Inviting Tender E-Tendering is a new methodology for conducting Public Procurement in a transparent and secured manner. Suppliers/Vendors will be the biggest beneficiaries of this new system of procurement. An e-tendering portal of Dedicated Freight Corridor Corporation of India (DFCCIL) introduced for the process of e-tendering which can be accessed on http://www.tenderwizard/DFCCIL. *(refer in the BID DOCUMENTS)*

Words in capital and not defined in this document shall have the same meaning as in "BID DOCUMENT".

A) <u>ACCESSING / PURCHASING OF BID DOCUMENTS:</u>

It is mandatory for all the Bidders to have class-III digital signature certificate (in the name of person who will sign the Bid) from any of the licensed certifying agency ("CA") *[Bidders can see the list of licensed CAs from the link www.cca.gov.in]* to participate in e-tendering of DFCCIL.

To participate in the E-bid submission, it is mandatory for the Bidders to get themselves registered with the Tender Wizard and to have user ID & password which has to be obtained by submitting an annual registration charges of INR 2000/- + GST to M/s ITI Ltd.

The online payment facility for the submission of Registration fee and Tender Processing Fee, which is payable to E- Tender service provider i.e. M/s ITI Ltd., has been enabled on E-Tender portal http://www.tenderwizard.com/DFCCIL. The Bidder can now pay Registration Charges and Tender Processing Fee through E-Payment using Credit Card/ Debit Card / Net Banking / International Credit Card only.

If the Bidder has already registered with the Tender Wizard and validity of registration has not expired, then such Bidder does not require fresh registration. Validity of online registration is one year. Following may be noted:

(a) Bids can be submitted only during the validity of registration with the Tender Wizard.

(b) The amendments / clarifications to the BID DOCUMENTS, if any, will be posted on http://www.tenderwizard.com/DFCCIL only.

(c) Registration with the tender wizard should be valid at least upto the date of submission of bid.

Rs 7,500/- + GST @ 18% is applicable towards Tender processing fee *(non-refundable)* and shall be paid to M/s ITI Ltd. towards Tender Processing Fee through E-Payment using Credit Card/ Debit Card / Net Banking / International Credit Card only.

To participate in bidding, Bidders have to pay a sum of Rs. 10,000/- + GST @ 18% i.e. Rs. 11,800/- *(Rs. Eleven Thousand & Eight Hundred Only)* as a cost of the BID DOCUMENT *(non-refundable)* as mentioned in clause 1.3.4.3 of preamble & general instructions to tenderer, Part I, Chapter III.

B) PREPARATION & SUBMISSION OF TENDER:

a. Before quoting the rate and uploading the 'Financial Bid', bidders are advised to upload scanned copies of all the requisite documents *(Item No.1 to 10 mentioned in "Check List of Part-I Chapter-I" of the tender document)* in the document library of E-Tender Portal. Thereafter, attach all these documents in the particular Tender through E-Tender Portal.

b. Similarly the bidders are required to download the tender document *(Item No.11 of the Check List of Part-I Chapter-I)* and Addendum/Corrigendum *(if any) (Item No.12 of the Check List of Part-I Chapter-I)* from the E-Tender Portal *(in PDF Format)* and upload the same through digital signature in the document library of the E-Tender Portal. Thereafter, attach all these documents in the particular Tender through E-Tender Portal.

c. After uploading above documents in the document library and thereafter attaching the same in tender document, bidders should quote their rates in the downloaded 'Financial Bid' file *(Item No. 13 of the Check list of Part-I Chapter-I)* and save the file

on their computer. After saving, the bidder can upload the duly filled in file at E-Tender Portal. The name of the downloaded 'Financial Bid' *('Financialbid.xls')* file should not be changed.

d. However, EMD should be submitted to DFCCIL as mentioned at Clause-1.3.8 of preamble & general instructions to tenderer, Part I, Chapter III in the Tender Document.

C) Modification / Substitution/ Withdrawal of bids:

(i) The Bidder may modify, substitute or withdraw its e- bid after submission, but prior to the Bid Due Date & time. No Bid shall be modified, substituted or withdrawn by the Applicant on or after the Bid Due Date & time.

(ii) Any alteration/ modification in the Bid or additional information supplied subsequent to the Bid Due Date & time *(unless the same has been expressly sought for by the Authority)* ***shall be disregarded.***

(iii) For modification of e-bid, applicant has to detach its old bid from e-tendering portal and upload / resubmit digitally signed modified bid.

(iv) For withdrawal of bid, applicant has to click on withdrawal icon at e-tendering portal and can withdraw its e-bid prior to bid due date & time.

(v) Before withdrawal of a bid, it may specifically be noted that, after withdrawal of a bid for any reason, applicant cannot re-submit e-bid again.

D) PRE-BID MEETING:

Bidders may request for a clarification on any Clause(s) of the Bid Document on or before the date of Pre-Bid meeting. Any request for clarification must be sent in writing, or by standard electronic means to DFCCIL. DFCCIL will respond with explaination of quries on E-Tender Portal *(including an explanation of the query but without disclosing the source of query)* only. If DFCCIL deem it necessary to amend the Bid Document as a result of clarification or any other reason, it shall do so.

At any time before the submission of tender, DFCCIL may modify/amend the bid document and extend the last date of submission/opening of the tender by issuing a corrigendum/addendum.

Any Corrigendum/Addendum thus issued shall form part of tender document and shall be posted only on Tender Wizard portal and the Bidders are thus advised to update their information by using said website www.tenderwizard.com/DFCCIL. To give the Bidders reasonable time to take an amendment into account in their bids and on account of any other reasonable circumstances, DFCCIL may at its discretion, extend the deadline for the submission/opening of the tender.

A Pre-Bid meeting with the prospective Bidders will be conducted as per the scheduled date & time mentioned in the NIT. However, if any change occurs in date & time of the meeting then it would be communicated through Tender Wizard portal only.

E) OPENING AND EVALUATION OF BIDS:

(i) Opening of Bids will be done through online process.

(ii) 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.***

The Authority shall open technical bid documents received in electronic form on the Bid due date in the presence of the Bidders who choose to attend. This Authority will subsequently examine and evaluate the Technical Bids in accordance with the provisions set out in the BID DOCUMENTS.

The Financial Bids will be opened only of the pre-qualified Bidders *(only after Technical evaluation) & t***he date of opening of Financial Bids will be notified later on.**

DISCLAIMER

The Bidder must read all the instructions in the BID DOCUMENTS and submit the same accordingly.

(iii) Scope of Work

Chief General Manager, Dedicated Freight Corridor Corporation of India Limited, D-89, 1st Floor, Sector-2, Noida-201301 India, herein after referred to as 'DFCCIL' is inviting e-tenders from Firms/ Companies having requisite experience and financial capacity for execution of the following work:

The brief scope of work is given below:

Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi

The drawings for guidance have been enclosed in the tender document. The brief scope of work is is given below.

The brief scope of work comprises of the following:

The Contractor undertakes the fit-out works in the area provided in the layout plans for Office Extension at Ground floor of Pragati Maidan Metro building and renovation of toilets on 3rd, 4th and 5th floor.

a) Preliminary works (e.g. indication of changes to as-built data, dismantling works, cleaning, etc.);

b) Interior and finishing works: floors, ceilings, partitions, doors, fixtures, fittings, etc;

c) Mechanical & Plumbing: HVAC, water supply, sewerage etc.;

d) Electrical: lighting, power, UPS connection cabling, data cabling etc.;

e) Other Miscellneous works;

f) Obtain all necessary permits, licenses, insurance, etc. necessary for the execution of the works;

g) Snagging, testing and hand over to the DFCCIL;

DESIGN Final Design Documentation (with shop drawings): - Interior, - Electrical & Small Current/ Data Network, - Mechanical (HVAC, water, sewerage),

Detailed scope of works:

Dismantling Works include, Existing Tile flooring, counters, RCC slabs, Wall plastering, Brick walls, ACP Cladding, Doors, Windows, Rolling shutters and Disposal for the same etc.

Masonry Works Include, brick work 115mm and 230mm thick, Plastering and pointing, waterproofing etc.

Concrete works Includes Plain cement concrete, Reinforced Cement concrete, Screeding, Shuttering etc.

Flooring & cladding Works include, Tile flooring, Laminated Wooden flooring, Raised flooring, Granite flooring, Italian marble flooring, Aluminium skirting, Tile skirting, Tile cladding, Anti Static Vinyl flooring, Transition profiles Granite counters, Marble counters etc.

Carpentry works include Gypsum partitions, Plywood partitions, Framed Glass partitions, Laminate Panelling, Lacquered glass panelling, wooden panelling, fabric panelling, Laminated doors, Glass doors, wooden door Frames etc

False ceiling works include Gypsum ceiling, Plywood ceiling, Grid tile ceiling, Baffle Ceiling, Laminated ceiling, Wooden Ceiling, under-deck Insulation etc.

Finishing Works include, Plastic Emulsion Paint, Polish over wooden surface, Pop punning in proper plumb and plain, Wallpaper pasted over finished wall surface or partition, Graphics pasted over finished wall surface or partition, Glass Films as per design, Roller Blinds on windows, Duco Paint, Exit Signs etc.

Loose Furniture Works include, Work stations, Cabin Table, Reception Table , Centre table , Side table, Conference table, Side Credenza, Pedestal Units, Wire manager, Low Height & Full Height Storage units, Chairs, Sofas, lounge sofas, Waiting chairs, Compactors for space optimize storage of files with proper under carriage and rails, know down construction properly levelled & smoothly operated system, Planters etc.

HVAC works include, Supply, Installation, testing and Commissioning of VRV/VRF/Split/ Cassette/ Indoors/ Outdoor Units, Ducts, Insulation, Inline fan, Axial Fans, Acoustic Lining, Grills/ Diffuser, Exhaust works, Wiring, Refrigerant Piping, Drain Piping etc.

Electrical & IT Works include , Installation, testing and Commissioning of Electrical Panels, Distribution boards, Connection with Existing set up, Light Fixtures, Fans, Wiring, Earthling, Conducting, Control cables, LT cabling, Termination, Cable trays, race ways, Junction boxes, Safety Equipments, UPS, Fire Alarm System, Public Announcement System, CCTV, It Networks, Switches/Sockets, MCBs, Busbars, HVAC panel, Occupancy sensors etc

Plumbing & Fire Fighting Works include, Supply , Installation, testing and Commissioning of all CP fittings, Chinaware in Toilets and Pantry, Internal Drainage installations, Water supply Installations, Piping, External Drainage installation, Rain water, Water Tank, Connection with existing drainage system and tanks, Vertical Stags, For water supply and drainage, Soap dispenser, Hand dryer, Tissue Dispenser, Dustbins, Urinal partitions, Fire Hose cabinet, Wet riser, Sprinkler System. Pressure Gauge, Values, Hydrants, etc.

(iv) Cost of the work: The estimated cost of the tendered work is approximately **Rs. 3,95,34,026/-** *(Rs. 3,35,03,412/- + GST @ 18%).*

(v) The tenderer(s) shall be governed by General Conditions of Contract (GCC), Preamble and General Instructions to Tenderers (ITT) and Special Conditions of Contract (SCC). Wherever, there is a conflict in any condition between GCC and Special Conditions of Contract mentioned in the tender documents, the condition mentioned in Special Conditions of Contract will prevail. However, Engineer's decision in this connection shall be final and binding.

Part-I, Chapter-IV and V of the tender document contains General Conditions of Contract and Special Conditions of Contract specific to this work and shall be applicable in the contract.

1.3.2 Form of Tender

(i) The Tender documents shall be in **two separate packets** viz: **-**

"Packet-A "containing **technical bid** and "**Packet–B** "containing **financial bid**. Detailed credentials as per the requirement of eligibility criteria and all tender papers **except** Summary of Prices and Schedule of Prices are to be submitted in "TECHNICAL BID" i.e. Packet-A.

Summary of Prices and Schedule of Prices with percentage above /below / at par duly filled in are to be submitted in "FINANCIAL BID".

(ii) **Documents to be enclosed with the TECHNICAL BID *(Packet- A)* and FINANCIAL BID *(Packet-B)* are to be uploaded/submitted as per the check list mentioned in Part-I Chapter-I of the Tender Document.**

1.3.3 Tender Document

This tender document consists of following four parts:

PART/CHAPTERS	DESCRIPTION
PART - I	
Chapter I	Check list of documents to be uploaded/submitted in the E-Tender

Chapter II	Notice Inviting E-Tender
Chapter III	Preamble and General Instructions to Tenderers
Chapter IV	General Conditions of Contract
Chapter V	Special Conditions of Contract
PART - II	Technical Specifications
PART - III	
Chapter I	Milestones and Time Schedule
Chapter II	Tender Forms
PART - IV	Drawings

1.3.4 Sale and Submission of Tender Document

1.3.4.1 Deleted

1.3.4.2 Clause applicable for tender documents downloaded from Internet

Tenderer/s is free to download tender documents at their own cost, for the purpose of perusal as well as for using the same as tender document for submitting their offer. **Master copy of the tender document will be available in the office of Chief General Manager**, D-89, 1st Floor, Sector-2, Noida- 201301, U.P., India.

After award of the work, an agreement will be drawn up. The agreement shall be prepared based on the master copy available in the office of Chief General Manager, Dedicated Freight Corridor Corporation of India Limited, D-89, 1st Floor, Sector-2, Noida- 201301, U.P., India and not based on the tender documents submitted by the Tenderer. In case of any discrepancy between the tender documents downloaded from the internet and the master copy, later shall prevail and will be binding on the Tenderers. No claim on this account shall be entertained.

1.3.4.3 Cost of Tender document downloaded from internet

Tender document is available on www.tenderwizard.com/DFCCIL and the same can be downloaded and used as tender documents for submitting the offer. The cost of tender document as mentioned in NIT shall be deposited by the tenderer in the form of Demand Draft (DD) or Banker's Cheque in favour of DFCCIL payable at Delhi/Noida from any Nationalized or Indian Scheduled Commercial Bank only.

The physical form *(originals)* of EMD & Cost of Bid Document shall be sealed in one envelope *(mentioning heading on top as "EMD & Cost of Bid Document" along with Tender No., Name of work and Name & address of Tenderer)* and should be submitted to Chief General Manager/DFCCIL/Noida Unit, D-89, 1st Floor, Sector-2, Noida- 201301 (U.P) on or before the last date & time of Bid submission.

Tenderer to note that, if the cost of bid document *(in the manner specified above)* is not received in original *(before bid submission date & time)* in the office of Chief General Manager/Noida, then, the tender would be ***summarily rejected.***

Also, the proof of submission of Tender document cost should be uploaded/attached along with Bid/offer document *(refer check list item no.2)*.

Please note that the cost of the tender document & Earnest Money Deposit should be paid separately and not to be clubbed together.

1.3.4.4 Complete tender documents must be submitted online duly completed in all respect **upto 15.00 Hrs on 21.01.2020. The "Packet-A *(TECHNICAL BID)"*** will be opened at **15:30 Hrs on 21.01.2020** and read out in the presence of such tenderer(s) as is/are present .In case the intended date for opening of tenders is declared a holiday, the tenders will be opened on the next working day at the same time. Any modified date and time for submission of tenders shall be uploaded on **www.tenderwizard.com/DFCCIL.** The detail procedure of tender opening will be as per para- 1.3.5 below.

1.3.4.5 Financial Bid *(Microsoft Excel file)* is to be downloaded from website www.tenderwizard.com/DFCCIL and then, filled, saved and uploaded *(through digital signature)* on the same website and ***not to be submitted in hard copy at all. The financial bid (after filling the rates) should neither be scanned & uploaded, nor, the hard copy of the same should be submitted to the office of CGM/DFCCIL/Noida.***

1.3.4.6 The rates should be quoted in figures only in the Financial Bid online.

1.3.4.7 Deleted

1.3.4.8 Care in Submission of Tenders–

(a) (i) Before submitting a tender, the tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account with that the rates he enters in the tender forms are adequate and all-inclusive to accord with the provisions in Clause 37 of the Standard General Conditions of Contract for the completion of works to the entire satisfaction of the Engineer/DFCCIL.

(a)(ii) Tenderers will examine the various provisions of the Central Goods and Services Tax Act, 2017(CGST)/ Integrated Goods and Services Tax Act, 2017(IGST)/Union Territory Goods and Services Tax Act, 2017(UTGST)/respective state's State Goods and Services Tax Act (SGST) also, as notified by Central/State Govt & as amended from time to time and applicable taxes before bidding. Tenders will ensure that full benefit of Input Tax (ITC) likely to be availed by them is duly considered while quoting rates.

(a)(iii) The successful tenderer who is liable to be registered under CGST/IGST/UTGST/SGST Act shall submit GSTIN along with other details required under CGST/IGST/UTGST/SGST Act to Railway/DFCCIL immediately after the award of contract, without which no payment shall be released to the contractor. The contractor shall be responsible for deposition of applicable GST to the concerned authority.

(a)(iv) In case, the successful tenderer is not liable to be registered under CGST/IGST/UTGST/SGST Act, the railway/DFCCIL shall deduct the applicable GST from his/their bills under reverse charge mechanism (RCM) and deposit the same to the concerned authority.

(b) When work is tendered for by a firm or company the tender shall be signed by the individual legally authorized enter into commitments on their behalf.

(c) The Railway/DFCCIL will not be bound by any power of attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. It may however, recongnize such power of attorney and changes after obtaining proper legal advice the cost of which will be chargeable to the contractor.

1.3.4.9 Tenders containing erasures and/or alteration of the tender documents are liable to be rejected. Any correction made by Tenderer(s) in his/their entries must be attested by him/them.

1.3.5 Opening of Tender: Two packet system of tendering shall be adopted in this tender

(a) Tender will be opened at **15:30** hrs on **21.01.2020**, in the office of Chief General Manager / Noida, **Dedicated Freight Corridor Corporation of India Limited, D-89, 1st Floor, Sector-2, Noida- 201301, U.P, India** in the presence of the tenderers or their representatives as may be present at the prescribed date and time.

(b) **'TECHNICAL BID (Packet- A)**'only of all the tenderers shall be opened and the contents there of i.e. qualification details shall be read out.

(c) After the opening of "TECHNICAL BID" (Packet-A) of all the tenderers, these bids shall be scrutinized and analysed. If, found necessary by the Employer, the tenderers shall be asked to furnish clarifications and the Employer may also hold discussions with the tenderers after giving due notice. The names of the tenderers whose bid are considered complete and meet eligibility criteria shall be short listed.

(d) The **FINANCIAL BID** (**Packet –B)** shall be opened on a subsequent date and time duly notified well in advance. The Financial bids of only those tenderers shall be opened who are short listed after scrutiny of their Technical bid. The Financial bid of the tenderers who do not qualify during scrutiny of Technical bid shall not be opened. The time of opening, date and venue shall be advised to qualified tenderers well in advance to enable them to depute their representative. The earnest money of non-qualifying tenderers will be returned back within a reasonable period of completion of results of Technical bid.

1.3.6 Constitution of the Firm: -

1.3.6.1 Tenderer shall clearly specify whether the tender is submitted on his own or on behalf of a partnership firm / Joint Venture (JV) / Company. The tenderer(s) who is / are constituents of the firm / Company, shall enclose self-attested copies of the constitution of their concern, Partnership Deed and Power of attorney along with their tender. Tender documents in such cases shall be signed by such persons as may be legally competent to sign them on behalf of the firm / company as the case may be.

1.3.6.2 The tenderer shall give full details of the constitution of the Firm / JV / Company and shall also submit following documents *(as applicable),* in addition to documents mentioned above:

(a) Sole Proprietorship Firm: The tenderer shall submit the notarized copy of the affidavit.

(b) Partnership Firm : The tenderer shall submit self-attested copies of (i) registered / notarized Partnership Deed and (ii) Power of Attorney duly authorizing one or more of the partners of the firm or any other person(s), authorized by all the partners to act on behalf of the firm and to submit & sign the tender, sign the agreement, witness measurements, sign measurement books, receive payments, make correspondences, compromise / settle / relinquish any claim (s) preferred by the firm, Sign "No claim Certificate", refer all or any dispute to arbitration and to take similar action in respect of all tenders / contracts or said tender / contract.

(c) Joint Venture: Deleted

(d) Companies registered under Companies Act-1956: The tenderer shall submit (i) the copies of Memorandum of Association (MOA) and Articles of Association (AOA) of the company; and (ii) Power of attorney duly registered / notarized by the company (backed by the resolution of Board of Directors) in favour of the individual, signing the tender on behalf of company.

1.3.6.3 If it is mentioned in the tender submission that it is being submitted on behalf of / by a sole Proprietorship Firm / Partnership Firm / ~~Joint venture~~ / registered Company etc. but above-mentioned documents *(as applicable)* are not enclosed along with tender, the tender ***is liable to be rejected.***

If it is NOT mentioned in the tender submission that it is being submitted on behalf of / by 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.

After opening of the tender, any document pertaining to the constitution of the Firm / ~~Joint Venture~~ etc. shall not be entertained / considered by DFCCIL, however, DFCCIL reserves the right to ask any clarification in regard to the same.

1.3.6.4 A tender from ~~Joint Venture~~ / Partnership Firm etc. shall be considered only where permissible as per the tender conditions.

1.3.6.5 The DFCCIL will not be bound by any power of attorney granted by the tenderer or by changes in the composition of the Firm made subsequent to the submission of tender. It may, however, recognize such power of attorney and changes after obtaining proper legal advice.

1.3.7 Validity of Tender: -

Tenderer shall keep his offer open for a minimum period of 120 days from the date of opening of the tender or as mentioned in the Tender Notice.

1.3.8 Earnest Money: -

(a) The cost of Earnest money deposit as mentioned in NIT shall be deposited by the tenderer in the form of Demand Draft (DD) or Banker's Cheque or FDR in favour of DFCCIL payable at Delhi/Noida from any Nationalized or Indian Scheduled Commercial Bank only.

The physical form *(originals)* of EMD & Cost of Bid Document shall be sealed in one envelope *(mentioning heading on top as "EMD & Cost of Bid Document" along with Tender No., Name of work and Name & address of Tenderer)* and should be submitted to Chief General Manager/DFCCIL/Noida Unit, D-89, 1st Floor, Sector-2, Noida- 201301 (U.P) on or before the last date & time of Bid submission.'

Tenderer to note that, if EMD *(in the manner specified above)* is not received in original *(before bid submission date & time)* in the office of Chief General Manager/Noida, then, the tender would be ***summarily rejected***.

Also, the proof of submission of EMD should be uploaded/attached along with Bid/offer document *(refer check list item no.1)*.

Please note that the cost of the tender document & Earnest Money Deposit should be paid separately and not to be clubbed together.

(b) The earnest money shall remain deposited with the DFCCIL for the period of validity of the offer prescribed in this tender i.e. 120 days from the date of opening of tender. If the validity of the offer is extended, the validity of earnest money should also be extended failing which, the offer after the expiry of the aforesaid period may not be considered by the DFCCIL.

(c) It shall be understood that the tender documents have been sold/issued to the tenderer and the tenderer is permitted to tender in consideration of stipulation on his part, that after submitting his tender he will not resile from his offer or modify the terms and conditions, thereof in a manner not acceptable to the DFCCIL. Should the tenderer fail to observe or comply with the said stipulation, the aforesaid amount shall be liable to be forfeited by the DFCCIL.

(d) The earnest money of the unsuccessful tenderer(s) will, save as here- in-before provided, be returned to the unsuccessful tenderer(s) within a reasonable time but the DFCCIL shall not be responsible for any loss or depreciation that may happen for the due performance of the stipulation to keep the offer open for the period specified in the tender documents or to the earnest money while in their possession nor be liable to pay interest thereon.

NOTE: No interest shall be paid by DFCCIL on earnest money amount.

1.3.9 Execution of Contract Agreement: -

The Tenderer whose tender is accepted shall be required to appear in person at the office of **Chief General Manager, Dedicated Freight Corridor Corporation of India Limited,** D-89, 1st Floor, Sector-2, Noida-201301, U.P., as the case may be, or if tenderer is a firm or corporation, a duly authorized representative shall appear and execute the contract agreement within 07 days of notice from DFCCIL that the contract agreement is ready. The Contract Agreement shall be entered into by DFCCIL only after submission of valid Performance Guarantee by the Contractor. Failure to do so shall constitute a breach of the agreement affected by the acceptance of the tender. In such cases, the DFCCIL may determine that such tenderer has abandoned the contract and there upon his tender and acceptance thereof shall be treated as cancelled and the DFCCIL shall be entitled to forefeit the full

amount of the earnest money and other dues payable to the Contractor under this contract. The failed Contractor shall be debarred from participating in the re-tender for that work.

1.3.10 Security Deposit on Acceptance of Tender:

The security deposit / rate of recovery / mode of recovery on acceptance of tender shall be as per the Para 16. (1) to 16. (3) of General Conditions of Contract (GCC).

1.3.11 Tenderer's Address

The tenderer should state in the tender his postal address legibly and clearly. Any communication sent in time, to the tenderer by post at his said address shall be deemed to have reached the tenderer duly and in time. Important documents should be sent by registered post.

1.3.12 Right of DFCCIL to Deal with Tenders

(a) The DFCCIL reserves the right of not to invite tenders for any of DFCCIL work or works or to invite open or limited tenders and when tenders are called to accept a tender in whole or in part or to reject any tender or all tenders without assigning reasons for any such action.

(b) The authority for the acceptance of the tender will rest with the DFCCIL. It shall not be obligatory on the said authority to accept the lowest tender or any other tender and no tenderer(s) shall demand any explanation for the cause of rejection of his/their tender nor the DFCCIL undertake to assign reasons for declining to consider or reject any particular tender or tenders.

1.3.13 (i) Eligibility Criteria

(A): <u>Technical Eligibility Criteria</u>

The tender 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 each costing not less than the amount equal to **30% of advertised value** of the tender, or

Two similar works each costing not less than the amount equal to **40% of advertised value** of the tender, or

One similar work each costing not less than the amount equal to **60% of advertised value** of the tender.

Note:

Work experience certificate from private individual shall not be considered.

However, in addition to work experience certificates issued by any Govt. Organisation, 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 at least 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 tender submits works 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 quantitites, 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 work shall mean **"Interior & Services work e.g. Flooring, Partitioning, Falseceiling, Plumbing and Electrical works etc."**

Note:

1. Value of complete work done by a member in an earlier JV Firm shall be reckoned only to the extent of the concerned member's share in that JV firm for the purpose of satisfying his or her compliance to the above-mentioned technical eligibility criteria in the tender under consideration.
2. In case the tenderer (s) is a partnership from, the work experience shall be in the name of partnership firm only.
3. For judging the Technical eligibility works which had been executed for the government/semi-government organization/PSU/Public listed company will only be considered.

(B): **Financial Eligibility Criteria**

The tenderer must have received contractual payments in the **previous three financial years and the current financial year upto the date of opening of tender, at least 150% of the advertised value of the Tender.** The tender 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.

Note: 1. Contractual payments received by a Member in an earlier JV firm shall be reckoned only to extent of the concerned member's share in that JV Firm for the purpose of satisfying compliance of the above-mentioned financial eligibility criteria in tender under considerations.

2. In case the tenderer/s is a partnership firm, the turnover etc shall be in the name of partnership firm only.

3. ***Contractual payment of only those works which had been executed for the Govt./Semi Govt. organization/PSUs/Public listed Company will only be considered & payments received from private individual/private organization shall not be considered for judging the financial eligibility.***

1.3.13 (ii) Credentials of Tenderer

The tenderer shall provide satisfactory evidence in support of their technical and financial eligibility, which are acceptable to DFCCIL, as follows:

(a) For Technical eligibility criteria, the details will be submitted in **Form No. 2A** along with

supporting documents.

(b) For Financial eligibility criteria, the details will be submitted in **Form No. 2B** along with supporting documents.

(c) The tenderer shall submit the completion certificates/certified completion certificates from the client(s) or Photostat of original certificates of client. All documents either original or photocopy should be attested by Notary. These certificates should indicate the details of works carried out and successful commissioning of similar type of work executed by the tenderer. ***Completion certificate from Govt. organisation/Semi Govt. organizations/PSUs/Public Listed Company will only be accepted***. The certificate from Private individual/Private Company for whom such works are executed shall not be accepted. In case, the work is executed for Public Listed Company, copy of work order, bill of Quantity, Billwise details of payment received duly certified by Chareted Accountant, TDS certificates for all payments received and copy of final/last bill paid by Company in support of above work experience certificate shall be submitted.

The following will be applicable for evaluating the eligibility:

(i) For technical eligibility, similar nature of work physically completed within the qualifying period**, i.e. last 07 years, ending last day of month previous to the one in which the tender is invited** (even though the work might have commenced before the qualifying period) shall only be considered in evaluating the eligibility.

(ii) For technical eligibility, the total value of similar nature of work completed during the qualifying period and not the payment received within qualifying period alone, shall be considered. In case, the final bill of similar nature of work has not been passed and final measurements have not been recorded, the paid amount including statutory deductions is to be considered. If final measurements have been recorded and work has been completed with negative variation, then also the paid amount including statutory deductions is to be considered.

However, if final measurements have been recorded and work has been completed with positive variation but variation has not been sanctioned, original contract agreement value or last sanctioned contract agreement value whichever is lower, shall be considered for judging eligibility.

(iii) For financial eligibility, as a proof of sufficient financial capacity and organizational resources, contractor should have received total payments against satisfactory execution of all completed /on-going works of all types (not confined to only similar works) during the last three financial years and in the current financial year (up to the date of opening of the tender) of a value not less than 150% of advertised tender value.

(iv) For judging Technical and Financial capability, only ***those works which had been executed for the Govt. organization/semi Govt. organizations/PSUs/Public Listed Company shall be considered*** and the tenderer(s) will submit the certificate to this effect from the Officer concerned duly signed under the official seal. ***It should be noted that credentials for the works executed for Private Individual/ Private Organization shall not be considered.***

(v) Tenderer shall submit a statement of contractual payments received during last three financial years and current financial year on the prescribed Performa as per Form No. 2B. The details shall be based on the form 16-A issued by the employer i.e. the certificate of deduction of tax at source as per Income Tax Act 1961 and Form-26AS issued by Income Tax Department. The photocopies of Form 16-A/Form-26AS shall be enclosed duly attested by Notary Public with seal and Notarial Stamp thereon or a certificate from auditor or audited balance sheet certified by Chartered Accountant clearly indicating the contractual amount received duly attested by Notary Public with seal and Notarial Stamp thereon. DFCCIL may invite the Tenderer for offline/online verification of Form-16A & Form-26AS.

(vi) The tenderer shall be considered ***disqualified/in-eligible if:***

(a) The Tenderer or any of its partners and/or subcontractors included in the tender has been banned for business with Ministry of Railways/DFCCIL along with any of its attached and subordinate offices through an order issued by Ministry of Railways as per list available on Web site (http://www.indianrailways.gov.in/railwayboard) of Railway Board pertaining to banning of Business, with the banning being valid as on the date of submission of the Tender.

(b) The Tenderer or any of its partners has suffered bankruptcy / insolvency or it is in the process of winding-up or there is a case of insolvency pending before any Court on the deadline of submission of application.

(vii) For the purposes of conversion of foreign currency to Indian rupees *(INR)* Bank Currency (BC) selling exchange rates as published by State Bank of India on the date 28 days prior to date of submission of tender shall be used. For few of the currencies where BC selling rates are not published by SBI or reserve bank of India, the exchange rate may be obtained from website- http://www.oanda.com/currency/historical-rates or http://www.xe.com.

(viii) For the purpose of evaluation of proposals, all values given in INR in eligible qualification criteria and the values provided by the applicants in the proposal in the currencies other than INR shall be converted into one i.e. INR as per exchange rate mentioned in para (vii) above.

1.3.14 Period of Completion

The entire work is required to be completed in all respects within **06 months *(six Months)*** from the date of issue of the acceptance letter. Time is the essence of contract. The contractor shall be required to maintain steady and regular progress to the satisfaction of the Engineer/DFCCIL to ensure that the work will be completed in all respects within the stipulated time.

1.3.15 If the Tenderer/s deliberately gives any wrong information about credentials / documents in his/their tenders and thereby create(s) circumstances for acceptance of his/their tender, DFCCIL reserves the right to reject such tender at any stage, besides, shall suspend business with such tenderer. **The EMD** of such tenderers shall ***also be forfeited.***

1.3.16 Quantum of work and materials:

The indicative schedule of quantities of various items of works is included in **Form Nos – 3 & 4** of the tender document.

1.3.17 Employer not bound to accept any tender:

The employer shall not be bound to accept the lowest or any tender or to assign any reason for non-acceptance or rejection of a tender. The employer reserves the right to accept any tender in respect of the whole or any portion of the work specified in the tender papers or to reduce the work or to accept any tender for less than the tendered quantities without assigning any reason whatsoever.

1.3.18 Deleted

1.3.19 Performance Guarantee: Refer clause no. 16(4) of GCC-2019.

1.3.20 The tenderer shall furnish information for making payment through ECS/NEFT/RTGS *(Tender Form No. 12 placed at Part III, Chapter-II of the tender document)*.

1.3.21 Negotiation:

Should DFCCIL decide to negotiate with a view to bring down the rates, the tenderer called for negotiations should furnish the following form of declaration before commencement of negotiations?
"I..... do declare that in the event of failure of contemplated negotiations relating to Tender No..... dated .....my original tender shall remain open for acceptance on its original terms and conditions,".

1.3.22 Site Inspection:

Tenderers are requested to inspect the site and carry out careful examination to satisfy them as to the nature of work involved and facilities available at the site. They should note carefully all the existing structures and those under construction through other agencies. They should also study the suitability of utilizing the different equipments and the machinery that they intend to use for the execution of the work. The tenderers should also select suitable sites for the purpose of locating their store yard, laboratory, staff quarters etc., and satisfy themselves with regard to the feasibility of transporting the girders, etc. from the yard to the final site of placement etc.

1.3.23 No form C & D shall be issued to the contractor for this work.

1.3.24 The rates quoted by the contractor are deemed to be inclusive of site clearance, setting out work, profile, setting lay out on ground, establishment of reference bench mark(s), installing various signage, taking spot levels, survey with total station, construction of all safety and protection devices, compulsory use of helmet and safety shoes, and other appropriate safety gadgets by workers, imparting continuous training for all the workers, barriers, preparatory works, construction of clean, hygienic and well ventilated workers housings in sufficient numbers working during monsoon or odd season, working beyond normal hours, working at all depths, height, lead, lift, levels and location etc. and any other unforeseen but essential incidental works required to complete this work. ***Nothing extra shall be payable*** on this account and ***no extension of time*** for completion of work shall be granted on these accounts.

The rates quoted by the tenderer shall be inclusive of all taxes and levies but excluding GST. The GST as legally leviable and payable by the Bidder under the provisions of applicable law/act shall be paid extra by DFCCIL.

Therefore, the Bidders should quote their rates after considering the Input Tax Credits on their input materials and services. Hence, Bidders should ensure that, full benefit of Input Tax Credit (ITC) likely to be availed by them is duly considered while quoting their rates.

Price variation will not be applicable in this tender.

1.3.25 ***No Mobilization Advance would be paid by DFCCIL.***

1.3.26 Contract value:

The contract value shall be inclusive of all taxes and duties including ESIC, PF, Conditions of Contract contribution & all other statutory taxes and levies *(if any)* applicable to the Contractors/Workers etc. ***but excluding GST.***

1.3.27 Taxes, Duties etc.:

(i) GSTIN of DFCCIL will be provided to the contractor along with the letter of acceptance *(LOA).*

(ii) Payment to the contractor will be subjected to TDS as per rules inforce from time to time. The tax deduction at source *(TDS)* shall be done as per the provisions of Income Tax Act & GST, as amended from time to time and a certificate to this effect shall be provided to the contractor by the DFCCIL.

(iii) Contractor shall submit GST compliant tax invoice containing *(GSTIN of DFCCIL)* and all the particulars as stipulated under invoice rules of GST law. Payment shall be made to the contractor only after submission of GST compliant tax invoice.

(iv) No reimbursement on account of increase/decrease in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Bidder has to make his own assessment of the impact of future variation *(if any)* in rate of taxes/duties/levies etc. in his price bid.

PART- I

CHAPTER- IV

GENERAL CONDITIONS OF CONTRACT

PART - I
CHAPTER IV

GENERAL CONDITIONS OF CONTRACT

DEFINITIONS AND INTERPRETATION

1. (1) Definition: - In these General conditions of Contract, the following terms shall have the meaning assigned hereunder except where the context otherwise requires: -

(a) **"Railway"** shall mean the President of the Republic of India or the Administrative Officers of the DFCCIL or of the Successor DFCCIL authorized to deal with any matters which these presents are concerned on his behalf.

(b) **"General Manager of Railway"** shall mean the officer - in-charge of the General Superintendence and Control of the Railway and shall mean and include their successors, of the successor Railway;

(c) **"Chief Engineer"** shall mean the officer - in-charge of the Engineering Department of Railway and shall also include Chief Engineer *(Construction)*, Chief Signal and Telecommunication Engineer, Chief Signal and Telecommunication Engineer *(Construction*), Chief Electrical Engineer, Chief Electrical Engineer *(Construction)* and shall also include CGM/GM/GGM of DFCCIL.

(d) **"Divisional Railway Manager"** shall mean the Officer in-charge of a Division of the Railway and shall also mean any officer nominated by Managing Director / DFCCIL and shall mean and include their successors of the successor Railway.

(e) **"Engineer"** and Employer's Engineer shall mean the Chief General Manager of DFCCIL / PMC appointed by DFCCIL. Employer/Owner shall mean DFCCIL.

(f) **"Engineer's Representative"** shall mean the Assistant Engineer, Assistant Signal and Telecommunication Engineer and Assistant Electrical Engineer, APM / PM / Dy. CPM / Add. CPM of DFCCIL in direct charge of the work and shall include any Sr. Sec. / Sec / Jr. Engineer / Executive / Sr. Executive, APM/PM / Dy CPM of DFCCIL of Civil Engineering / Signal & Telecommunication Engineering/ Electrical Engineering Department appointed by the Railway / DFCCIL and shall mean and include the Engineer's Representative of the successor Railway / DFCCIL/PMC.

(g) **"Contractor"** shall mean the person / Firm / Company / JV whether incorporated or not who enters into the contract with the DFCCIL and shall include their executors, administrators, and successors and permitted assigns.

(h) **"Contract"** shall mean and include the Agreement of Work Order, the accepted schedule of rates of the Schedule or Rates of DFCCIL modified by the tender percentage for items of work quantified, or not quantified, General Conditions of Contract, Special Conditions of Contracts,

if any, Drawings, Specifications, Additional / Special Specifications, if any and tender forms, if any, and all other documents included as part of contract .

(i) **"Works"** shall mean the works to be executed in accordance with the contract.

(j) **"Specifications"** shall mean the Specifications for materials and works referred / mentioned in tender documents.

(k) **"Schedule of rates of CPWD"** shall mean the Delhi Schedule of Rates issued under the authority of the Director General CPWD from time to time and shall also include Rates specified in tender document.

(l) **"Drawing"** shall mean the maps, drawings, plans and tracings or prints there of annexed to the contract and shall include any modifications of such drawings and further drawings as may be issued by the Engineer from time to time.

(m) **"Constructional Plan"** shall mean all appliances or things of whatsoever nature required for the execution, completion or maintenance of the works or temporary works *(as hereinafter defined)* but does not include materials or other things intended to form or forming part of the permanent work.

(n) **"Temporary Works"** shall mean all temporary works of every kind required for the execution completion and/or maintenance of the works.

(o) **"Site"** shall mean the lands and other places on, under, in or through which the works are to be carried out and any other lands or places provided by the Railway for the purpose of the contract.

(p) **"Period of Maintenance"** shall mean the defect liability period from the date of completion of the works as certified by the Engineer.

1.(2) Singular and Plural: - Words importing the singular number shall also include the plural and vice versa where the context requires.

1.(3) Headings & marginal headings: -The headings and marginal headings in these 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 or the contract.

GENERAL OBLIGATION

2. (1) Execution Co-relation and intent of contract Documents: -The contract documents shall be signed in triplicate by the DFCCIL and the Contractor. The contract documents are complementary, and what is called for by any-one shall be as binding as if called for by all, the intention of the documents is to include all labour and materials, equipments and transportation necessary for the proper execution of work. Materials or work not covered by or properly inferable from any heading or class of the specifications shall not be supplied by the DFCCIL to the contractors unless distinctly specified in the contract documents. Materials or works described in words which so applied have a

well-known technical or trade meaning shall be held to refer to such recognized standards.

2.(2) If a work is transferred from the jurisdiction of one Railway to another Railway or to a Project Authority/DFCCIL or vice versa while contract is in subsistence, the contract shall be binding on the Contractor and the Successor Railway/Project in the same manner & take effect all respects as if the Contractor and the Successor Project were parties there to from the inception and the corresponding officer or the Competent Authority in the Successor Railway/Project will exercise the same powers and enjoy the same authority as conferred to the Predecessor Railway/Project under the original contract/agreement entered into.

2.(3) If for administrative or other reasons, the contract is transferred to the Successor Railway/Successor Project Authority of DFCCIL, the contract shall not withstanding any things contained herein contrary there to, be binding on the Contractor and the Succcessor Railway/Project Authority/DFCCIL in the same manner and take effect in all respects as if the Contractor and the Successor Railway/Successor Project Authority of DFCCIL had been parties thereto from the date of this contract. The contract shall be Administered/Managed by GGM/GM/CGM/nominated by DFCCIL.

3.(1) **Law governing the contract: -**The contract shall be governed by the law for the time being in force in the Republic of India.

3.(2) **Compliance to regulations and bye-laws:-**The contractor shall conform to the provision of any statute relating to the works and regulations and bye-laws of any location authority and of any water and lighting companies or undertakings, with whose system the work is proposed to be connected and shall before making any variation from the drawings or the specifications that may be necessitated by so confirming give to the Engineer notice specifying the variation proposed to be made and the reasons for making the variation and shall not carry out such variation until he has received instructions from the Engineer in respect thereof. The contractor shall be bound to give all notices required by statute, regulations or bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

4. **Communications to be in writing: -** All notices, communications, reference and complaints made by the DFCCIL or the Engineer or the Engineer's representative or the contractor inters concerning the work shall be in writing or e-mail on registered e-mail ID's and no notice, communication, reference or complaint not in writing or through e-mail, shall be recognized.

5. **Service of Notices on Contractors:-**The contractor shall furnish to the Engineer the name designation and address of his authorized agent and all complaints, notices, communications and references shall be deemed to have been duly given to the contractor if delivered to the contractor or his authorized agent or left at or posted to the address so given and shall be deemed to have been so given in the case of posting on day on which they would have reached such address in the ordinary course of post or on the day on which they were so delivered or left. In the case of contract by partners, any change in the constitution of the firm shall be forthwith notified by the contractor to the Engineer/DFCCIL.

6. **Occupation and use of land: -** No land belonging to or in the possession of the Railway/DFCCIL shall be occupied by the Contractor without the permission of the Railway/DFCCIL. The Contractor shall not use, or allow to be used; the site for any purposes other than that of executing the works. Whenever non-railway bodies/persons are permittedto use railway premises with competent authority's approval, **conservancy charges** as applicable from time to time **may be levied**.

7. **Assignment or subletting of contract: -** The contractor shall not assign or sublet the contract or any part thereof or allow any person to become interested therein any manner whatsoever without the special permission in writing of the DFCCIL. Any breach of this condition shall entitle the DFCCIL to rescind the contract under clause 62 of these conditions and also render the contractor liable for payment to the DFCCIL in respect of any loss or damage arising or ensuing from such cancellation; provided always that execution of the details of the work by petty contractor under the direct and personal supervision of the Contractor or his agent shall not be deemed to be sub-letting under this clause. The permitted subletting of work by the contractor shall not establish any contractual relationship between the sub- contractor and the DFCCIL and shall not relieve the contractor of any responsibility under the contract.

8. **Assistance by the DFCCIL for the Stores to be obtained by the Contractor:-** Owing to difficulty in obtaining certain materials (including Tools & Plant) in the market, the DFCCIL may have agreed without any liability therefore to endeavour to obtain or assist the contractor in obtaining the required quantities of such materials as may be specified in the tender. In the event of delay or failure in obtaining the required quantities of the aforesaid material the contractor shall not be deemed absolved of his own responsibility and shall keep in touch with day to day positions regarding their availability and accordingly adjust progress of works including employment of labour and the DFCCIL shall not in any way be liable for the supply of materials or for the non-supply thereof for any reasons whatsoever nor for any lossor damage arising in consequence of such delay or non-supply.

9. **Deleted**

10. **Carriage of materials: -** No forwarding orders shall be issued by the DFCCIL for the conveyance of contractor's materials, tools and plant by Rail which may be required for use in the works and the contractor shall pay full freight charges at public tariff rates therefore.

11. **Deleted**

12. **Representation on Works:-** The contractor shall, when he is not personally present on the site of the works place and keep a responsible agent at the works during working hours who shall on receiving reasonable notice, present himself to the Engineer/DFCCIL and orders given by the Engineer/DFCCIL or the engineer's/DFCCIL's representative to the agent shall be deemed to have the same force as if they had been given to the Contractor. Before absenting himself, the contractor shall furnish the name and address of his agent for the purpose of this clause and failure on the part of the Contractor to comply with this provision at any time will entitle the DFCCIL to **rescind the contract** under clause

62 of these conditions.

13. **Relics and Treasures:-** All gold, silver, oil and other minerals of any description and all precious stones, coins, treasures relics antiquities and other similar things which shall be found in or upon the site shall be the property of the DFCCIL and the Contractor shall duly preserve the same to the satisfaction of the DFCCIL and shall from time to time deliver the same to such person or persons as the DFCCIL may appoint to receive the same.

14. **Excavated material:-**The contractor shall not sell or otherwise dispose of or remove except for the purpose of this contract, the sand, stones, clay, ballast, earth, rock or other substances or materials which may be obtained from any excavation made for the purpose of the works or any building or produced upon the site at the time of delivery of the possession thereof but all the substances, materials, buildings and produce shall be the property of the DFCCIL provided that the contractor may, with the permission of the Engineer/DFCCIL, use the same for the purpose of the works either free of cost or pay the cost of the same at such rates as may be determined by the Engineer/DFCCIL.

15. **Indemnity by Contractors:** The Contractor shall indemnify and save harmless the Railway/DFCCIL from and against all actions, suit proceedings losses, costs, damages, charges, claims and demands of every nature and description brought or recovered against the Railways/DFCCIL by reason of any act or omission of the contractor, his agents or employees, in the executionof the works or in his guarding of the same. All sums payable by way of compensation under any of these conditons shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

16.(1) **Security Deposit: -** The Earnest Money deposited by the Contractor with his tender will be retained by the Railways as part of security for the due and faithful fulfillment of the contract by the Contractor. The Security Deposit shall be 5% of the contract value. Security Deposit may be deposited by the Contractor before release of first on account bill in cash or Term Deposit Receipt issued from Scheduled Bank, or may be recovered at the rate of 10% of the bill amount till the full Security Deposit is recovered. Provided also that in case of defaulting Contractor, the Railway may retain any amount due for payment to the Contractor on the pending "on account bills" so that the amounts so retained (including amount guaranteed through Performance Guarantee) may not exceed 10% of the total value of the contract.

Further, in case of contracts having value equal to or more than ₹ 50 crore (Rs Fifty crore) the Security Deposit may be deposited as Bank Guarantee Bond also, issued by a scheduled bank after execution of contract documents, but before payment of 1st on account bill. Provided further that the validity of Bank Guarantee Bond shall be extended from time to time, depending upon extension of contract granted in terms of Clause 17 of the Standard General Conditions of Contract.

Further, in case Security Deposit has been submitted as Term Deposit Receipt/Bank Guarantee Bond in full amount, the Earnest Money deposited by the Contractor with his tender will be returned by the Railways.

Note: After the work is physically completed as certified by competent authority, Security Deposit recovered from the running bills of a Contractor can be returned to him, if he so desires, in lieu of Term Deposit Receipt/irrevocable Bank Guarantee for equivalent amount from Scheduled Bank, to be submitted by him.

16.(2)(i) Refund of Security Deposit: Security Deposit mentioned in sub clause (1) above shall be returned to the Contractor along with or after, the following:

(a) Final Payment of the Contract as per clause 51. (1) and
(b) Execution of Final Supplementary Agreement or Certification by Engineer that Railway/DFCCIL has No Claim on Contractor and
(c) Maintenance Certificate issued, on expiry of the maintenance period as per clause 50. (1), in case applicable.

16.(2)(ii) Forfeiture of Security Deposit: Whenever the contract is rescinded as a whole under clause 62 (1) of GCC, the Security Deposit already with railways/DFCCIL under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under clause 62 (1) of GCC, the Security Deposit shall not be forfeited.

16.(3) No interest shall be payable upon the Earnest Money and Security Deposit or amounts payable to the Contractor under the Contract, but Government Securities deposited in terms of Sub-Clause 16. (4)(b) of this clause will be payable with interest accrued thereon.

16.(4) Performance Guarantee

The procedure for obtaining Performance Guarantee is outlined below:

(a) The successful bidder shall have to submit a Performance Guarantee (PG) within 21 (Twenty-one) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 21 (Twenty-one) days and upto 60 days from the date of issue of LOA may be given by the Authority who is competent to sign the contract agreement. However, a penal interest of 12% per annum shall be charged for the delay beyond 21(Twenty-one) days, i.e. from 22nd day after the date of issue of LOA. Further, if the 60th day happens to be a declared holiday in the concerned office of the Railway, submission of PG can be accepted on the next working day.

In all other cases, if the Contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract is liable to be terminated. In case contract is terminated railway/DFCCIL shall be entitled to forfeit Earnest Money Deposit and other dues payable against that contract. In case a tenderer has not submitted Earnest Money Deposit on the strength of their registration as a Startup recognized by Department of Industrial Policy and Promotion (DIPP) under Ministry of Commerce and Industry, DIPP shall be informed to this effect.

The failed Contractor shall be debarred from participating in re-tender for that work.

(b) The successful bidder shall submit the Performance Guarantee (PG) in any of the following forms, amounting to 5% of the contract value:

(i) Deleted

(ii) Irrevocable Bank Guarantee;

(iii) Deleted

(iv) Deleted

(v) Deleted

(vi) Deleted

(vii) Deleted

(viii) Deleted

(ix) Deleted

(x) Deleted

(xi) Deleted

(c) The Performance Guarantee shall be submitted by the successful bidder after the Letter of Acceptance (LOA) has been issued, but before signing of the contract agreement. This P.G. shall be initially valid upto the stipulated date of completion plus 60 days beyond that. In case, the time for completion of work gets extended, the Contractor shall get the validity of P.G. extended to cover such extended time for completion of work plus 60 days.

(d) The value of PG to be submitted by the Contractor will not change for variation upto 25% (either increase or decrease). In case during the course of execution, value of the contract increases by more than 25% of the original contract value, an additional Performance Guarantee amounting to 5% (five percent) for the excess value over the original contract value shall be deposited by the Contractor. On the other hand, if the value of contract decreases by more than 25% of the original contract value, Performance Guarantee amounting to 5% (five percent) of the decrease in the contract value shall be returned to the Contractor. The PG amount in excess of required PG for decreased contract value, available with Railways/DFCCIL, shall be returned to Contractor as per his request duly safeguarding the interest of railways/DFCCIL.

(e) The Performance Guarantee (PG) shall be released after physical completion of the work based on 'Completion Certificate' issued by the competent authority stating that the Contractor has completed the work in all respects satisfactorily.

(f) Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encashed in addition to forfeiture of Security Deposit available with railway.

(g) The Engineer/DFCCIL shall not make a claim under the Performance Guarantee except for amounts to which the DFCCIL is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:

(i) Failure by the Contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer/DFCCIL may claim the full amount of the Performance Guarantee.

(ii) Failure by the Contractor to pay DFCCIL any amount due, either as agreed by the Contractor or determined under any of the Clauses/Conditions of the Agreement, within 30 days of the service of notice to this effect by Engineer.

(iii) The Contract being determined or rescinded under clause 62 of the GCC

(h) The tenderer who has offered lower total cost as compared to tender value by more than 10 %, shall be required to submit additional Performance Guarantee of value equal to percentage of tender value by which offer is lower than 10%.

17. Force Majeure Clause:- If at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract shall be prevented or delayed by reason of any war, hostility, acts of public enemy, civil commotion, sabotage, serious loss or damage by fire, explosions, epidemics, strikes, lockouts or acts of God (hereinafter, referred to events) provided, notice of the happening of any such event is given by either party to the other within 30 days from the date of occurrence thereof, neither party shall by reason of such event, be entitled to terminate this contract nor shall either party have any claim for damages against the other in respect of such non-performance or delay in performance, and works under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist, and the decision of the Engineer as to whether the works have been so resumed or not shall be final and conclusive, PROVIDED FURTHER that if the performance in whole or in part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 120 days, either party may at its option terminate the contract by giving notice to the other party.

17-A Extension of time in Contracts:- Subject to any requirement in the contract as to completion of any portion or portions of the works before completion of the whole, the Contractor shall fully and finally complete the whole of the works comprised in the contract (with such modifications as may be directed under conditions of this contract) by the date entered in the contract or extended date in terms of the following clauses:

(i) **Extension due to modification:-** If any modifications have been ordered which in the opinion of the Engineer have materially increased the magnitude of the work, then such extension of the contracted date of completion may be granted as shall appear to the Engineer to be reasonable in the circumstances, provided moreover that the Contractor shall be responsible for requesting such extension of the date as may be considered necessary as soon as the cause thereof shall arise and in any case not less than one month before the expiry of the date fixed for completion of the works.

(ii) **Extension for Delay not due to Railway or Contractor:** If in the opinion of the Engineer, the progress of work has any time been delayed by any act or neglect of Railway's employees or by other Contractor employed by the Railway under Sub-Clause (4) of Clause 20 of these Conditions or in executing the work not forming part of the contract but on which Contractor's performance necessarily depends or by reason of proceeding taken or threatened by or dispute with adjoining or to neighbouring owners or public authority arising otherwise through the Contractor's own default etc. or by the delay authorized by the Engineer pending arbitration or in consequences of the Contractor not having received in due time necessary instructions from the Railway for which he

shall have specially applied in writing to the Engineer or his authorized representative then upon happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer within 15 days of such happening, but shall nevertheless make constantly his best endeavours to bring down or make good the delay and shall do all that may be reasonably required of him to the satisfaction of the Engineer to proceed with the works. The Contractor may also indicate the period for which the work is likely to be delayed and shall be bound to ask for necessary extension of time. The Engineer on receipt of such request from the Contractor shall consider the same and shall grant such extension of time as in his opinion is reasonable having regard to the nature and period of delay and the type and quantum of work affected thereby. No other compensation shall be payable for works so carried forward to the extended period of time; the same rates, terms and conditions of contract being applicable as if such extended period of time was originally provided in the original contract itself.

(iii) **Extension for Delay due to Railways:** In the event of any failure or delay by the Railway to hand over the Contractor possession of the lands necessary for the execution of the works or to give the necessary notice to commence the works or to provide the necessary drawings or instructions or any other delay caused by the Railway due to any other cause whatsoever, then such failure or delay shall in no way affect or vitiate the contract or alter the character thereof or entitle the Contractor to damages or compensation therefor, but in any such case, the Railway may grant such extension or extensions of the completion date as may be considered reasonable.

17-B **Extension of Time with Liquidated Damages (LD) for delay due to Contractor:** The time for the execution of the work or part of the works specified in the contract documents shall be deemed to be the essence of the contract and the works must be completed not later than the date(s) as specified in the contract. If the Contractor fails to complete the works within the time as specified in the contract for the reasons other than the reasons specified in Clause 17 and 17-A, the Railway may, if satisfied that the works can be completed by the Contractor within reasonable short time thereafter, allow the Contractor for further extension of time (Proforma at Annexure-VII) as the Engineer may decide. On such extension the Railway will be entitled without prejudice to any other right and remedy available on that behalf, to recover from the Contractor as agreed damages and not by way of penalty for each week or part of the week, a sum calculated at the following rates of the contract value of the works.

For the purpose of this Clause, the contract value of the works shall be taken as value of work as per contract agreement including any supplementary work order/contract agreement issued. Provided also, that the total amount of liquidated damages under this condition shall not exceed 5% of the contract value or of the total value of the item or groups of items of work for which a separate distinct completion period is specified in the contract.

S.No.	Duration of extension of time under Clause 17-B	Rate of Liquidated Damages
(i)	Up to Twenty percent of original period of completion including period of extension of DOC granted under Section 17A(i)	As decided by Engineer, between 0.01% to 0.10% of contract value for each week or part of the week
(ii)	Above Twenty percent but upto Thirty percent of original period of completion including period of extension of DOC granted under Section 17A(i)	0.20% of contract value for each week or part of the week
(iii)	Above Thirty percent but upto Forty percent of original period of completion including period of	0.30% of contract value for each week or part of the week

	extension of DOC granted under Section 17A(i)	
(iv)	Above Forty percent of original period of completion including period of extension of DOC granted under Section 17A(i)	0.50% of contract value for each week or part of the week

Provided further, that if the Railway is not satisfied that the works can be completed by the Contractor and in the event of failure on the part of the contractor to complete the work within further extension of time allowed as aforesaid, the Railway shall be entitled without prejudice to any other right or remedy available in that behalf, to appropriate the contractor's Security Deposit and rescind the contract under Clause 62 of these Conditions, whether or not actual damage is caused by such default.

17-C **Bonus for Early Completion of Work:** In case of open tenders having value more than Rs 20 crore and original period of completion 12 months or more, when there is no reduction in original scope of work by more than 10%, and no extension granted on either railway or Contractor's account, Contractor shall be entitled for a bonus of 1% for each 30 days early completion of work. The period of less than 30 days shall be ignored while working out bonus. The maximum bonus shall be limited to 3% of original contract value. The completion date shall be reckoned as the date of issuance of completion certificate by engineer.

18.(1) Illegal Gratification:- Any bribe, commission, gift or advantage given, promised or offered by or on behalf to the contractor or his partner, agent or servant or, anyone on his behalf, to any officer or employee of the DFCCIL, or to any person on his behalf in relation to obtaining or execution of this or any other contract with the DFCCIL shall, in addition to any criminal liability which he may incur, subject contractor to the ***rescission of the contract*** and all other contracts with the DFCCIL and to the payment of any loss or damage resulting from such decision and the DFCCIL shall be entitled to deduct the amounts so payable from the Contractor(s)/bills/security deposite or any other dues of contractor with Railways/DFCCIL.

18.(2) The contractor shall not lend or borrow from or have or enter into any monitory dealings and transactions either directly or indirectly with any employee of the DFCCIL and if he shall do so, the DFCCIL shall be entitled forthwith to ***rescind the contract*** and all other contracts with the DFCCIL. Any question or dispute as to the commission or any such offence or compensation payable to the DFCCIL under this clause shall be settled by the Chief General Manager/Noida of the DFCCIL, in such a manner as he shall consider fit and sufficient and his decision shall be final and conclusive. In the event of rescission of the contract under this clause, the contractor will not be paid any compensation whatsoever except payments for the work done up to the date of rescission.

EXECUTION OF WORKS

19.(1) 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.

19.(2) Commencement of works: -The contractor shall commence the works within 15 days after the receipt by him of an order in writing to this affect from the Engineer/DFCCIL and shall proceed with the same with due expedition and without delay.

19.(3) Accepted Programme of work:- The contractor who has been awarded the work shall as soon as possible but not later than 30 days after the date of receipt of the acceptance letter in respect of contracts with initial completion period of two years or less or not later than 90 days for other contracts have to submit the detailed programme of work indicating the time schedule of various items of works in the form of Bar Chart/PERT/CGM. He shall also submit the details of organization *(in terms of labour and supervisors)* plant and machinery, that he intends to utilize *(from time to time)* for execution of the work within stipulated date of completion. The programme of work amended as necessary by discussions with the Engineer/DFCCIL, shall be treated as the agreed programme of the work for the purpose of this contract and the contractor shall endeavour to fulfil this programme of work. The progress of work will be watched accordingly and the ***liquidated damages will be with reference to the overall completion date***. Nothing stated herein shall preclude the contractor in achieving earlier completion of item or whole of the works than indicated in the programme.

19.(4) Setting out of works: - 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.

20.(1) Compliance to Engineer's/DFCCIL instructions:-The Engineer/DFCCIL shall direct the order in which the several parts of the works shall be executed and the contractor shall execute without delay all orders given by the Engineer from time to time but the contractor shall not be relieved thereby from responsibility for the due performance of the works in all respects.

20.(2) Alterations to be authorized: -No alterations in or additions to or omissions or abandonment of any part of the works shall be deemed authorized, except under instructions from the Engineer/DFCCIL. The contractor shall be responsible to obtain such instructions in each and every case in writing from the Engineer/DFCCIL.

20.(3) Extra works:- Should works over and above those included in the contract require to be executed at the site, the contractor shall have no right to be entrusted with the execution of such works which may be carried out by another contractor or contractors or by other means at the option of the DFCCIL.

20.(4) Separate contracts in connection with works: - The DFCCIL shall have the right to let other contracts in connection with the works. The contractor shall afford other contractors' reasonable opportunity for the storage of their materials and the execution of their works and shall properly connect and coordinate his work with theirs. If any part of the contractor's work depends for proper execution or result upon the work of another contractor(s), the contractor shall inspect and promptly report to the Engineer any defects in such works that render it unsuitable for such proper execution and results. The contractor's failure so-to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work, except as to defects which may develop in the other contractor's work after the execution of his work.

21. Instruction of Engineer's/DFCCIL Representative: - Any instructions or approval given by the Engineer's/DFCCIL representative to contractor in connection with the works shall bind the contractor as though it had been given by the Engineer/DFCCIL provided always as follows.

(a) Failure of the Engineer's/DFCCIL representative to disapprove any work or materials shall not prejudice, the power of the Engineer/DFCCIL thereafter to disapprove such work or material and to order the removal or breaking up thereof.

(b) If the Contractor shall be dissatisfied by reason of any decision of the Engineer's/DFCCIL representative, he shall be entitled to refer the matter to the Engineer/DFCCIL who shall there upon confirm or vary such decision.

22.(1) Adherence to specifications and drawings: - The whole of the works shall be executed in perfect conformity with the specifications and drawings of the contract. If contractor performs any works in a manner contrary to the specifications or drawings or any of them and without such reference to the Engineer/DFCCIL he shall bear all the costs arising or ensuing therefore and shall be responsible for all loss to the DFCCIL.

22.(2) Drawings and specifications of the works: - The contractor shall keep one copy of drawings and specifications at the site, in good order, and such contract documents as may be necessary available to the Engineer/DFCCIL or the Engineer's/DFCCIL's representative.

22.(3) Ownership of drawings and specifications: - All drawings and specifications and copies thereof furnished by the DFCCIL to the Contractor are deemed to be the property of the DFCCIL. They shall not be used on other works and with the exception of the signed contract set, shall be returned by the contractor to the DFCCIL on completion of the work or termination of the contract.

22.(4) Compliance with Contractor's request for details: - The Engineer/DFCCIL shall furnish with reasonable promptness, after receipt by him of the contractor's request for the same, additional instructions by means of drawings or otherwise, necessary for the proper execution of the works or any part thereof. All such drawing and instructions shall be consistent with the contract Documents and reasonably inferable there from.

22.(5) Meaning and intent of specification 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 measurements of the works the decision of the Engineer/DFCCIL thereon shall be final subject to the appeal *(within 7 days of such decision being intimated to the contractor)* to the CGM who shall have the power to correct any errors, omissions, or discrepancies in aforementioned items and whose decision in the matter in dispute or doubt shall be final and conclusive.

23 Working during night: - The contractor shall not carry out any work between sun-set and sun-rise without the previous permission of the Engineer. However, if the Engineer is satisfied that the work is not likely to be completed in time except by resorting to night work, he may order the same without confirming any right on the Contractor for claiming any extra payment for the same.

24. Damage to Railway / DFCCIL property or private life and property:-The contractor shall be responsible for all risk to the work and for trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway or the lives, persons or property of others from whatsoever cause in connection with the works until they are taken over by the Railway/ DFCCIL and this although all reasonable and proper precautions may have been taken by the contractor, and in case the Railway / DFCCIL shall be called upon to make good any costs, loss or damages, or to pay an compensation, including that payable under the provisions of the Workmen's Compensation Act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid by reason of any act, or any negligence or omissions on the part of the contractor the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway / DFCCIL may incur in reference thereto, shall be charged to the contractor. The Railway / DFCCIL shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to contractor, as aforesaid any sum or sums of money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defence or compromise, and the incurring of any such expenses shall not be called in question by the contractor.

25. Sheds, stores houses and Yards:-The contractor shall at his own expense provide himself with sheds, stores houses and yards in such situations and in such numbers as in the opinion of the Engineer is requisite for carrying on the works and the contractor shall keep at each such sheds, stores houses and yard a sufficient quantity of materials and plant in stock as not to delay the carrying out of the works with due expedition and the Engineer and the Engineer's representative shall have free access to the said sheds, store houses and yards at any time for the purpose of inspecting the stock of materials or plant so kept in hand, and any materials or plan which the Engineer may object to shall not be brought upon or used in the works, but shall be forthwith removed from the sheds, store houses or yards by the contractor. The contractor shall at his own expenses provide and maintain suitable mortar mills, soaking vats or any other equipments necessary for the execution of the works.

26. Provision of efficient and competent Staff at work sites by the Contractor: -

26.1 The contractor shall place and keep on the works at all times efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound and proper manner and shall employ only such supervisors, workmen and labourers in or about the execution of any of these works as are careful and skilled in the various trades.

26.2 The contractor shall at once remove from the works any agents, permitted sub-contractor, supervisor, workman or labourer who shall be objected to by the Engineer/DFCCIL and if and whenever required by the Engineer/DFCCIL, he shall submit a correct return showing the names of all staff and workmen employed by him.

26.3 In the event of the Engineer/DFCCIL being of the opinion that the contractor is not employing on the works a sufficient number of staff and workmen as is necessary for the proper completion of the works within the time prescribed, the contractor shall forthwith on receiving intimation to this effect deploy the additional number of staff and labour specified by the Engineer/DFCCIL within seven days of being so required and failure on the part of the contractor to comply with such instructions will entitle the DFCCIL to ***rescind the contract*** under clause 62 of these conditions.

26A. Deployment of Qualified Engineers at Work Sites by the Contractor: **-**

26A.1 The contractor shall also employ Qualified Graduate Engineer or Qualified Diploma Holder Engineer, based on value of contract, as may be prescribed by the Ministry of Railways/DFCCIL through separate instructions from time to time.

26A.2 In case, the contractor fails to employ the Engineer, as aforesaid in Para 26A.1, he shall be liable to pay liquidity damages at the rates, as may be prescribed by the Ministry of Railways/DFCCIL through separate instructions from time to time for the default period.

26A.3 Deleted

27.(1) Workmanship and testing:- The whole of the works and / or supply of materials specified and provided in the contract or that may be necessary to be done in order to form and complete any part thereof shall be executed in the best and most substantial workman like manner with materials of the best and most approved quality of their respective kinds, agreeable to the particulars contained in or implied by the specifications and as referred to in and represented by the drawings or in such other additional particulars, instructions and drawings may be found requisite to be given during the carrying on of the works and to the entire satisfaction of the Engineer/DFCCIL according to the instructions and directions which the contractors may from time to time receive from the Engineer/DFCCIL. The materials may be subjected to tests by means of such machines, instruments and appliances as the Engineer/DFCCIL may direct and ***wholly at the expense of the contractor.***

27.(2) Removal of improper work and materials: - The Engineer/DFCCIL or the Engineer's/DFCCIL Representative shall be entitled to order from time to time:

(a) The removal from the site within the time specified in the order of any materials which in his opinion are not in accordance with the specifications or drawings.

(b) The substitution of proper and suitable materials, and

(c) the removal and proper re-execution, notwithstanding any previous tests thereof or on account payments therefore, of any work which in respect of materials or workmanship; is not in his opinion in accordance with the specifications and in case of default on the part of the contractor in carrying out such order the DFCCIL shall be entitled to ***rescind the contract*** under clause 62 of these conditions.

28. Facilities for inspection:- The contractor shall afford the Engineer/DFCCIL and the Engineer's/DFCCIL's Representative every facility for entering in and upon every portion of the work at all hours for the purpose of inspection or otherwise and shall provide all labour, materials, planks, ladders, pumps, appliances and things of every kind required for the purpose and the Engineer/DFCCIL and the Engineer's/DFCCIL's Representative shall at all times have free access to every part of the works and to all places at which materials for the works are stored or being prepared.

29. Examination of work before covering up:- The contractor shall give 7 days' notice to the Engineer/DFCCIL or the Engineer's/DFCCIL'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/DFCCIL or the Engineer's/DFCCIL's representative be uncovered and measured at the contractor's expense or no allowance shall be made for such work or materials.

30. 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/DFCCIL shall be removed by him at his expenses when they are no longer required and in such manner as the Engineer/DFCCIL shall direct. In the event of failure on the part of the contractor to remove the temporary works, the Engineer/DFCCIL 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 Railway / 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 ejected by the Railway / DFCCIL necessary expenses incurred by the Railway / DFCCIL in connection therewith shall be borne by the contractor.

31.(1) Contractor to supply water for works: - Unless otherwise provided in the contract, the contractor shall be responsible for the arrangements to obtain supply of water necessary for the works.

31.(2) Deleted

31.(3) Deleted

31.(4)(a) Contractor to arrange supply of Electri power for works: - Unless otherwise provided in the contract, the contractor shall be responsible for arrangements to obtain supply of electric power for the works.

31.(4)(b) Deleted

32. Property in materials and plant:- The materials and plant brought by the Contractor upon the site or on the land occupied by the Contractor in connection with the works and intended to be used for the execution thereof shall immediately, they are brought upon the site of the said land, be deemed to be the property of the Railway / DFCCIL. Such of them as during the progress of the works are rejected by the Engineer/DFCCIL under Clause 25 of these conditions or are declared by him not to be needed for the execution of the works or such as on the grant of the certificate of completion remain unused shall immediately on such rejection, declaration or grant cease to be deemed the property of the Railway / DFCCIL and the Contractor may then *(but not before)* remove them from the site or the said land. This clause shall not in any way diminish the liability of the Contractor nor shall the Railway / DFCCIL be in any way answerable for any loss or damage which may happen to or in respect of any such materials or plant either by the same being lost, stolen, injured or destroyed by fire, tempest or otherwise.

33. (1) Deleted

33.(2) Deleted

34.(1) Precaution during progress of works:- During the execution of works, unless otherwise specified, the Contractor shall at his own cost provide the materials for and execute all shoring, timbering and strutting works as is necessary for the stability and safety of all structures, excavations and works and shall ensure that no damage, injury or loss is caused or likely to be caused to any person or property.

34.(2) Roads and Water courses: - Existing roads or water courses shall not be blocked, cut through, altered, diverted or obstructed in any way by the Contractor, except with the permission of the Engineer/DFCCIL. All compensations claimed for any unauthorized closure, cutting through, alterations, diversion or obstruction to such roads or water courses by the Contractor or his agent or his staff shall be recoverable from the Contractor's bill/security deposite or any other dues of contractor with the Railway/DFCCIL.

34.(3) Provision of access to premises:- During progress of work in any street or thoroughfare, the Contractor shall make adequate provision for the passage of traffic, for securing safe access to all premises approached from such street or thoroughfare and for any drainage, water supply or means of lighting which may be interrupted by reasons of the execution of the works and shall react and maintain at his own cost barriers, lights and other safeguards as prescribed by the Engineer/DFCCIL, for the regulation of the traffic, and provide watchmen necessary to prevent accidents. The works shall in such cases be executed night and day if so ordered by the Engineer/DFCCIL and with such vigour so that the traffic way be impeded for as short a time as possible.

34.(4) Safety of Public: - The Contractor shall be responsible to take all precautions to ensure the safety of the public whether on public or DFCCIL/Railway property and shall post such look out men as may in the opinion of the Engineer/DFCCIL, be required to comply with regulations apertaining to the work. Contractor shall ensure placement of barricading/partitions at the place of work to ensure safety of habitants of adjacent area, failing which Engineer/DFCCIL may advise stoppage of work as per his discretion.

34.(5) Display Board: - The contractor shall be responsible for displaying the details of works i.e. name of work, approximate cost, expected date of completion, name and address of the Contractor and address of Engineer on a proper steel Board of size not less than 1m x 1m.

35. Use of Explosives: Explosives shall not be used on the works or on the site by the Contractor without the permission of the Engineer and then also only in the manner and to the extent to which such permission is given. Where explosives are required for the works, they shall be stored in a special magazine to be provided by and at the cost of the Contractor in accordance with the Explosive Rules. The Contractor shall obtain the necessary license for the storage and the use of explosives. All operations in which or for which explosives are employed shall be at the sole risk and responsibility of the Contractor and the Contractor shall indemnify the Railway in respect thereof.

36.(1) Suspension of works:- The Contractor shall on the order of the Engineer/DFCCIL, suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer/DFCCIL may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer/DFCCIL. If such suspension is: -

(a) Provided for in the contract, or

(b) Necessary for the proper execution of the works or by the reason of weather conditions or by some default on the part of the Contractor, and/or

(c) Necessary for the safety of the works or any part thereof.

36.(2) The Contractor shall not be entitled to the extra costs, if any, incurred by him during the period of suspension of the works, but in the event of any suspension ordered by the Engineer/DFCCIL for reasons other than aforementioned and when each such period of suspensions exceeds 14 days, the contractor shall be entitled to such extension of time for completion of the work as the Engineers may consider proper having regard to the period or periods of such suspensions and to such compensations as the Engineer/DFCCIL may consider reasonable in respect of salaries or wages paid by the Contractor to his employees during the periods of such suspension.

36.(3) Suspension lasting more than 3 months:- If the progress of the works or any part thereof is suspended on the order of the Engineer/DFCCIL for more than three months at a time, the Contractor may serve a written notice on the Engineer/DFCCIL requiring permission within 15 days from the receipt thereof to proceed with the works or that part thereof in regard to which progress is suspended and if such permission is not granted within that time the Contractor by further written notice so served may, but is not bound to, elect to treat the suspension where it affects part only of the works as an omission of such part or where it affects the whole of the works, as an abandonment of the contract by the DFCCIL.

37. Rates for items of works:- The rates, entered in the accepted Schedule of Rates of the Contract are intended to provide for works duly and properly completed in accordance with the general and special *(if any)* conditions of the contract and the specifications and drawings together with such enlargements, extensions, diminutions, reductions, alterations or additions as may be ordered in terms of Clause 42 of these conditions and without prejudice to the generality thereof and shall be deemed to include and cover superintendence and labour, supply, including full freight of materials, stores, patterns, profiles, moulds, fittings, centring, scaffolding, shoring props, timber, machinery, barracks, tackle, roads, pegs, posts, tools and all apparatus and plant required on the works, except such tools, plant or materials as may be specified in the contract to be supplied to the Contractor by the DFCCIL, the erection, maintenance and removal of all temporary works and, buildings, all watching, lighting, bailing, pumping and draining, all prevention of or compensation for trespass, all barriers and arrangements for the safety of the public or of employees during the execution of works, all sanitary and medical arrangements for labour camps as may be prescribed by the DFCCIL, the setting of all work and of the construction, repair and upkeep of all centre lines, bench marks and level pegs thereon, site clearance, all fees duties, royalties, rent and compensation to owners for surface damage or taxes and impositions payable to local authorities in respect of land, structures and all material supplied for the work or other duties of expenses for which the Contractor may become liable or may be put to under any provision of law for the purpose of or in connection with the execution of the contract, and all such other incidental charges or contingencies as may have been specially provided for in the specifications.

However, if rates of existing GST or cess on GST for Works Contract is increased or any new tax /cess on Works Contract is imposed by Statute after the date of opening of tender but within the original date of completion/date of completion extended under clause 17 & 17A and the Contractor thereupon properly pays such taxes/cess, the Contractor shall be reimbursed the amount so paid.

Further, if rates of existing GST or cess on GST for Works Contract is decreased or any tax/cess on Works Contract is decreased / removed by Statute after the date of opening of tender, the reduction in tax amount shall be recovered from Contractor's bills/Security Deposit or any other dues of Contractor with the Railway/DFCCIL.

38. Deleted

39.(1) Rates for extra items of works:- Any type of work carried out by the Contractor on the instructions of the Engineer which is not included in the accepted schedules of rates shall be executed at the rates set forth in the "Delhi Schedule of Rates of CPWD" modified by the tender percentage and such items are not contained in the latter, at the rate agreed upon between the Engineer and the Contractor before the execution of such items of work and the Contractors shall be bound to notify the Engineer at least seven days before the necessity arises for the execution of such items of works that the accepted schedule of rates does not include rate or rates for the extra work involved. The rates payable for such items shall be decided at the meeting to be held between the Engineer and Contractor, in as short a period as possible after the need for the special item has come to the notice. In case the Contractor fails to attend the meeting after being notified to do so or in the event of no settlement being arrived at, the DFCCIL shall be entitled to execute the extra works by other means and the Contractor shall have no claim for loss or damage that may result from such procedure.

The assessment of rates for extra items shall be arrived at based on the prevailing rates and by taking guidance from the following documents in order of priority:

(i) Analysis of Delhi Schedule of Rates issued by CPWD

(ii) Market Analysis

39.(2) Provided that if the Contractor commences work or incurs any expenditure in regard thereto before the rates as determined and agreed upon as lastly hereunto fore-mentioned, then and in such a case the Contractor shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of determination of rates as aforesaid according to the rates as shall be fixed by the Engineer/DFCCIL. However, if the Contractor is not satisfied with the decision of the Engineer/DFCCIL in this respect, he may appeal to the CGM within 30 days of getting the decision of the Engineer/DFCCIL, supported by analysis of the rates claimed. The CGM after hearing both the parties in the matter would be final and binding on the Contractor and the DFCCIL.

40. (1) Handing over of works: - The Contractor shall be bound to hand over the works executed under the contract to the DFCCIL complete in all respects to the satisfaction of the Engineer/DFCCIL. The Engineer/DFCCIL shall determine the date on which the work is considered to have been completed, in support of which his certificate shall be regarded as sufficient evidence for all purposes. The Engineer/DFCCIL shall determine from time to time, the date on which any particular section of the work shall have been completed, and the contractor shall be bound to observe any such determination of the Engineer/DFCCIL.

40.(2) Clearance of site on completion:- On completion of works, the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and works clean and in a workman like condition to the satisfaction of the Engineer/DFCCIL. No final payment in settlement of the accounts for the works shall be paid, held to be due or shall be made to the, Contractor till, in addition to any other condition necessary for final payment, site clearance shall have been affected by him, and such clearance may be made by the Engineer/DFCCIL at the expense of the Contractor in the event of his failure to comply with this provision within 7 days after receiving notice to that effect. Should it become necessary for the Engineer/DFCCIL to have the site cleared at the expenses of the Contractor, the DFCCIL shall not be held liable for any loss or damage to such of the Contractor's property as may be on the site and due to such removal there from which removal may be effected by means of public sales of such materials and property or in such a way as deemed fit and convenient to the Engineer.

Clause 40A: At the final stage of completion and commissioning of work, in case the contractor's failure is limited to only some of the works costing not more than 2% of the original contract value, and the Contractor request the engineer/DFCCIL that such works may be offloaded from him and got executed through another agency and additional cost incurred, if any, should be recovered from his dues; the Engineer/DFCCIL on being convinced that the anticipated additional cost for such works will not be substantial and can be recovered from the dues of the contractor and that such offloading will help in completion and commissioning of work, may agree to such offloading without any adverse repercussion on the performance guarantee and security deposit of the Contractor. However, the

Engineer/DFCCIL will not be under any compulsion to agree to such a request. Further, before issuing letter of acceptance to another agency for such work, the Contractor shall be informed of the rates at which the work will be got executed and the Contractor should give his consent to do so and certify that he would have no future claim on this account and that the extra expenditure so incurred, if any, by the Engineer/DFCCIL in getting the offloaded work done, shall be recovered from subsequent Bills or any other dues of the Contractor. In case the Contractor fails to give such consent within three working days, the Engineer/DFCCIL may treat the same as not acceptable to Contractor and proceed accordingly. In any case, DFCCIL shall deduct 10% of cost of such work or Rs one lakh whichever is lower, from the Contractor's dues as administrative charges for the process of finalizing new agency for such work irrespective of whether or not such work is finally offloaded from Contractor or not.

VARIATIONS IN EXTENT OF CONTRACT

41. Modification to contract to be in writing: - In the event of any of the provisions of the contract requiring 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.

42.(1) Powers of modification to contract:- 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.

42.(2) (i) Unless otherwise specified in the contract, the accepted variation in quantity of each individual item of the contract would be up to 25% of the quantity originally contracted, except in case of foundation work.

(ii) 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 up to the limit of 25% variation in quantity of individual item of works.

(iii) 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 excuted 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 exess of 140% but upto 125% of the agreement quantity of the

concerned item shall be paid 96% of the rate awarded for that item in that particular tender;

(c) Variation in quantity 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 for 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.

d(iv) In case of earthwork, the variation limit of 25% shall apply to the gross quantity of earth work and variation in the quantities of individual classifications of soil shall not be subject to this limit.

d(v) In case of foundation work, no variation limit shall apply and the work shall be carried out by the contractor on agreed rates irrespective of any variation.

d(vi) As far as SOR items are concerned, the limit of 25% would apply to the value of SOR schedule as a whole and not on individual SOR items. However, in case of NS items, the limit of 25% would apply on the individual items irrespective of the manner of quoting the rate (single percentage rate or individual item rate).

42.(3) Valuation of variations:- The enlargements, extensions, diminution, reduction, alterations or additions referred to in sub-clause (2) of this clause 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 and the amounts to be paid therefore shall be calculated in accordance with the accepted schedule of rates. Any extra items / quantities of work falling outside the purview of the provisions of sub-clause (2) above shall be paid for at the rates determined under clause-39 of these conditions.

CLAIMS

43.(1) Monthly Statement of Claims:- The Contractor shall prepare and furnish to the Engineer/DFCCIL once in every month an account giving full and detailed particulars of all claims for any additional expenses to which the Contractor may consider himself entitled to and of all extra or additional works

ordered by the Engineer/DFCCIL which he has executed during the preceding month and no claim for payment for and such work will be considered which has not been included in such particulars.

43.(2) Signing of "No Claim" Certificate:- The Contractor shall not be entitled to make any claim whatsoever against the DFCCIL under or by virtue of or arising out of this contract, nor shall the DFCCIL entertain or consider any such claim, if made by the Contractor, after he shall have signed a "No Claim" Certificate in favour of the DFCCIL in such form as shall be required by the DFCCIL after the works are finally measured up. The contractor shall be debarred from disputing the correctness of the items covered by "No Claim" Certificate or demanding a clearance to arbitration in respect thereof.

MEASUREMENTS, CERTIFICATES AND PAYMENTS

44. Quantities in schedule annexed to Contract:- The quantities set out in the accepted schedule of rates with items of works quantified are the estimated quantities of the works and they shall not be taken as the actual and correct quantities of the work to be executed by the Contractor in fulfilment of his obligations under the contract.

45.(i) Measurement of works by Railway/DFCCIL:- The Contractor shall be paid for the works at the rates in the accepted schedule of rates and for extra works at rates determined under Clause 39 of these conditions on the measurements taken by the Engineer/DFCCIL or the Engineer's/DFCCIL's representative in accordance with the rules prescribed for the purpose by the DFCCIL. The quantities for items the unit of which in the accepted schedule of rates is 100 or 1000 shall be calculated to the nearest whole number, any; fraction below half being dropped and half and above being taken as one; for items the unit of which in the accepted schedule of rates is single, the quantities shall be calculated to two places of decimals. Such measurements will be taken of the work in progress from time to time and at such intervals as in the opinion of the Engineer shall be proper having regard to the progress of works. The date and time on which "on account" or final measurements are to be made shall be communicated to the Contractor who shall be present at the site and shall sign the results of the measurements *(which shall also be signed by the Engineer or the Engineer's representative)* recorded in the official measurements book as an acknowledgement of his acceptance of the accuracy of the measures. Failing the Contractor's attendance the work may be measured up in his absence and such measurements shall, notwithstanding such absence, be binding upon the Contractor whether or not he shall have signed the measurement books provided always that any objection made by him to measurement shall be duly investigated and considered in the manner set out below:-

(a) It shall be open to the Contractor to take specific objection to any recorded measurements or Classification on any ground within seven days of the date of such measurements. Any re-measurement taken by the engineer/DFCCIL or the Engineer's/DFCCIL's representative in the presence of the Contractor or in his absence after due notice has been given to him in consequence of objection made by the Contractor shall be final and binding on the Contractor and no claim whatsoever shall thereafter be entertained regarding the accuracy and classification of the measurements.

(b) If an objection raised by the Contractor is found by the Engineer/DFCCIL to be incorrect the Contractor shall be liable to pay the actual expenses incurred in measurements.

45.(ii) Measurement of works by Contractor's Authorized Representative *(In case the Contract provides for the same)*

(a) The Contractor shall be paid for the works at the rates in the accepted Schedule of Rates and for extra works at rates determined under Clause 39 of these Conditions on the measurements taken by the contractor's authorized engineer in accordance with the rules prescribed for the purpose by Railways/DFCCIL. The quantities for items the unit of which in the accepted Schedule of Rates is 100 or 1000 shall be calculated to the nearest whole number, any fraction below half being dropped and half above being taken as one; for items the unit of which in the accepted Schedule of Rates is single, the quantity shall be calculated to two places of decimals. Such measurements will be taken of the works in progress from time to time. The date and time on which 'on account or final' measurements are to be made shall be communicated to the Engineer/DFCCIL.

Date and time of test checks shall be communicated to the Contractor, who shall be present at the site and shall witness the test checks, failing Contractor's adherence, the test check may be conducted in his absence and such test checks shall not, withstanding such absence be binding upon Contractor provided always that any objections made by Contractor to test check shall be duly investigated and considered in the manner set out below:

(i) It shall be open to Contractor to take specific objections to test check of any recorded measurements within 7 days of date of such test checks. Any re-test check done by the concerned Railway's/DFCCIL's Authority in the presence of the Contractor or in his absence after due notice, given to him in consequent of objections made by the Contractor shall be final and binding on the Contractor and no claim whatsoever shall thereafter be entertained regarding the accuracy and classification of the measurements.

(ii) If an objection raised by the Contractor is found by the Engineer/DFCCIL to be incorrect, the Contractor shall be liable to pay the actual expenses incurred in measurements.

(b) Incorrect measurement/action to be taken:

If in case during test check or otherwise, it is detected by the Engineer/DFCCIL that Agency has claimed any exaggerated measurement or as claimed any false measurement for the work which have not been executed; amounting to variation of 5% or more of claimed gross bill amount, action shall be taken as following:

(i) On first occasion of noticing, exaggerated/false measurement, Engineer/DFCCIL shall impose a penalty of 10% of claimed gross bill value.

(ii) On any next occasion of noticing any exaggerated/false measurement, Railway/DFCCIL shall impose penalty of 15% of claimed gross bill value. In addition, the facility of recording of measurement by Contractor as well as release of provisional payment shall be withdrawn. Once withdrawn, measurement shall be done by Railway/DFCCIL as per Clause-45(i) above.

46. (1) "On-Account" Payments: - The Contractor shall be entitled to be paid from time to time by way of "One-Account" payment only for such works as in the opinion of the Engineer/DFCCIL he has executed in terms of the contract.

All payments due on the Engineer's/DFCCIL or the Engineer's/DFCCIL's representative's certificates of measurements or Engineer's/DFCCIL Certified "Contractor's Authorized Engineer's measurements" shall be subject to any deductions which may be made under these presents and shall further be subject to, unless otherwise required by Clause 16 of these conditions, a retention of ten percent by way of security deposits, until the amount of security deposit by way of retained earnest money and such retentions shall amount to 5% of the total value of the contract provided always that the Engineer/DFCCIL may by any certificate make any correction or modification in any previous certificate which shall have been issued by him and that the Engineer/DFCCIL may withhold any certificate if the works or any part thereof are not being carried out to his satisfaction.

46.(2) Rounding off amounts: - The total amount due on each certificate shall be rounded off to the nearest rupee i.e. sum less than 50 paise shall be omitted and sums of 50 paise and more upto Re. 1/- will be reckoned as Re. 1/-.

46.(3) On Account Payments not prejudicial to final settlement:- "On- Account" payments made to the 'Contractor shall be without prejudice to the final making up of the accounts *(except where measurements are specifically noted in the Measurement Book as "Final Measurements" and as such have been signed by the Contractor Engineer's/Engineer's Representative/DFCCIL)* and shall in no respect be considered or used as evidence of any facts stated in or to be inferred from such accounts nor of any particular quantity of work having been executed nor of the manner of its execution being satisfactory.

46.(4) Manner of payment: - Unless otherwise specified payments to the Contractor will be transferred electronically to his bank account.

46A PRICE VARIATION CLAUSE*:(Not applicable)*

46A.1 Deleted

46A.2 Deleted

46A.3 Deleted

46A.4 Deleted

46A.5 Deleted

46A.6 Deleted

46A.7 Deleted

46A.8 Deleted

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46A.10 Deleted

47.0 Maintenance of works:- The Contractor shall at all times during the progress and continuance of the works and also for the period of maintenance specified in the Tender Form after the date of passing of the certificate of completion by the Engineer/DFCCIL or any other earlier date subsequent to the completion of the works that may be fixed by the Engineer/DFCCIL be responsible for and effectively maintain and uphold in good substantial, sound and perfect condition all and every part of the works and shall make good from time to time and at all times as often as the Engineer/DFCCIL shall require, any damage or defect that may during the above period arise in or be discovered or be in any way connected with the works, provided that such damage or defect is not directly caused by errors in the contract documents, act of providence or insurrection or civil riot, and the contractor shall be liable for and shall pay and make good to the DFCCIL or other persons legally entitled thereto whenever required by the Engineer/DFCCIL so to do, all losses, damages, costs and expenses they or any of them may incur or be put or be liable to by reasons or in consequence of the operations of the Contractor or of his failure in any respect.

48.(1) Certificate of completion of works:- As soon as in the opinion of the Engineer/DFCCIL, the works has been completed and has satisfactorily passed any final test or tests that may be prescribed, the Engineer/DFCCIL shall issue a certificate of completion duly indicating the date of completion in respect of the work and the period of maintenance of the work shall commence from the date of completion mentioned in such certificate. The certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned.

The Engineer/DFCCIL may also issue such a certificate indicating date of completion with respect to any part of the work *(before the completion of the whole of work),* which has been both completed to the satisfaction of the Engineer and occupied or used by the DFCCIL. When any such certificate is given in respect of part of a work, such part shall be considered as completed and the period of maintenance of such part shall commence from the date of completion mentioned in the completion certificate issued for that part of the work.

48.(2) Contractor not absolved by completion Certificate:- The Certificate of completion in respect of the works referred to in sub-clause (1) of this clause shall not absolve the Contractor from his liability to make good any defects imperfections, shrinkages or faults which may appear during the period of maintenance specified in the tender arising in the opinion of the Engineer/DFCCIL from materials or workmanship not in accordance with the drawings or specifications or instruction of the Engineer/DFCCIL, which defects, imperfections, shrinkages or faults shall upon the direction in writing of the Engineer/DFCCIL be amended and made good by the Contractor at his own cost: and in case of default on the part of Contractor the Engineer/DFCCIL may employ labour and materials or appoint another Contractor to amend and make good such defects, imperfections, shrinkages and faults and all expenses consequent thereon and incidental thereto shall be borne by the Contractor and shall be recoverable from any moneys due to him under the contract.

48.(3) Final Supplementary Agreement: After the work is completed or otherwise concluded by the parties with mutual consent, and taken over by the Railway as per terms and conditions of the contract agreement, and there is unequivocal no claim on either side under the Contract other than as mentioned in item 4 of Form no. 20, the parties shall execute the Final Supplementary Agreement as per Form no. 20.

49. Approval only by maintenance Certificate:- No certificate other than maintenance certificate referred to in Clause 50 of the conditions shall be deemed to constitute approval of any work or other matter in respect of which it is issued or shall be taken as an admission of the due performance of the contract or any part thereof.

50.(1) Maintenance Certificate: - The Contract shall not be considered as completed until a Maintenance Certificate shall have been signed by the Engineer stating that the works have been completed and maintained to his satisfaction. The Maintenance Certificate shall be given by the Engineer upon the expiration of the period of maintenance or as soon thereafter as any works ordered during such period pursuant to sub clause (2) Clause 48 of these conditions shall have been completed to the satisfaction of the Engineer/DFCCIL and full effect shall be given to this Clause notwithstanding the taking possession of or using the works or any part thereof by the DFCCIL.

The Competent Authority to issue above Maintenance Certificate shall normally be the authority who is competent to sign the contract. If this Competent Authority is of the rank lower than JA Grade, then a JA Grade Officer (concerned with the work) should issue the Certificate. The Certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned.

50.(2) Cessation of Railway's / DFCCIL Liability:- The DFCCIL shall not be liable to the Contractor for any matter arising out of or in connection with the contract of the execution of the works unless the contractor shall have made a claim in writing in respect thereof before the issue of the Maintenance Certificate under this clause.

50.(3) Unfulfilled Obligations:- Notwithstanding the issue of the Maintenance certificate the Contractor and *(subject to sub-clause 2 of this clause)* the DFCCIL shall remain liable for the fulfilment of any obligation incurred under the provision of the contract prior to the issue of the maintenance Certificate which remains unperformed at the time such certificate is issued and for the purposes of determining the nature and extent of any such obligations the contract shall be deemed to remain in force between the parties thereto.

51.(1) Final Payment:- On the Engineer's/DFCCIL certificate of completion in respect of the works, adjustment shall be made and the balance of account based on the Engineer/DFCCIL or the Engineer's/DFCCIL representative's certified measurements or Engineer's/DFCCIL certified "Contractor's Authorized Engineer's measurements" of the total quantity of work executed by the contractor upto the date of completion and on the accepted schedule or rates and for extra works on rates determined under Clause 39 of these conditions shall be paid to the Contractor subject always to any deduction which may be made under these presents and further subject to the Contactor having

signed delivered to the Engineer/DFCCIL either a full account in detail of all claims he may have on the DFCCIL in respect of the works or having delivered "No Claim Certificate" and the Engineer/DFCCIL having after the receipt of such account given a certificate in writing that such claims are not covered under excepted matter i.e. Clauses 8, 18, 22(5), 39, 43(2), 45(a), 55, 55-A(5), 57, 57A, 61(1), 61(2) and 62(1) to (xiii)(B) of Standard General Conditions of Contract or in any Clause (stated as excepted matter) of the Special Conditions of the Contract, that the whole of the works to be done under the provisions of the Contracts have been completed, that they have been inspected by him since their completion and found to be in good and substantial order, that all properties, works and things, removed, disturbed or injured in consequence of the works have been properly replaced and made good and all expenses and demands incurred by or made upon the Railway for or in the respect of damage or loss by from or in consequence of the works, have been satisfied agreeably and in conformity with the contract.

51.(2) Post Payment Audit:- It is an agreed term of contract that the DFCCIL reserves to itself the right to carry out a post-payment audit and or technical examination of the works and the final bill including all supporting vouchers, abstracts etc. and to make a claim on the contractor for the refund any excess amount paid to him till the release of Security Deposite of settlement of claims, which ever is later, if as a result of such examination any over-payment to him is discovered to have made in respect of any works done or alleged to have been done by him under the contract.

51A. Production of vouchers etc. by the Contractor: -

(i) For a contract of more than one crore of rupees, the contractor shall, whenever required, produce or cause to be produced for examination by the Engineer/DFCCIL any quotation, invoice, cost or other account, book of accounts, voucher, receipt, letter, memorandum, paper of writing or any copy of or extract from any such document and also furnish information and returns verified in such manner as may be required in any way relating to the execution of this contract or relevant for verifying or ascertaining cost of execution of this contract (the decision of the engineer on the question of relevancy of any documents, information or return being final and binding in the parties).The contractor shall similarly produce vouchers; etc., if required to prove to the Engineer/DFCCIL, that materials supplied by him, are in accordance with the specifications laid down in the contract.

(ii) If any portion of the work in a contract of value more than one crore of rupees be carried out by a sub-contractor or any subsidiary or allied firm or company (as per Clause 7 of the General Conditions of Contract), the Engineer/DFCCIL shall have power to secure the books of such sub-contract or any subsidiary or allied firm or company, through the contractor, and such books shall be open to his inspection.

(iii) The obligations imposed by sub clause (i) & (ii) above is without prejudice to the obligations of the contractor under any statute rules or orders binding on the contractor.

52.0 Withholding and lien in respect of sums claimed:- Whenever any claim or claims for payment of a sum of money arises out of or under the contract against the contractor, the DFCCIL shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any, deposited by the contractor and for the purpose aforesaid, the DFCCIL shall be entitled

to withhold the said cash security deposit or the security if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the DFCCIL shall be entitled to withhold and have a lien to the extent of the such claimed amount or amounts referred to supra, from any sum or sums found payable or which at any time thereafter may become payable to the contractor under the same contract or any other contract with this or any other DFCCIL or any Department of the Central Government pending finalization or adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above, by the DFCCIL will be kept withheld or retained as such by the DFCCIL till the claim arising out of or under the contract is determined by the arbitrator *(if the contract governed by the arbitration clause)* or by the competent court as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to supra and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the DFCCIL shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company, as the case may be whether in his individual capacity or otherwise.

52A. Lien in respect of claims in Other Contracts: -

(i) 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 a 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.

(ii) 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/Railways' dues against the terminated contract.

(iii) 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.

53.0 Signature on Receipts for Amounts:- Every receipt for money which may become payable or for any security which may become transferable to the Contractors under these presents, shall, if signed in

the partnership name by anyone of the partners of a Contractor's firm be a good and sufficient discharge to the DFCCIL in respect of the moneys or security purported to be acknowledged thereby and in the event of death of any of the Contractor, partners during the pendency of the contract it is hereby expressly agreed that every receipt by anyone of the surviving Contractor partners shall if so signed as aforesaid be good a sufficient discharge as aforesaid provided that nothing in this clause contained shall be deemed to prejudice or effect any claim which the DFCCIL may hereafter have against the legal representative of any contractor partner so dying for or in respect to any breach of any of the conditions of the contract, provided also that nothing in this clause contained shall be deemed to prejudice or effect the respective rights or obligations of the Contractor partners and of the legal representatives of any deceased Contractor partners interse.

LABOUR

54.0 Wages to Labour: - The Contractor shall be responsible to ensure compliance with the provision of the Minimum Wages Act, 1948 (hereinafter referred to as the "said Act") and the Rules made there under in respect of any employees directly or through petty contractors or subcontractors employed by him on road construction or in building operations or in stone breaking or stone crushing for the purpose of carrying out this contract.

If, in compliance with the terms of the contract, the Contractor supplied any labour to be used wholly or partly under the direct orders and control of the DFCCIL whether in connection with any work being executed by the Contractor or otherwise for the purpose of the DFCCIL such labour shall, for the purpose of this clause, still be deemed to be persons employed by the Contractor.

If any moneys shall, as a result of any claim or application made under the said Act be directed to be paid by the DFCCIL, such money shall be deemed to be moneys payable to the Railway/DFCCIL by the Contractor and on failure by the Contractor to repay the Railway/DFCCIL any moneys paid by it as aforesaid within seven days after the same shall have been demanded, the Railways/DFCCIL shall be entitled to recover the same from Contractor's bills/Security Deposit or any other dues of Contractor with the Railway/DFCCIL.

54A. Apprentices Act: - The Contractor shall be responsible to ensure compliance with the provisions of the Apprentices Act, 1961 and the Rules and Orders issued there under from time to time in respect of apprentices directly or through petty contractors or sub-contractors employed by him for the purpose of carrying out the Contract.

If the contractor directly or through petty contractors or sub-contractors fails to do so, his failure will be a breach of the contract and the DFCCIL may, in its discretion, rescind the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation of the provisions of the Act.

55. Provisions of payments of Wages Act: - The Contractor shall comply with the provisions of the Payment of Wages Act, 1936 and the rules made there under in respect of all employees employed by him either directly or through petty Contractors or sub-contractors in the works. If in compliance with the terms of the contract, the Contractor directly or through petty Contractors or sub-contractors shall

supply any labour to be used wholly or partly under the direct orders and control of the Engineer/DFCCIL whether in connection with the works to be executed hereunder or otherwise for the purpose of the Engineer/DFCCIL, such labour shall nevertheless be deemed to comprise persons employed by the Contractor and any moneys which may be ordered to be paid by the Engineer/DFCCIL shall be deemed to be moneys payable by the Engineer/DFCCIL on behalf of the Contractor and the Engineer/DFCCIL may on failure of the Contractor to repay such money to the Railways deduct the same from any moneys due to the Contractor in terms of the contract. The Railway shall be entitled to recover the same from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India all moneys paid or payable by the Railway by way of compensation of aforesaid or for costs of expenses in connection with any claim thereto and the decision of the Engineer/DFCCIL upon any question arising out of the effect or force of this Clause shall be final and binding upon the Contractor.

55A. Provisions of Contract labour *(Regulation and Abolition)* Act, 1970:

55A. (1) The contractor shall comply with the provision of the contract labour *(Regulation and Abolition)* Act, 1970 and the Contract labour *(Regulation and Abolition)* Central Rules 1971 as modified from time to time, wherever applicable and shall also indemnify the DFCCIL from and against any claims under the aforesaid Act and the Rules.

55A. (2) The Contractor shall obtain a valid licence under the aforesaid Act as modified from time to time before the commencement of the work and continue to have a valid licence until the completion of the work. Any failure to fulfil the requirement shall attract the penal provision of the Act.

55A. (3) The Contractor shall pay to the labour employed by him directly or through subcontractors the wages as per provision of the aforesaid Act and the Rules wherever applicable. The Contractor shall notwithstanding the provisions of the contract to the contrary, cause to be paid the wages to labour indirectly engaged on the works including any engaged by subcontractors in connection with the said work, as if the labour had been immediately employed by him.

55A. (4) In respect of all labour directly or indirectly employed in the work for performance of the contractor's part of, the contract, the Contractor shall comply with or cause to be complied with the provisions of the aforesaid Act and Rules wherever applicable.

55A.(5) In every case in which, by virtue of the provisions of the aforesaid Act or the rules, the DFCCIL is obliged to pay any amount of wages to a workman employed by the Contractor or his sub-contractor in execution of the work or to incur any expenditure on account of the contingent, liability of the DFCCIL due to the Contractor's failure to fulfill his statutory obligations under the aforesaid Act or the rules, the DFCCIL will recover from the Contractor, the amount of wages so paid or the amount of expenditure so incurred and without prejudice to the rights of the DFCCIL under the Section 20, Sub-Section (2) and Section 2, Sub-Section (4) of the aforesaid Act, the DFCCIL shall be at liberty to recover such amount or part thereof from Contractor's bills/Security Deposit or any other dues of Contractor with the Railway/DFCCIL. The DFCCIL shall not be bound to contest any claim made against it under Sub-Section (1) of Section 20 and Sub-Section (4) of Section 21 of the aforesaid Act

except on the written request of the Contractor and upon his giving to the DFCCIL full security for all costs for which the DFCCIL might become liable in contesting such claim. The decision of the Chief General Manager regarding the amount actually recoverable from the Contractor as stated above shall be final and binding on the Contractor.

55B. Provisions of Employees Provident Fund and Miscellaneous Provisions Act, 1952:

The Contractor shall comply with the provisions of Para 30 & 36-B of the Employees Provident Fund Scheme, 1952; Para 3 & 4 of Employees' Pension Scheme, 1995; and Para 7 & 8 of Employees Deposit Linked Insurance Scheme, 1976; as modified from time to time through enactment of "Employees Provident Fund & Miscellaneous Provisions Act, 1952", wherever applicable and shall also indemnify the DFCCIL from and against any claims under the aforesaid Act and the Rules.

55C. Contractor is to abide by the provisions of Payment of Wages act & Minimum Wages act in terms of clause 54, 55, 55A and 55B of Indian Railways General Condition of Contract. In order to ensure the same, an application has been developed and hosted on website 'www.shramikkalyan.indianrailways.gov.in'. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The Registration/ updation of Portal shall be done as under:

(a) Contractor shall apply for one-time registration of his company/firm etc. in the Shramikkalyan portal with requisite details subsequent to issue of Letter of Acceptance. Engineer/DFCCIL shall approve the contractor's registration in the portal within 7 days of receipt of such request.

(b) Contractor once approved by any Engineer/DFCCIL, can create password with login ID (PAN No.) for subsequent use of portal for all LoAs issued in his favour.

(c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LoA) / Contract Agreements on shramikkalyan portal within 15 days of issue of any LoA for approval of concerned engineer. Engineer shall update (if required) and approve the details of LoA filled by contractor within 7 days of receipt of such request.

(d) After approval of LoA by Engineer, contractor shall fill the salient details of contract labours engaged in the contract and ensure updating of each wage payment to them on shramikkalyan portal on monthly basis.

(e) It shall be mandatory upon the contractor to ensure correct and prompt uploading of all salient details of engaged contractual labour & payments made thereof after each wage period.

(ii) While processing payment of any 'On Account bill' or 'Final bill' or release of 'Advances' or 'Performance Guarantee / Security deposit', contractor shall submit a certificate to the Engineer/DFCCIL or Engineer's/DFCCIL representatives that "I have uploaded the correct details of contract labours engaged in connection with this contract and payments made to them during the wage period in Railway's Shramikkalyan portal at 'www.shramikkalyan.indianrailways.gov.in' till ____Month, ____Year."

55-D Provisions of "The Building and Other Construction Workers *(Regulation of Employment and Conditions of Service)* Act, 1996" and "The Building and Other Construction Workers' Welfare Cess Act, 1996":

The tenderers, for carrying out any construction work, shall get themselves registered with the Registering Officer under Section-7 of the Building and Other Construction Workers Act, 1996 and rules made thereto by the concerned State Govt., and submit certificate of Registration issued from the Registering Officer of the concerned State Govt. (Labour Dept.). The Cess shall be deducted from contractor's bills as per provisions of the Act.

56.0 Reporting of Accidents:- The Contractor shall be responsible for the safety of all employees directly or through petty contractors or sub- contractor employed by him on the works and shall report serious accidents to any of them however and wherever occurring on the works to the Engineer/DFCCIL or the Engineers/DFCCIL Representative and shall made every arrangements to render all possible assistance.

57.0 Provision of Workmen's Compensation Act:- In every case in which by virtue of the provisions of section 12 sub-section (1) of the Workmen's Compensation Act 1923, DFCCIL is obliged to pay compensation to a workman directly or through petty contractor or subcontractor employed by the Contractor in executing the work, DFCCIL will recover from the Contractor the amount of the compensation so paid, and, without prejudice to the rights of DFCCIL under Section 12 Sub-section (2) of the said Act, DFCCIL shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by DFCCIL to the Contractor whether under these conditions or otherwise, DFCCIL shall not be bound to contest any claim made against it under Section 12 Sub-section (1) of the said Act except on the written request of the Contractor and upon his giving to DFCCIL full security for all costs for which DFCCIL might become liable in consequence of contesting such claim.

57A. Provision of Mines Act:- The contractor shall observe and perform all the provisions of the Mines Act, 1952 or any statutory modifications or re-enactment thereof for the time being in force and any rules and regulations made there under in respect of all the persons directly or through the petty contractors or sub-contractors employed by him under this contract and shall indemnify the DFCCIL from and against any claims under the Mines Act, or the rules and regulations framed there under, by or on behalf of any persons employed by him or otherwise.

58.0 Railway/DFCCIL not to provide quarters for Contractors: - No quarters shall normally be provided by the DFCCIL for the accommodation of the contractor or any of his staff employed on the work. In exceptional cases where accommodation is provided to the Contractor at the DFCCIL discretion, recoveries shall be made at such rates as may be fixed by the DFCCIL for the full rent of the buildings and equipments therein as well as charges for electric current, water supply and conservancy.

59.(1) Labour Camps:- The contractor shall at his own expense make adequate arrangements for the housing, supply of drinking water and provision of latrines and urinals for his staff and workmen, directly or through the petty contractors or sub-contractors and for temporary crèche *(Bal-mandir)* where 50 or more women are employed at a time. Suitable sites on DFCCIL land, if available, may be allotted to the contractor for the erection of labour camps, either free of charge or on such terms and conditions that may be prescribed by the DFCCIL. All camp sites shall be maintained in clean and sanitary conditions by the contractor at his own cost.

59.(2) Compliance to rules for employment of labour:- The contractor(s) shall conform to all laws, by-laws rules and regulations for the time being in force pertaining to the employment of local or imported labour and shall take all necessary precautions to ensure and preserve the health and safety of all staff employed directly or through petty contractors or sub-contractors on the works.

59.(3) Preservation of peace: - The contractor shall take requisite precautions and use his best endeavours to

(i) Prevent any riotous or unlawful behaviour by or amongst his workmen and other employed directly or through the petty contractors or sub-contractors on the works and for the preservation of peace and protection of the inhabitants and

(ii) Security of property in the neighbourhood of the works. In the event of the DFCCIL requiring the maintenance of a special Police Force at or in the vicinity of the site during the tenure of works, the expenses thereof shall be borne by the contractor and if paid by the DFCCIL shall be recoverable from the contractor.

59.(4) Sanitary arrangements:- The contractor shall obey all sanitary rules and carry out all sanitary measures that may from time to time be prescribed by the Railway Medical Authority and permit inspection of all sanitary arrangements at all times by the Engineer/DFCCIL, the Engineer's/DFCCIL Representative of the Medical staff of the Railway/DFCCIL. Should the contractor fail to make the adequate sanitary arrangements, these will be provided by the DFCCIL and the cost therefore recovered from the contractor.

59.(5) Outbreak of infectious disease:- The contractor shall remove from his camp such labour and their families as refuse protective inoculation and vaccination when called upon to do so by the Engineer or the Engineer's representative on the advice of the DFCCIL. Should cholera, plague or other infectious disease break out, the contractor shall burn the huts, beddings, clothes and other belongings of or used by the infected parties and promptly erect new huts on health sites as required by the engineer/DFCCIL, failing which within the time specified in the Engineer's/DFCCIL requisition, the work may be done by the DFCCIL and the cost therefore recovered from the contractor.

59.(6) Deleted

59.(7) Medical facilities at site: - The Contractor shall provide medical facilities at the site as may be prescribed by the Engineer/DFCCIL on the advice of the DFCCIL in relation to the strength of the Contractor's resident staff and workmen.

59.(8) Use of intoxicants: - The sale of ardent spirits or other intoxicating beverages upon the work or in any of the buildings, encampments or tenements owned, occupied by or within the control of the contractor or any of his employees shall be forbidden and the Contractor shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition.

59.(9) Restrictions On The Employment Of Retired Engineers Of Railway/DFCCIL Services Within one Year Of Their Retirement: The Contractor shall not, if he is a retired Government Engineer of Gazetted rank, himself engage in or employ or associate a retired Government Engineer of Gazetted

rank, who has not completed one year from the date of retirement, in connection with this contract in any manner whatsoever without obtaining prior permission of the President and if the Contractor is found to have contravened this provision it will constitute a breach of contract and administration will be entitled to terminate the contract at the risk and cost of the contract and forfeit his Security Deposit.

60.(1) Non-employment of labours below the age of 15:- The Contractor shall not employ children below the age of 15 as labourers directly or through petty contractors or subcontractors for the execution of work.

60.(2) Medical Certificate of fitness for labour: - It is agreed that the contractor shall not employ a person above 15 and below 19 years of age for the purpose of execution of work under the contract unless a medical certificate of fitness in the prescribed form *(Proforma at Form no. 14)* granted to him by a certifying surgeon certifying that he is fit to work as an adult is obtained and kept in the custody of the contractor or a person nominated by him in this behalf and the person carries with him, while at work; a token giving a reference to such certificate. It is further agreed that the responsibility for having the adolescent examined medically at the time of appointment or periodically till he attains the age of 19 years shall devolve entirely on the contractor and all the expenses to be incurred on this account shall be borne by him and no fee shall be charged from the adolescent or his parent for such medical examination.

60.(3) Period of validity of medical fitness certificate: - A certificate of fitness granted or renewed for the above said purposes shall be valid only for a period of one year at a time. The certifying surgeon shall revoke a certificate granted or renewed if in his opinion the holder of it is, no longer fit for work in the capacity stated therein. Where a certifying surgeon refuses to grant or renew a certificate or revoke a certificate, he shall, if so, required by the person concerned, state his reasons in writing for doing so.

60.(4) Medical re-examination of labourer:- Where any official appointed in this behalf by the Ministry of labour is of the opinion that any person employed in connection with the execution of any work under this contract in the age group 15 to 19 years is without a certificate of fitness or is having a certificate of fitness but no longer fit to work in the capacity stated in the certificate, he may serve on the Contractor, or on the person nominated by him in the regard, a notice requiring that such persons shall be examined by a certifying surgeon and such person shall not if the concerned official so directs, be employed or permitted to do any work under this contract unless he has been medically examined and certified that he is fit to work in the capacity stated in the certificate.

EXPLANATIONS: -

(1) Only qualified medical practitioners can be appointed as "Certifying Surgeons" and the term "Qualified Medical Practitioners" means a person holding a qualification granted by an authority specified in the Schedule to the Indian Medical Degrees Act, 1916 *(VII to 1916)* or in the Schedule to the Indian Medical Council Act, 1933 *(XXVII*) of 1933.

(2) The Certifying surgeon may be a medical officer in the service of State or Municipal Corporation.

DETERMINATION OF CONTRACT

61.(1) Right of DFCCIL of determine the contract:- The DFCCIL shall be entitled to determine and terminate the contract at any time should, in the DFCCIL/Railway'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 therefore shall be conclusive evidence thereof.

61. (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 Railways /DFCCIL shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfaction of the Engineer/DFCCIL. The DFCCIL/Railway's decision on the necessity and propriety of such expenditure shall be final and conclusive.

61.(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.

62.(1) Determination of contract owing to default of contractor: - If the Contractor should**: -**

(i) Becomes bankrupt or insolvent, or

(ii) Make an arrangement with of 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) Assign the contract or any part thereof otherwise than as provided in Clause 7 of these conditions, or

(vi) Abandon the contract, or

(vii) Persistently disregard the instructions of the Engineer, or contravene any provision of the contract, or

(viii) 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 in terms of Clause 8 of the Regulations for Tenders and Contracts.

(ix) Fails to submit the documents pertaining to identity of JV and PAN in terms of Clause 17.11 of Tender Form available in the Regulations for Tenders and Contracts.

(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 under Clause 25 and 27 of these Conditions, or

(xi) Fail to take steps to employ competent or additional staff and labour as required under Clause 26 of the Conditions, or

(xii) Fail to afford the Engineer/DFCCIL or Engineer's/DFCCIL representative proper facilities for inspecting the work or any part thereof as required under clause 28 of the conditions, 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 Railways/DFCCIL 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 (Proforma at Form no. 15) 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 Railway shall be entitled after giving 48 hours' notice (Proforma at Form no. 16 or 18, as the case may be) in writing under the hand of the Engineer/DFCCIL 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 (Proforma at Form no. 17 or 19, as the case may be) should be issued.

Note: Engineer/DFCCIL at his discretion may resort to the part termination of contract with notices (Proforma at Form no. 15, 18 and 19), only in cases where progress of work is more than or equal to 80% of the original scope of work.

62.(2) Right of DFCCIL after, rescission of contract owing to default of contractor:

In the event of any or several of the courses, referred to in sub-clause (1) of the clause, being adopted.

(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 railways 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.

(ii) The Security Deposit of part terminated contract shall be dealt as per clause 16(2) of GCC.

(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/DFCCIL or the Engineer's/DFCCIL 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/DFCCIL 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/DFCCIL should be released expeditiously.

STATEMENT OF DISPUTES - INDIAN RAILWAY ARBITRATION AND CONCILIATION RULES

63.0 **Reconciliation of disputes:** All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the Contractor to the "Chief General Manager" through “Notice of Dispute” provided that no such notice shall be served later than 30 days after the date of issue of Completion Certificate by the Engineer/DFCCIL. Chief General Manager shall, within 30 days after receipt of the Contractor’s “Notice of Dispute”, notify the name of conciliator(s) to the Contractor.

The Conciliator(s) shall assist the parties to reach an amicable settlement in an independent and impartial manner within the terms of contract.

If the parties reach agreement on a settlement of the dispute, they shall draw up and sign a written settlement agreement duly signed by Engineer In-charge, Contractor and conciliator(s). When the parties sign the settlement agreement, it shall be final and binding on the parties.

The parties shall not initiate, during the conciliation proceedings, any arbitral or judicial proceedings in respect of a dispute that is the subject matter of the conciliation proceedings.

The conciliation proceedings shall be terminated as per Section 76 of 'The Arbitration and Conciliation Act, 1996.

63.1 Matters Finally Determined by the DFCCIL: All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the Contractor to the CGM and the CGM shall, within 120 days after receipt of the Contractor's representation, make and notify decisions on all matters referred to by the Contractor in writing provided that matters for which provision has been made in Clauses 8, 18, 22(5), 39, 43(2), 45(a), 55, 55-A(5), 57, 57A,61(1), 61(2) and 62(1) of Standard General Conditions of Contract or in any Clause (stated as excepted matter) of the Special Conditions of the Contract, shall be deemed as 'excepted matters' (matters not arbitrable) and decisions of the DFCCIL Authority, thereon shall be final and binding on the Contractor; provided further that 'excepted matters' shall stand specifically excluded from the purview of the Arbitration Clause.

64. (1) Demand for Arbitration: -

64. (1)(i) In the event of any dispute or difference between the parties hereto as to the construction or operation of this contract, or the respective rights and liabilities of the parties on any matter in question, dispute or difference on any account or as to the withholding by the DFCCIL of any certificate to which the Contractor may claim to be entitled to, or if the DFCCIL fails to make a decision within 120 days, then and in any such case, but except in any of the "excepted matters" referred to in Clause 63.1 of these Conditions, the Contractor, after 120 days but within 180 days of his presenting his final claim on disputed matters shall demand in writing that the dispute or difference be referred to arbitration.

64.(1) (ii)(a) The demand for arbitration shall specify the matters which are in question, or subject of the dispute or difference as also the amount of claim item-wise. Only such dispute or difference, in respect of which the demand has been made, together with counter claims or set off, given by the DFCCIL, shall be referred to arbitration and other matters shall not be included in the reference.

64.(1) (ii)(b) The parties may waive off the applicability of Sub-Section 12(5) of Arbitration and Conciliation (Amendment) Act 2015, if they agree for such waiver in writing, after dispute having arisen between them, in the format given under (*Form no. 21)* of these conditions.

64.(1)(iii)(a) The Arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for arbitration is received by the DFCCIL.

64.(1)(iii)(b) The claimant shall submit his claims stating the facts supporting the claims alongwith all the relevant documents and the relief or remedy sought against each claim within a period of 30 days from the date of appointment of the Arbitral Tribunal.

64.(1)(iii)(c) The DFCCIL shall submit its defence statement and counter claim(s), if any, within a period of 60 days of receipt of copy of claims from Tribunal, unless otherwise extension has been granted by Tribunal.

64.(1)(iii)(d) Place of Arbitration: The place of arbitration would be New Delhi.

64.(1)(iv) No new claim shall be added during proceedings by either party. However, a party may amend or supplement the original claim or defense thereof during the course of arbitration proceedings subject to acceptance by Tribunal having due regard to the delay in making it.

64.(1)(v) If the Contractor(s) does/do not prefer his/their specific and final claims in writing, within a period of 90 days of receiving the intimation from the Railways/DFCCIL that the final bill is ready for payment, he/they will be deemed to have waived his/their claim(s) and the Railway/DFCCIL shall be discharged and released of all liabilities under the contract in respect of these claims.

64.(2) **Obligation During Pendency of Arbitration:** Work under the contract shall, unless otherwise directed by the Engineer/DFCCIL, continue during the arbitration proceedings, and no payment due or payable by the DFCCIL shall be withheld on account of such proceedings, provided, however, it shall be open for Arbitral Tribunal to consider and decide whether or not such work should continue during arbitration proceedings.

64.(3) Appointment of arbitrator

64.(3)(a) Appointment of Arbitrator where applicability of Section-12(5) of Arbitration and Conciliation Act has been waived off:

64.(3)(a)(i) In cases where the total value of all claims in question added together does not exceed ₹ 1,00,00,000/- (Rupees One Crore), the Arbitral Tribunal shall consist of a Sole Arbitrator nominated by MD DFCCIL. The sole arbitrator shall be appointed within 60 days from the day when a written and valid demand for arbitration is received by MD DFCCIL.

64.(3)(a)(ii) In cases not covered by the Clause 64(3)(a)(i), the Arbitral Tribunal shall consist of a panel of three Officials as the Arbitrators. For this purpose, the DFCCIL will send a panel of at least four (4) names of DFCCIL Officers which may also include the name(s) of Officer(s) empanelled to work as Arbitrator to the Contractor within 60 days from the day when a written and valid demand for arbitration is received by the MD DFCCIL.

Contractor will be asked to suggest to MD DFCCIL at least 2 names out of the panel for appointment as Contractor's nominee within 30 days from the date of dispatch of the request by DFCCIL. The MD DFCCIL shall appoint at least one out of them as the Contractor's nominee and will, also simultaneously appoint the balance number of arbitrators either from the panel or from outside the panel, duly indicating the 'presiding arbitrator' from amongst the 3 arbitrators so appointed. MD DFCCIL shall complete this exercise of appointing the Arbitral Tribunal within 30 days from the receipt of the names of Contractor's nominees. While nominating the arbitrators, it will be necessary to ensure that one of them is from the Accounts Department. An officer of Selection Grade of the Accounts Department shall be considered of equal status to the officers in Senior Administrative Grade of other departments of the DFCCIL for the purpose of appointment of arbitrator.

64.(3)(a)(iii) The serving railway/DFCCIL officer working in arbitral tribunal in the ongoing arbitration cases as per clause 64.(3)(a)(i) and clause 64.(3)(a)(ii) above, can continue as arbitrator in the tribunal even after his retirement.

64.(3)(b): Appointment of Arbitrator where applicability of Section 12 (5) of Arbitration and Conciliation Act has not been waived off:

(i) In cases where the total value of all claims in question added together does not exceed ₹ 50,00,000/- (Rupees Fifty Lakh), the Arbitral Tribunal shall consist of a Retired Railway/DFCCIL Officers, as the arbitrator. For this purpose, the DFCCIL will send a panel of at least four (4) names of retired Railway/DFCCIL Officer(s) empanelled to work as Railway/DFCCIL Arbitrator duly indicating their retirement dates to the Contractor within 60 days from the day when a written and valid demand for arbitration is received by the MD DFCCIL.

Contractor will be asked to suggest to MD DFCCIL at least 2 names out of the panel for appointment as arbitrator within 30 days from the date of dispatch of the request by DFCCIL. The MD DFCCIL shall appoint at least one out of them as the arbitrator.

(ii) In cases where the total value of all claims in question added together exceed ₹ 50,00,000/- (Rupees Fifty Lakh), the Arbitral Tribunal shall consist of a Panel of three (3) retired Railway/DFCCIL Officer, as the arbitrators. For this purpose, the DFCCIL will send a panel of at least four (4) names of retired Railway/DFCCIL Officer(s) empanelled to work as DFCCIL Arbitrator duly indicating their retirement date to the Contractor within 60 days from the day when a written and valid demand for arbitration is received by the MD DFCCIL.

Contractor will be asked to suggest to MD DFCCIL at least 2 names out of the panel for appointment as Contractor's nominee within 30 days from the date of dispatch of the request by DFCCIL. The MD DFCCIL shall appoint at least one out of them as the Contractor's nominee and will, also simultaneously appoint the balance number of arbitrators either from the panel or from outside the panel, duly indicating the 'Presiding Arbitrator' from amongst the 3 arbitrators so appointed. MD DFCCIL shall complete this exercise of appointing the Arbitral Tribunal within 30 days from the receipt of the names of Contractor's nominees. While nominating the arbitrators, it will be necessary to ensure that one of them has served in the Accounts Department.

64.(3)(c)(i): If one or more of the arbitrators appointed as above refuses to act as arbitrator, withdraws from his office as arbitrator, or vacates his/their office/offices or is/are unable or unwilling to perform his functions as arbitrator for any reason whatsoever or dies or in the opinion of the MD DFCCIL fails to act without undue delay, the MD DFCCIL shall appoint new arbitrator/arbitrators to act in his/their place in the same manner in which the earlier arbitrator/arbitrators had been appointed. Such re-constituted Tribunal may, at its discretion, proceed with the reference from the stage at which it was left by the previous arbitrator (s).

64.(3)(c)(ii): (a) The Arbitral Tribunal shall have power to call for such evidence by way of affidavits or otherwise as the Arbitral Tribunal shall think proper, and it shall be the duty of the parties hereto to do or cause to be done all such things as may be necessary to enable the Arbitral Tribunal to make the award

without any delay. The proceedings shall normally be conducted on the basis of documents and written statements.

(b) Before proceeding into the merits of any dispute, the Arbitral Tribunal shall first decide and pass its orders over any plea submitted/objections raised by any party, if any, regarding appointment of Arbitral Tribunal, validity of arbitration agreement, jurisdiction and scope of the Tribunal to deal with the dispute (s) submitted to arbitration, applicability of time 'limitation' to any dispute, any violation of agreed procedure regarding conduct of the arbitral proceedings or plea for interim measures of protection and record its orders in day to day proceedings. A copy of the proceedings duly signed by all the members of tribunal should be provided to both the parties.

64.3(c)(iii): (i) Qualification of Arbitrator (s):

(a) Serving Railway/DFCCIL Officers of not below JA/JGM Grade level.

(b) Retired Railway/DFCCIL Officers not below SA Grade/GM level, one year after his date of retirement.

(c) Age of arbitrator at the time of appointment shall be below 70 years.

(ii) An arbitrator may be appointed notwithstanding the total number of arbitration cases in which he has been appointed in the past.

(iii) While appointing arbitrator(s) under Sub-Clause 64.(3)(a)(i), 64.(3)(a)(ii), 64.(3)(b)(i) & 64.(3)(b)(ii) above, due care shall be taken that he/they is/are not the one/those who had an opportunity to deal with the matters to which the contract relates or who in the course of his/their duties as Railway / DFCCIL servant(s) expressed views on all or any of the matters under dispute or differences. A certification to this effect as per Form no. 22 shall be taken from Arbitrators also. The proceedings of the Arbitral tribunal or the award made by such Tribunal will, however, not be invalid merely for the reason that one or more arbitrator had, in the course of his service, opportunity to deal with the matters to which the contract relates or who in the course of his/their duties expressed views on all or any of the matters under dispute.

64.(3)(d)(i): The arbitral award shall state item wise, the sum and reasons upon which it is based. The analysis and reasons shall be detailed enough so that the award could be inferred therefrom.

64.(3)(d)(ii): A party may apply for corrections of any computational errors, any typographical or clerical errors or any other error of similar nature occurring in the award of a Tribunal and interpretation of a specific point of award to Tribunal within 60 days of receipt of the award.

64.(3)(d)(iii): A party may apply to Tribunal within 60 days of receipt of award to make an additional award as to claims presented in the arbitral proceedings but omitted from the arbitral award.

64.(4): In case of the Tribunal, comprising of three members, any ruling on award shall be made by a majority of members of Tribunal. In the absence of such a majority, the views of the Presiding Arbitrator shall prevail.

64.(5): Where the arbitral award is for the payment of money, no interest shall be payable on whole or any part of the money for any period till the date on which the award is made.

64. (6): The cost of arbitration shall be borne by the respective parties. The cost shall inter-alia include fee of the arbitrator(s), as per the rates fixed by DFCCIL from time to time and the fee shall be borne equally by both the parties, provided parties sign an agreement in the format given at Form no. 21 to these condition after/ while referring these disputes to Arbitration. Further, the fee payable to the arbitrator(s) would be governed by the instructions issued on the subject by Railway Board from time to time irrespective of the fact whether the arbitrator(s) is/are appointed by the Railway Administration/DFCCIL or by the court of law unless specifically directed by Hon'ble court otherwise on the matter.

64.(7) Subject to the provisions of the aforesaid Arbitration and Conciliation Act 1996 and the rules thereunder and relevant para of General Conditions of Contract (GCC) and any statutory modifications thereof shall apply to the appointment of arbitrators and arbitration proceedings under this Clause.

Part- I

Chapter-V

Special Conditions of Contract

SPECIAL CONDITIONS OF THE CONTRACT

1. The Tenderer shall visit the site and shall satisfy himself as to conditions under which the work is to be performed. He shall also check, ascertain the locations of any existing structures or equipments or any other situation which may affect the work. No extra claim as a consequence of ignorance or on ground of insufficient description will be allowed at a later date.

2. The price of items includes all accessories, consumables etc. as required to make the item complete in all respects, compatible with other related/associated items and fully functional.

3. Contractor shall be fully responsible for any error, difficulty in execution/damage incurred owing to discrepancy in drawings which has been overlooked by him, However, the several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawing being following in preference to small scale drawing and figured dimensions in preference to scaled dimensioned.

   In the case of discrepancy between schedule oI quantities, the specifications/ and/or the drawings, the following order of preference shall be observed:

   (i) Description in the schedule of items and Quantities

   (ii) Drawings.

   (iii) Technical Specifications.

   If there are varying or conflicting provisions made in anyone documents forming part of the contract, the accepting authority of the Employer shall be the deciding authority with regard to the intention of the document.

   Any error in decision, quantity or rate in Schedule of Quantities or any omission therefrom shall not vitiate the contract or release the contractor from the execution of the whole or any part of the work comprised therein according to drawing d specification or from any of his obligations under the contract.

4. For each item of BOQ, normally brands/makes are mentioned in the tender document. However, DFCCIL reserves the right to substitute any mentioned brand/make. Also, the material will be used only after approval of DFCCIL and DFCCIL for which contractor shall maintain proper records. Based on quantity and site requirement, DFCCIL can go for a different brand/make for which no extra rate shall be paid to the contractor.

5. **Land for Contractors Establishment**

   For the purpose of construction of Contractor's storeyard, godowns, site office etc, the contractors may utilize with the permission of the Employer / Architect, portion and / space belonging to the Employer if available at such location as would not interfere with the execution of the work. The contractor shall for this purpose submit to the Employer for his approval a plan or plans of the proposed layouts for the site facilities. The Employer/Architect reserve the right to modify the contractor's proposal as he may deem fit.

Signature of Tenderer

6. CONTRACTOR'S GENERAL RESPONSIBILITIES:

6.1 The Contractor shall execute and maintain the works with due care and diligence and shall provide all materials, labour including supervision thereof, constiuctional plant, temporary works, transport and alt other things, whether of temporary ot permanent nature, required for the proper execution and maintenance of the works.

6.2 The Contractor shall execute the whole and every part of the work, in the most substantial and workmanlike manner, both as regards materials and labour and in every respect in strict accordance with the contract documents. The Contractor shah conform exactly, fully and faithfully to the designs, drawings, and instructions relating to the works.

6.3 Before commencing any item of work, the Contractor shall correlate all relevant drawings and information and satisfà himself that the information available thereof is complete, unambiguous and without any discrepancies. The Contractor shall be responsible for any errors in the execution of the works and/or his sub- contractor and/of the specialist agency to which the wotk has been assigned and is not brought to the notice of the DFCCIL.

6.4 Levels, dimensions and other information shown on the drawings are believed to be correct. The Contractor shall however, verify them for himself and no claim of allowance whatsoever shall be entertained on account of any errors or omissions in the levels, dimensions etc. from those shown in the drawings.

6.5 The Contractor shall pay, in full, all the third-party suppliers and sub-contractors the amounts due in respect of the purchase/ of goods and services made for the, works and shah on demand from the DFCCIL provide evidence of such payments. It is clarified that DFCCIL is not responsible to the third-party suppliers and/or sub- contractors for the payment of any dues.

6.6 **TECHNICAL EXAMINATIONS** The proposed work covered under this tender during its progress is subject to inspection by the Chief Technical Examiner / Technical examiner, Central Vigilance Commission, Govt. of Índia or by àn officer of the Vigilance cell of the Employer. The contractor will be required 'to extend all assistance and facilities for each inspection.

6.7 **GUARANTEE** Wherever provisions for submissíon of a guarantee has been advised, the same shall be submitted from the specialized agency along with a counter guarantee by the main contractor engaged for the work. The guarantee shall be fumished on a non-judicial stamp paper of appropriate value. If the contractor is required to submit guarantee/guarantees for any item/items for a period of more than 12 months, the guarantee/guarantees in case of these item shall remain valid even after expiry of the defect liability period of 12 months as stipulated.

6.8 **INSURANCE FOR WORKS:**

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*** **(DFCCIL)** from reputed companies for the following requirements:

a) Contractor's All Risk (CAR) Policy.

b) 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.

c) Construction Plant, Machinery and Equipment brought to site by the Contractor.

d) Workmen Compensation Policy

e) Any other insurance cover as may be required by the law of the land.

f) The Contractor, if required, will engage a suitable Engineer to liaise with Insurer Company in the interest of realization of insurance claims at no cost to Employer.

g) Contractor/Insurance Company shall have to indemnify DFCCIL for all loses. Claims if any given by insurance company to be given directly to DFCCIL. Decision of DFCCIL will be binding on Contractor to distribute claim in part or full.

All insurance covers referred to in the Contract shall be affected with an Indian Insurance Company incorporated and registered in India.6.8 **WATER** The rates quoted by the contractor shall include all expenditure for providing all the water for the full contract period required for the work, including that for the work people and all staff on the site. He shall make his own arrangement for the supply of good quality water. He shall obtain municipal connection. And all charges for the connection & consumption shall be borne by him. If municipal water is not available or inadequate, he shall make other arrangements like sinking tubewells, or making borewells or transport from outside by tanker or any other suitable means entirely at his own and no separate payment for the same shall be made.

6.9 **POWER** The contractor shall at his own cost arrange for necessary power construction and lighting for the entire period of contract. If, however, separable power is available in the premises, the contractor shall make his own arrangements to obtain necessary connections, maintain efficient services of electric lights and power and shall pay for all the requisite charges for the sarfie. The employer, as well as the consultant shall give the recommendations necessary to obtain power and water connections from the concerned authorities, but the responsibilities for obtaining the same shall rest with the contractor.

If any other contractor, appointed by the employer, is required to use water and power, be shall be allowed to use the same and make temporary connections from the supply arranged by the main contractor at rates, terms and conditions that may be decided by the Employer/Consultant.

6.10 **FIRST-AID FACILITIES** The contractor shall at his own expense arrange to ensure availability of medical attendance promptly when necessary. He shall provide properly equipped first-aid station, in charge of qualified person at suitable location within easy reach of the workmen and staff. The contractor shall also provide for transport of serious cases to the nearest hospital. The contractor shall be responsible for any liability which may be excluded from the insurance policies referred in above mentioned clause and also for all other damages to any person, animal or property arising out of or incidental to the negligence or defective carrying out of this contract. He shall also indemnify the Employer in respect of any cost, charges or expenses arising out of any claims or proceedings and also in respect of any award of compensation and damages arising there from.

The Employer shall with the concurrence of the consultant be entitled to deduct the amount of any damages, compensation, cost, charges and expenses arising from or occurring from or in respect of any such claim or damages from any or all sums due to or become to the contractor without prejudice to the employer's rights in respect thereof.

Signature of Tenderer

6.11 **FIRE EXTINGUISHERS** The contractor shall at his own expenses provide at suitable, prominent and easily accessible places, requisite number of fire I extinguishers buckets some filled with sand filled and some with sand and some' with water.

7. **MANUFACTURERS' DESIGN & CATALOGUES:**

7.1 For the items of works which are executed to the manufacturers' designs and specifications, the Contractor shall allow in his tender for providing DFCCIL with 3 copies of all designs, drawings and specifications, general arrangements drawings and shop drawings which he may be called upon to submit.

7.2 The Contractor shall supply 3 copies of manufacturer's catalogues, brochures of all equipment and proprietary articles specified or which the Contractor proposes to use for the approval by the DFCCIL as soon as is reasonably practicable.

8. **CONTRACTOR'S SUPERVISION:**

8.1 The contractor shall provide all necessary supervision during the execution of the works and the guarantee period for the proper fulfilment of the Contractor's obligations under the contract documents.

8.2 The Contractor shall employ for the execution of the works — such technical persons as are qualified and experienced and such representatives, foremen arid superrisory staff as are competent to give supervise on the works and in the course of any operations carried out by him for the purpose of completing any outstanding work or rectification of defects during the Guarantee Period.

8.3 The supervisors deployed can be demobilized on instructions of DFCCIL, if not found fit for the job.

8.4 Any material rejected by DFCCIL shall be removed from within 24 hours by the contractor at his own cost.

9. **CO-OPERATION AND INTERFACE WITH OTHER CONTRACTORS:**

9.1 The Contractor shall co-operate and interface with other Contractors and consulting agencies and freely exchange with them such technical information as necessary for the proper execution of the work.

9.2 The Contractor shall afford all reasonable opportunities to other Contractors, their workmen and to the workmen of DFCCIL for carrying out their works.

9.3 All operations necessary for the execution of works shall be carried out so as not to interfere unnecessarily with the execution of works by other Contractors. Execution or works under this contract shall be coordinated with the work of other contractors where it would interfere with their work or working. The DFCCIL and the concerned Contractor shall be informed well in time for effective co- ordination and proper execution of works.

10. **CO-ORDINATION OF WORK:**

10.1 At the commencement of work, and ff0m time to time, the Contractor shall interface with other Contractor, sub-contractors, person engaged on separate contracts in connection With the works, and with the DFCCIL for the purpose of co- ordination and execution of the various phases of work. The

Contractor shall ascertain from the other Contractors, sub-contractors and persons engaged in separate contracts in connection with the works the extent of all chasing, cutting and forming of all opening, holes, gloves etc., as may be required to accommodate the various services.

10.2 The Contractor shall ascertain the routes of all services and the position of all floors and wall outlets, traps etc., in connection with the installation of plant, services and arrange for the construction of work accordingly. The breaking and cutting of the completed work must not be done unle ecifically au orized in writing by the DFCCIL. Generally, all breaking shall tié by e Contractor for civil works and no work shall be done over broken or patched work without first ascertaining that the broken surface is adequately prepared and reinforced to receive and hold further work.

10.3 The contractor shall protect and preserve the works from all damages or accidents.

10.4 The contractor shall properly clean the work as it progresses and shall remove all rubbish and debris from the site from time to time as is necessary and as directed. On completion, the contractor shall ensure that the premises and/or site are cleaned, surplus materials, debris, sheds etc. removed. All fixtures cleared add polished wherever necessary. All appliances commissioned so that the whole installation is left fit for immediate occupation or use and to the satisfaction of the Employer.

11. PROGRAMME / PROGRESS EVALUATION AND REVIEW:

11.1 Network based integrated time schedule shall be submitted by the contractor. The time schedule shall include details of mobilization of resources, materials, equipment and labour. After the award of conduct, the DFCCIL shall require the Contractor to expand the information given in the programme, until it is suitable for the effective review of progress during the execution of the works. The critical path shall be determined. The Contractor has to submit a time schedule that has to be duly approved by the DFCCIL and is available prior to be ćommencement of the works.

11.2 The Contractor shall every week, review and update this programme and furnish for the information to the DFCCIL, in writing, details of the Contractor's arrangement for executing the works, materials procured, erected, balance at site and expected deliveries the next week, skilled / unskilled labour, foremen, supervisors working at site and steps proposed for speeding np progress of work. A progress report, in writing, comparing the actual work to the completion schedule should be provided to the DFCCIL on a weekly basis.

11.3 If, at any time it appears to DFCCIL, that the progress of the work does not conform to the approved programme, the Contracior shall furnish a revised programme and take such steps at his cost, as are necessary to expedite progress and ensure completion of works within the completion period or extended date of completion.

11.4 Approval by DFCCIL of such programme or the fumishing of such particulars shall not relieve the Contractor of any of his duties or responsibilities under the contract documents.

11.5 The Contractor shall be called upon to attend co-ordination meetings with DFCCIL and shall fully cooperate with persons and agencies involved in these discussions. The Contractor shall take notes of the discussions during the meeting and shall strictly adhere to the decisions of DFCCIL in performing the works.

Signature of Tenderer

11.6 The Employer shall have the right to take possession of or use any compleled or partially completed part of work. Such possession or use will not be ari acceptance of any work not completed in accordance with the contract agreement.

12. **QUALITY OF MATERIALS AND WORKMANSHIP:** All materials and workmanship shall be the best of the respective kinds described in the Contract and in accordance with the instructions and directions of the DFCCIL and shall be subjected from time to time, to such test as the DFCCIL may direct at the place of manufacture or fabrication or on the site or at such other places as may be directed. The Contractor shall execute the whole and every parts of the works in the substantial and workmen like manner, both as regards to materials and workmanship, and in every respect in strict accordance with the contract documents and in compliance with the applicable government laws, governmental laws, ordinance, statues, codes, rules and regulations. The Contractor shall also conform exactly and faithfully to the designs, drawings and instructions in writing of the DFCCIL.

13. **QUALITY CONTROL:** The Contractor shall submit to the DFCCIL a comprehensive quality approval plan for all materials, equipments and things to be provided under the contract. No material or equipment shall be dispatched by the manufacture or vendor or brought to site by the Contractor until the quality of the material or equipment has been established through inspection and tests or through test certificates furnished by the manufacturer. In case the DFCCIL accepts such test certificates as sufficient proof that the material or equipment conforms to the contract document, he shall accord his approval for the dispatch of materials or equipment.

14. **STANDARD OF WORKMANSHIP**: To determine the acceptance standard of workmanship, the DFCCIL may require the Contractor to execute certain proportions of works and services such as walls, flooring, joinery, finishes sanitary installation etc., under his close supervision. On approval of such samples of work shall be termed as guiding samples. Work shail be executed to conform to the standard of workmanship of these samples.

15. **INSPECTION OF WORKS:**

15.1 The DFCCIL of any person authorized by them shall at aJl times access to the works and to all workshops and places where work is being prepared or from where materials, or equipment are being obtained for the works and the contract shall assure and make available every facility and assistance in obtaining the right to access at his own cost.

15.2 All work embracing more than one process shall be subject to examination and approve at each stage thereof and the Contractor shall give due notice to the DFCCIL when such each stage is ready.

16. ADHERENCE OF TIME SCHEDULE: Timely completion of work is the essence of the contract.

17. WITHHOLDING OF PAYMENTS: DFCCIL may withhold or on account of subsequently discovered evidence, nullify the whole or part of any certificate to such extent as may be necessary to protect DFCC from loss on account of:

(a) Defective work not remedied.
(b) Failure of the contractor to make payments properly to sub-contractors for materials or equipments or labour.
(c) Damage to works of another Contractor or Sub-Contractor.
(d) A reasonable doubt that the contractor is unlikely to complete the contract for the balance amount unpaid.
(e) A reasonable doubt that the contractor intends to leave the work incomplete.
(f) Delay the work at site.

18. In no event shall the contractor be entitled to collect any additional fees or further payments for general condition, administrative or overhead costs or expensed or profit in connection with any change in the works. No change in the works, whether by way of alteration or addition to the works, shall be carried out unless the authorization is received. No course of conduct or dealings between the parties, nor expenses or implied acceptance of alterations or additions to the workbe. carriedaim that DFCCIL has been unjustly enriched by any alteration or addition or addition to the work, whether or not there is in fact any such unjust enrichment shall be the basis for any claim to an increase in the contract sum or extend the completion date.

19. The work as detailed in this Tender shall be executed and completed in all respects in accordance with the Tender document, instruction to Tenderers. Bill of Quantities, General & Special Conditions of the Contract, technical specification, schedules and Drawings to the satisfaction of DFCCIL.

20. DFCCIL does not bind itself to accept the lowest Tender and reserves the right to reject any or all the Tenders without assigning any reasons whatsoever.

21. Defects Liability Period (DLP)

21.1 Defects liability period shall be taken as **06 (six) months** from the date of completion of the work for building as a whole, wherein all the defects shall be rectified by the contractor at his own cost.

For specialized works such as water proofing etc, the defect liability period shall be for a minimum period of 10 years, in which:

a. The contractor shall be fully responsible for and shall guarantee proper performance of the entire waterproofing system for a period of 10 (Ten) years from the final completion of works. For this, a specific 10 years written guarantee *(to be furnished in a non-judicial stamp paper of value not less than Rs.100/-)* in the prescribed proforma ***(Form No.11)*** shall be submitted for the performance of the system before final payment and shall not in any way limit any other rights the Employer may have under the contract. All water-proofing work shall be carried out through specialized agency as per method of working approved by the Engineer. However, the contractors shall be solely responsible for waterproofing treatment until the expiry of the above guarantee period.

b. In addition, ***10% (ten percent) of the cost of these items of water proofing under this sub head shall be retained as guarantee to watch the performance of the work executed.*** However, if the performance of the waterproofing works is found satisfactory, then, half of this amount *(withheld)* would be released after five years from the date of completion of the work & the remaining withheld amount, shall be released after completion of ten years from the date of completion of work *(if the performance of the waterproofing work is found satisfactory)*.

However, if any defect is noticed during the guarantee period, it would need to be rectified by the contractor within seven days of issuing of notice by the Engineer / DFCCIL and, if not attended to, the same shall be got done through other agency at the risk and cost of the contractor and recovery shall be effected from the amount retained towards guarantee. In any case, the contractor and the specialized agency, during the guarantee period, shall inspect and examine the treatment once in every year and make good any defect observed and confirm the same in writing to DFCCIL. The security deposit can be released in full, if bank guarantee of

equivalent amount, valid for the duration of guarantee period is produced and deposited with the Department.

21.2 Defects of serious nature causing inconvenience such as leakage, reverse floor slopes affecting the drainage *(ponding of water), warping and opening of joints in doors and window shutters, etc, shall be undertaken by th*e contractor immediately on receipt of the complaint but not exceeding one week time, failing which, the defects will be got removed at his risk and ***cost plus 25%*** as supervision and establishment charges.

21.3 All other defects notified to the contractor during the DLP shall be rectified to the entire satisfaction of Engineer or item replaced as soon as possible but not beyond one month failing which, Engineer shall get it done at his cost plus 25% as supervision and establishment charges. **The decision of Engineer/DFCCIL regarding a defect being of serious nature or otherwise shall be final and binding**.

Signature of Tenderer

PART – II

TECHNICAL SPECIFICATIONS

GENERAL TECHNICAL SPECIFICATION

All works shall be executed as per latest CPWD's specification as amended up to date, BIS Codes amended up to date and other relevant codes as per directions of Engineer/DFCCIL.

In terms of work for which CPWD specifications are not available, execution of work shall be carried out in accordance with Technical specifications as given below. Further, if any specification(s) is not available in technical specification as provided in the tender document, standard practices and/or Manufacturer's catalogue are to be referred and opted in consultation with DFCCIL. Before execution of such items, Contractor has to submit his methodology of execution & Manufacturer's catalogues for approval to Engineer /DFCCIL. Decision of Engineer /DFCCIL in this regard shall be final & binding on the contractor.

TECHNICAL SPECIFICATIONS FOR INTERIOR WORKS (SECTION-1)

SECTION – 1

TECHNICAL SPECIFICATIONS FOR INTERIOR WORKS

1.0 **GENERAL: -** Unless provided otherwise the work shall be executed as per CPWD specifications 2009 Volume I & II with up to date amendments, and correction. All relevant Indian Standard (IS) codes related to items of work shall be completely followed for execution.

1.1 The Contractor shall furnish for approval, with reasonable promptness, samples of all materials and workmanship. The Engineer-in-charge/ DFCCIL shall check and confirm in consultation with Architect / Consultants, approval of such samples with reasonable promptness only to conform with the design concept of the Works and for compliance with the information given in the contract documents. The work shall be in accordance with approved samples. The procedure for submission and approval of samples shall be as follows; -

a) All material samples in duplicate shall be delivered to the Engineer-in-charge/ DFCCIL's office at the Contractor's cost. Samples shall be properly labeled with.

- Name of Project
- Name of Contractor
- Name Product
- Name of Manufacturer
- Reference No of Schedule of Quantities (BOQ)
- Date of Submission
- Date of fabrication / casting – if applicable

b) Samples shall be accompanied with technical specification / manufacturer's catalogue

c) In case the Contractor intends to keep an approved sample in his possession he shall submit one additional samples for the Engineer-in-charge/ DFCCIL's approval.

d) Samples shall be furnished well in advance to give the Engineer-in-charge/ DFCCIL reasonable time for their consideration.

1.2 **MOCKUP:**

The contractor shall erect mockup of each type of paneling or repetitive item and proceed with final work after getting approval in writing from the Engineer in Charge and Architect / Consultant. The disapproved mockup unit shall be removed by contractor, immediately. No extra cost will be paid to the contractor for erection of any such mockup, modification of it or for removal of mockup. In case of repetitive items like tables, side units, storages etc. contractor shall make one sample piece and get it approved by Engineer in charge/Architect /Consultant in writing and then only start manufacturing other items.

Drawings:

Two copies of all drawings, the schedule of quantities and specifications shall be furnished by the Engineer-in-charge to the contractor for his own use to be kept at site office for reference & execution of works till the completion of the project in all respect. It shall be accessible at all reasonable times to the Engineer-in-charge and their representatives. All documents that is i.e. contract Agreement and all Drawings must be return to the Engineer- in-charge after completion of the project.

All-important drawings are to be mounted on boards and placed in racks and indexed.

Dimensions:
Figured dimensions are in all cases to be followed & accepted in preference to scaled sizes. Large-scale details take precedence over small-scale drawings. In case of discrepancy the Contractor is to ask for clarification before proceeding with the work. The decision of Engineer-in-charge shall be final and binding.

2.0 DISMANTLING

TERMINOLOGY

(i) **Dismantling**: The term 'Dismantling' implies carefully separating the parts without damage and removing. This may consist of dismantling one or more parts of the building as specified or shown on the drawings.

(ii) **Demolition**: The term 'Demolition' implies breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown on the drawings.

2.1 GENERAL

This chapter relates to buildings only.

2.1.1 Precautions

2.1.1.1 All materials obtained from dismantling or demolition shall be the property of the Government unless otherwise specified and shall be kept in safe custody until they are handed over to the Engineerin-Charge/ authorized representative.

2.1.1.2 The demolition shall always be well planned before hand and shall generally be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Engineer-in-Charge before starting the work. Due care shall be taken to maintain the safety measures prescribed in IS 4130.

2.1.1.3 Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property. Wherever specified, temporary enclosures or partitions and necessary scaffolding with suitable double scaffolding and proper cloth covering shall also be provided, as directed by the Engineer-in-Charge.

2.1.1.4 Necessary precautions shall be taken to keep noise and dust nuisance to the minimum. All work needs to be done under the direction of Engineer-in-Charge. Helmets, goggle, safety belts etc. should be used whenever required and as directed by the Engineer-in-Charge. The demolition work

shall be proceeded with in such a way that it causes the least damage and nuisance to the adjoining building and the public.

2.1.1.5 Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully removed first. Chisels and cuters may be used carefully as directed. The dismantled articles shall be removed manually or otherwise, lowered to the ground (and not thrown) and then properly stacked as directed by the Engineer-in-Charge.

2.1.1.6 Where existing fixing is done by nails, screws, bolts, rivets, etc., dismantling shall be done by taking out the fixing with proper tools and not by tearing or ripping off.

2.1.1.7 Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Engineer-in-Charge within a lead of 50 metres. All unserviceable materials, rubbish etc. shall be disposed off as directed by the Engineer-in-Charge.

2.1.1.8 The contractor shall maintain/disconnect existing services, whether temporary or permanent, where required by the Engineer-in-Charge.

2.1.1.9 No demolition work should be carried out at night especially when the building or structure to be demolished is in an inhabited area.

2.1.1.10 Screens shall be placed where necessary to prevent injuries due to falling pieces.

2.1.1.11 Water may be used to reduce dust while tearing down plaster from brick work.

2.1.1.12 Safety belts shall be used by labourers while working at higher level to prevent falling from the structure.

2.1.1.13 First-aid equipment shall be got available at all demolition works of any magnitude.

3.0 BRICK AND BLOCK WORK

3.1 SCOPE

This specification describes the general requirements for brickwork and blockwork on projects.

3.2 APPLICABLE CODES

The latest revision of the following Indian Standards and Codes, unless otherwise specified, shall be applicable to all brickwork and blockwork.

IS 383 Coarse and fine aggregate from natural source for concrete IS 432 Specifications for Mild Steel and Medium Tensile Bars.

IS 1077Specification for Common Burnt Clay Building Bricks. IS 2116Specification for Sand for Masonry Mortar.

IS 2185Specification for Cement Concrete Block. IS 2212Code of Practice for Brickwork

IS 2250Code of Practice for Preparation and Use of Masonry Mortar IS 2572Code of practice for Construction of Concrete Walls

IS 3495Method of testing for burnt clay building bricks IS 9103Specification for Admixture of Concrete

IS 1200 (Part 3) Method of Measurement for Building Works – Brick works.

IS 5454Method of Sampling of clay building bricks.

3.3 BRICKWORK

Bricks shall conform to the relevant Indian Standards and shall be table moulded, sound, hard, homogeneous in texture, well burnt without being vitrified, deep red, cherry or copper coloured, of regular shape and size and shall have sharp and square edges and parallel faces.

Bricks shall be free from pores, chips, flaws or humps of any kind. Bricks containing unground particles and/or which absorb more than 20% of their weight in water when soaked for 24 (twenty-four) hours shall be rejected. Over- burnt or under-burnt bricks shall be rejected.

Bricks shall give a clear ring sound when struck and shall have a minimum crushing strength of 75 Kg/sq. cm. Unless otherwise specified. The classes and quality requirements of bricks shall be as laid down in IS 1077.

Bricks shall be 23 x 11.5 x 7.5 cm, unless otherwise specified. Tolerances up to +/- 3mm in each direction will be permitted. However the contractor may be permitted to use 200mm long modular bricks of specified quality on getting written approval from Consultant /PMC. No extra claim shall be entertained in this regard.

Bricks shall be provided with frogs. Only full size bricks shall be used for masonry work. Cut bricks may be used with the permission of the Consultant / PMC only to make up required wall lengths or for bonding. Sample bricks shall be submitted to the Consultant / PMC for approval and bricks supplied shall strictly conform to the approved samples.

The brick samples shall be tested by the Contractor at his own cost in accordance with IS 3495 as and when required by Consultant / PMC. Bricks rejected by the Consultant / PMC for whatever reason shall be removed from the Site within 24 (twenty four) hours.

3.4 FACING BRICKWORK

Facing bricks of the type, size and colour specified shall be laid in the positions indicated on the drawings. Samples brick shall be submitted to the Consultant / PMC for approval and bricks supplied shall strictly conform to the approved samples.

Fair faced brickwork shall be well bonded to the backing brickwork and no fair faced brickwork shall be at any time more than 600mm above the backing brickwork or raised more than one metre per day.

Fair faced brickwork shall be pointed as the work proceeds and internal faces of the brickwork shall be pointed with neat flush joints to give a fair face. Bricks shall be kept constantly moist on all faces for a minimum period of 10 (ten) days.

Newly laid fair-faced brickwork shall be protected from rain by suitable covering until the mortar has sufficiently set.

Fair-faced brickwork shall be kept clean and free from damage, defacing, dis- colouration and the like at all times. The Contractor shall carefully fill all holes with bricks similar to the surrounding brickwork and point as required to the satisfaction of the Consultant / PMC.

Double scaffolding shall be used against fair-faced brickwork and no holes in fair- faced brickwork shall be allowed for the erection of scaffolding.

The rates quoted by the Contractor are inclusive of transoms and mullions. The Contractor shall provide the same as shown or indicated on the drawings. They shall be generally provided only in half and one brick walls. Dimensions of the transoms and mullions shall conform to wall thickness. Concrete work for transoms and mullions shall conform to the Specifications for concrete and shall be of concrete Grade M20.

3.5 CONCRETE BLOCKWORK

Hollow or solid concrete blocks shall conform to IS 2185 and shall be regular in size and shape and of the specified strength.

Blocks shall be properly cured before being bought to Site and shall have a texture such that plaster and/or render will readily adhere to it.

The Contractor shall supply samples for the approval of the Consultant / PMC and all blocks supplied shall conform strictly to the approved samples.

Half or three quarter size blocks may be used wherever required to make up lengths of walls but broken blocks shall not be used.

Pre-cast concrete screen or special blocks or 'jali' work for decorative purposes shall be as specified on the drawings or as directed by the Consultant / PMC. Sample blocks shall be submitted to the Consultant / PMC for approval and blocks supplied shall strictly conform to the approved samples.

3.6 MORTAR FOR BRICKWORK AND BLOCKWORK

Mortar shall be prepared in accordance with IS 2250. Mixes for cement mortar shall be as specified for the respective items of work.

Cement shall be 43 grade ordinary Portland cement as described in Specification for concrete works Chapter 2.0.

Sand shall be natural sand in accordance with IS 383, passing a 4.75mm size IS sieve, and shall be free from clay, shale, loam, alkali, organic and other deleterious matter and shall be of sound, hard, clean and durable particles. Sand shall be approved by the Consultant / PMC and, if so directed, shall be thoroughly washed until it is free of any contamination.

Gauge boxes for sand shall be of such dimensions that one complete 50 Kg bag of cement forms one unit.

For the preparation of cement mortar the ingredients shall first be thoroughly mixed dry in the mixer machine. Water shall then be added and the mixing continued until a uniform mix of the required consistency is achieved. Only machine mixed mortar is permitted.

However hand mixing in troughs may be allowed with the approval of the Consultant / PMC for the quantity of brick work less than 1 cum in whole days work. Mortar so mixed shall be used within 25 (twenty five) minutes of mixing. Mortar left unused within the specified period shall be rejected and disposed of by the Contractor to the satisfaction of the Consultant / PMC. Re-tempering of mortar shall not be permitted.

The Contractor shall arrange at his own cost for tests on mortar samples, if so directed by the Consultant / PMC.

3.7 WORKMANSHIP FOR BRICKWORK

Workmanship shall conform strictly to IS 2212. Bricks shall be thoroughly soaked in clean water for at least one hour immediately before being laid. Cement mortar for brickwork shall be as specified in the respective item or work.

Brickwork of thickness 230 mm and above shall be laid in English Bond unless otherwise specified. Brickwork 115 mm thick shall be laid in Stretcher Bond. Brickwork 200 mm thick shall be laid as per the drawings issued by the Consultant / PMC. If Brick of length 200 mm is used after approval of Consultant / PMC, the brick work shall be laid similar to English Bond.

A layer of mortar shall be spread over the full width of a suitable length of the lower course and bricks pressed into the mortar and shoved into final position so as to embed the brick fully in mortar. Bricks shall be laid with frogs uppermost.

Bricks shall be laid so that all joints are well filled with mortar. The thickness of joints shall not be less than 6mm and not more than 10mm. Face joints shall be raked to a minimum depth of 12mm by raking tools during the progress of work when the mortar is still green so as to provide a proper key for pointing, plastering or rendering. When pointing, plastering or rendering is not required joints shall be uniform in thickness, struck flush and finished at the time of laying.

Brickwork shall be plumb, square and true to lines and the dimensions shown on drawings. Vertical joints in alternate courses shall laid directly one over the other and be in line. Horizontal courses shall be leveled.

The thickness of brick courses shall be kept uniform. For walls greater than 230 m thick both faces shall be kept in vertical planes. All interconnected brickwork

shall be carried out at one level (so that there is uniform distribution of pressure on the supporting structure) and no portion of the work shall be left more than one course lower than the adjacent work. Where this is not possible the work shall be raked back according to bond (and not saw toothed) at an angle not exceeding 45□ but in no case shall the difference in levels between adjoining walls be allowed to exceed 1.25 metres.

Faces of brickwork shall be cleaned daily and all mortar droppings cleaned off and removed. Top surfaces of each course shall be thoroughly cleaned before other courses are laid. If mortar in lower courses has begun to set joints shall be raked out to a depth of 12mm before laying is continued.

Brickwork shall be built tightly against columns, floor slabs or other structural members.

Where drawings indicate that structural steel columns are to be fireproofed with brickwork, brickwork shall be built closely against all flanges and webs with all spaces between the steel and brick work filled solid with mortar. Steel members partly embedded in brick and not described as fireproofed with concrete shall be covered with coat of mortar not less than 12mm thick unless otherwise directed by the Consultant / PMC.

Openings, arches, chases, pockets and the like shall be provided as shown on the drawings to receive windows, louvers, before frames and the like.

Wall ties and flashing shall be built into brickwork in accordance with the drawings and Specifications. It shall be clearly understood that the rates quoted by the Contractor shall be deemed to include for leaving openings, forming arches, cutting chases, pockets and the like in brickwork for various trades.

3.8 WORKMANSHIP FOR BLOCKWORK

Blockwork shall be plumb, square and properly bonded with broken joints. The thickness of the courses shall be uniform with courses horizontal. All connected work shall be carried out at one level and no portion of the work shall be left more than one course lower than the adjacent work.

Blocks shall be laid so that all joints are well filled with mortar. Joined shall not be less than 6mm and not more than 8mm thick. Face joints shall be raked to a minimum depth of 10mm by raking tools during the progress of work when the mortar is still green so as to provide a proper key for pointing, plastering or rendering. When pointing, plastering or rendering is not required joints shall be struck flush.

For pointed blockwork or blockwork without plaster or render approved, smooth textured concrete blocks shall be used.

Faces of blockwork shall be cleaned daily and all mortar droppings cleaned off and removed. Top surface of each course shall be thoroughly cleaned before other courses are laid. If mortar in lower courses has begun to set joints shall be raked out to a depth of 12mm before laying is continued.

Where blocks are to be used for load bearing walls the uppermost course of blocks supporting slabs or other structural members shall be solid or treated as directed by the Consultant / PMC.

Openings, arches, chases, pockets and the like shall be provided as shown on the drawings to receive windows, louvers, doors frames and the like.

Wall ties and flashing shall be built into blockwork in accordance with the drawings and Specifications. It shall be clearly understood that the rates quoted by the Contractor shall be deemed to include for leaving openings,

4.0 GYPSUM BOARD WORKS

4.1 SCOPE

This Specification describes the general requirements pertaining to materials and methods to be used for gypsum board works.

4.2 APPLICABLE CODES

The latest revision of the following Indian Standards and Codes, unless otherwise specified shall be applicable to all gypsum board works.

IS 2095 – 1982Gypsum Plaster boards.

IS 2542 – 1981 (Part 1/Sec 1 to 12 & Part 2/Sec 1 to 8) Methods of test for gypsum plaster, concrete and products.

4.3 GYPSUM BOARD – PLAIN

The gypsum board shall consist of an aerated gypsum core treated with special additives covered on each face with a specially prepared durable paper liner binding the longitudinal sides of the board.

Physical Properties and Performance

i. Thickness: 12.5 mm

ii. Width 610 mm and 1220 mm

iii. Weight: 10.20 Kg/m2

iv. Density (dry state): 807.10

v. Fire Resistance: as per BS 476 Part – 7 1971

vi. Sound Insulation: The average rate of noise reduction – between frequencies of 100-3150 Hz:

* 35.6 dB for a partition of 75mm or 97 mm thickness with a 12.5mm board on each face.

* 38.5 dB for a partition as above but including 25mm of mineral wool in the cavity.

• 42.5 dB for a 100mm partition comprising of two layers of 12.5mm board on each side.

vii. Resistance to knocking and scuffing: Greater than that of cement plaster work.

viii. Thermal Conductivity: 0.16 W/mK

ix. Thermal Resistance: 0.08 m2 K/W.

The Gypsum boards shall be of tapered edged boards which gives an invisible joint, gap between each board being filled and finished in such a way that the linings or partitions present a continuous, smooth and seamless surface.

Accessories

i. Floor and ceiling channel: The floor and ceiling channel used for metal – framed partition shall be 0.55 mm thick, in width 72 mm or 148 mm as specified in Bill of Quantities with equal flange of 32 mm each.

ii. Stud Section: The stud section used for partition shall be 0.55 mm thick with width 70mm or 146mm as specified in Bill of Quantities and one flange of 36mm and other flange of 34mm. The studs shall be cut along its length for services.

iii. Drywall screws: The drywall screw used for fixing the gypsum board shall be zinc plated, self drilling and self tapping screws with counter sunk Phillips heads of the length as required as per the thickness and number of layers of the gypsum boards:

Gypsum boards of thickness Screw length

12.5 mm 25 mm

25 mm 35 mm

iv. Angle bead: The angle bead shall be galvanized steel angle strip, used to reinforce external angles that need maximum protection. It shall be a 25mm x 25 mm x 2 mm, suitable for 12.5 mm gypsum board.

v. Edge bead: The edge bead shall be perforated, galvanized steel angle strip of 2mm thickness, used to form a positive perimeter detail where cover strips are not used. It shall be a 25mm and a 10mm short return leg, suitable for 12.5 mm and 25 mm gypsum board.

vi. Control Joints: Control joints shall be used where the ceiling covers a large area or where long partitions are used. The control joints shall be formed by a GI cold rolled metal strip of thick 0.38 mm and 47 mm wide with the edges perforated to ensure adhesion of applied finishes.

4.4 METAL STUD GYPSUM PARTITION (SINGLE / DOUBLE LAYER)

The System should consist of single/double layer of tapered edge Gypsum board of thickness 12.5 mm each screw fixed to lightweight cold rolled metal sections to be suitable for any type of direct decoration. The partition shall be extremely versatile should provide high levels of fire resistance, sound insulation and stability.

Metal stud partitions include single / double layer of tapered edge 12.5 mm thick Gypsum board (conforming to IS: 2095 – 1982) screw fixed with drywall screw of 25 mm for first layer and 35 mm for second layer at 300 mm centre to either side of studs as per manufacturers specifications & as mentioned in the relevant item (0.55 mm thick having one flange of 34 mm and another flange of 36 mm made of G.I. steel) placed at 610 mm centre to centre in 72 mm floor and ceiling channel (0.55 mm thick having equal flanges of 32 mm made of G.I. steel) with joints staggered on each layer to avoid through joints. 25 mm thick rockwool to be provided in the cavity after fixing one side board. Finally square and tapered edges of the board are to be jointed and finished so as to have a flush look which includes filling and finishing with jointing compound, joint paper tape and two coats of Drywall topcoat suitable for Gypboard (as per the recommended practice of Indian Gypsum of Equivalent).

Double layer of Gypboard is fixed to either side of each stud and channel section with Gypboard drywall screws at 300 mm centers. At external angle, screw centers are reduced to 200 mm centers.

Finally the boards are to be jointed and finished to have a flush look which includes filling and finishing the tapered or Square edges of boards with jointing compound and point paper tapes. Two coats of Drywall Top coat are applied as primer.

4.5 GYPSUM BOARD FALSE CEILING

The false ceiling of gypsum board shall be laid on the supporting system Comprising of :

a) GI perimeter channels shall be of size 27 mm x 0.55 mm thick having one flange of 20 mm another flange of 30 mm. These shall be along the perimeter of the ceiling, fixed to brick wall / partition with the help of rawl plugs and screws.

b) GI intermediate channels shall be of size 45 mm x 0.9 mm thick with two flanges of 15 mm each and shall be suspended from the soffit at 1200 mm centre to centre.

c) Ceiling angle 25 mm x 10 mm x 3 mm.

d) They shall be fixed to soffit with GI cleat and steel expansion fasteners.

e) Ceiling section of 0.55 mm thickness having knurled web of 51.5 mm and two flanges of 26 mm each with lips of 10.5 mm are to be fixed to the intermediate channel with the help of connecting clips and in direction perpendicular to the intermediate channel at 450 mm centre to centre.

f) Painting MS members with red oxide paint.

The gypsum board shall be 12.5 mm thick tapered edge gypsum plaster board (conforming to IS: 2095 – 1092) should be screw fixed to the ceiling section with

25 mm drywall screws at 230 mm centre to centre, keeping board length perpendicular to ceiling section, using screw driver or drilling machine with suitable attachment.

The tapered edges of the boards should be jointed and finished to a flush finish with requisite filler, paper tapes, finisher and primer suitable for gypsum plasterboards. (As per recommendation of manufacturer, Indian Gypsum or equivalent). The job shall be completed including necessary hardware and provisions for light fitting and grills, diffusers, (cut-outs have to be made with the frame of perimeter channels of size 20 x 27 x 30mm x 0.5 mm thick supported suitably) and painting with two or more coats of plastic emulsion paint etc.

4.6 CELOTEX GRID CEILING SYSTEM AND TILES

Fixing of false ceiling Celotex Grid System is done using Pre-coated GI angle size 19 x 19 x 0.45 mm fixed to the brick wall / partition at the perimeter of the ceiling with nylon sleeves and screws at 600 mm centers. Main tee of size 24 x 38 x 0.38 mm at every 1200 mm c/c max and 1200 mm long Cross Tee of size 24 x 25 x 0.38 mm at every 600 mm c/c max between the main runners, 600 mm cross tee of size 24 x 25 x 0.38 mm at every 1200 mm centrally between the 1200 mm cross tees to form a grid of size 600 x 600 mm. The main runners are to be suspended with the help of metal rawl plug, soffit cleat and GI rod 4 mm dia with galvanized heat tempered spring steel clip. Finally Gypboard Ceiling tile range of 8mm thick is to be laid onto the formed grid.

TILES

GYPBOARD PLAIN TILE (With or without back side coated with WATER RESISTANT SEALANT) Size: 595 x 595 x 8mm.

GYPBOARD POLY PANEL (With or without backside coated with WATER RESISTANT SEALANT) Size: 595 x 595 x 8mm. One side pre-painted with Polyurethane paint.

NOTE: FITTINGS AND ACCESS PANELS

Frame for the light fittings etc. have to be made with Cross Tee section cut and bent and fixed with steel screws to the Main Tee section to form a suitable size of the openings.

Where light fittings, access panels and similar components are incorporated as part of the design requirements, consideration must be given to maintaining the integrity of the ceiling.

4.7 METHOD OF MEASUREMENT

The work shall be measured net in square metres. Deductions shall be made for predefined openings exceeding 0.5 square metres in area. Rates shall be

inclusive of all supporting systems, extras for fittings and access panels, consumables, etc. complete.

Rates for Celotex grid ceiling system shall exclude the cost of ceiling tile.

5.0 FLOORING, SKIRTING, DADOING

5.1 SCOPE

This Specification describes the general requirements for flooring, tiling & cladding & chemical rendering workis.

5.2 APPLICABLE CODES

IS 8112 Specification for 43 grade ordinary Portland Cement.

IS 383 Specification for Coarse and fine Aggregates from natural sources.

IS 457 Specification for Ceramic unglazed Vitreous Acid-Resisting tiles. IS 777 Specification for Glazed Earthenware Tiles.

IS 1237 Specification for Cement Concrete Flooring Tiles.

IS 1443 Code of Practice for Laying and Finishing of Cement concrete Flooring Tiles.

IS 2114 Specification for laying in-situ terrazzo floor finish.

IS 2571 Code of Practice for Laying In-situ Cement Concrete Flooring. IS 1200 (Part 11) Method of measurement of building works.

5.3 IN-SITU TERRAZO

5.3.1 Material:

The cement used shall conform to IS 8112.

The aggregate & sand shall conform to IS 383 & shall be approved by the Consultant / PMC.

Coloured cement may be either ready mix material or may be obtained by mixing pigments and the cement at site. The colour pigment shall conform to IS 2114 – 1962.

The marble chips shall be white, green, black, chocolate, grey, yellow and green of Udaipur / Baroda variety of size specified in the BOQ items.

5.3.2 **Methodology:**

The surface to receive the flooring shall be thoroughly cleaned with water using wire brush and made free from all dust and oily substances before the work is started.

The terrazzo cast – in – situ floor shall be laid on the cement concrete screed base of 1:2:4 cement concrete mix using 12mm down aggregate.

The thickness of the base shall be as specified in the BOQ. The mixing, laying and other related activities shall be as specified in chapter 2.0 (Concrete). The top surface of the screed shall be roughened / broomed for proper bonding with terrazzo layer on top.

The PVC / metal / glass strip of the specified size shall be secured properly in the concrete bed maintaining proper line & level to form panels of area not greater than 1.5 mm2 each. The top of these strips shall be flush with the laid terrazzo level to ensure full & clear exposure after polishing.

When the cement concrete base has sufficiently hardened, terrazzo mixture of chips & cement of appropriate thickness as specified in the BOQ shall be laid. The terrazzo mix shall be prepared by dry mixing of marble chips, cement, pigments in the specified proportions. Water shall then be added to obtained a plastic mix of suitable consistency as directed.

This terrazzo layer shall be then rolled length wise as well as cross wise. Additional chips shall be sprinkled on the surface and rammed until the surplus cement oozes out and chips forced together to ensure that the finished floors have less than 70% visible aggregate. Final surface shall be lightly trowelled. Templates shall be used for leveling. Leveling shall be true and checked with 3 m straight edge.

In case of skirting & dadoing, terrazzo layer of approved mix & colour shall be laid over a base coat of cement mortar 1:3 (1 Cement : 3 Coarse Sand) to true line & level.

Laid terrazzo shall be kept wet for a period not less than 6 (Six) days and then minimum 3 (Three) coats of machine polishing shall be done using Carborundum stone of appropriate grade. Sufficient quantity of water shall be used while polishing to prevent scratching. Voids, if any, shall be filled with neat grout of same mix & colour as the base and allowed to cure for minimum 72 (Seventy two) hours before subsequent coat of polishing is taken up. The surface shall then be cleaned thoroughly, dried and finally be polished using approved made of polish to a finish to the entire satisfaction of the Consultant / PMC.

Samples of terrazzo and mosaic work shall be prepared first for the approval of the Consultant / PMC. Work shall conform strictly to the approved samples and only approved materials shall be brought to the Site.

5.3.3 **Measurements**

In-situ terrazzo flooring & dadoing shall be measured in Square metres after making deductions for openings and the likes. Skirting shall be measured in running meters of specified height except for staircase where the same shall be measured in square metres. The rates shall include providing base, forming angles, rounding, curing, rubbing and polishing etc. complete.

5.4 INDIAN PATENT STONE

5.4.1 Cement concrete floor in a ratio of 1:2:4 (1 cement: 2 Sand: 4 Aggregate) of average 50 mm thickness shall be laid in panels.

The concrete surface finish may be monolithically laid with structural slab or laid over hardened structural slab. For convenience and to protect final finish during the period of construction, laying of concrete over- hardened structural slab shall be preferred.

5.4.2 Indian Patent Stone – Laid over hardened slab shall be carried out as under:

a) Hardened structural slab shall be thoroughly wire-brushed, hacked with mechanical scabler to remove all scum, laitance of cement mortar and allowed to expose coarse aggregate. Surface shall be wetted and cleaned thoroughly.

b) Concrete shall be laid in panels. Panels shall be such as to minimize shrinkage and curing. Their length to breadth ratio shall be 1.5:1. It is advisable to keep the maximum length of each panel as 3.0m.

Panels shall be formed by providing shuttering of timber or steel angles to dead accurate level. They shall be rigid and watertight.

c) In case dividing strips are to be provided, the same shall be fixed to dead accurate level and concrete poured into them.

5.4.3 a) The concrete mix used shall be as stiff as possible. When mix is held in hand it shall form a ball but when released will crumble by itself.

b) All excess water from the surface shall be mopped up keeping surface just wet.

c) Thick cement paste/slurry shall be brushed into the surface just prior to laying of the concrete. It must be noted that slurry shall not be brushed over area where concrete laying is likely to be delayed.

d) Concrete laid shall be rammed & compacted as required. It shall be leveled with 3m straight edge.

e) Surface shall be well trowelled and rubbed smooth to the satisfaction of the Consultant / PMC.

f) No additional dry cement or cement mortar shall be sprinkled on the stiffened concrete surface to achieve smoothness.

g) Concrete shall be kept moist for 14 days.

h) Edges of panels shall be well compacted to minimize liftings and curlings.

5.4.4 IPS-laid monolithic with structural concrete shall be carried out as under:

a) Floor concrete slab shall be allowed to stiffen enough but still be in a plastic stage.

b) Mix shall be laid in position and well compacted with wooden float and leveled with 3 m straight edge.

c) After the surface has become slightly hard, steel trowelling shall be carried out to achieve a smooth, leveled surface.

d) No additional dry cement or cement mortar shall be sprinkled on the stiffened concrete surface at any stage.

e) The concrete shall be wet cured for 14 days.

5.4.5 The hardener in the concrete floor of quality as approved shall be applied at the rate as specified by the manufacture in the top coat of flooring, if specified in BOQ.

5.4.6 In case of skirting & dadoing, it shall be laid with a cement – sand rendering 1:3 to true line & level and finished with a floating coat of neat cement.

5.5 MARBLE FLOORING / GRANITE FLOORING

5.5.1. Materials

Marble / granite Slab – The marble / granite shall be of approved shade/texture and sources as mentioned in the schedule of quantities and their size and the thickness shall be as shown on the drawings and as approved by the Consultant / PMC. They shall be of selected quality, hard, dense, uniform and homogeneous in texture and free from flaws, cracks or other structural defects. It shall have even and crystalline grains. The surfaces & edges shall be machine cut, surfaces to an even and perfectly plain surface and edges true and square. The rear face shall be keyed to provide bond for the mortar. No slab shall be thinner than the specified thickness at its thinnest part. The dimension of the slab shall be sizes as required. In case of bigger slabs, smaller sizes in required shapes may be drawn out as shown on drawings. The granite slabs shall be pre-worked to mirror/flame/chisel dressed finish. A few approved samples of finished slabs shall be deposited by the contractor in the office of the Consultant / PMC.

Concrete Base and Mortar Bedding – Cement mortar for bedding shall be mixed by a mechanical mixer or as directed. The amount of water added shall be the minimum necessary to give just sufficient plasticity for laying and satisfactory bedding. Care shall be taken in preparing the mortar to ensure that there are no hard lumps that would interfere with the even bedding of the stones. Before spreading the mortar, base shall be cleaned of all dirt, scum, or loose materials and then well wetted without formed any pool of water on the surface. In case of RCC floors, the top shall be left a little dry. All point of level for the finished paving surface shall be marked out. The mortar shall then be evenly and smoothly spread over the base by the use of screed battens to line, Level/slope asified, only over so much area as will be covered with slabs within half an hour. The thickness of the mortar

bedding shall be as specified in the BOQ and shall not be less than 12 mm. Unless otherwise specified, the proportion of mortar bedding shall be 1:4 cement mortar (1 cement : 4 coarse sand).

5.5.2 **Workmanship**

Laying Marble / granite slabs – Before laying, the marble / granite shall be thoroughly wetted with clean water. Neat cement grout of honey like consistency shall be spread on the mortar bed over as much area as cold be covered with the slabs within half an hour. Specified type of marble / granite slabs shall be laid to pattern as directed on the neat cement float evenly and firmly and shall be laid to a pattern as directed on the bed to the required level and slope in the mortar bed. Each slab shall begently tapped with a wooden

mallet, till it is firmly and properly bedded. There shall be no hollows left. If there is a hollow sound heard while gently tapping on the slabs, such slabs shall be removed and refixed properly. The edges of the slabs shall be buttered with slurry of white cement mixed with pigment matching the colour of stone slab and joint shall be hair fine in width and straight, grouted with neat coloured cement slurry to match the colour of the marble / granite. The joints shall be stuck smooth but there shall be no smearing of mortar over the slabs. The edges of the adjoining slabs shall be in one plain. All surplus cement slurry shall be removed and the surface wiped out clean with wet soft cloth.

The flooring shall be kept undisturbed for at least 7 days, and wet for fourteen days. Marble flooring shall be machine polished to anti-skid/wax/tin-oxide polish finish as specified.

5.5.3 **Rates to include**

The rates for item of marble / granite flooring shall include for the following:

- Preparing/treating the sub-floor or base.
- All labour, materials and equipment and consumables, sub-base, laying mortar bed, grouting, fixing marble / granite slabs, as specified and making up the joints including grinding, finishing, polishing and all bye works to the satisfaction of Consultant.
- Any cutting and wastage, if required, to achieve required size/shape and configuration as specified in the drawing.
- Curing and removal of muck.
- Cleaning the floor from all stains, etc.
- Rounding or nosing at the edge and making holes, finishing around opening wherever required and finishing with the adjoining surface and machine polishing wherever required.
- Work at all locations & heights with all lead and lift.

5.6. **CERAMIC TILE FLOORING**

5.6.1 **Materials**

Ceramic tiles shall be coated or fully vitrified and shall conform to IS:770/ BS 6431/E.N.777 of the latest edition. Sizes maybe 450 x 450. 300 x 300, 200 x

200mm or as specified. The thickness of the tiles shall vary from 7.3mm to 10mm. The colour, design and brand shall be as approved by Consultant / PMC.

5.6.2 **Workmanship**

Sub-floor preparation – The floor should be structurally sound and rigid and cleared off waxy/oily/films and curing compounds. Surface must be free from rising dampness and hydrostatic pressure. If required, the floor should be leveled with cement screed as per directions of the Consultant / PMC.

Floor layout – The room should be squared off, measured and chalk lines are marked. Once marking is in place, lay loose tiles across the slope in both directions to balance the room so that the cut tiles are of the same size on either side.

Fixing – Tiles shall be laid over a cement mortar 1:4 (1 Cement : 4 Coarse Sand) and a floating coat of neat cement of required thickness as per the drawings. Joints shall be finished and pointed with white cement and pigment of matching shade.

5.7 **GLAZED/CERAMIC TILES DADO AND SKIRTING, ETC.**

5.7.1 **Materials**

Tiles – Glazed, coloured, plain or with design, glossy or mat finished of size as specified, including specials, shall be of approved make and quality and shall have a gloss or mat unfading stable finish of uniform shade, free from flaws and defects and shall conform to IS 777 1961 in all respects. Samples of tiles shall be got approved by the Consultant / PMC who will keep them in his office for verification as to whether the materials brought and used conform to the approved samples.

Mortar backing – All joints in the face work shall be raked out to a depth equal to but not less than the width of the joints or as directed bys the Consultant / PMC. Concrete surfaces shall be properly hacked to the lines and levels. All dirt, soot, spill, or any other materials that might interfere with satisfactory bond shall be removed. The surface shall be cleaned and scrubbed with fresh water and kept wet for 6 hours prior to applying backing mortar. The dado work shall not be commenced unless the preparatory work is passed by the Consultant / PMC. The proportion of mortar for backing shall be 1:3 cement mortar. Sand in mortar bedding shall be form approved source, and shall conform to quality of sand for plastering. The thickness of mortar backing shall be as specified in the BOQ but shall not be less than 12 mm.

5.7.2 **Workmanship**

Fixing Dado Tiles – The fixing of tiles to the walls shall be done only after flooring is laid. The white or coloured glazed tiles shall be soaked in water for at least 12 hours before use. Tiles shall be fixed when the cushioning mortar is still plastic and before it gets very stiff. The back of tiles shall be covered with a layer of neat cement paste and the tile shall then be pressed in the mortar and gently tapped against the wall with a wooden mallet until it achieves the desired level and plumb and configuration, as specified in the drawing. The fixing shall be done from bottom of wall upwards without any hollows in the bed or joints. Each tile shall be fixed as close as possible to the adjoining tiles so that all tiles faces are in one vertical plane. The joints between the tiles shall be filled with

non-staining white cement/white cement mixed with pigment for coloured tiles and shall not exceed 1.5 mm in width and they shall be kept continuously wet for 14 days. If doors, windows or other openings are located with in the dado area, the sills, jambs, angles, etc. shall be provided with appropriate specials according to the specification and such areas shall be measured along with the dado. Drains shall be provided with specials.

Cleaning – After the tiles have been fixed the surplus cement grout that may have come out of the joints shall be cleaned off before it sets. After the complete curing, the dado or skirting work shall be washed and thoroughly cleaned.

5.7.3 **Rates to include**

The rates for the items of dado or skirting shall include the following:

i) Preparing/treating the base surface to the required line, level or slope to the specified configuration with all bye-works.

ii) Backing mortar.

iii) Providing and fixing tiles including all specials, like round edges, angles, gappings, etc. in neat cement float over backing mortar, including cutting of tiles and wastage of tiles etc.

iv) Joining of the tiles with white cement or white cement mixed with pigment slurry.

v) Curing.

vi) Cleaning the wall/dado/skirting surface and flooring from all stains and removal of all debris.

vii) All labour, materials, use of tools and equipments and consumables for carrying out the items as specified above including all by works for achieving the required surface finish.

viii) Chamfering the edges including cutting or making holes in tiles for providing, opening in walls wherever required.

ix) Work at all locations & heights with all lead and lift.

5.8 **KOTA STONE FLOORING**

5.8.1 **Materials**

The slabs shall be of selected quality and sizes as required or bigger from which smaller sizes are drawn out as shown on drawings, hard, sound, dense and homogenous in texture, free from cracks, decay, weathering and flaws. It shall be free from strains, cracks, decay and weathering, flaws, defects or damages. These shall be machine cut to the requisite sizes, they should be of the colour indicated in the drawings or as instructed by the Consultant / PMC. The slabs shall have the top (exposed) face polished before laying.

Before starting the work, the contractor shall get the samples of slabs approved by the Consultant / PMC.

5.8.2 **Workmanship:**

Dressing of slabs – Each slab shall be cut to the required size and shape and fine dressed/cut at all the edges to the full depth. The sides thus dressed shall have a full contact if a straight edge is laid along. The sides shall be table rubbed with coarse sand or machine rubbed before paving. All angles and edges of the slabs shall be in true square and free from chippings giving a plane surface.

Preparation – The surface shall be clean and wetted thoroughly before commencing the laying work.

Laying – Sub-grade shall be cleaned, wetted and mopped and mortar bedding spread to line, level/slope as specified. The slab shall be washed clean before laying. It shall be laid on top of bedding, pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar is then allowed to harden a bit. Over this surface a cement slurry of honey like consistency at 4.4 kg of cement per square metre shall be spread. The edges of the slabs already paved shall be buttered with grey or white cement with or without pigment to match the shade of the kota slabs as given in the description of item. The slab shall then be gently placed in position and taped with wooden mallet till it is properly bedded, in level with and close to the adjoining slab. The joint shall be as fine as possible and surplus cement on the surface of the slab shall be removed. The slabs fixed in the floor adjoining the walls shall enter not less than 10 mm under the plaster, skirting or dado. The junction between the wall and floor shall be finished neatly. The finished surface shall be true to lines, levels and slopes as specified in the drawing and or instructed by Consultant/PMC.

Curing – The floor shall be cured for a minimum period of seven days.

Polishing and Finishing – Unevenness at the meeting edges of slabs shall be removed by fine chiseling. First grinding shall be done with Carborundum stones of 48 to 60 grade grit fitted in the machine. Water shall be properly uses during grinding. The second grinding shall be started with carborundum of 120 grit. Final grinding shall be done when other works are finished. The machine shall be fitted with Carborundum of grit 220 to 350 and the floor ground using water in abundance. The floor shall then be washed clean with water. The floor shall then be finally finished/polished as specified.

5.9. **GRANITE SLAB CLADDING**

5.9.2 **Materials**

Slab shall be of selected quality, hard, sound, dense and homogeneous textures, free from cracks, decay, weathering of flaws. Stone slabs shall be of uniform colours and as approved by the Consultant / PMC. They shall be machine cut and mirror polished or finished as specified and shall conform to the required sizes. Thickness shall be as specified in the respective items.

5.9.3 **Workmanship**

Stone or stone slab shall be of size as shown on drawings or as directed by Consultant / PMC. Exposed faces, full beds and joints shall be dressed/finished as directed. Joints shall be cut square to the face and shall be at right angles to each other or as directed. The facing shall be fixed in cement mortar truly in plumb and in perfect place straight or curved as shown on drawing, the base being

fully flushed with mortar. The joints shall be exactly true to details. The joints shall be machine polished/fine tooled work. The stones shall break joints for about half height of the coarse. Courses shall be shown on the drawing as directed. Gap between the facing stone and the wall shall be filled with 1:3 cement mortar. Lugs of approved design shall be used to support the stone at every 600mm height and 450mm apart or as necessary to secure the facing stone slab. The surface shall be protected from sun and rain and cured for ten days. Face shall be finished as specified or directed after filling the joints with matching shade cement/cement mortar 1:1 proportion mixed with approved water proofing materials.

5.9.4 **Rates to include**

The rates for the items of cladding / dado shall include the following:

i. Preparing/treating the surface of the base to the required line, level or slope to the specified configuration with all bye-works.

ii. Backing mortar.

iii. Providing and fixing slabs including wastage etc.

iv. Joining of the slabs with white cement or white cement mixed with pigment slurry (white cement and pigment to be provided by the contractor).

v. Curing.

vi. Cleaning the wall/dado surface and flooring from all stains and removal of all debris.

vii. All labour, materials, use of tools and equipments and consumables including lugs etc. for carrying out the items as specified above including all by works for achieving the required surface finish.

viii. Chamfering/rounding at the edges including cutting or making holes in slabs for providing, opening in walls wherever required and finishing with the adjoining.

ix. Work at all locations & heights with all lead and lift including scaffolding, platform etc., complete.

5.10 SELF LEVELLING EPOXY FLOORING FOR DUST PROOF, LIGHT DUTY FLOORING

5.10.1 **Scope**

This specification defines the material and other performance requirements for self leveling epoxy flooring in pharmaceutical, food, hospital and other industries. The thickness shall be as specified.

5.10.2 **Recommended Epoxy system**

The system should be resin rich (resin and hardener component in comparison to the filler content), solvent free, attractive in nature having a smooth finish, excellent adhesion to concrete, excellent chemical and abrasion resistance, easy to clean and tested by National Chemical Laboratory for anti fungal and anti bacterial properties.

The self leveling floor compound is epoxy based consisting of four component viz., resin, hardener, color paste and filler which when mixed provides approx. 1mm or 2mm thick flooring as required. A two component epoxy primer is suggested to thoroughly cleaned substrate prior to application of self leveling compound. The self level flooring system should have the following mechanical properties:

Compressive strength - 780 kg/cm2 Flexural strength - 62 kg/mr

Tensile strength - 200 kg/cm2

Impact strength - 68 kg/cm2 Bond strength - 36 kg/cm2

Pot life - 50 – 60 minutes

Full curing - 7 days for heavy loads. 2 days for light Loads.

5.10.3 Application

Surface Preparation

Oil grease, algae or any other substances likely to impair good bonding, should be removed from the surface. All new concrete should be sound and be given a maturation time of 28 days and dried thoroughly. Moisture testing should be done to ensure moisture limit not exceeding 7%. Ground floor slabs should be water proofed to prevent seepage from the negative side. Shot blasting should be carried out on all surfaces prior to application of primer coat.

Mixing Proportion

Primer coat

As per approved manufacturer's specification

Self level topping (Beck Bond SLF 18 or equivalent) As per approved manufacture's specification Method of Application

Primer Application

Mix the two components viz. resin and hardener in proportion as directed. Once mixed the system should be applied in a thin, continuous film using stiff brush or roller. Porous floors may require two coats of primer. The system should be allowed to be tack free (approx. 4h at room temperature) prior to application of the self leveling compound.

Self leveling topping

Beck bond SLF 18 or equivalent is supplied in pre-weighed four components ready to use on site. Preferably use slows speed electric stirrer for mixing the components. First mix Beck Bond SLF 18 A with Beck Bond SLF 18 CP in a mixing vessel until uniform colour is obtained. Then add Beck Bond SLF 18 B and stir well. Finally add Beck Bond SLF 18 F and stir until a homogeneous mixture is obtained. Spread Beck Bond SLF 18 mixture on the prepared surface by using toothed trowel or comb as per desired size for the required thickness. After

approx. 10 minutes, use spiked roller to remove entrapped air. Allow floor topping to cure for 2 for 7 days at room temperature before use.

The area should be covered properly to ensure no deposition of dust and other particles to ensure that the finish does not get affected.

5.10.4 **Coverage**

Coverage depends on the nature of the substrate. Approximate consumption:

0.25 kg/sq.m. for primer

6.0 sq.m. kit for floor topping of a thickness of 1mm.

5.10.5 **Handling precaution**

Only skilled and experienced workers should be entrusted with the application of the self leveling epoxy system. Rubber or polyethylene gloves must be worn by the workers handling resin products. Tools and mixing equipment should be cleaned immediately after use by using scrappers and solvents like xylene.

5.11 **AQUEOUS EPOXY COATING FOR WALLS AND CEILINGS**

5.11.1 **Scope**

This specification defines the material and other performance requirements for aqueous epoxy coatings for walls, ceilings, cold storage rooms, operation theatres in pharmaceutical, food, hospital and other industries.

5.11.2 **Recommended Epoxy System**

Aqueous epoxy coatings should be non toxic, can be safely used when contact with food, odourless, having excellent chemical resistance and approved by

F.D.A. and CFTRI, Mysore.

Beck Bond FDC 47 or equivalent aqueous epoxy based coating shall be used for such applications.

3.4 Aqueous Epoxy coating should have the following properties:

Tensile strength	-	256 kg/cm2
Elongation to break	-	15 to 20%
Pot life	-	40 minutes
Full curing	-	2 days

5.11.3 **Application Surface Preparation**

All existing paints, loose particles, oil, grease, algae or any other substances likely to impair good bonding, should be removed preferably sand blasted and vacuum dusted. All new concrete should be sound and be given a maturation time of 28 days, dried thoroughly and be cleaned with metal brushes and carefully dusted. Moisture testing should be done to ensure moisture limit not exceeding 7%. Acrylic leveling materials to be applied and allowed to set.

Mixing Proportion

Primer coat (Beck Bond FDC 47 or equivalent)

Beck Bond FDC 47 A – 100 parts by weight Beck Bond FDC 47 B – 285 parts by weight

Beck Bond FDC 47 A – 100 parts by weight Beck Bond FDC 47 B – 285 parts by weight

Beck Bond 47 is supplied in 3.86 kg kits in pre weighed quantities. Method of Application

Mix the two components in suggested proportion using low speed mechanical stirrer. Apply a first coat, thinned with 15% by weight of water. Second coat should be applied without any water addition. Coating can be applied by brush roller or air less spray with an over coating interval of 24 hours.

The area should be covered properly to ensure no deposition of dust and other particles to ensure that the finish does not get affected.

5.11.4 **Coverage**

Coverage depends on the nature of the substrate.

Approximate consumption:

0.20 kg/sq.m for first coat

0.20 kg/sq.m for second coat.

5.11.5 **Handling Precaution**

Only skilled and experienced workers should be entrusted with the application of the epoxy coating system. Rubber or polyethylene gloves must be worn by the workers handling resin products. Tools and mixing equipment should be cleaned immediately after use by using scrappers and solvents like xylene.

6. TIMBER, ALUMINIUM DOORS & WINDOWS

6.1 SCOPE

This Specification describes the general requirements of woodwork & joinery & Aluminium works to be used on projects.

6.2 APPLICABLE CODES

The latest revision of the following Indian Standards and Codes, unless otherwise specified shall be applicable.

6.2.1 **Woodwork & Joinery**

IS 287 Recommendations for Maximum Permissible Moisture Content for Timber Wood for Different Purposes in different Zones.

IS 851 Specification for synthetic Resin Adhesive for Construction (Non- Structural) in Wood.

IS 1141 Code of practice for Seasoning Timber.

IS 852 Specification for Animal Glue for General Woodworking Purpose. IS 2202 Specification for Wooden Flush Door Shutters (solid core type)

Part I Plywood Face Panels.

Part II Particle Board Panels and Hardboard Face Panels

IS 3087 Specification for Wood Particle Board (medium density) for General Purposes.

IS 1200 Recommended for method of measurement.

6.2.2 **Aluminium Works**

IS: 504 Methods of Chemical Analysis of Aluminium and its alloys

IS: 733 Wrought Alumini8um Alloys Bars, Rods and Sections (for General Engineering Purposes)

IS: 1081 Code of Practice for Fixing and Glazing of Metal (Steel and Aluminium) door, Windows and ventilators.

IS: 1285 Specifications for Wrought Aluminium and Aluminium Alloy, Extruded Round Tube and Hollow Sections (for General Engineering Purposes)

IS: 1382 Glossary of Terms Relating to Glass and Glassware

IS: 1868 Specification for Anodic Coatings on Aluminium and its Alloys.

IS: 1948 Specification for Aluminium Doors Windows and Ventilators (incorp amend – 1)

IS: 1949 Specification for Aluminium Doors Windows for Industrial Buildings

IS: 2553 Safety glass-specification (Part-1) General Purpose(third Revision).

IS: 2673 Dimensions for Wrought Aluminium and Aluminium Alloys, Extruded Round Table.

IS: 2835 Specification for Flat Transparent Sheet Glass.

IS: 6477 Methods of Testing Anodic Coatings on Aluminium.

Note:

1. Wherever a reference to any Indian Standard appears in this specification and as above it shall be taken as a reference to the latest version of the Standard.

The lists are included for guidance only and the omission of any CP, IS code from the list does not relieve the contractor from compliance therewith:

Aluminium Glazing shall be designed and fabricated as per Indian Standard Codes of practice relevant to Aluminium doors, windows, glazing, testings, measurements etc. in absence, guidance is also to be taken from British and American Standards. All such reference to be taken for guidance and adopted to suit local conditions.

6.3 WOOD WORK AND JOINERY

6.3.1 Timber

Timber used for joinery shall be the best of its respective class, seasoned for a minimum of six months by air-drying, of natural growth and free from defects such as cracks, splits, shakes, dead knots, soft spongy spots and waves of injurious open stakes. When one kind of timber is used it shall be of uniform colour to the satisfaction of the Consultant / PMC.

Grains shall be reasonably larger than 6 square centimeters and the aggregate of all knots shall not exceed 0.5% area of any one piece.

Timber shall be kiln dried to IS: 1141 and conform to IS: 287 in regard to moisture content. The maximum permissible limit shall be +3% for the average moisture content of all samples from a given lot and +5% from individual samples from a given lot. This shall apply when the thickness of timber is more than 50mm. Small size timber tolerances shall be +/- 2% and +/- 3% respectively.

The Contractor shall provide samples of all timber and other materials to be used in the work for the approval of the Consultant / PMC. All timber and other materials brought on to the Site shall strictly comply with the approved samples.

Timber shall be seasoned, chemically treated and treated with a 10 (ten) year guaranteed and approved anti-termite treatment to render it free from decay and insect attack.

6.3.2 Doors

Doors shall be paneled or solid flush doors as described, external flush doors being made with weatherproof plywood. Flush doors shall conform to IS:2202 (Part I) and commercial veneers shall conform to IS: 303.

Decorative veneers shall be Grade 1 and conform to the requirements for decorative veneers specified for Grade 1 decorative plywood interior grade with a thickness not exceeding 1 mm.

Lippings shall be of best quality hardwood. Teak lippings, where described, shall conform to the specification for best quality teakwood. Lippings around doors shall be of one piece not less than 25mm wide with a depth equal to the door thickness. Double leaf doors shall have lippings on the meeting stiles not less than 35/40 mm deep.

Formica or other approved plastic or laminated veneers shall be provided where specified and fixed with “Revicol” or other equal and approved adhesive. Finished surfaces shall be thoroughly cleaned with wax polish.

6.3.3 Windows

Windows shall be as specified and, unless otherwise described, shutters shall have one pair of hinges, two tower bolts (one 225mm long and the other 150mm long), one handle and one hook with eye and a pegstay. Ventilators shall have two mild steel holdfasts and hinges, one handle and one hook and eye at each end with one tower bolt in the centre.

6.3.4 Cupboards and Cabinets

Cupboards, wooden cabinets shall be provided as shown on the drawings. Doors may be either hinged type or sliding type as detailed. Dimensions shown on the drawings shall be strictly followed.

6.3.5 Railings and Architraves

Railings and architraves shall conform to the shape shown ons the drawings or as approved by the Consultant/PMC and fixed by means of screws, counter-sunk or otherwise, or bolts.

6.3.6 Glazing in Windows, Doors

Glazed windows, louvers, ventilators and doors shall be provided with either clear, float or pinheaded glass 5.5mm thick or as otherwise described, shall be free from all blemishes and conform to IS 1761.

6.3.7 Ironmongery and Fittings

Fittings and fixtures and other ironmongery shall be as detailed drawing and shall comply with the relevant IS Standards and Codes of Practice.

All nails, screws, fixings, and the like shall be of hot dip galvanized or brass or non-ferrous material as described.

6.4 WORKMANSHIP

6.4.1 General

Workmanship shall be of the best quality and the Contractor shall check all dimensions on Site prior to putting joinery work in hand.

All joinery work shall be accurately set out in strict accordance with the drawings and shall be framed together in the best possible manner and with the best possible method of jointing.

No timber shall be painted, tarred, oiled or the like before it has been inspected by the Consultant /PMC. Any effort to hide defects by plugging, painting and the like shall lead to the timber being rejected by the Consultant/PMC. All rejected timber shall be immediately removed from the Site.

Thickness specified for wrought timber are, unless otherwise specified, prior to planning and an allowance of 3mm shall be made for wrought faces.

Sawing and planning of timber shall be done in straight lines and planes to produce uniform thickness. Joinery work shall be wrought on all faces and finished off by hand with sandpaper with slightly rounded arises.

Before joining wood frame members shall be planed smooth and accurate to the final size. Rebates, roundings, mouldings and the like shall be made before the members are jointed.

Mortice and tenon and dovetailed joints as required shall be strong, neat and shall fit without wedging and/or filling. Joints of frames shall be pinned with 10 to 15mm diameter hardwood pins and white lead after the members have been glued and pressed together.

Joinery work which splits, fractures, shrinks or shows flaws or other defects due to unsoundness, inadequate seasoning or bad workmanship shall be immediately removed and replaced with sound material at the Contractor's own cost.

6.4.2 **Door and Window Frames**

Door, window and ventilator frames, transoms and mullions shall be rebated. Top frame members of doors and top and bottom frame members of windows and ventilators shall project about 150mm in brickwork. Vertical members of door-frames shall project about 50mm below finished floor levels.

Door and window frames shall be provided on each side with 3 nos. 225 x 25 x 6mm mild steel flat split hold-fasts which shall be built into masonry or cast into concrete work in accordance with IS: 4021.

Frames shall be finished smooth to receive paint, polish or any other specified finish. Surfaces of timber fixed to masonry or concrete shall be painted with hot bitumen coal tar or any other approved wood preservative or primer before being placed in position.

6.4.3 **Door and Window Shutters**

Door and window shutters shall conform to the requirements of IS: 1003 (Part I and II) and IS: 2202 (Part I)> If required, flush door panels shall be tested in accordance with the requirements of IS: 4020.

All faces of door and window shutters shall be at right angles, free from twist and warp in the plane. Faces shall be sanded to obtain a smooth, even texture.

Shutters shall be painted on the commercial side with two coats of synthetic enamel paint over an approved coat of primer. Decorative veneer sides shall be wax or French or Melamine polished with two or more coats as specified.

Double leaf shutters shall have meeting stiles rebated 20mm deep and shall be either splayed or square type with teak wood lipping not less than 35/40 mm deep.

Care shall be taken to prevent damage of any kind or loss of shape during transport, handling, stacking and hanging.

6.5 **MEASUREMENT AND PAYMENT**

Timber frame for Doors, windows, ventilators and louvers will be measured in cubic metres. Shutter for Doors Windows shall be measured in square metre. Quoted rates shall be deemed to be inclusive of nails, screws and other types of fixing and glazing, unless otherwise described. Hardware and ironmongery shall be measured separately, unless otherwise described in the Bill of Quantities. Quoted rates shall be deemed to the exclusive of polishing and/or painting.

6.6 **SPECIFICATION FOR ALUMINIUM WORK**

Standards, Specifications, associations, and regulatory bodies are generally referred to throughout the specifications by their abbreviated designations. The materials and workmanship shall be in

accordance with the requirement of the appropriate CP, IS code wherever applicable together with any building regulations or bye-laws governing the works.

6.7. SCOPE

This specification applies to the aluminium windows and glazing works to be executed by the Contractor. It is to be read in conjunction with and subject to the general and special conditions of contract and in conjunction with the drawings, the schedule of rates and such other documents as may from time to time be agreed upon as comprising part of this contract.

6.7 DESCRIPTION

The work as shown or specified includes the designing, fabricating, furnishing and installing of Exterior Windows and fixed glazing and related glazing materials.

The work shall include all labour, materials, equipments, accessories, tools, plants and services necessary to complete the aluminium windows as shown on the drawings and specified herein, but not limited to the following:-

Aluminium casement windows with one side / both side openable shutters. Fixed aluminium windows with large size glasses.

Clear Indian Float Glass (Modi-float) Grey tinted Indian Glass (ASHAI FLOAT) Anchors and Accessories

6.8 SETTING OUT THE WORKS

The Contractor shall arrange necessary instruments, equipments and personnel and shall establish lines and elevations at the site as required for completion of the Works as per architectural drawings. The proposed layout showing all grid lines and exterior wall locations and setting-out points, lines etc. shall be got checked from the Project Manager.

All setting-out points / levels shall be protected during construction by the Contractor and he shall also be responsible for any intermediate setting-out points / levels required for the work.

6.9 SUBMITTALS

6.10.1 SAMPLES

The Contractor shall submit to the Architects samples of all materials for approval and no work shall commence before such samples are duly approved. Samples of aluminium finishes, 300 mm square samples of each type of glass required, range olf tinted / reflective glasses, glazing sealants, locking arrangements, hinges, hardwares and other accessories and every other work requiring samples in the opinion of the Architects shall be supplied to him by the Contractor and these samples will be retained as standards of materials and workmanship. The cost of the samples shall be borne by the Contractor. The Contractor shall also install sample between two strips of materials similar to or representative of channel surface here sealant or gasket will be used, held part to represent typical joint details.

6.10.2 **SHOP DRAWINGS**

Contractor's and / or Manufacturer's and Supplier's full scale fabrication, installation and assembly drawings for fullscale each type of windows and for all parts of the work in sufficient detail to enable the Project Manager / Architect to verify conformity with the intent of Contract. Drawing shall identify materials

and show the details and dimensions of all component parts including plan and elevation, cross section and details.

Documents showing conformance with specified sound rating.

Design analysis and calculation include design calculations for review of design loads and member profile.

Design parameter adopted and their sources.

6.11 **SPECIFICATION FOR FIRE DOORS**

6.11.1 **Materials**

Door frames and leaves are made from Galvanized Steel and in Stainless Steel 304 Grade on request.

6.11.2 **Door Leaves**

Constructed from 1.25 MM thick galvanized sheet press formed to provide a 46 MM thick fully flush, double skin door shell with lock seam joints and stile edges. Internal reinforcements are provided at top, bottom and stile edges for fire rating. The internal construction of the door is a specially designed honey comb structure with reinforcement at top, bottom and stile surrounds. The internal construction of the door varies with the degree of fire rating as tested. For doors having overall height in the excess of 2300 mm the shutters shall essentially have double latching.

6.11.3 **Panels Removeable**

Constructed from 1.25 MM thick galvanized steel sheet press formed to provide a 46 MM thick fully flush, double skin panel shell with lock seam joints at stile edges. Internal reinforcements are provided at top, bottom and stile edges for the rating. The internal construction of the panel is a specially designed honey comb structure with reinforcement at top, bottom and stile surrounds. The internal construction of the panel varies with the degree of Fire Rating as tested.

6.11.4 **Door Frames**

Produced from 1.6 MM thick galvanized steel sheet press formed to double rebate profile of size 143 X 57 MM (+/- 0.3 MM) with a maximum bending radius of 1.4 MM.

The door frames may be built into the brick or block walls using corrugated "TEE" anchors not welded to the frame (first fix). Frames may also be fixed on plastered openings with the help of Metallic Expansion Shield with counter sunk screw (second fix). Door Frames are supplied to knock down form with butt joints for bolted assembly at site.

6.11.5 **Vision Glass**

Fire rated vision glass with 6 MM thick clear glass can be provided for a maximum of 2 hours fire rating. The vision glass can be provided in 380 MM dia or square / rectangle in various dimensions such as 200 MM X 300 MM, 300 MM X 300 MM etc.

6.11.6 **Finish**

The doorframes and door shutters are primed with Zinc-Phosphate Stoving Primer. Various finishes in Synthetic Stoving Enamel, Acrylic Stoving Paint or Polyurethane can be provided on request.

6.12 **IRONMONGERY**

6.12.1 **Hinges**

M.S. Powder Coated Hinges 3 MM thick, fixed to the frame and shutter or stainless steel ball bearing butt hinges 3 MM thick available on request.

6.12.2 **Lock**

Mortise Sash Lock with Internal Thumb Turn & External Key Operation with Lever Handles, Mortise Dead Bolt, Mortise Baby Latch etc.

6.12.3 **FLUSH BOLTS (DOUBLE DOOR)**

300 MM concealed extended lever action flush bolt satin finish fixed to top and bottom of the inactive blade.

6.13 **SPECIAL FITTINGS**

Automatic Door Closer, Panic Hardware, Electro Magnetic Hold Open Device, Door Coordinator, Smoke Seals etc., shall be provided if/as specified.

7. **STEEL WORK**

7.1 **SCOPE**

This Specification describes the general requirements for metalwork on projects.

7.2 **STEEL DOORS, WINDOWS AND FITTINGS**

Steel doors, windows, ventilators and louvers shall conform to IS 4351 and 1038. Workmanship shall conform to IS 1081.

Steel doors, windows, ventilators, louvers and the ties shall be of the sizes specified and conform to the description in the respective items of work. Whether or not specifically mentioned, all fixtures and fittings necessary for the operation of doors, windows, ventilators and louvers shall be provided.

Doors, windows, ventilators and louvers shall be obtained from an approved manufacturers. Specific approval of the Consultant /PMC for such purchases shall be obtained. Sample shall also be provided for approval before the start of manufacture.

Steel doors shall be of gauge as specified in Bill of Quantities pressed steel flush type with or without removable transoms. Doors shall be provided with a three way bolting device and locking arrangement with duplicate keys and handles on both sides and openable as specified.

Steel windows shall be provided with friction hinges in place of windows with pegstays if so directed by the Consultant /PMC. For centre hung and top hung ventilators suitable spring catch/pulley and chord arrangements shall be provided to facilitate opening. Whenever fly mesh over windows is specified it shall be fixed to windows and suitable lever type roto-type arrangements provided for the opening or closing of the glazed panels from inside.

Where specified steel doors, windows, ventilators and louvers shall be airtight. For this purpose the Contractor shall provide necessary padding material such as rubber felt or other equal and approved material.

Doors, windows, ventilators and louvers shall be measured in square metres. Quoted rates, unless otherwise described shall be inclusive of glazing and shall be free from all blemishes.

Quoted rates shall also be inclusive of fixing doors, windows, ventilators and louvers to brickwork, concrete work or steel framing by making holes/drilling holes in steelwork where required complete.

Quoted rates, unless otherwise described in the Bill quantities, shall include for one coat of approved zinc rich primer.

7.3 **ROLLING SHUTTERS**

Rolling shutters shall conform to the size indicated on the drawings and shall be of best quality to the approval of the Consultant /PMC. Rolling shutters shall be in one piece and be made of minimum 18-gauge heave steel sheets.

Cylindrical hoods shall be provided at the top to enclose the shutter when open and rolling shutters shall be provided with suitable locking arrangements and deep channel guides.

Galvanized rolling shutters shall be made of hot dipped galvanized slats; hood, and deep channel guides all preferably in one piece.

Hand operated pull and push type rolling shutters of sizes larger than 10 square metres in area and of very large gear operated and/or as directed by the Consultant /PMC shall be provided with ball bearings for smooth and efficient operation. In case of large rolling shutters and depending upon local wind conditions rolling shutter should be provided with special locking type of wider channel guides or shall be provided with central movable channel supports to take up the design wind pressures in the area.

Quoted rates shall be deemed to be inclusive of providing one coat of approved primer coat. Quoted rates shall also include the cost of lever locks and erection. Fixing lugs are to be provided to guide channel to suit actual site conditions or as directed by the Consultant/PMC.

7.4 PRESSED STEEL DOOR FRAME

7.4.1 Material

Guardian Door frames and leaves are form galvanized steel.

7.4.2 Door Leaves

Constructed from 1.25 MM thick galvanized sheet press formed to provide a 46 MM thick fully flush, double skin door shell with lock seam joints at stile edges. Internal reinforcements are provided at top, bottom and stile edges for fire rating. The internal construction of the door is a specially designed honey comb structure with reinforcement at top, bottom and stile surrounds. The internal construction of the door varies with the degree of fore rating as tested.

7.4.3 Door Frames

Produced from 1.6 MM thick galvanized steel sheet press formed to double rebate profile of size 143 X 57 MM (+/- 0.3 MM) with a maximum bending radius of 1.4 MM.

The door frames may be built into the brick or block walls using corrugated “TEE” anchors not welded to the frame (first fix). Frames may also be fixed on plastered openings with the help of Metallic Expansion Shield with counter sunk

screw (second fix). Door Frames are supplied to knock down form with butt joints for bolted assembly at site.

7.4.4. Vision Glass

Fire rated vision glass with 6 MM thick clear glass, if specified shall be provided for a maximum of 2 hours fire rating. The size of the vision glass may be 380 MM dia or square / rectangle in various dimensions such as 200 MM X 300 MM, 300 MM X 300 MM, 130 MM X 270 MM etc.

7.4.5 Finish

The door frames and door shutters shall be primed with Zinc-Phosphate Stoving Primer.

7.5 IRONMONGERY

7.5.1 Hinges

Stainless steel ball bearing butt hinges, 3 MM thick, flushed to the frame and shutter.

7.5.2 Lock

Mortise Sash Lock with Internal Thumb Turn & External Key Operation with Lever Handles.

7.5.3 Flush Bolts (Double Door)

300 MM concealed extended lever action flush bolt satin finish fixed to top and bottom of the inactive blade.

7.5.4 **Options**

Automatic Door Closer, Panic Hardware, Electro Magnetic Hold Open Device, Door Coordinator, Smoke Seals etc., can be provided if required.

7.6 **MILD STEEL GRILLS**

Mild steel grills for window's, ventilators and the like shall be made of square, flat or round steel sections and of the sizes specified and conform to the descriptions of the respective items of work.

Grills shall be fixed to the structure of any material by the use of build-in fixings, screws and/or welding and the making good of the surround.

Quoted rates, unless otherwise specified in the Bill of Quantities shall include for painting with two coats of approved enamel paint over one coat of approved zinc rich primer.

7.7 **MILD STEEL RAILINGS**

Mild steel railings shall be made of square, flat or round steel sections and of the sizes specified and conform to the description of the respective items of work.

Quoted rates shall include for all fabrication and fixing in place as shown on drawings using the described methods.

Quoted rates, unless otherwise specified in the Bill of Quantities, shall also include for painting with two coats of approved enamel paint over one coat of approved zinc rich primer.

Quoted rates shall not include for woodwork items, such as hand rail, sills, side posts, newels and the like, which shall be paid separately against corresponding items in the Bill of Quantities.

7.7.1 **MILD STEEL LADDERS / CATWALK**

Mild steel ladders of the width and length specified shall be made of 40mm x 6mm or approved size flat steel stringers and 18mm or approved diameter steel rungs and fixed to the structure as described.

Quoted rates shall include for all fabrication and fixing in place as shown on drawings using the methods described.

Quoted rates, unless otherwise specified in the Bill of Quantities, shall also include for painting with two coats of approved enamel paint over one coat of approved zinc rich primer.

8. **WATER PROOFING**

8.1 **SCOPE**

This specification describes the general requirements of water proofing for basements, water tanks, toilets and roofs on projects.

8.2 APPLICABLE CODES

The latest revision of the following India Standard and Codes, unless otherwise specified shall be applicable to roof treatment:

1202-1978 Determination of Specific Gravity (Reaffirmed 1990)

1203-1978 Determination of Penetration (Reaffirmed 1990)

1205-1978 Determination of Softening Point (Reaffirmed 1988)

1208-1978 Determination of Ductility (Reaffirmed 1988)

1209-1978 Determination of Flash Point and Free Point (Reaffirmed 1988)

1211-1978 Determination of Water Content (Dean and Stark Method) (Reaffirmed 1988)

1212-1978 Determination of Loss On Heating (Reaffirmed 1988)

2645-1975 Specifications For Integral Cement Water Proofing Compounds (Reaffirmed 1992) (1st Revision)

3346-1980 Method of The Determination of Thermal Conductivity Of Thermal Insulation Materials (two slabs guarded not Plat method (Reaffirmed 1990)

3348-1965 Specifications For Fibre Insulation Boards (Reaffirmed 1990)

4671-1984 Expanded Polystyrene For Thermal Insulation Purposes (Reaffirmed 1990) (1st Revision)

5688-1982 Method of Test of Preformed Block Type and Pipe Covering Type Thermal Insulations (Reaffirmed 1990) (1st Revision)

7193-1994 Cellular Concrete For Thermal Insulation (Reaffirmed 1990)

8183-1976 Bonded Mineral Wool (1st Revision)

8183-1993

IS 1200Recommended mode of measurement.

8.3 **WATERPROOFING AND INSULATION**:

Waterproofing and Insulation for roof slab: waterproofing treatment and insulation on concrete slabs with polymetric standard waterporoofing membrane of 3 kg/sq.m. of 4mm thick (Multiplas standard) including coating with compatible Multiplas primer / Cold sticker / Multiplas blown bitumen 85/25 or 90/15 and torch application of membrane with 10 cms overlap where required and ensuring all joints are staggered and overlapped including flashing on parapet or any wall up to a height of 300 mm.

Laying 50mm thick Extruded Polystyrene – Formular Metric 150 slab roof insulation boards to be laid on the above surface with CPRX compound.

Spreading a layer of polyethylene sheet of 200 gauge and struck with bitumen compound at the overlap joints only.

Over the polyethylene sheet fix wire mesh with screed cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded aggregate 12 mm downgrade) with small amount.

Laying screed cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded aggregate 12 mm downgrade) of average thickness 75 mm with slopes to match the drainage including the wattas, gola, etc. including all labour material, plant and machinery etc., complete as directed.

8.4 **WATERPROOFING TREATMENT**

Waterproofing treatment on concrete slabs with polymetric standard waterproofing membrane of 3 kg/sq.m of 4mm thick (Multiplas standard) including coating with compatible Multiplas primer / Cold sticker / Multiplas blown bitumen 85/25 or 90/15 and torch application of membrane with 10 cms overlap where required and ensuring all joints are staggered and overlapped including flashing on parapet or any wall upto a height of 300 mm.

The above description is only guidelines. The work shall be carried out as approved by the Consultant / PMC in line with manufacture's specification & details including providing the guarantee and all labour material, plant and machinery etc., complete as directed.

8.5 **INSULATION**

Insulation over terrace at all levels 50mm thick Extruded Polystyrene – Formular Metric 150 slab roof insulation boards to be laid on the above surface with CPRX compound through the approved specialist agency, Spreading a layer of polyethylene sheet of 200 gauge and struck with bitumen compound at the overlap joints only the method of application shall confirm to manufacturer's specification.

8.6 **CEMENT SCREED**

Laying at all levels & locations the cement screed to required slope with average thickness of 75mm in 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 12.5mm) with the weld mesh of size 150mm x 150mm x 3.25mm as per drawing

& details with slopes to match the drainage with all labour, material, plant and machinery etc. including the wattas, Khuras etc. all complete, as directed.

8.7 WATERPROOFING FOR TOILET

Acrylic Polymer modified cementitious compound water-proofing

Treatment to toilet floors and vertical sides up to 150mm high as under including all labour, material plant and machinery etc. all complete with guarantee of 10 years.

1st coat of Tapecrete or equivalent Acrylic Polymer modified cementitious compound mixed with white cement and silica in proportion of 1:2:1-1/2 (1 Tapecrete: 2 white cement: 1-1/2 silica).

2nd coat of Tapecrete or equivalent Acrylic Polymer modified cementitious compound mixed with white cement in proportion 1:2.

3rd coat of Tapecrete or equivalent Acrylic Polymer modified cementitious compound mixed with white cement in proportion 1:2 (allow for necessary curing and drying time of each coat, providing proper bonding keys in the coats where required) and vata of 75 mm on all vertical and horizontal junctions.

Protective layer: A layer of cement sand screed plaster of thickness 12mm in proportion 1:3 (1 Cement: 3 Sand) mixed with the water proofing Compound as per manufacturer's specification including providing the guarantee for 10 years and all labour material, plant and machinery etc., complete as directed.

8.8 WATERPROOFING KURRAS

Khurras of size approx. 45x45 cm with average minimum thickness of 50 mm cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate of 20mm nominal size) over PVC sheet 1m x 1m x 400 micron, finished with 12mm cement plaster 1:3 (1 cement: 3 coarse sand) and a coat of neat cement rounding the edges and making it flash with the water proofing treatment and finishing the outlet complete as per the details including all labour, material, plant and machinery.

8.9 BOX TYPE WATERPROOFING

Box type water proofing treatment using KOTA or OTHER APPROVED STONE SLABS and Mortar with water proofing compound as per proprietary treatment approved for tanks, lift pits, floors and walls in single layer including all labour,

material, plant and equipment at all depths and heights as approved by the Consultant / PMC. The rate shall include the cost of testing and providing guarantee for period of 10 years, and all labour, material, plant and machinery, scaffolding, curing etc. complete as directed.

The guideline methodology for the treatment shall be as follow:

1. Plain cement concrete, minimum 150mm thick or as specified shall be laid. The mix of PCC shall be C.C. in the ratio of 1:3:6. The raft shall project about 100mm than the finished size of RCC structure. The rate of P.C.C. shall be paid under concrete only.

2. Surface of P.C.C. should be cleaned properly through wire brush and water before laying the Kota stones.

3. 20-25mm thick rough Kota stones 600 x 600mm in size shall be laid flat with CM 1:4 water proofing admixture as per the manufacturer specification in single layer.

4. Gaps and edges of Kota stones should be grouted with cement slurry mixed with approved water proof compound.

5. Similar treatment shall be provided on the vertical surface of RCC member in single layer.

6. Suitable care to be taken at the top portion of Kota stone boxing. 7.Care to be taken during back filling and consolidation.

7. The system shall be guaranteed for 10 years against all defects and liabilities thereof from the date of completion of project. The guarantee shall be on stamp paper of Rs. 100/- in proforma to be approved by Consultant / PMC.

8.10 XYPER CRYSTALLISATION METHOD WATER PROOFING

Xypex Crystallisation method water proofing treatment to the basement wall and slabs.

For Construction Joint:

Step 1: Make the concrete raft, footing, tie-beams and side walls are free of dust, dirt form oil, films, laitance, loose portions of the concrete and any other

foreign matters. The treatment shall be carried out over a rough wood finish surface and in damp conditions.

Step 2: In between pours apply a slurry coat of Xypex Concentrate @ 1.00 Kg/M2. Pre-form a groove / slot in the construction joints and interfaces to dimensions of 1 inch wide and 1 inch deep. A 'V' shaped slot is not acceptable.

For walls and floor

Step 1: Remove all loose material & saturate with clean water. Acid etch the surfaces by mixing HCL Concentrated diluted with clean water in 1:4 ratio. Thoroughly clean the acid etached areas with clean water. Then allow clean water to soak into concrete and then remove all excess water.

Step 2: Apply one slurry coat of Xypex Concentrate @ 1.0 Kg / M2 to "U" shaped slot and 3 inched on either side of it.

Step 3: While slurry coat is still tacky (after 5 minutes). Fill "U" shaped slot with XYPEX PATCH'N PLUG in thick putty like consistency @ 1.00 Kg / M (for 1" X 1" Slot).

Step 4: After 15 minutes, apply a slurry coat of XYPEX CONCENTRATE at a coverage rate of 0.81 Kg / M2 over the slots, the raft slab. Footings, beam sides and side walls.

Step 5: After another 3 hours apply the second coat of XYPEX MODIFIED slurry @ a coverage of 0.81 Kg / M2 at right angle to the first coat.

Step 6: For curing, spray periodically with clean water 4 days, 4 times a day using a misty fog sprayer equipment (Do not stagnate water over the treated area for at least 4 days after the final application).

Step 7: Topping over the Xypex treatment (on walls, beams & footings) is absolutely required (such as plaster, screeds).

8.11 BRICKBAT COBA

Providing and laying 100 mm thick average brick bat coba water proofing treatment on RCC slab / screed surface with acrylic chemicals of approved make by 1% by weight i.e. minimum 1 kg. Of chemical shall be mixed with 100 Kg. Of ordinary Portland cement of approved make including finishing the surface complete as per specifications for terrace. Cleaning of RCC slabs/screed surface laying a coazt of slurry and plaster in cement mortar 1:4 (minimum 20mm thick) consisting of admixture of cement chemical to have even surface and to have

grip existing surface/brick bats. Laying a layer of broken bricks in cement mortar 1:4 or as specified admixed with chemical to necessary gradient. After proper curing, once again chemical slurry is provided to fill the joints. The top surface is then finished smoothly with cement mortar 1:4 (minimum 20mm thick) mixed with chemicals. The whole area shall be flooded with water for a period of 2 weeks for curing and testing.

8.12 MEASUREMENT AND PAYMENT FOR WATERPROOF TREATMENT

For terraces and flat and sloping roofs work shall be measured and paid for on the basis of the quoted rates per square metre of surface treated including finished wattas, which will not be measured separately.

Vertical surface treatment shall be measured along the inside perimeter of the parapet and he height of treatment. Treatment continued over horizon tops of parapets shall be added to the vertical areas calculated as above. Payment will made on the basis of the quoted rates per square metre.

Brickbat coba treated with waterproofing compound will be measured and paid on the basis of quoted rates per Square metre.

8.13 MODE OF MEASUREMENT

For terraces, underground and overhead water tanks, basements, lift pits, AHU Rooms, kitchens and pantries and the like the area covered between the insides of walls (finished) shall be measured in square meters.

Vertical surface treatment shall be calculated in square meters by taking the inside perimeter of the parapet and the height of the treatment over parapet walls measured from the finished horizontal treatment. Where the treatment is continued over horizontal portions of parapets the same shall be added of the areas calculated as above.

Construction Joint treatment shall be measured in Running Metres.

For bathrooms and WC areas treatment carried out in the areas of the sunken floors shall be measured separately in square meters.

Treatment to walls in bathrooms and WC areas shall be measured in square meters taking the height of the waterproof treatment above the finished level of the treatment to the sunken floors.

Brickbat coba treated with waterproofing compound will be measured in square metres.

No deductions shall be made in the floor and wall treatment for sanitary and other fittings and fixtures.

9. PLASTERING

9.1 Scope

This Specification describes the general requirements for plaster finishes and rendering on projects.

IS 383 Specification for Coarse and Fine Aggregates.

IS 412 Specification for Expanded Metal Sheet for general Purposes.

IS 8112 43 Grade Ordinary Portland cement. IS 1542 Specification for Sand for Plaster.

IS 2402 Code of Practice for External Rendered Finishes.

IS 2645 Specification for Integral Cement Waterproofing

Compound.

IS 1200 Method of Measurement of building and civil

Engineering works : Part 12 Plastering and pointing (third revision).

9.2 Materials

Cement shall be ordinary Portland cement confirming to IS 8112 for all purposes.

Sand shall confirm to IS 1542 for white and for colour render only quartz or silica sand shall be used.

For textured finishes and final or finishing coats sand used shall be screened through 3.35mm and 22.36mm IS sieves respectively. For torn texture a slightly larger proportion of sand screened through a 4.75mm IS sieve shall be used.

Water used for mixing and curing shall be clean, clear and free from silt, oil alkalis, acids, salts and the like.

Coloured cement shall be either ready mixed material or may be obtained by mixing pigments and cement on Site. Pigments mixed with cement shall conform to IS 2114.

Integral waterproofing compound shall conform to IS 2645.

Expanded metal backgrounds for plastering and/or rendering shall conform to IS 412.

Neeru shall be obtained by mixing lime putty and sand in equal proportions with chopped jute at the rate of 4 kg per cubic metre and ground to a fine paste in a

chemical grinder. Ready mixed neeru shall only be used with prior approval of the Consultant /PMC.

9.3 Workmanship

Mortar mix shall be measured in volume using gauge boxes or by weight. Mixing shall be done mechanically and each mortar batch shall be used within 30 (thirty) minutes. Hand mixing shall only be allowed with the prior approval of the Consultant /PMC and in accordance with his directions.

Proportions for mortar shall be as specified under the respective items of work. Cement and sand shall be mixed dry in the required proportion to obtain uniform colour and water added to produce the required consistency of plaster or render.

Joints in masonry shall be raked to a depth of 12mm with a hooked tool made for the purpose when the mortar is still green and in any case within 48 (forty eight) hours of laying. Concrete surfaces shall be hacked or chipped. Excess bulges and uneven surfaces must be removed and chipped properly to line and level and no additional payment shall be made for this work.

Surfaces to be plastered or rendered shall be washed with fresh clean water to remove all dirt, lose material, grease and the like and thoroughly wetted for 6 (six) hours before plaster work or render is commenced. Concrete surfaces to be plastered or rendered shall however, be kept perfectly dry.

Walls shall not be too wet but only damp at the time of plastering. Damping shall be uniform to obtain a uniform bond between the plaster and walls.

Curing of plaster or render shall be started as soon as the applied coats have hardened enough so as not to be damaged. Curing shall be done by the continuous application of water in a fine spray and shall be carried out for at least 10 (seven) days. Where the specification or the item of work calls for water proofing, the Contractor shall add the recommended percentage of waterproofing compound to the mortar mix.

Plaster or render to ceilings shall be carried out before plaster or render to walls and plaster or render to walls shall commence at the top and proceed downwards.

9.4 Internal Plaster or Render

12mm thick single coat cement sand mortar shall be dashed on to prepared wall and ceiling surfaces and finished smooth by trowelling on the surface with neeru (lime cream).

Internal plaster shall also be applied to door and window jambs and the undersides of lintels and the like.

9.5 External Plaster or Render

18mm two coat cement and sand mortar shall be applied to external surfaces as specified. The first coat shall be 12mm thick and the second coat 6mm thick. The first layer shall be dashed against prepared surfaces with a trowel to obtain an even surface. The second layer shall then be applied and finished moving a trowel finished even and uniform surface.

9.6 External Sand Faced Plaster or Render

18mm two coat cement and sand mortar shall be applied to external surfaces. The first or the scratch coat shall be approximately 12mm thick and shall be carried out continuously without break to the full lengths of walls or natural breaking points, such as doors, windows and the like. The scratch coat shall be applied to prepared surfaces with heavy pressure to produce a true and even surface and then lightly roughened by cross scratch lines to provide a bond for the finishing coat. The scratch coat shall be cured for at least 7 (seven) days and then allowed to dry.

The second coat shall be 6mm thick and shall not be applied until at least 10 (ten) days after the application of the scratch coat. Before the application of the second coat the scratch coat shall be uniformly dampened. This coat shall be applied from top to bottom in one operation and without joints and the finish shall be straight, true and even. Only approved white sand shall be used for the second coat and for finishing work Sand for finish shall be of even coarse size and shall be dashed on the surface and sponged.

Where 32mm thick plaster or render is specified for the purpose of providing breading, bands and the like work shall be carried out in either two or three coats as directed by the Consultant / PMC.

For pebble face finished plaster or render pebbles of approved size and quality shall be dashed against the final surface to obtain a uniform pattern to the satisfaction of the Consultant/PMC.

9.7 Plaster of Paris

Surface of walls / Ceilings where specified shall be treated with Plaster of Paris. The particular brand of this special plaster and its composition must be previously approved by the Consultant/PMC. The basic materials for the plaster shall be either Calcium Sulphate for Gypsum. The entire surface must be very smooth and unevenness must be removed. Special trained and skilled artisans with previous experience of this work will have to be employed for the purpose of achieving high grade finish.

Before application of Plaster of Paris the surface to be treated shall be thoroughly cleaned, brushed and patching must be scraped properly, and then all holes, cracks and patches shall be made good with approved materials.

9.8 Waterproof Finishes

Where specified or directed by the Consultant/PMC the Contractor shall mix approved waterproofing admixtures obtained from reputed manufacturers to the mortar for plasterwork and render.

Quantities to be used and the method of mixing shall be strictly in accordance with the manufacturer’s instructions subject to the satisfaction of the Consultant/PMC. Admixtures shall not contain calcium chloride unless specifically approved by the Consultant/PMC and shall conform to IS 2645.

9.9 Measurement

Work under this item shall be measured by taking the surface of the area plastered or rendered, less deductions for openings, doors, windows, fan opening and the like. Plasterwork or render carried on

door and window jambs, around openings and the like shall be measured and added to the general areas. Wherever wattas are required they will not be measured separately but included in the surface areas as measured here above.

10. PAINTING

10.1 SCOPE

This Specification describes the general requirements of painting and decorating on internal and external surfaces, woodwork and metal work and varnishing and polishing to be executed on projects.

10.2 APPLICABLE CODES

IS 75 Specification for raw and refined linseed oil. IS 345 Specification for transparent liquid wood filler IS 348 Specification for French polish

IS 427 Specification for distemper – dry colour

IS 428 Specification for distemper – oil emulsion colour IS 533 Specification for gum spirit of turpentine

IS 1477Code of Practice for painting of ferrous metals in buildings Parts I and II (Pre-treatment and Painting)

IS 2338 Code of Practice for finishing of wood and wood-based materials

– Parts I and II (Operation and workmanship and Schedule).

IS 2395 Code of Practice for painting concrete, masonry and plaster surfaces.

IS 2932 Specification for enamel synthetic exterior undercoating and finishing.

IS 2933 Specification for enamel exterior undercoating and finishing.

IS 3140 Code of Practice for painting asbestos cement building products.

IS 3537 Specification for ready-mixed paint, finishing, interior, for general purposes to IS colours.

IS 4597 Code of Practice for finishing of wood and wood-based products with nitro-cellulose and cold-catalysed materials.

IS 5410 Specification for coloured cement paints.

IS 6005 Code of Practice for phosphating iron and steel

IS 6278 Code of Practice for whitewashing and colour washing IS 1200 Recommended for mode of measurement.

10.3 PAINTING, LIME WASING AND COLOUR WASHING

10.3.1 General

Paint, lime wash and colour wash shall except for white wash, be factory made, delivered to Site in manufacturers' sealed drums in colours approved by the consultant /PMC and conform to the relevant Standards.

Paints shall be such as to be capable of withstanding the effects of weather and the atmosphere and the results of wood decay and metal corrosion and shall have good spreading coverage, be easy to apply, form a thin uniform film upon application, not crack when dry and have hard and durable surfaces.

10.3.2 **Lime Wash**

Materials for lime wash shall be freshly burnt fat lime of good quality free from unburnt stone and other foreign matter dissolved in sufficient quantities of water (4 to 5 litres per kg. Of lime), stirred thoroughly and strained through a clean coarse cloth. Clean gum or Fevicol dissolved in hot water shall then be added in the proportion of 2 gm of gum Arabic per litre of lime to prevent lime wash being removed when rubbed.

Surfaces shall be prepared by removing all mortar droppings and other deleterious foreign matter and thoroughly cleaned with wire or fibre brushes to the approval of the Consultant /PMC. Holes and/or depressions shall be finished with mortar and cured prior to lime washing.

Lime wash shall be applied by brush, the first stroke being from the top downwards, the second from the bottom upwards over the first stroke and similarly with strokes from right and left over the first strokes before they dry. This application forms one coat and each coat shall be allowed to dry and shall be subject to inspection by the Consultant /PMC before the next coat is applied. When dry surfaces shall not show signs of cracking and present a smooth and uniform finish free from brush marks, not easily removed when rubbed. Patchy or streaky work will be rejected and shall be re-executed at the Contractor's own expense.

Doors, windows, floors, fittings, fixtures and the like shall be protected from splashes, splashing and droppings, if any being removed and surfaces thoroughly cleaned to the satisfaction of the Consultant / PMC.

10.3.3 **Colour Wash**

Colour wash shall consist of lime was composed as described above to which a solution of water and lime fast pigment, boiled if directed, shall be gradually added and stirred until the required tinge is obtained to the satisfaction of the Consultant /PMC.

Surfaces shall be prepared by removing all mortar droppings and other deleterious foreign matter and thoroughly cleaned with wire or fibre brushes to the approval of the Consultant /PMC. Holes and/or depressions shall be finished with mortar and cured prior to colour washing.

Colour wash shall be applied by brush, the first stroke being from the top downwards, the second from the bottom upwards over the first stroke and similarly with strokes from right and left over the first strokes before the dry. This application forms one coat and each coat shall be allowed to dry and shall be subject to inspection by the Consultant /PMC before the next coat is applied. When dry surfaces shall not show signs of cracking and present a smooth and uniform finish free from brush

marks, not easily removed when rubbed. Patchy or streav work will be rejected and shall be re-executed at the contractor's own expense.

Doors, windows, floors, fittings, fixtures and the like shall be protected from splashes, splashing and droppings, if any, being removed and surfaces thoroughly cleaned to the satisfaction of the Consultant / PMC.

10.3.4 **Dry Distemper**

Dry distemper shall be of approved make and shade and shall be applied only in dry weather with a broad stiff brush in long parallel strokes.

Priming coats shall be applied to completely dry surfaces as recommended by the manufacturers of patent distempers and approved by the Consultant / PMC and allowed to dry thoroughly before the next coat is applied.

Surfaces shall be cleaned and all cracks, holes and surface defects repaired with gypsum and allowed to set hard. All irregularities shall be removed by sand papering smooth and wiped clean and surfaces so prepared shall be completely dry and free from dust before distempering is commenced. In the case of newly plastered surfaces special care shall be taken to ensure that they are completely dry before any application is attempted.

Existing, previously distempered surfaces shall be cleaned of grease, dirt, dust and other deleterious matter and cracks, holes and surface defects repaired with plaster of Paris, allowed to set hard, sand papered smooth and wiped clan. Flaking from previous coatings, if any shall be thoroughly removed.

10.3.5 **Synthetic Washable Distemper**

Synthetic washable distemper shall be of approved make and shade and shall be applied only in dry weather with a broad stiff brush in long parallel strokes.

Priming coats shall be applied to completely dry surfaces as recommended by the manufacturers of patent distempers and approved by the Consultant / PMC and allowed to dry thoroughly before the next coat is applied.

Surfaces shall be cleaned and all cracks, holes and surface defects repaired with gypsum and allowed to set hard. All irregularities shall be removed by sand papering smooth and wiped clean and surfaces so prepared shall be completely dry and free from dust before distempering is commenced. In the case of newly plastered surfaces special care shall be taken to ensure that they are completely dry before any application is attempted.

Existing, previously distempered surfaces shall be cleaned of grease, dirt, dust and other deleterious matter and cracks, holes and surface defects repaired with

plaster of Paris, allowed to set hard, sand prepared smooth and wiped clan. Flaking from previous coatings, if any shall be thoroughly removed.

10.3.6 **Acrylic Emulsion Paint**

Acrylic emulsion paint shall be of approved make, color and shade to the satisfaction of the Consultant / PMC.

Acrylic emulsion paint shall be diluted by the addition of a quantity of water equivalent to half the volume of the paint to be applied. The paint and water shall be thoroughly mixed and then strained through cloth.

Priming coats shall be applied to surfaces by brush and allowed to dry properly, holes and depressions being filled with putty prepared with whitening and Acrylic emulsion paint and rubbed smooth and dry and touched up with Acrylic emulsion paint.

Subsequent coats, diluted by the addition of a quantity of water equivalent to about 15% to 20% of the volume of paint to be applied shall be applied to surfaces by brush and allowed to dry thoroughly so that no brush marks shall be seen.

Surfaces shall be cleaned and all cracks, holes and surface defects repaired with gypsum and allowed to set hard. All irregularities shall be removed by sand papering smooth and wiped clean and surfaces so prepared shall be completely dry and free from dust before painting is commenced. In the case of newly plastered surfaces special care shall be taken to ensure that they are completely dry before any application is attempted.

Existing, previously distempered or painted surfaces shall be cleaned of grease, dirt, dust and other deleterious matter and cracks, holes and surface defects repaired with plaster of Paris, allowed to set hard, sand papered smooth and wiped clean. Flaking from previous coatings, if any shall be thoroughly removed.

10.3.7 **Synthetic Enamel Paint**

Synthetic Enamel Paints and primers, in general, shall be of approved quality, colour and of approved manufacturer. These materials shall be in sealed tins and shall be opened in the presence of the Consultant / PMC.

Preparation of Surface

Iron and Steel Works:

Surface to be painted shall be thoroughly cleaned, sand papered and / or rubbed with emery cloth, if necessary, to remove grease, mortor or any other foreign materials incase of rusted surface, it shall be first cleaned with wire brush till the corroded rust is removed. The prepared surface shall be shiny and free from brush marks, patches, blisters and other irregularities. The surface thus finished shall be got approved for painting.

Wood Work:

All surface to be painted shall be thoroughly cleaned sand papered and removed of all foreign materials. In case of surface having knots and nails holes, this shall be filled knotting and stopping materials. The materials shall be consist of pure shellac dissolved in methylated spirit. Stopping materials shall consist of putty. The surface thus treated shall be allowed to dry and then sand paper

smooth (for veneered surface film or French chalk shall be provided to give a smooth surface prior to application of primer).

Application

After preparing the surface, a primer coat shall be applied. The primer coat shall be ready mixed of approved make and manufacturer. After the primer coat is applied and perfectly dried all holes, cracks etc., still remaining shall be filled in with putty and the surface sand papered smooth. Then a second coat of paint of approved shade and manufacturer shall be evenly applied and allowed to dry.

The third coat shall be carefully applied to achieve smooth and even surface after the previous coat has dried up. Minimum 3 coats of paint

Shall be applied inclusive of a primer coat. If a proper and even surface is not obtained to be the satisfaction of the Consultant / PMC in 3 coats. Contractor shall be taken to be see that dust or other foreign materials do not settle or otherwise disfigure the various coats.

10.3.8 **Enamel Painting**

Enamel paint shall conform to the relevant Standards and be of the specified make, colour and shades as approved by the Consultant / PMC. Materials shall be obtained directly from approved manufacturers and brought to Site in manufacturers' sealed drums and tins for inspection by the Consultant / PMC.

Paint for undercoats and finishing coats shall be ready mixed. Mixing by the Contractor shall not be allowed except with the prior written permission of the Consultant / PMC, in which case preparation of the ingredients and the control

of quality shall be in strict conformity with the manufacturers' recommendations and the relevant Standards and Codes of Practice.

Materials shall be properly stored and protected when not in use with the lids of containers kept tightly closed. Paint in open containers during painting operations shall be covered with a thin layer of turpentine to prevent the formation of skin on the surface.

If required by the Consultant /PMC paint supplied by the Contractor shall be quality tested in an approved laboratory as described in IS 101. Rejected paint shall be removed immediately from Site.

Application

Unless otherwise specified, paint shall be applied by brush. Brushes of appropriate size shall either round or oval shaped and shall be maintained carefully throughout the work so as to be pliable and free from loose bristles. All brushes, rollers, implements and the like used for painting shall be cleaned of all foreign matter prior to beginning different operations.

Contents of drums and tins shall be well stirred before use and constantly during operations with a small, clean and smooth stick to prevent sedimentation at the bottom of containers.

Painting shall be carried out, as far as possible, in dry, warm weather.

Primer coats shall be applied as soon as surfaces have been cleaned and before the deterioration of surfaces by rust and/or contamination by dust, dirt or any other deleterious material. Sufficient time shall be allowed for one coat of paint to dry before the next is applied.

Painted surfaces shall be protected from sun, rain condensation, contamination or other surface damage until they are completely dry, "wet Paint" boards being placed where necessary.

Surface preparation, the application of priming coats, undercoats and finishing coats shall be carried out as specified below or as recommended by the manufacturer.

New plaster shall be carefully rubbed smooth and thoroughly cleaned with fresh water to leave dry and smooth surfaces free from dirt.

Surfaces shall not be primed or painted until they are completely dry and hard and have been approved by the Consultant /PMC.

Steel surfaces shall be degreased using proprietary brand solvent cleaners approved by the Consultant /PMC or mineral turpentine or petroleum and other petroleum solvents, such as trichloroethylene or other equal and approved alkali solutions or detergents.

De-rusting of steel surfaces shall be done by manual scraping using wire brushes, fine steel-wool, sand paper and the like, mechanically by sand blasting, shot blasting or by flame cleaning or chemical cleaning by methods approved by the Consultant /PMC.

Enamel paint shall not be applied to woodwork that is not well seasoned. Surfaces of woodwork to be painted shall be thoroughly dry clean and smooth and prepared by using coarse and medium grade sandpaper with finished surfaces free from scratches.

Before applying primers to surfaces of woodwork knotting shall be done with two coats of varnish made by dissolving Shellac in methylated spirits wine or as directed by the Consultant /PMC.

Recommended Primer shall be

a) Wood Work - Pink conforming to IS 3534

b) Steel Work - Red oxide, zine chromate contorming to IS 2074.

c) Cement Primer - Conforming to IS 109.

Plastered Surfaces: Priming coats shall consist of equal parts of white and red lead mixed in boiled linseed oil to the required consistency applied uniformly over surfaces to be painted. When dry, all cracks, holes and other such defects shall be filled with a mixture of one part of white lead and 3 parts of ordinary putty. Surfaces shall then be rubbed with sandpaper and dusted clean and an undercoat thinly applied so that plastered surfaces are saturated.

Steel surfaces: Priming coats shall consist of red lead conforming to IS 102 applied uniformly over surfaces to be painted. On old or previously painted surfaces and new surfaces already primed with red lead, surfaces shall be thoroughly cleaned and primed with red lead on exposed surfaces as necessary or over whole surfaces as directed by the Consultant / PMC.

Woodworker surfaces: Priming coats shall consist of red lead, white lead, raw and boiled linseed oil and patent dryers applied uniformly over surfaces to be painted. When dry, small holes, cracks, open joints and other minor defects shall be stopped with putty made from whitening mixed to proper consistency with raw linseed oil and white lead to facilitate hardening of putty. Surfaces shall then be lightly rubbed down smooth with sandpaper and dusted clean.

Finishing coats: Unless otherwise specified, finishing of all surfaces shall consist of minimum two coats of synthetic enamel paint of approved make, colour and shade. The second coat of paint shall give a flat, semi-glossy or glossy finish as specified or as directed by the Consultant / PMC and shall present on even appearance and show no brush marks. Stipple finishes, if directed by the Consultant / PMC, shall be provided at no extra cost.

10.3.9 **French Polishing**

French sprit polish shall conform to IS 2338 and shall be made by dissolving 0.15 Kg of best quality shellac, free from resin or dirt, in 1 litre of methylated spirit. Suitable pigment shall be added to obtain the required shade or colour.

Workmanship

Surfaces to be polished shall be cleaned and all unevenness rubbed smooth with sandpaper, knots, if visible, being covered with a preparation of red lead and glue. Holes and indentations in surfaces shall be filled with putty made of whiting and linseed oil. Surfaces shall then be given a coat of filler comprising 2.25 Kg of whiting dissolved in 1.5 litres of methylated spirit. When dry surfaces shall again be rubber down perfectly smooth with sandpaper and wiped clean.

Polish shall be applied by using pieces of clean fine cotton cloth wrapped around cotton wool made into pads. Pads shall be moistened with polish sparingly, but uniformly, and completely over the entire surface. When dry a further coat shall be applied in the same way. Finishing shall be carried out with pads covered with a fresh pieces of clean, fine cotton cloth, slightly dampened with methylated spirit, rubbing lightly and quickly with a circular motion, to give a uniform, high class texture.

10.3.10 **Wax Polishing**

Was polishing shall be approved quality and make and brought to Site in sealed containers as marketed by the manufacturers.

Workmanship

Woodwork to be polished shall be thoroughly cleaned, stopped and rubbed down perfectly smooth with different grades of sandpaper, the final rubbing done with sandpaper slightly moistened with linseed oil.

Polish shall be applied evenly with clean cloth pads in such a way as to leave no blank patches and rubbed continuously for at least thirty minutes. When surfaces are dry, the second coat shall be applied and rubbed for not less than two hours until surfaces have assumed a uniform gloss, showing no signs of stickiness when touched.

10.4 RATES FOR PAINTING AND POLISHING

The Contractor's rates for painting, polishing and varnishing work shall include:

1. Provision of all materials, labour and equipment required to execute the work as specified.
2. Provision of scaffolding (single/double) including erection and removal.
3. Preparation of surfaces.
4. Application of the specified number of coats of approved paint, polish or varnish, including priming coat and where proper, even surfaces or shades are not obtained the application of extra coat (s) as directed and to the final approval of the Consultant / PMC.
5. Application of additional priming or other preparatory coat

   (s) to obtain thoroughly saturated surfaces and filling with putty as required and/or directed.
6. Extra cost of painting smooth and/or rough surfaces, such as precast concrete pardis, rough cast plaster, sand faced plaster and the like.
7. Curing cement paint as directed for a minimum of 7 days.
8. Protection of doors, windows, floors, furniture and fittings, including ironmongery and metalwork from splashing and droppings, including cleaning surfaces as directed.
9. Repair of cracks, developing in plaster prior to or after final painting, by filling with suitable putty and painting surfaces again as directed to give even surfaces to the satisfaction of the Consultant /PMC. Neeru surfaces damaged due to any reason before painting shall be redone by using plaster of Paris as directed.
10. Cleaning of all surfaces after painting, polishing and varnishing.

10.5 MEASUREMENT COEFFICIENTS

10.5.1 Timber Doors and Windows

1. Panelled doors/windows Measured flat 1.3 (for each side)

   including frame
2. Flush Doors -do- 1.20(for each side)
3. Partly paneled and partly -do- 1.0 (for each side) glazed
4. Fully glazed doors windows -do- 0.80(for each side)
5. Fully venetioned or louvered
6. Door / Windows -do- 0.80(for each side)

10.5.2 Steel Doors and Windows

1. Fully glazed doors/windows Measured flat 0.50 (for each side)

   including frame

2. Plain sheeted steel doors / -do- 1.10 (for each side) windows

3. Collapsible gates Measured flat 1.50 (for painting all over)

4. Rolling shutters of interlocked -do- jump guide 1.10. (for each side) laths bottom rails, locking arrangement included (Top cover measured separately)

10.5.3 **General Work**

1. Expanded metal, MS grill work, Measured flat 1 (Painting all over) grating in guard bars, supporting of balustrades, railing and members shall not be measured separately.

TECHNICAL SPECIFICATIONS FOR INTERIOR WORKS
(SECTION-2)

1.0 GENERAL:

1.1 All the materials to be used for the works shall be of the best quality confirming to relevant I. S. Code and as per approved brands or approved by Engineer in charge / Architect / Consultant for non-branded items.

1.2 All the exposed timber shall be as per sample approved, with moisture content as per I.S. standards and well-seasoned, free from knots, cracks, warps, and other defects and shall be treated against white ants with Aldrex chemicals, as per specifications of the manufacturers (minimum 2 coats).

1.3 The entire internal timber frame shall be 1st quality, Salwood, well-seasoned free from knots, cracks, warps, and other defects and shall be treated against white ants with Aldrex chemical (minimum 2 coats) as per approved sample.

1.4 Rate of all items include the cost of finishing timber, Veneer, Plywood etc. with synthetic enamel paint / spirit / wax polish /melamine as specified to match with surrounding surface. The decision of the Engineer in charge /Architect /Consultant on the nature of finishing shall be final and binding on the contractor without any extra cost.

1.5 All particle boards / ply sheets both marine and veneered block boards (Phenol bonded) will be water proof quality with ISI mark and as per approved brands only.

1.6 All the edges shall have teak wood leaping /moulding as per drawings and specifications.

1.7 The contractor shall obtain the approval regarding shade, quality, type and approved brands of color in respect of paint and polish, carpet or fabric from the Engineer in charge / Architect /Consultant before purchasing. The contractor, if required, shall produce the reasonable number of samples and put up such samples on wall, partitions, and furniture as directed by the Engineer in charge / Architect /Consultant.

1.8 All unexposed surface of paneling / ceiling will have coat of primer and / or polish as specified or directed by the Engineer in charge / Architect /Consultant.

1.9 Externally exposed Laminates to be used for finishing shall be of 1.0mm thick and internal finishing shall be of 1.0mm thick egg white laminates from approved brands and approved list of materials.

1.10 The frame work for false ceiling / paneling etc. shall be laid in true line, level in both directions; the wooden scantlings shall be straight and fixed rigidly with screws of appropriate size, at appropriate distance as directed at required level. The framework shall be painted with two coats anti – termite solution or Black Japan before the same is covered with ceiling / paneling boards etc.

1.11 The G. I. suspenders for false ceiling shall be straight and fixed rigidly to R.C.C. structures / slab / roof truss / purlin or wood support etc.

1.12 For wall paneling and ceiling and partitioning should be calcium silicate boards with all the G.I. suspenders, ceiling sections, perimeter channels, intermediate channels, ceiling angles, connecting clips, soffit cleats etc. used or as per directions given by the Engineer in charge / Architect /Consultant.

1.13 For ceiling and paneling work, filling joints, finishing and painting should be done as per the manufacturer's specifications and directions given by the Engineer in charge / Architect / Consultant. (I.S. 2542 & 2095)

1.14 Agro-wood paneling, polishing, should be done as per the directions of the manufacturer Andaman Timber Ltd. Polish should be applied after cutting & to all the surfaces.

1.15 The fabric to be used should be of required acoustical grade and as per approved samples by Engineer in charge / Architect /Consultant.

1.16 All the hardware to be used in furniture paneling and partitions will have to be approved brands only.

1.17 Paint shall be use of the approved brands and type as per direction by Engineer in charge / Architect /Consultant. Different types of paints may be required for different paneling or sections of paneling and ceiling and contractor should follow the specifications & directions given by the Engineer in charge / Architect / Consultant about this.

1.18 Melamine polish – preparation of surface – filling grain completely with putty made of whiting powder with required strainer and Acrypol N 83 Sand and Surface mildly with 120/150 Emery paper softer drying for 15 min. polishing – 1. Mix Acrypol SP 85 matt in equal proportions. Spray the mixture uniformly with a spray gun at a pressure of 30 psi. 2. Allow it to dry for 6 – 8 hrs. 3. Sand surface with 120 / 150 Emery paper. 4. Repeat 1, 2 and 3 for two more coats up to required surface or approved by the Engineer in charge / Architect /Consultant. Poly-urethane finish - to veneered tops surfaces & edges: Surface preparation as require for polishing (French & melamine). Sand surface mildly with 100 Emery paper, for 15 min, after first coat polishing. Apply one coat of Primer and allow 8-12 hours of drying. Spray first coats of Polyurethane transparent matt finish and recoat after interval leading to tacking of first coat.

1.19 The rates quoted for various items included in this tender such as wooden framework, false ceiling, paneling etc. shall be inclusive of the cost of necessary framework, scaffolding, all tools and tackles, machineries required for execution of the works, lifting of materials etc. As the work is proposed to be executed at various heights, no extra claim shall be entertained on account of execution of work at various heights / floor. The measurement of items included in this work shall not be taken and paid separately for different floor levels and varying heights.

2.0 MODULAR WORKSTATIONS (TILE BASED SYSTEM)

2.1 Components:-

Panels Construction - Each panel consists of Vertical extrusions 2Nos and Horizontal extrusions made of 1.2mm thick aluminum with duly powder coated at every division of tile/block. Each panel have Bottom frame fabricated for 50-60mm panel comprises of L-channels made of 2mm thick CRCA steel (IS: 513), formed plates of 3mm thick HR steel (IS: 2062) & ERW steel tube of size 35x15x1.6mm thick in oval cross section (IS: 7138) welded together. The complete bottom frame shall be powder coated with an average of 50-60 microns thickness of epoxy powder coating. The Bottom Frame is bolted with the Upright verticals. Each Panel is provided with 2Nos Legs of height 120mm are fixed at the bottom frame of the panel. Legs are fabricated by CO2 welded MS Tube of section 38mm x 25mm (IS: 7138 ERW Tube, 38mm x 25mm x 16bg) with the base plate of the MS plate of 35x22x5mm (IS: 2062, 5mm HR) over which an M8 Leveler is fitted which allows for

adjustment of the height by 50mm. It will be coated with 45-50micron thickness of epoxy powder coating. Each Panel consists of 2Nos Intermediate blocks. In a 50-60mm Thick panel intermediate block shall comprise of 38mm thick paper honeycomb with 3mm MDF/ Hollow MDF on each sides and 0.6mm decorative laminate on both sides. Particle board framing shall be used on outer boundary of these blocks as well as intermediately at certain locations forming conduit for passing cables. These blocks will be located in the middle bands of the panels made out of a composite construction of MDF and paper honeycomb/ hollow MDF. Each Panel consists of TOP TILES/SPLIT TILES. These tiles shall be slide in to the panels from top before fixing the top horizontal. These tiles shall be supported from top & bottom side with clips made from PP co polymer fitted in horizontal extrusion. In case of split tiles it shall be offered in Fabric magnetic tiles, Whiteboard tiles. Each Panel consists a BOTTOM TILE. These bottom tiles shall be press fitted on to the assembly frame of the panel with the help of snap on clips made of nylon-66 and support clips made from Polypropylene (PP). All partitions and side panels have levelling screws for adjustment in case of uneven floor to take care of +/- 40 mm of uneven flooring.

Tile Finishes:

• FABRIC MAGNETIC TILES: Fabric magnetic tiles shall be fabric upholstered metal tiles in 0.6 mm thick G.I. Grade O as per IS: 277. The fabrics shall be upholstered with adhesives.

• FABRIC TACK TILES: Fabric tackable tiles shall be upholstered metal tiles in 0.6mm thick G.I. grade O as per IS: 277, with Polyurethane foam in the tile for tackablity. The fabric shall be upholstered with adhesives.

• WHITE BOARD TILES : White board tiles shall be made of 8.0 mm thick particle board conforming to IS: 12823 laminated with 0.6mm thick white glossy high pressure laminate on outer side & 0.6mm backing laminate on inner surface and will be having all its edges with minimum 0.5 mm thick PVC edging.

Aluminum Trims: The top trims and end trims for 50-60 mm shall be made from aluminum extrusion. All kinds of extrusions for 50-60mm shall have average wall thickness of 1.2 mm & having finish of powder coating. Top trim in 50-60mm thick panel shall be press fitted on the horizontal extrusion, it shall be slide fitted with the help of top trim connector made from PP copolymer 3530 grade. End trim for 50-60mm thick panel shall be slide fitted with the help of end trim connector made from 2.0mm thick M.S. CRCA Grade D as per IS: 513.

Legs - System shall also have 120 mm high powder coated welded metal legs to give the system an elevated look. Single side legs are fabricated by CO2 welded MS Tube of section 38 mm x 25 mm (IS: 7138 ERW Tube, 38 mm x 25 mm x 16bg) with the base plate of the MS plate of 35mm x 22mm x 5mm (IS: 2062, 5 mm HR) over which an M8 Leveler is fitted.

End/Intermediate separator: partitions of 22.8mm thick including powder coated aluminum trims and supported on Legs for better air circulation and helps in keeping floor clean. The 22.8 mm panels are only to be used as Separator/End panels to provide additional privacy. These panels have various finishes and no cable management ability.

Panel Construction: The 22.8mm End/Separator panels shall be made of horizontal and vertical uprights. These uprights and horizontals shall be made of aluminum extrusion having material AL96063-T6 & have average wall thickness of 1.2mm & powder coated with epoxy-polyester powder. The Blocks for the End/Separator panels shall be of 16mm to 18mm thickness in the selected finish. The top most block in the panel shall be the top block of the panel. It shall be available in fabric, laminate, whiteboard, fabric metal, tackable and clear glass finishes. The 2Nos blocks in the intermediate bands shall be available in fabric or laminate finish and the lowermost block in the panel shall be the bottom block which shall be in fabric, metal or laminate finish.

Tiles: Tile Finishes in End/Separator Partitions to be provided as per the site and layout approval. Finishes in these panels shall be

- LAMINATE FINISH BLOCKS: Laminate finish blocks shall be made from 18mm thick particle board, cladded with 1mm thick laminate of approved shade
- FABRIC FINISH BLOCKS: These shall be made from 18mm thick Pre-Laminated Particle Board upholstered with 1mm thick approved shade of fabric using adhesives.
- WHITEBOARD BLOCKS: These shall be made of 16mm thick particle board laminated with 0.6mm thick white glossy high pressure laminate on both sides and having all its edges with minimum 0.5 mm thick PVC edging.
- GLASS BLOCKS: These shall be made of 4mm thick toughened plain glass having diamond polish edge finish.
- FABRIC TACKABLE BLOCKS: These shall be made from 18mm thick Pre-Laminated Board battens which hold 3mm MDF in between. 6mm thick Polyurethane foam shall be pasted on 3mm thick MDF and this assembly shall be upholstered with approved shade of fabric on both sides using adhesive.
- METAL FINISH BLOCKS: Metal finish blocks shall be made from two components of 0.8mm thick M.S. CRCA Grade D as per IS: 513 powder coated with epoxy polyester finish.

Aluminum Trims: The top trims and end trims for 22.8mm partition shall be made from aluminum extrusion having material AL96063-T6. Top trim in 22.8mm thick panel shall be slide fitted with the help of top trim connector made from PP copolymer 3530 grade. End trim for 50-60mm thick panel shall be slide fitted with the help of end trim connector made from 2.0mm thick M.S. CRCA Grade D as per IS: 513. End trim for 22.8 mm thick panel shall slide with the help of end trim connector made from nylon-66.

Legs: Legs shall be 120 mm high powder coated welded metal legs. Legs shall be fabricated by CO2 welding MS Tube of section 38mm x 20mm (IS: 7138 ERW Tube) with the base plate of the MS plate of 35mm x 22mm x 5mm (IS: 2062, 5 mm HR) over which an M8 Leveler shall be fitted, The height of the panel leg will be 126mm. This shall be coated with minimum 45 micron thickness of epoxy powder coating.

Workstation Worktop as per the approved shape and site requirement made out of 25mm thick prelam particle board. All the open edges of work surface shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The work surface shall be provided with circular cut out of Dia.65mm as per the requirement, for passing of wires. These cut outs shall be provided with ABS covers. Work surfaces are fitted to the panels by work surface brackets. Brackets are made of 2.0mm thick CRCA grade D steel as per IS : 513-19. Brackets are slide in between end trim and vertical extrusions. The product should be complete and as per approved sample and as per the direction of Engineer-In-charge.

Computer Key Board Tray of 480mm (L) X 280mm (D) X 40mm(H) made out of CRCA steel as per IS : 513I made of 0.9mm thick powder coated with sliding channels and other fixtures/fittings. It should also have a sliding system for accommodating mouse. The product should be complete and as per approved sample and as per the direction of Engineer-In-charge.

Mobile Pedestal having 3 Drawers Unit having flat metal front and top with Central locking. The Drawer Unit consists of 2Box and 1File Drawers. The Overall size of the Drawer Units is 450mm(W) X 435mm(D) X 646mm(H). Construction & Material of Drawer Unit : Welded Assembled of 0.8 thick CRCA for Body Shell, Drawer Front & tray, Front Side Stiffener, Rear Side Stiffener & Bottom, 1.2mm thick CRCA Top Stiffener & Bottom stiffener. Drawer Fronts & Metal Front Straight Edge. All Drawers with Double extension precision ball slide shall be provided. For Drawer pulling, side wise tapered recess provided in shell behind Drawer Fronts. Locking:10 lever Cam Lock & Central RH locking with actuator & lock channel mechanism. Top Panel : 0.8mm thick Metal Straight Edge Top. Castors : Swiveling non-lockable 4Nos Castors mounted below the body shell. The Total drawer unit is finished with Epoxy Polyester Powder coated to the thickness of 50 microns (+/-10). The product should be complete and as per approved sample and as per the direction of Engineer-In-charge.

2.2 **Electrical Fittings and Wire management:-**

Wires shall be taken into the system through cable ducts from the junction boxes and it is carried upto the panels through concealed conduits inside the blocks. Wires runs through the system from Bottom tile and extended to the top at various locations by the help of 2 nos. vertical Cable Ducts in each panels. Cable duct shall be made from 0.8 mm thick M.S. CRCA Grade D as per IS: 513 - 1994. It is constructed with two parts, one is body & another is cover. It holds the cables & gives aesthetic appearance by covering all cables entry, which are moving upward to the panels. Size of Cable duct is 107mm W X 154 mm H X 21 mm D.

2.3 **Measurement**:

Measurement for payment shall be for each unit for single person seating capacity

3.0 TILE BASE FULL HEIGHT MODULAR PARTITION

3.1 **Frames:** -

Partition thickness is 50- 80mm for added stability and main structure shall be a combination of different Aluminum Sections made from Aluminum alloy 63400-WP and shall be powder coated

with Epoxy Polyester or Anodized, varying in heights and widths to make a full height cabin up to 3000 mm below the false ceiling level. The frame structure shall be made by joining Aluminum Extrusions by means of brackets made of 3 mm thick HR (IS-2062) and screws. Overall thickness of panel assembly shall be 66 mm. In elevations, the width of tiles shall vary from 300mm to 2400mm in pitch of 150mm and heights shall vary from 600 mm to 2400 mm (actual 534 mm to 2136 mm) in pitch of 600 mm. The system shall provide to make junctions straight partition panels as per approved layout. The super structure above false ceiling level shall consist of True ceiling mounting bracket which shall hold wooden batten frame work made from Rubber wood (50x50xlength of partition). The partition panel extrusions shall be grouted to this superstructure. The system shall have provision for leveling adjustment to compensate for floor unevenness (up to 40 mm) as well as false ceiling height difference(up to 15 mm). Provision shall be provided Horizontal adjustment at wall side with adjustment up to 20 mm.

3.2 **Raceways:-**

Provision of wire management through the panels vertically shall be possible. Wiring intake into the panel from flooring as well as ceiling shall be provided. Provision in panel width up to 1200 mm width for 2 slots of 100 x 25 at a distance of 100 mm from the edge of the panel shall be provided. Beyond 1200 mm to 2400 mm, the slots shall increase from 2 to 4 nos. the intermediate slots shall be equidistance from the end slots. The end slots shall be same as the ones in the 1200 mm w panels. Provision to provide wire management in full glazed panel in separate power post should be possible

3.3 **Tiles:-**

Fabric Tile:

Fabric Non-tack tiles shall be made of 9.0 mm thick PLB / PLT boards(IS: 12823:1990) edge banded with 0.5 mm thick PVC lipping, and upholstered with approved fabric on front side. The overall thickness of tile shall be 10mm.

Glass Tile:

The glass used is 5 mm thick clear Toughened glass or 5mm thick BPG Toughened glass (IS-2835)

PVC Rubber extrusion fixed on to the extrusion profile, supports the glass edges from back side.

Tackable tile:

Fabric Tackable tiles shall be made of 0.7mm thick GI Sheet (IS-277), with 8mm thick P.E. foam glued to it on front side which are fabric upholstered on front side. The overall thickness of tile shall be 9 mm. Stiffeners made of GI Sheet (IS-277) shall be provided at the back of the tile.

Whiteboard marker tiles:

Back painted glass of 5 mm Shall be provided for glass finished writing board in the panel itself.

Laminate Tile:

Wooden DL tile of 9 mm thick PLB edge banded with 0.5 mm thick PVC lipping with approved design of laminate shade shall be provided as per approved panel elevations.

3.4 **Wire Management:** -

Provision of wire management through the panels vertically shall be possible. Wiring intake into the panel from flooring as well as ceiling shall be provided. Provision in panel width up to 1200 mm width for 2 slots of 100 x 25 at a distance of 100 mm from the edge of the panel shall be provided. Beyond 1200 mm to 2400 mm, the slots shall increase from 2 to 4 nos. the intermediate slots shall be equidistance from the end slots. The end slots shall be same as the ones in the 1200 mm w panels. Provision to provide wire management in full glazed panel in separate power post should be possible

3.5 **Doors:-**

Door Frame Size - 2400x1050 (Actual 2268 x 1050) - is made of Aluminum extrusions

and can be offered in anodized finish as well as powder coated finish.

1. Glass door with Floor spring

Double side opening Glass door is provided with Floor Spring, Handle for Door and

top/bottom patches. The door is made of 10mm thick clear Toughened glass (IS-2835).

Standard Door Shutter Size: 2200 x 956 mm (actual)

2. Wooden Door

Wooden door can be offered in this system. The door is made of 25 mm Rubber wood

batten with 8 mm MDF with decorative paper from Both Side. Door is mounted on

Aluminum Extrusion frame with 3 Hinges and Door lock.

Standard Door Shutter Size: 2201 x 956 x 41 mm (actual)

4.0 **ROLLER BLINDS**

4.1 The item shall include supplying & fixing roller blinds of following specifications:

The drive unit shall be made of moulded plastic with steel spring support & inserted into the tube and it shall be driven by a ball chain pulley with ball chain and can be positioned at right side or left side of the shade. The shade when lowering or raising, shall be automatically locked in position upon release of the ball chain by means of a built-in friction lock. The end plug shall be moulded of plastic with a steel location pin. The plug shall be inserted into the tube end.(opposite to the drive unit).

The support brackets shall be of coated steel & provided with covers & used in right hand positions differentiated by the acceptance of the rectangular drive unit support or the round idler plug pin. The roller tube shall be of extruded aluminum with 38mm internal diameter & skin thickness of 1mm & shall incorporate a keyway integral with the tube to accommodate the spline. The outside diameter of the roller tube shall be 40mm.The bottom rail shall be a stiffening inserted into bottom rod pocket.

The bottom rail shall be a stiffening inserted into bottom rod pocket. The material may be timber, PVC covered steel tube or VB bottom rail. The ball chain shall be 2mm diameter cord with 4.5mm diameter acetal balls moulded co-axially to it on 6mm pitch to form an endless ball chain which is used for raising or lowering action of the shades.

Fabric shall be attached to the tube with an adhesive strip. A minimum of one turn of fabric must be placed on the roller before the working section of fabric starts.

The fabric shall be as per selection from specified Manufacturer's range & shall be sized according to site requirements, manufactured by Approved make as described below:

a. Blackout roller blinds with 100% polyester blackout fabric with reverse & front side pigment colour coated complete with installation.

b. Green screen roller blinds with fabric100% polyester fabric with double side vinyl acetate, pigment coated. Complete with installation.

4.2 **Measurements:**

Length and breadth shall be measured correct to cm. fully opened Roller Blind area from Drive unit to Bottom rail shall be measured in square meter nearest to two places of decimal. The rate shall include the cost of materials and labour required for all the operations described above.

5.0 **FALSE CEILING (GRID CEILING)**

5.1 **Installation:-**

The installation system shall comprise main runner spaced at 1200mm centres securely fixed to the structural soffit using suspension system at 1200 mm maximum centre & not more than 150mm from spliced joints. The First/Last suspension system at the end of each main runner should not be greater than 600mm from the adjacent wall. 1200mm long cross tees to be interlocked between main runners at 600mm centre to form 1200 x 600mm module. Cut cross tees longer than 600mm require independent support. 600 x 600 mm modules to be formed by fitting 600 mm long cross tees centrally between the 1200 mm cross tees. The 1200 mm cross tees to have central "birdsmouth" notches to facilitate fitting of 600 mm cross tees. Perimeter trim to be wall angles, secured to wall at 450mm maximum centres.

The grid should be of approved make with 15mm wide T-section flanges colour white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees . The T Sections have a Galvanizing of 120 grams per M2 & passed through 500 hrs of Salt test.

The Tile & Grid system used together should carry a 15 year warrantee.

5.2 **Suspension System:-**

Accessories manufactured and supplied by approved makes consisting of M6 Anchor Fasteners with Vertical Hangers made of Galvanised steel of size 26 x 26 x 25 x 1.2 mm with a Galvanized thickness of 80 grm/sqm, A pre-straightened Hanger wire of dia-2.68mm of 1.83 m length, thickness of 80 g/sq.m and a tensile strength of 344-413 MPa, along with adjustable hook clips of 0.8mm thick, galvanised spring steel for 2.68 mm with a minimum pull strength of 110 kg. The adjustable clip also consists of a 3.5mm aquiline wire to be used with the main runner.

5.3 **Mineral Fiber Grid Ceiling:-**

Mineral Fibre Ceiling TilesMineral Fibre suspended ceiling system with micro look edge tiles 15mm thick of approx. size 600mm x 600mm with silhouette exposed grid. The tiles should have life long guarantee with Humidity Resistance of 95%, NRC= .50. The tile shall be laid on Silhouette profile grid system with 15mm white flanges incorporating a 6mm central reveal in white/black colour. Silhouette, Main Runners & Cross Tees to have mitred ends & "birdsmouth" notches to provide mitred cruciform junction.

6.0 **WOODEN FLOORING: -**

6.1 **Material Properties: -**

The material shall have a wear resistance surface abrasion resistance of class AC4, impact resistance, indentation resistance, resistance to rolling castors, resistance to furniture legs, stain resistance, resistance to burning cigarettes, slip resistance and resistance to color fading. Apart from the above properties, the material shall have following additional properties: -

Dimensional Stability: Less than 0.9 mm

Surface Soundness: More than 1.0 N per sq mm

Impact Sound Resistance: 17 to 19 dB

Thickness Swelling: Less than 12%.

6.2 **Material Storage & Pre-requisites: -**

The material shall be stored in unopened packages at normal room temperature at least 0.5m away from the walls, for at-least 48 hours prior to the installation. The contractor shall ensure that the boards are undamaged and free from any faults before installation. The contractor shall use felt pads and castor cups on furniture legs and provide external doormats inside all the external doorways to protect the floor at the time of handover. A maintenance guide of the approved company shall be made available any time and handed over to the client at the time of handover.

6.3 **Material Installation: -**

The normal method of installation of laminated wooden flooring is in a random installation pattern taking into consideration the type of installation pattern desired for the purpose of aesthetics or any technical reasons. The joinery is tongue & grooved in an interlocking pattern including beading at the end. A teak moulding of size about 45 X 45 shall be provided and installed at the joinery junction of the wall and the floor as per the approved manufacturer's specifications. The quoted rate shall be inclusive of leveling the surface, polishing etc complete to the satisfaction. Underlay shall be provided as per manufacturer specification.

It is important to ensure the sub floor on which the laminate is being laid is smooth, flat & hard & free from moisture, grease, etc. In case of uneven sub floor the same should be leveled by self leveling compound. The moisture level present in the subfloor should be less than 8% before installation of the floor. The laminate shall have Unilin locking system. It is recommended to use underlay having water barrier of 250 microns and 2mm polyethylene foam under the planks. The installation shall be undertaken as per the manufacturer's installation instructions.

6.4 **Measurements: -**

Length and breadth of superficial area of the finished work shall be measured correct to a cm. The area shall be calculated in square metre correct to two places of decimal. No deduction shall be made nor extra paid for voids not exceeding 0.20 square metre. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square metres. The rate shall include the cost of the labour, T&P and materials involved in all the operations described above. The rates shall include the cost of skirting, other accessories etc. complete.

7.0 **STAINLESS STEEL RAILING WORKS**

7.1 **Dia 50mm Round Baluster System:** -

Supply and installation of Arch make 304 Grade Stainless Steel Knock Down railing system

comprising Ø 50mm Handrail fixed on Ø 50mm S.S. Round baluster (Design Code ABT222-1- 163) placed at maximum 1200mm c/c along with 3 Nos. Ø 16 mm mid rails connected at the side of baluster with fixtures. The balustrade would be fixed onto floor with casted base plate of minimum 6mm thickness. Base plate shall be concealed with suitable S.S. 304 grade cover Cap so that the mounting anchor fasteners are not visible after installation. Wall thickness of Handrail & Baluster Pipes shall be taken as 1.5mm & Mid Rail Shall be 1.2 mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Railing height to be taken @ 1000mm from floor level.

7.2 **Wall Mounted Railing system:-**

Supply and installation of Arch make 304 Grade Stainless Steel Knock Down Wall mounted Railing system comprising Ø 50mm Handrail mounted on the wall through Wall Brackets & anchor fasteners which will be placed at maximum 1200mm c/c distance and as per site requirement. Wall thickness

of all Pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength.

7.3 **Installation:-**

Installation shall be by done a qualified, authorized representative of the manufacturer. Installation must be in accordance with standard or non-standard, yet applicable details (instructions) included on installation/shop drawings provided by the manufacturer. Install components plumb and in-line, accurately fitted, free from distortion or defects and securely anchored to structure.

7.4 **Protection after installation**:-

Contractor is to provide protective covering on handrails and guardrails if construction is not yet finished in the area where the railings are installed.

7.5 **Measurements:-**

Length of the finished Railing shall be measured correct to a cm. The rate shall include the cost of the labour, T&P and materials involved in all the operations described above.

8.0 **FIRE RATED CEMENT & BULKHEAD SYSTEMS:-**

8.1 **120 Minutes Fire Rated Cement systems:-**

The Shaft and services openings in fire rated wall floors are to be properly fire stopped with 2hrs fire rated Insulation & integrity with cement single side for. The system would involve providing and fixing of cement with 50mm thick Mineral Wool of 150 Kg density to achieve the required Insulation. Service Penetrations through walls and floors to be sealed with Cement as tested to BS: 476 Part 20 & AS 1530 part 4 to maintain the required fire rating of 2hrs of the building element. Installation shall be done in accordance with the tested specification. The system will be supported by a valid Test report.

The service lines could be of various types like electrical cables trays, metal pipes, GI Ducts for AC, Etc. Total thickness of systems 70mm.

Application Areas: Cable tray penetration, bus way penetration, HVAC penetration, metal pipe penetration.

8.2 **120 Minutes Fire Rated Bulkhead System:-**

Fire resistance bulkhead system or equivalent with minimum 2 hours fire rating when tested in accordance with BS 476 part 20 for horizontal openings in fire rated floors or slabs and vertical openings in walls for passing services shafts. The fire resistant system shall comprise of a mineral wool board having a minimum density of 120 KG/M3 coated with 1-2mm thick Bulkhead . All contact surfaces and cavities shall be sealed with Promaseal Intumescent selant. The service lines could be of various types like electrical cables trays, metal pipes, etc.

Application Areas: Cable tray penetration, multiple penetrations.

TECHNICAL SPECIFICATIONS FOR PLUMBING WORKS

SECTION-I: BASIS OF DESIGN

1. BASIS OF DESIGN

The internal Plumbing, Sanitary, Drainage System for the project is designed keeping in view the following:

1.1 Requirement of adequate and equal pressure availability of hot and cold water lines in public/cor kitchen (sinks) will be already installed.

1.2 Adequate storage of water in underground raw and treated domestic water tanks, already exist at the

The works execution and materials used shall be as per the latest relevant I.S. specifications

Wherever reference has been made to International Standards or any other specifications, the same sl to the latest specification irrespective of any particular edition of such specification being n specifications below or in Schedule of Quantities.

2. CONCEPT OF THE SYSTEM

The following services are envisaged for the tender:

2.1 Soil/waste & water supply lines are already exist at the fixture level.

2.2 All sanitary items to be supplied & installed considering drawings & site conditions.

2.3 The Contractor shall visit the site and shall satisfy himself as to the conditions under which the work is to be performed. He shall also check and ascertain the location of any existing structure or equipment, or any other situation which may affect the work. No extra claim as a consequence of ignorance or on ground of insufficient description will be allowed at a later date.

3. PLUMBING/SANITARY WORKS:

3.1 GENERAL:

3.1.1 The work shall be carried out in the accordance with the drawings and design as would be issued to the Contractor by the Design Consultant and duly signed and stamped by him. The Contractor shall not take cognizance of any drawings, designs, specifications etc. not bearing Design Consultant's signature and stamp. Similarly the Contractor shall not take cognizance of instructions given by any other Authority except the instructions given by the Client's Representative in writing.

3.1.2 The work shall be executed and measured as per metric dimensions given in the Bills of Quantities, drawings etc.

3.1.3 The Contractor shall acquaint himself fully with the partial provisions for supports that may or may not be available in the structure and if they are available then he utilize them to the extent possible.

In any case the Contractor shall provide all the supports regardless of provisions that they have been already made. Nothing extra shall be payable for situations where insert plates (for supports) are not available or are not useful.

3.1.4 Shop coats of paint that may be damaged during shipment or erection shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with paint to match the finish over the adjoining shop painted surface.

3.1.5 The Contractor shall protect/handle the material carefully and if any damage occurs while handling by the Contractor then the sole responsibility shall be of the Contractor. Such damages shall be rectified/ recovered by the Contractor at no extra cost whatsoever.

3.1.6 The Contractor shall, within twenty one (21) days of receipt of the Notice of Award for the Project, where applicable, complete the submission of shop drawings to the Client's Representative for approval by the Design Consultants in order to conform to the contract schedule.

3.1.7 Measurements:
All measurements shall be taken in accordance with relevant NFPA codes, unless otherwise specified.

4. SANITARY FIXTURES & PIPE FITTINGS

4.1 SCOPE:

Work under this section shall consist of transportation, furnishing, installation, testing and commissioning and all labour as necessary as required to completely install all sanitary fixtures, brass and chromium plated fittings, and accessories as required by the drawings and specified hereinafter or given in the Bills of Quantities.

4.2 General Requirements

All fixtures and fittings shall be fixed with all such accessories as are required to complete the item in good working condition, whether specifically mentioned or not in the Bills of Quantities, specifications, and drawings.

All fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per architectural design requirements. Wherever necessary the fittings shall be centered to dimensions and patterns desired.

Fixing screws shall be half round head chromium plated brass with C.P. washers wherever required as per directions of Client's Representative.

All fittings and fixtures shall be fixed in a neat workmanlike manner true to levels and heights shown s on the drawings and in accordance with the manufacturers' recommendations. Care shall be taken to fix all inlet and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, wall or ceiling surfaces, shall be made good at Contractor's cost.

All fixtures of the similar materials shall be by the same manufacturers.

All fittings shall be of chromium plated materials.
Without restricting generally to the foregoing, Sanitary Fixtures shall include all sanitary fixtures, C.P. fittings, and accessories etc. necessary and required for the building.

Whether specifically mentioned or not, all fixtures and appliances shall be provided with approved fixing devices, nuts, bolts, screws, hangers, etc. as required. These supports shall have the necessary adjustments to allow for irregularities at the construction site.

For the installation of the CP fittings, Teflon tape shall be used.

4.3 EUROPEAN W.C:

European W.C. of glazed vitreous china shall be wash down, single or double siphonic type, floor or wall mounted set, flushed by means of flush valve as specified in the Bills of Quantities. Flush pipe/bend shall be connected to the W.C. by means of suitable rubber adopter. Wall hung W.C. shall be supported by C.I. floor mounted chair.

Each W.C. seat cover shall be so fixed that it remains absolutely stationary in vertical position without falling down on the W.C. Seat cover shall be of white solid plastic, elongated open front with heavy duty hinges. Exposed fixture trims shall be Chrome plated, and trims of similar function shall be by the same manufacturer.

Flush valves shall be of the best approved quality procurable with C.P. control valve and C.P. flush pipe.

The flush pipe/bend shall be connected to the W.C. by means of a suitable rubber adopter.

4.4 MacFit Pan connector (McAlpine)

The WC pan connector shall be of Macfit type, soft and shall be made of single body construction with integral fins, made from EVA (Ethyl Vinyl Acetate). The pan connector must confirm to BS 5627:1984.The pan connector must be supplied with one seal made of TPE (Thermoplastic Elastomeric). The pan connector must be supplied with factory fitted spring loaded seal guard fixed on the seal.

The connector shall not be allowed to come in contact with mineral oil, grease, putty or any compound containing mineral oil or grease.

The pan connectors must be stored away from direct sun light and flames.

Fixing: The soil pipe must be reasonably clean and smooth on the inner surface; in case the soil piping is in C.I. then supplier supplied bush/adaptor shall be used. The connector socket is pushed fully home onto the pan spigot; thereafter the WC is placed in position gently pushing the fitment to ensure that the connector end fits into the spigot of the pipe. The pan connector must be pushed in such a way as to ensure that the seals and fins turn inward to ensure proper sealing.

4.5 FLUSHING CISTERN:

Alternatively flushing cistern to be used shall conform to the requirements. High level cisterns shall be of cast iron unless otherwise specified. Low level cistern shall be of the same material as the water closet or as instructed by the Owner/Architect/ Consultant. The cisterns shall be mosquito

proof & shall fulfill the requirements of the local Authority.

The levels of the W.C. should be checked by placing sprit level on the W.C. W.C. should be tested on completion of fixing by putting small paper balls and flushing out. If all the paper balls are not flushed out. The fixing will have to be rectified / re-aligned.

4.6 URINALS:

Half stall wall hung urinals of glazed vitreous china shall be provided with 15mm dia. C.P. brass spreader, 32mm dia. C.P. domical waste, and C.P. cast brass bottle trap with pipe and wall flange, and shall be fixed to wall by one C.I. bracket and two C.I. clips as recommended by manufacturers and as directed by the Client's Representative.

Urinals shall be flushed by means of "NO-TOUCH" infrared operated flush valves.

Waste pipes for urinals shall be any one of the two below given materials and as directed by the Client's Representative:

- G.I. Pipes
- Rigid PVC/High density polyethylene.

Waste pipes may be exposed on wall or concealed in chase as directed by the Client's Representative.

4.7 URINAL PARTITIONS:

Urinal partitions shall be white glazed vitreous china, marble, granite or any other material selected by the Project Manager.

Urinal partitions shall be fixed at proper heights with C.P. brass bolts, anchor fasteners, and M.S. Clips as recommended by the manufacturer and directed by Project Manager..

4.8 WASH BASINS:

Wash basins shall be of white vitreous china of best quality manufactured by an approved firm and sizes, and as specified in the Bills of Quantities.

Wash basin shall be of table top / under counter drop in type shall be supported on a pair of rolled steel brackets of approved design and shall be mounted on a countertop so that rim and basin bowl are exposed from top.

Wash basin shall be provided with single lever mixer with chain and rubber plug, chromium plated brass bottle trap of approved quality, design and make, where hot water required. Single tap where hot water is not required.

Wash basin shall be fixed at proper location and height and truly horizontal as shown on drawing or as directed by Client's Representative.

4.9 BOTTLE TRAPS

Bottle trap (for wash basins, sinks, urinals etc.,) shall be deep seal (minimum 60mm water seal) cast brass
Bottle, heavy chromium plated. All bottle traps shall be provided with suitable cleaning eye,

extension
Piece, flare nuts, all chromium plated. Bottle traps shall be of approved make and design. Traps for washbasins, urinal and sinks shall be 32mm

4.10 PILLAR COCK / BASIN MIXTURE

As per OEM (Original Equipment Manufacturer) / Manufacturer's standards.

Wash basin shall be provided with single lever mixer where hot water required. Pillar cock where hot water is not required.

4.11 SINKS:

Sinks shall be of stainless steel material as specified in the Bills of Quantities/Drawings.

Each sink shall be provided with R. S. brackets and clips and securely fixed. Counter top sinks shall be fixed with suitable angle iron clips or brackets as recommended by the manufacturer. Each sink shall be provided with 40 mm dia. Chromium Plated waste with chain and plug or P.V.C. waste with Escutcheon plates. Fixing shall be done as directed by Client's Representative.

Supply fittings for sinks shall be mixing fittings or C.P. taps, angle cocks etc. all as specified in the Bills of Quantities/Drawings.

4.12 SINK BIB COCK / SINK MIXTURE

These shall be chromium plated brass heavy quality and shall be easy type with capstan head. The size shall be as specified in the Bills of Quantities.

Supply fittings for sinks shall be mixing fittings where hot water required or long body bib cock where hot water is not required, all as specified in the Bills of Quantities/Drawings.

4.13 HEALTH FAUCET/SPRAY (OPTIONAL)

A chromium plated spray with integral hand control valve and connected to a flexible pipe and angle valve with wall flange and hook are fixed as shown on the drawings or as directed by the Project Manager. The angle valve and flange shall be paid under relevant item.

4.14 ANGLE VALVE

As per OEM (Original Equipment Manufacturer) / Manufacturer's standards.

4.15 COCKROACH TRAP

Wherever specified in the drawings, and/or found necessary by Project Manager to provide approved cockroach trap (multi-trap or plain floor traps as specified) having a minimum water seal of 50mm, suitable for fully vented one pipe system shall be provided. When buried in floor, the traps shall be encased in cement concrete 1:2:4 mix after jointing and testing for support and stability.

4.16 HOSE CONNECTION

As per OEM (Original Equipment Manufacturer) / Manufacturer's standards.

4.17 **2 WAY BIB TAP**

These shall be chromium plated brass heavy quality of "EGO" type or equivalent, and shall be easy type with capstan head. The size shall be as specified in the Bills of Quantities.

5.0 **ELECTRICAL WATER HEATER:**

The Electric Water Heater shall be a complete package unit ready for plumbing and electrical service conditions. It shall be insulated with heavy duty 50 mm thick fiberglass blanket insulation and high gloss enamel finish outer shell. Electric Heating Coil rating and storage capacity shall be as shown on drawings.

Vertical pressure type electric water heaters shall be suitable for a minimum working head of 10 bars.

Construction: Inner containers shall be coated with glass, fused to steel at 870°C. This glass should provide corrosion resistance for steel.

Elements brazed to detachable brass heater plate, the whole being easily replaceable when required.

Heating elements constructed of a nickel chromium resistance wire, sheathed in a mineral filling, the whole being encased in a copper tube and subjected to a high voltage test of 1750 volts. Heater shall be supplied with adjustable setting thermostat including high temperature safety cut-out and over-pressure relief valve, drain point, electrical point, temperature indication, pilot indication, and necessary ancillaries.

SECTION-II: SOIL, WASTE VENT & FITTING

1 Noise Insulated Piping System (POLOPLAST – POLO-KAL NG)

1.1 **SOCKET PIPES**

Three Layer sound insulated Polypropylene piping (PP) system as per ON EN 1451-Part 1-6 & EN 12056 Part 1-5 with 3 layer pipe made of PP-C + PP-MV + PP-C in Blue Ral 5014 (halogen and calcium free) colour, push-fit type, food safe, having high impact and stiffness, offering sound levels of not more than 21 dBA with POLO clip HS/ 22 dBA with Bismat 2000 clamp /equivalent and 16 dBA with Bismat 1000 clamp/equivalent as per DIN 4109 at a flow rate of 4 l/s and having pipe ring stiffness as per 1S0/DIS 9969 and tightness as per EN 1277/B and C and DIN 19560, density = 1.25gms/cm3, elongation = 0.05mm/m0K and tensile strength > 24 N/mm2, with all necessary fittings in blue colour, fitted with factory fitted lip ring, having 3 layers, pipes to be painted with ordinary cement paint for external installation:

- **INTERNAL LAYER:**
  Of PP-C, hot water resistant to 97 degree C, tested in accordance to ON EN 1451-1 and DIN 19560, good heat and corrosion ageing stability as well as high chemical resistance and a smooth pipe inner-surface.

  Color: Blue (halogen and calcium free)

- **INTERMEDIATE LAYER:**
  Of PP-MV compound reinforced with mineral aggregate, which guarantees greater stiffness and stability.

  Color: Grey.

- **EXTERNAL LAYER:**
  Of PP-C. With high impact resistance and good weathering resistance.

  Color: Blue (halogen and calcium free)

1.2 **PIPE RING STIFFNESS:**

Pipe ring stiffness would be in accordance with IS0/DIS 9969 and TIGHTNESS as per EN 1277/B and C and DIN 19560.

1.3 **MARKINGS:**

All pipes shall carry the following markings: Batch number; year and week of manufacture; company name; dimension application class; stiffness class, test mark and material details.

1.4 **FITTINGS:**

Single- Layered fitting reinforced with mineral aggregate, made of a Halogen free PP-C-KV synthetic material, a reinforced wall and factory fitted lip ring, hot water resistant upto 95 degree c in accordance to ON EN 1451-PART 1-6 EN 12056 PART 1-5. Color: Blue (halogen and calcium free)

1.5 **INSTALLATION:** The piping system must be clamped properly as required, pipes passing through walls, beams, slabs, columns should pass through sleeves which are padded with insulation material internally (between pipe and sleeve) covering the pipe to avoid transfer of body and structural borne sounds (refer manufacturer's installation guide lines). The piping must not touch any wall, structure, paneling, false ceiling etc.

Minimum supporting:

Nominal outer diameter DN/OD mm	Bracket distance Horizontal pipe routing*) D max. m (max. 15 x da)	Vertical pipe routing*) D max. m
32	0,5	1,50
40	0,6	1,50
50	0,75	1,50
75	1,10	2,00
90	1,35	2,00
110	1,65	2,00
125	1,85	2,00
160	2,40	2,00
200	3,00	2,00
250	3,00	2,00

2.0 **Traps**

2.1 **Floor Traps**

Floor traps where specified shall be siphon type full bore PP (WHITE), McAlpine, UK having a minimum 50 mm deep seal. All traps are under slung from the slab and shall be adequately supported.

2.2 **Urinal Traps**

Urinal traps shall be siphon type full bore PP (WHITE), McAlpine, UK having a minimum 50 mm deep seal. All traps are under slung from the slab and shall be adequately supported.

2.3 **Cleanout Plugs**

Floor Clean Out and line clean out plugs

Clean out plug for soil, waste or rain water pipes laid under floors shall be provided near pipe junctions bends, tees, "Y" and on straight runs at such intervals as required as per site conditions. Clean out plugs shall terminate flush with the floor levels. Line clean outs shall be supported with manufacturer provided bracket. They shall be of push fit type of PKNG mane (Poloplast)

3.0 Drainage under floor/above floor (service floors, basement ceiling etc.) (POLOPLAST – POL-KAL NG (upto 250mm dia / ECO-PLUS Premium above 250mm dia)

3.1 All drainage lines passing under building, in exposed position above ground e.g. service floors, basement ceiling etc. shall be Multilayered as per details given in sub-clause 3.10 above or shall be as per details given below. Position of such pipes shall generally be shown on the drawings.

3.2 **SOCKET PIPES**

3 layer technology Polo-Eco Plus Premium 10 pipes and fittings for underground/ misc. drainage applications having external layer of PP-Blend + mineral reinforcement, supporting layer of PP + magnesium silicate and internal in PP with chemical resistance between 2-13pH and ring rigidity of =/> 10kN/m2 having OFI certification for longitudinal stability & impermeability of pie connection in line with EN 14741.

3.3 **FITTINGS**

3-layered reinforced polypropylene (PP) sewage pipes, halogen and lead free, with integral push-fit socket and factory-fitted lip ring, tested and monitored according to the Product Standard EN 1852 – 1. Fittings upto dimension DN/OD 200 are manufactured by injection molding (1-layer), above DN/OD 200 (250 and above) the fittings are butt or extrusion welded by the manufacturer. Fabrication of fittings at site shall not be permitted.

3.4 **Pipe Joints**

Field-proven push-fit connection with improved and modified lip ring of high ageing-resistant shall be provided with the pipes and fittings for easy push-fit installation, installation procedure as given in clause 3.10 above shall be followed.

4.0 **Air Admittance Valves (AAV) (McAlpine, UK / STUDOR, UK)**

Air admittance valves shall be made in ABS/PVC capable of operating at temperatures between 0 degree c and 60 degree c. The AAV shall be of suitable flow rate and installed in main discharge stacks and / or branches. Design based on air flow capacity required in proportion to the discharge unit capacities. The vendor is to supply data sheet showing relevant calculations and drawings indicating location and type of AAV as required.

AAV's to have following performance parameter:

- Temperature range: -20 degree Celsius to 60 degree Celsius.
- Open pressure: -70 pa (-0.010 psi)
- Max. Pressure rating tightness: 10,000 pa (1 m/40" h2o) at 0 pa or higher

4.1 **Maxi Filtra:**

Maxi Filtra shall be in black ABS to be installed at the outlet of the vent pipe discharging gases in the atmosphere. They are fitted with active carbon filters with iodine level being 1050mg/g. The replaceable carbon filters must be changed regularly as per manufacturer's specifications.

5.0 **SS GRATING**

Floor gratings shall be hinged type cast/ sheet stainless steel with matching recessed rim. Each grating will be provided with a cockroach trap. Each floor drain shall be provided with a specially fabricated sheet metal stainless steel double anti-cockroach internal grating to prevent ingress of cockroaches inside the building.

SECTION-III: RAIN WATER PIPES & FITTINGS

RAIN WATER PIPES

All open terraces shall be drained by rain water down takes.

Rainwater down takes are separate and independent of the soil and waste system and will discharge into the open ground Storm water Drainage system of the Complex.

Rain water in open courtyards shall be collected in catch basins and connected to the storm water drainage line.

PVC Pipes & Fittings

Pipes and fittings shall be uPVC. All pipes shall be straight and smooth as specified in Schedule of Quantities.

Pipes and fittings for main vertical stacks and branches 110 mm. & 160 mm. dia., shall be Rainwater System known in the short form as drainage system with injection moulded fittings and approved type of socket & 'O' rubber ring joints.

Joints shall be done as per the manufacturer's recommendations. The pipes and fittings must have matching dimensions for perfect joints in the system. 'O' ring fittings must have sufficient gap (approx. 10 mm.) for thermal expansion of pipes.

uPVC pipes shall be clamped to the wall with approved type uPVC saddle clamps/U clamps and G.I. rod fixed to the angle iron support system within the shaft.

Use proper uPVC pipe adapters for connections between traps & uPVC pipes where necessary. Such joints shall be made of an approved type of 'Putty'.

MEASUREMENT:

Sanitary fixtures shall be measured by numbers.

Rates for all items mentioned above shall be inclusive of cutting holes and chases and making good the same, stainless steel screws, nuts, bolts and any fixing arrangements required and recommended by manufacturers, testing and commissioning.

Project Manager's decision with respect to the correct interpretation regarding mode of measurement shall be final and binding on the contractor.

SECTION- IV: WATER SUPPLY SYSTEM

Scope of work

Work under this section consists of furnishing all labour, materials equipment and appliances necessary and required to completely install the water supply system as required by the drawings, specified here-in -after and given in the Schedule of Quantities.

Without restricting to the generality of the foregoing, the water supply system shall include the following:-

Distribution system from main supply headers to all fixtures and appliances for cold & hot water.
Cold water supply lines from city water connections to Under Ground Water Tank.
Garden irrigation system
Excavation and refilling of pipes trenches.
Pipe protection and painting.
Control valves, masonry chambers and other appurtenances.
Connections to all plumbing fixtures, tanks, appliances and municipal mains
Inserts for R.C.C. tanks

General requirements

All materials shall be new of the best quality conforming to specifications. All works executed shall be to the satisfaction of the Project Manager.

Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workman like manner.

Short or long bends shall be used on all main pipe lines as far as possible. Use of elbows shall be restricted for short connections.

Pipes shall be fixed in such a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.

Pipes shall be securely fixed to walls and ceilings by suitable clamps at intervals specified.

Clamps, hangers and supports on RCC walls, columns & slabs shall be fixed only by means of approved made of expandable metal fasteners inserted by use of power drills.

All pipe clamps, supports, nuts, bolts, washers shall be galvanised MS steel throughout the building. Painted MS clamps & MS nuts, bolts & washers shall not be accepted.

Valves and other appurtenances shall be so located as to provide easy accessibility for operations, maintenance and repairs.

Water Supply System

Contractor should study the site plan and the water supply systems including one for domestic water supply.

Source Water supply will be acquired from Municipal Corporation water mains (as available) to a service connection and collected in water storage tanks located underground.

The system has been connected to a gravity feed system from overhead tanks to all parts of the building

It is proposed to provide flushing cistern for all WCs. Infrared NO-TOUCH flush valves shall be provided for Urinals. These will be fed from overhead tank by gravity.

Domestic water supply shall be provided with cold water system only. Hot water provisions to kitchen and all toilets connected to a local electric hot water storage geyser other than add on solar system at terrace for inlet of geyser in kitchen etc.

(CPVC) G.I. pipes & fittings

All pipes inside the buildings for domestic hot and cold water supply shall be CPVC conforming to CTs SDR-13.5 at a working pressure of 320 PSI at 23 deg.C. and 80 PSI at 82 deg. C.

Solvent welded CPVC fittings etc. tees, elbows, couplers, unions, reducers, brushing etc. including transition fittings (connection between CPVC and metal pipes/G.I. ie. Brass adopters conforming to ASTM D-2846) shall be provided.

All pipes shall be fixed in accordance with layout and alignment shown on the drawings. Care shall be taken to avoid air pockets. G.I. pipes inside toilets shall run above false ceiling with vertical drop in wall chases for all fixtures. No pipes to run inside sunken floor as far as possible. Pipes may run under the ceiling or floors and other areas as shown on drawings.

Joining Pipes & Fittings

Cutting

Pipes shall be cut either with a wheel type plastic pipe cutting or hacksaw blade and care shall be taken to make a square cut. All burrs should be removed for proper contact between pipe and fittings during jointing.

Solvent Cement Application

Only CPVC solvent cement conforming to ASTM-F-493 should be used for joining pipe with fittings. An even coat of solvent cement should be applied on the pipe end and a thin coat inside the fitting socket.

Assembly

After applying the solvent cement on both pipe and fitting socket, pipe should be inserted into the fitting socket within 30 seconds, and rotating the pipe ¼ to ½ turn while inserting so as to ensure even distribution of solvent cement with the joint. The assembled system should be held for 10 seconds (approximately) in order to allow the joint to set up.

Testing

The system should be hydrostatically pressure tested at 150 psi (10 Bar) for one hour. During pressure testing, the system should be fitted with water and if a leak is found, the joint should be cut out the replaced with new one.

Transition of Flow guard CPVC in metals

When making a transition connection to metal threads, special brass/plastic transition fitting (Male and female adapters) should be used. Plastic threaded connections should not be over torque.

Threaded sealants

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

Solvent Cement

Only CPVC solvent cement conforming to ASTMF 493 should be used for joining pipe with fittings and valves.

Hangers and supports

For horizontal runs, support should be given at 90 cm. intervals for diameters of 25mm. and below and at 1.2 m. intervals for larger sizes.

Supports should be as per the below mentioned table: (Change sizes into mm.)

Size of pipe	20ºC	49ºC	71ºC	82ºC
Inch (mm)	Ft. (mm)	Ft. (mm)	Ft. (mm)	Ft. (mm)
½" (15mm)	5.5 (420mm)	4.5 (340)	3.0 (230)	2.5 (190mm)
¾" (20mm)	5.5	5.0 (380)	3.0	2.5
1" (25mm)	6.0 (460mm)	5.5	3.5 (270)	3.0
1¼" (32mm)	6.5 (500mm)	6.0	3.5	3.5
1¼" (40mm)	7.0 (530mm)	6.0	3.5	3.5
2" (50mm)	7.0	6.5	4.0 (305mm)	3.5

Please confirm above physical (mm) dimensions in practice

Anchor Fasteners

All pipe supports, hangers and clamps to be fixed on RCC walls, beams, columns, slabs and masonry walls 230mm. thick and above by means of galvanised expandable anchor fasteners in drilled holes

of correct size and model to carry the weight of pipes. Drilling shall be made only by approved type of power drill as recommend and approved by manufacturer of the anchor fasteners. Failure of any fastening devices shall be the entire responsibility and contractor shall redo or provide additional supports at his own cost. He shall also compensate the DPL for any damage that may be caused by such failures.

Unions

Contractor shall provide adequate number of unions on all pipes to enable easy dismantling later when required. Unions shall be provided near each gunmetal valve, stop cock, or check valve and on straight runs as necessary at appropriate locations as required and/or directed by Project Manager.

Flanges

Flanged connections shall be provided on pipes as required or where shown on the drawings, all equipment connections as necessary and required or as directed by the Project Manager. Connections shall be made by correct number and size of GI nuts, bolts & washers with 3mm thick gasket. Where hot water connections are made insertion gasket shall be of suitable high temperature grade and quality approved by the Project Manager. Bolt hole dia. for flanges shall conform to match the specification for C.I. sluice valve and C.I. butterfly valve.

Trenches

All water supply pipes below ground shall be laid in trenches with a minimum cover of 60 cms. The width and depth of the trenches shall be as follows:-

Dia. of pipe	Width of trench	Depth of trench
15 mm to 50 mm	30 cm	75 cm
65 mm to 150 mm	45 cm	100 cm

Sand filling

G.I. pipes in trenches shall be protected with fine sand 15 cms all round before filling in the trenches.

Painting (Painting for CPVC pipes not required)

All pipes above ground shall be painted with one coat of red lead and two coats of synthetic enamel paint of approved shade and quality. Pipes shall be painted to standard colour code given in this document or specified by Project Manager.

Pipe protection (Protection for CPVC pipes not required)

All G.I. pipes in wall chase /below floors or laid under-ground shall be protected against corrosion by the application of two coats of bitumen paint covered with polythene tape and a final coat of bitumen paint.

G.I. waste pipes buried in ground or sunken slab shall be protected with multilayer bitumen membrane tape 3mm thick with a final coat of hot or cold applied bitumen. Pypkote or equivalent.

Ball Valves

Valves upto 40 mm dia. shall be screwed type Ball Valves with stainless steel balls, spindle, teflon seating and gland packing tested to a hydraulic pressure of 20 kg/cm2, and accompanying couplings and steel handles.(to BS 5351)

Butterfly Valves

Valves 50 mm dia and above shall be cast iron butterfly valve to be used for isolation. The valves shall be bubble tight, resilient seated suitable for flow in either direction and seal in both direction with accompanying flanges and steel handle.

Motorised Water Valve:

The Motorized Water Valve shall consist of gunmetal valve body with stainless steel trim and equal percentage flow characteristics, modulating motor and linkage.

Testing
All pipes, fittings and valves after fixing at site, shall be tested by hydrostatic pressure of 1.5 times the working pressure or 10 kg/cm2 whichever is more.
Pressure shall be maintained for a period of at least thirty minutes without any drop.
A test register shall be maintained and all entries shall be signed and dated by Contractor (s) and Project Manager.

In addition to the sectional testing carried out during the construction, Contractor shall test the entire installation after connections to the overhead tanks or pumping system or mains. He shall rectify all leakages and shall replace all defective materials in the system. Any damage done due to carelessness, open or burst pipes or failure of fittings, to the building, furniture and fixtures shall be made good by the Contractor during the defects liability period without any cost.

After commissioning of the water supply system, Contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. Valves which do not effectively operate shall be replaced by new ones at no extra cost and the same shall be tested as above.

Measurement

CPVC or G.I. pipes above ground shall be measured per linear meter (to the nearest cm) and shall be inclusive of

all fittings e.g. coupling, tees, bends, elbows, unions, flanges and U clamps with nuts, bolts & washers fixed to wall or other standard supports.

Jointing with teflon tape, white lead and insertion gasket of appropriate temperature grade.

Cutting holes, and chases in walls, floors, any pipe support required for pipes below ground & making good the same.

Excavation, back filling, disposal of surplus earth and restoring the ground & floor in original condition.

Pipe Supports.

Fabricated and galvanised supports shall be measured by weight. Weight for each type of clamp shall be calculated on basis of the quantity of structural and MS used from the theoretical weight calculated on basis of the components theoretical weight of the sections.

Rate quoted for supports & hangers shall be inclusive of:-
Expandable anchor fastens.
Galvanising of all supports & hangers.
Cutting holes in walls, ceilings on floors and making good where permitted.
Nuts, bolts and washers for fixing and assembling.
Wooden/PVC pipe saddles for vertical or horizontal runs.

ML5 ULTRA-V PIPES

ULTRA VIOLET PROTECTED PP-r PE 80 glass fibre compound 5 layer piping system in BLACK color with proprietary Ecosan GREEN fittings, with operating conditions as per EN ISO 21003, jointing to be by hot socket fusion method, having life span of 50 years (extrapolated) and having linear expansion of 0.038 mm/mK. The used irradiation rate is equivalent to more than 10 years in the city of Cairo, Egypt.

5 LAYER TECHNOLGY, having:

- 1st layer of specially stabilized PP-r of UV protection.
- 2nd and 4th layer of HPCE glass fibre compound for greater stability and a 75% lower linear expansion as compared to single layer pipes.
- 3rd and 5th layer of PP-RCT provides high temperature stability and improved long term resistance.

AVAILABLE IN SIZES: 20MM TO 63MM.

TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORKS

1 GENERAL

Technical Specifications in this section cover the Internal Wiring Installations comprising of:

- Wiring for lights and convenience socket outlets etc. in concealed/surface conduit/raceways.
- Wiring for telephone outlets.
- Wiring for fire detection system
- Sub main wiring.

2 STANDARDS AND CODES

The following Indian Standard Specifications and Codes of Practice will apply to the equipment and the work covered by the scope of this contract. In addition the relevant clauses of the Indian Electricity Act 1910 and Indian Electricity Rules 1956 as amended upto date shall also apply. Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable.

BIS certified equipment shall be used as a part of the Contract in line with Government regulations. Necessary test certificates in support of the certification shall be submitted prior to supply of the equipment.

It is to be noted that updated and current Standards shall be applicable irrespective of those listed below.

660/1100 V grade PVC insulated wires.	IS	694: 1990
Rigid steel conduits for electrical wiring.	IS	9537: Part I 1980
	IS	9537: Part II 1981
Accessories for rigid steel conduits	IS	3837: 1990
Flexible steel conduits for electrical wiring	IS	3480: 1990
Switch socket outlets	IS	4615: 1990
Switches for domestic and similar purposes	IS	3854: 1997
Boxes for the enclosure of electrical accessories	IS	5133: Parts I &II 1969
Code of practice for personal hazard fire safety of buildings	IS	1644: 1998
Code of practice for electrical installation fire safety of buildings	IS	1646: 1997
Code of practice for electrical wiring installations	IS	732: 1989

3 CONDUITS

3.1 PVC :

Conduits shall be heavy gauge rigid PVC / G.I of minimum thickness of 1.8 mm. Conduits shall be ISI marked conforming to IS 9537 (Part 3) – 1983. All conduit and conduit accessories shall be of PVC. Conduits shall be joined together by a vinyle type cement/ solvent. Minimum size of conduit shall be 20 mm. Conduit shall be fixed on ceiling, wall or above false ceiling. All conduits shall be concealed in wall ceiling etc. or fixed on surface of wall with clamps at regular interval as called for else where. For termination of PVC conduits into switch outlet boxes, PVC female adopters shall be used. Wherever conduit run exceeds 10 meter, circular junction boxes shall be provided to facilitate pulling and inspection of wires. Inspection boxes shall be suitable size springs. Long radius bends shall be provided. Heating shall not be used to bend the conduits. Size of conduit shall depend upon number and size of wires to be drawn.

3.1.1 FIXING OF CONDUITS

Surface Conduit

Conduit pipes shall be fixed by heavy gauge saddles, secured to suitable wood plugs or other approved plugs with screws in an approved manner at an interval of not more than one mete but on either side of the couplers or bends or similar fittings, saddles shall be fixed at a distance of 30 cm from the center of such fittings. The saddles should not be less than 24 gauge for conduits upto 25 mm dia and not less than 20 gauge for larger diameter conduits. The corresponding widths shall be 19 mm & 25 mm. Where conduit pipes are to be laid along the trusses, steel joint etc. the same shall be secured by means of special clamps made of MS. Where as it is not possible to drill holes in the trusses members suitable clamps with bolts and nuts shall be used.

For 25mm diameter conduit width of clip shall be 19 mm and of 20 SWG. For conduit of 32 mm and above, width of clip shall be 25 mm and of 18 SWG.

Where conduit pipes are to be laid above false ceiling, either conduit pipes shall be clamp to false ceiling frame work or suspended with suitable supports from the soffit of slab. For conduit pipe run along with wall, the conduit pipe shall be clamped to wall above false ceiling in uniform pattern with special clamps if required to be approved by the Engineer-in Charge at site.

3.1.2 Recess/ concealed Conduit

The chase in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of building under construction, conduit shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work. Entire work of chasing the wall, fixing the conduit in chases, and burning the conduit in mortar before plastering shall form \part of this work.

The conduit pipe shall be fixed by means of stapples or by means of saddles not more than 60 cm apart or by any other approved means of fixing. Fixing of standard bends and elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with the long radius, which shall permit easy drawing in of conductors. All threaded joints of conduit pipe

shall treated with some approved preservative compound to secure protection against rust. Suitable inspection boxes to the barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers. Wherever the length of conduit run is more than 10 meters, then circular junction box shall be provided.

3.2 **Steel Conduits**

These shall be of mild steel 16 gauge upto 32mm and 14 gauge for sizes above 32mm, electric resistance welded (ERW), electric threaded type having perfectly circular tubing. Conduits shall be precession welded ERW and shall be fabricated from tested steel strips of thickness as per ISS by high frequency induction weld process. Weld shall be smooth and of consistent of high quality to ensure crack proof bending. The conduits shall be black enamel painted inside and outside in its manufactured form. Wherever so specified, the conduit shall be galvanized. All conduits used in this work shall be ISI embossed.

3.3 **HDPE Conduits**

Wiring shall be carried out in recessed/surface HDPE conduits. The HDPE conduit shall conform to IS 9537 Part-IV and shall be ISI embossed. The inner wall shall be with silicore lining and should be free from all obstructions. The conduits shall be bendable with bending radius not less than 20 times of outer diameter of conduit. All joints in conduits shall be made with approved accessories. Damaged conduits/fittings shall not be used. Cut ends of conduits shall not have sharp edges. Conduits shall be supplied with end caps so that dirt & water does not clog the conduit.

Bends:

Large right angle bends (more than 75 mm radius) or non-right angle bends in conduit runs shall be made carefully so as not to cause any crack/kink in the conduit. Small right angle bends in conduit runs can be made by standard conduit accessories (Long bend/Elbow/Inspection Elbow). No run of conduits shall have more than four right angle bends from outlet to outlet. Bends in multi runs of conduits shall be parallel to each other and neat in appearance, maintaining the same distance as between straight runs of conduits.

Conduit Accessories

Heavy duty standard conduit fittings and accessories like standard/Deep junction boxes, Bends, End caps, Standard/Inspection elbows, Inspection Tees, Couplers, Bell couplers, Saddles etc. shall be of superior quality and of approved makes.

3.4 **Steel Conduit Connections**

Connections between steel conduits shall be with screwed couplers of approved quality and finish, ensuring screwed metal to metal contact. Length of threads shall be as per ISS and sufficient to accommodate pipes to full threaded portion of couplers or accessories. Threads and sockets shall be free from grease and oil. Conduits shall be connected to outlet boxes by means of M.S. hexagon check-nuts fixed both inside and outside the box. Conduit edges shall be free of burrs and provided

with screwed PVC bushes to avoid damage to insulation of conductors while pulling them through the conduits. Connections between M.S. and PVC conduits, if required, shall be through a junction box and never directly.

3.5 Bends

Large right angle bends (more than 75 mm radius) or non right angle bends in conduit runs shall be made by means of conduits bending machines carefully so as not to cause any crack in the conduit. Small right angle bends in conduits runs can be made by standard conduit accessories (solid/inspection bends/elbows) no run of conduits shall have more than four right angle bends from outlet to outlet. Bends in multi runs of conduits shall be parallel to each other and neat in appearance, maintaining the same distance as between straight runs of conduits.

3.6 Conduit Accessories.

3.6.1 Standard accessories

Heavy duty black enamel painted standard conduit fittings and accessories like standard/extra-deep circular boxes, looping in boxes, junction boxes, normal/ inspection bends, solid/inspection elbows, solid/inspection tees, couplers, nipples, saddles, check nuts, earth clips, ball socket joints etc. shall be of superior quality and of approved makes. Heavy duty covers screwed with approved quality screws shall be used. Superior quality screwed PVC bushes shall be used Samples of all conduits fittings and accessories shall be got approved by Owners/Architects before use.

3.6.2 Fabricated accessories

Wherever required, outlet/junction boxes of required sizes shall be fabricated from 1.6 mm thick MS sheets excepting ceiling fan outlet boxes which shall be fabricated from minimum 2 mm thick sheets. The outlet boxes shall be of approved quality, finish and manufacture. Suitable means of fixing connectors etc., if required, shall be provided in the boxes. The boxes shall be protected from rust by zinc phosphate primer process. Boxes shall be finished with minimum 2 coats of enamel paint of approved colour. A screwed brass stud shall be provided in all boxes as earthing terminal.

3.6.2.1 Outlet Boxes For Light Fittings.

These shall be minimum 75mm x 75mm x 50mm deep and provided with required number of threaded collars for conduit entry. For ceiling mounted florescent fittings, the boxes shall be provided 300 mm off centre for a 1200 mm fitting and 150 mm off centre for a 600 mm fitting so that the wiring is taken directly to the down rod. 3 mm thick Perspex/hylam sheet cover of matching colour shall be provided.

3.6.2.2 Outlet Boxes For Ceiling

Outlet boxes for ceiling fans shall be fabricated from minimum 2 mm thick MS sheet steel. The boxes shall be hexagonal/round in shape of minimum 75 mm depth and 60 mm sides or 120 dia in case of round type box. Each box shall be provided with a recessed fan hook in the form of one 'U' shaped 12 mm dia rod welded to the box and securely tied to the top reinforcement of the concrete

slab for a length of minimum 150 mm on either side. 3 mm thick Perspex/hylam sheet cover of matching colour shall be provided.

3.6.3 Boxes For Modular Wiring Accessories

3.6.3.1 Switch Boxes - Modular Type

Switch boxes suitable to house modular type switches of required ratings, and fan regulators as required shall be provided. In case the number of switches in one box is not tallying with that available in standard manufacture, the box accomodating the next higher number of switches shall be provided without any extra cost. In case fan regulator/regulators is /are to be provided at a later dated, suitable provision for accomodating such regulators shall be made in the switch boxes and blank off covers shall be provided without any extra cost. Boxes shall be of same make as of Switches.

Switch boxes shall be so designed that accessories are mounted on a grid plate with tapped holes for brass machine screws leaving ample space at the back and on the sides for accommodating conductors, check-nuts and screwed bushes at conduit entries etc. The grid plates and M.S. boxes shall be fitted with a brass earth terminal. Boxes shall be attached to conduits by means of check-nuts on either sides of their walls. Moulded front covers made from high impact resistant, flame retardant and ultra violet stabilised engineering plastics shall be fixed by means of counter sunk chromium plated brass machine screws. No timber shall be used for any supports. Switch boxes shall be located with bottom at 1200 mm above floor level unless otherwise indicated.

3.6.3.2 Modular Type Boxes for Socket/ Telephone/Call Bell Outlets

Outlet boxes shall be suitable for housing modular type switched socket outlets/ telephone outlets/ buzzers and any other outlet as required. These shall be so designed that accessories are mounted on a grid plate with tapped holes for brass machine screws leaving ample space at the back and on the sides for accommodating conductors, checknuts and screwed bushes at conduit entries etc. The grid plates and M.S. boxes shall be fitted with a brass earth terminal. These shall be attached to conduits by means of check nuts on either sides of their walls. Moulded front covers made from high impact resistant, flame retardant and ultra violet stabilized engineering plastics shall be used to mount the outlets and shall be fixed to the outlet M.S. boxes by means of counter sunk chromium plated brass machine screws. No timber supports shall be used.

3.7 Cross Section

The conduits shall be of ample sectional area to facilitate simultaneous drawing of wires and permit future provision also. Total cross section of wires measured overall shall not normally be more than half the area of the conduit. Maximum number of PVC insulated 660/1100 Voltage grade copper conductor cable conforming to IS - 694 - 1990 as per table give below.

Maximum no of PVC insulated 650/1100 V grade aluminium/copper

Conductor cable conforming to IS : 694 – 1990

Normal Cross Sectional area of conductor in sq. mm	20 mm		25 mm		32 mm		38 mm		51 mm		64 mm	
	S	B	S	B	S	B	S	B	S	B	S	B
1	2	3	4	5	6	7	8	9	10	11	12	13
1.50	5	4	10	8	18	12	-	-	-	-	-	-
2.50	5	3	8	6	12	10	-	-	-	-	-	-
4	3	2	6	5	10	8	-	-	-	-	-	-
6	2	-	5	3	4	8	7	-	-	-	-	-
10	2	-	4	3	6	5	8	6	-	-	-	-
16	-	-	2	2	3	3	6	5	10	7	12	8
25					3	2	5	3	8	6	9	7
35							3	2	6	5	8	6
50									5	3	6	5
70									4	3	5	4

Note:

1. The above table shows the maximum capacity of conduits for a simultaneous drawing in of cables.

2. The columns headed 'S' apply to runs of conduits which have distance not exceeding 4.25 m between draw boxes and which do not deflect form the straight by an angle of more than 15 degrees. The columns headed 'B' apply to runs of conduit which deflect form the straight by an angle of more than 15 degrees.

3. Conduits sizes are the nominal external diameters.

4. **WIRES**

Wiring shall be carried out with PVC insulated 660/1100 volt grade unsheathed single core wires with electrolytic annealed stranded copper (unless otherwise stated) conductors and conforming to IS 694/1990. All wire rolls shall be ISI marked. All wires shall bear manufacturer's label and shall be brought to site in new and original packages. Manufacturer's certificate, certifying that wires brought to site are of their manufacture shall be furnished as required.

5 COAXIAL CABLES

The coaxial cables shall be of wide band type with operation up to 300 MHz capability. Aging resistance shall comply with DIM 472.52 part 2 e.i. maximum 5% increase in attenuation at 200 MHz measured by artificial aging (14 days at 80o C) cables shall meet all exceed following specifications

Center core Dia	0.8 mm
Diaelectric Dia	4.8 mm
Dielectric	PE
Outer Conductor Dia	5.4 mm
Outer Dia	7.0 mm
Bending radius	more than 30 mm
Impedance	75 ohms
D.C Resistance	50 ohms/KM
Screening factor	more than 50
Attenuation	
50 MHz	6.5
100 MHz	9
200 MHz	13
300 MHz	16

6 LAYING OF CONDUITS

- Conduits shall be laid either recessed in walls and ceilings or on surface on walls and ceilings or partly recessed and partly on surface, as required.
- Same rate shall apply for recessed and surface conduiting in this contract.
- Stranded copper conductor insulated wire of size as per schedule of quantities shall be provided in entire conduiting for loop earthing.
- GI wire of suitable size to serve as a fish wire shall be left in all conduit runs to facilitate drawing of wires after completion of conduiting.

6.1 Recessed Conduiting

Conduits recessed in concrete members shall be laid before casting, in the upper portion of slabs or otherwise as may be instructed, so as to embedded the entire run of conduits and ceiling outlet boxes

with a cover of minimum 12 mm concrete. Conduits shall be adequately tied to the reinforcement to prevent displacement during casting at intervals of maximum 1 meter. No reinforcement bars shall be cut to fix the conduits. Suitable flexible joints shall be provided at all locations where conduits cross expansion joints in the building.

Conduits recessed in brick work shall be laid in chases to be cut by electrical Contractor in brick work before plastering. The chases shall be cut by a chase cutting electric machine. The chases shall be of sufficient width to accommodate the required number of conduits and of sufficient depth to permit full thickness of plaster over conduits. The conduits shall be secured in the chase by means of heavy duty pressed steel clamps screwed to MS flat strip saddles at intervals of maximum 1 meter. The chases shall then be filled with cement and coarse sand mortar (1:3) and properly cured by watering.

Entire recessed conduit work in concrete members and in brick work shall be carried out in close coordination with progress of civil works. Conduits in concrete members shall be laid before casting and conduits in brick work shall be laid before plastering. Should it become necessary to embedded conduits in already cast concrete members, suitable chase shall be cut in concrete for the purpose. For minimizing this cutting, conduits of lesser diameter than 25 mm and outlet boxes of lesser de pth than 50 mm could be used by the Contractor for such extensions only after obtaining specific approval from Architects/Owners. For embedding conduits in finished and plastered brick work, the chase would have to be made in the finished brick work. After fixing conduit in chases, chases shall be made good in most workmanlike manner to match with the original finish.

Cutting chases in finished concrete or finished plastered brick work for recessing conduits and outlet boxes etc shall be done by the Contractors without any extra cost.

6.2 **Surface Conduiting**

Wherever so desired, conduit shall be laid in surface over finished concrete and/or plastered brickwork. Suitable spacer saddles of approved make and finish shall be fixed to the finished structural surface along the conduit route at intervals not exceeding 600 mm. Holes in concrete or brick work for fixing the saddles shall be made neatly by electric drills using masonry drill bits. Conduits shall be fixed on the saddles by means of good quality heavy duty MS clamps screwed to the saddles by counter sunk screws. Neat appearance and good workmanship of surface conduiting work is of particular importance. The entire conduit work shall be in absolute line and plumb.

6.3 **Fixing of conduit fittings and accessories**

For concealed conduiting work, the fittings and accessories shall be completely embedded in walls/ceilings leaving top surface flush with finished wall/ceiling surface in a workman like manner.

Loop earthing wire shall be connected to a screwed earthstead inside outlet boxes to make an effective contact with the metal body.

6.4 **Painting and Colour coding of conduits**

Before laying, conduits shall be painted specially at such places where paint has been damaged due to vice or wrench grip or any other reason.

If so specified, surface conduits shall be provided with 20 mm wide and 100 mm long colour coding strips as below

Use	Code colour
Low voltage	Grey
Fire alarm	Red
Telephone	Black
PA system	Brown
Earthing system	Green
Control system lighting	Purple

6.5 **Protection of Conduits**

To safeguard against filling up with mortar/plaster etc. all the outlet and switch boxes shall be provided with temporary covers and plugs which shall be replaced by sheet/plate covers as required. All screwed and socketed joints shall be made fully water tight with white lead paste.

6.6 **Cleaning of Conduit Runs**

The entire conduit system including outlets and boxes shall be thoroughly cleaned after completion of erection and before drawing in of cables.

6.7 **Protection against Dampness**

All outlets in conduit system shall be properly drain and ventilated to minimise chances of condensation/sweating.

6.8 **Expansion Joints**

When crossing through expansion joints in buildings, the conduit sections across the joint shall be through approved quality heavy duty metal flexible conduits of the same size as the rigid conduit.

6.9 **Loop Earthing**

Loop earthing shall be provided by means of ROHS copper conductor wires of sizes as per Schedule of Quantity laid alongwith wiring inside conduits for all wiring outlets and sub-mains. Earthing terminals shall be provided inside all switch boxes, outlet boxes and draw boxes etc.

7 LAYING AND DRAWING OF WIRES

7.1 Bunching of Wires

Wires carrying current shall be so bunched in conduits that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not be run in the same conduit.

7.2 Drawing of Wires

The drawing of wires shall be done with due regard to the following precautions:-

- No wire shall be drawn into any conduit, until all work of any nature, that may cause injury to wire is completed. Burrs in cut conduits shall be smoothen before erection of conduits. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire. Approved type bushes shall be provided at conduit terminations.

- Before the wires are drawn into the conduits, conduits shall be thoroughly cleaned of moisture, dust, dirt or any other obstruction by forcing compressed air through the conduits if necessary..

- While drawing insulated wires into the conduits, care shall be taken to avoid scratches and kinks which cause breakage of conductors.

- There shall be no sharp bends.

- The Contractor shall, after wiring is completed, provide a blank metal/sunmica plate on all switch / outlet / junction boxes for security and to ensure that wires are not stolen till switches / outlets etc.. are fixed at no extra cost the contractor shall be responsible to ensure that wires and loop earthing conductors are not broken and stolen. In the event of the wire been partly / fully stolen , the contractor shall replace the entire wiring alongwith loop earthing at no extra cost to the Owners. No joint of any nature whatsoever shall be permitted in wiring and loop earthing .

7.3 Termination /Jointing of Wires

- Sub-circuit wiring shall be carried out in looping system. Joints shall be made only at distribution board terminals, switches/buzzers and at ceiling roses/connectors/lamp holders terminals for lights/fans/ socket outlets. No joints shall be made inside conduits or junction/draw/inspection boxes.

- Switches controlling lights, fans or socket outlets shall be connected in the phase wire of the final sub circuit only. Switches shall never be connected in the neutral wire.

- Wiring conductors shall be continuous from outlet to outlet. Joints where unavoidable, due to any special reason shall be made by approved connectors. Specific prior permission from Architect/Owners in writing shall be obtained before making such joint.

- Insulation shall be shaved off for a length of 15 mm at the end of wire like sharpening of a pencil and it shall not be removed by cutting it square or wringing.
- Strands of wires shall not be cut for connecting terminals. All strands of wires shall be twisted round at the end before connection..
- Conductors having nominal cross sectional area exceeding 4 sq. mm shall always be provided with crimping sockets.
- At all bolted terminals, brass flat washer of large area and approved steel spring washers shall be used.
- Brass nuts and bolts shall be used for all connections.
- The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less.
- Switches controlling lights, fans, socket outlets etc. shall be connected to the phase wire of circuits only.
- Only certified valid license holder wiremen shall be employed to do wiring / jointing work.

7.4 **Load Balancing**

Balancing of circuits in three phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.

7.5 **Colour Code of Conductors**

Colour code shall be maintained for the entire wiring installation - red, yellow, blue for three phases, black for neutral and green for earth.

8. **MEASUREMENT AND PAYMENT OF WIRING**

Wiring for lights, fans, convenience socket outlets and telephone outlets etc. shall be measured and paid for on POINT BASIS as itemized schedule of quantities and as elaborated as below unless otherwise stated

8.1 **Primary and Secondary light point wiring**

In respect of group control of lights (more than one light controlled by one switch or MCB), wiring upto the first light in the group shall be measured and paid for as a primary light point. Wiring for other lights looped in one group for switch controlled as also MCB controlled lights shall be measured and paid for as secondary light points. Primary light points for switch controlled lights shall include the cost of control switch whereas primary light points controlled by MCBs shall not include the switch cost. The cost of MCB controlling such lights shall not be included in the primary light point rate since the MCB shall be paid for in the item of DB.

The point wiring basis shall assume average wiring length and average conduiting length per point based on parameters stipulated in para 8.2 below. The average wiring length and average conducting length forming the basis of point wiring payment, shall take the electrical layouts of the entire project into consideration. Tenderers are advised to seek clarifications, if they so desire, on this aspect before submitting their tenders. No claim for extra payment on account of electrical layouts in part or whole of the project requiring larger average wiring and conduiting length per point, whether specifically shown in tender drawings or not, shall be entertained after the award of contract.

8.2 **Parameters:** Wiring shall be carried out as per following parameters in recessed/ surface conduit system.

- Only looping system of wiring shall be adopted throughout. No joints excepting at wiring terminals shall be permitted.
- All accessories shall be flush type unless otherwise stated.
- For estimation of load, following loads per point shall be assumed.

Light points	100 Watts.
6 amps socket outlet points	100 Watts.
Fan points	60 Watts.
Exhaust fan points	300 Watts or as specified.
16 amp socket outlet points	1000 Watts.

- Lights, fans and 6 amp socket outlets may be wired on a common final such circuit. Such circuit shall not normally have more than a total of ten lights, fans or socket outlets or a load of 800 watts whichever is lesser.
- Power circuits shall normally have maximum one 16 amps socket outlet unless otherwise stated. Separate circuit shall be run for each geyser, kitchen equipment, window air conditioners and similar appliances.
- Wiring rates shall include painting of conduits and other accessories as required.
- Wiring rates shall include cleaning of dust, splashes of colour wash or paint from all fixtures, fans, fittings etc. at the time of taking over of the installation.
- Wiring rates shall include blanking of outlet boxes to prevent damage/pilferage of wires as elaborated in para 7.2.

8.3 **Definitions**

8.3.1 **Wiring for Lights**

Primary Light Points : Wiring for primary light points, as defined in para 8.1 above, shall commence at the Distribution Board terminals and shall terminate at the ceiling rose/connector in ceiling box/lamp holder via the control switch (for switch controlled lights). Rates for primary light

point wiring shall be deemed to be inclusive of the cost of entire material and labour require for completion of primary light point thus defined including : .

- Recessed / surface conduting system with all accessories, junction/draw/inspection boxes, bushes, check nuts etc. complete as required,
- Wiring with stranded copper conductor PVC insulated 660/1000 volt grade wires including terminations etc. complete as required.
- Control switch with switch box and cover plate of specified type including fixing screws, earth terminal etc. complete as required. Cost of this switch is applicable only for switch controlled points. This cost shall not be applicable for DB controlled points.
- Loop earthing with insulated copper wires.

Secondary Light points :

Secondary light points, as defined in para 8.1 above, shall cover the cost of interconnection wiring between group controlled light fittings and shall be deemed to be inclusive of the cost of entire materials and labour required for completion of the secondary light point thus defined including

- Recessed / surface conduting system with all accessories, junction/draw/inspection boxes, bushes, check nuts etc. complete as required,
- Wiring with stranded copper conductor PVC insulated 660/1000 volt grade wires including terminations etc. complete as required.
- Loop earthing with insulated copper wires.

8.3.2 **Wiring for Ceiling Fans**

Wiring for ceiling fan points shall be same as for primary light points and shall, in addition, include ceiling outlet box with recessed fan hooks and provision in the switch box for mounting the fan regulator.

8.3.3 **Wiring for Exhaust Fans**

Wiring for exhaust fan points shall be same as for primary light points and shall in addition include the cost of providing a 3/5 pin 6 amp socket outlet near the fan and a 6 amp control switch at convenient location near the room entry.

8.3.4 **Wiring for Call Bell Points**

Wiring for call bell points shall be the same as for primary light points and shall in addition include the cost of a call bell/buzzer of approved type and make in the required location and a call bell in lieu of the control switch at a convenient location as required.

8.3.5 **Wiring for Telephone Outlets**

Wiring for telephone outlets points shall include the entire wiring and conduiting from the telephone tag block to the telephone outlet including the telephone outlet complete as required and as itemized in the Schedule of Quantities

8.3.6 **Wiring for Convenience Socket Outlets**

3/5 pin 6 amps and 3/6 pin 16 amps single phase switched convenience socket outlets shall be provided in the building as indicated in the layout drawings.

9. ROUTINE AND COMPLETION TESTS

9.1 Installation Completion Tests

At the completion of the work, the entire installation shall be subject to the following tests:

1. Wiring continuity test
2. Insulation resistance test
3. Earth continuity test
4. Earth resistivity test

Besides the above, any other test specified by the local authority shall also be carried out. All tested and calibrated instruments for testing, labour, materials and incidentals necessary to conduct the above tests shall be provided by the contractor at his own cost.

9.2 **Wiring Continuity Test**

All wiring systems shall be tested for continuity of circuits, short circuits, and earthing after wiring is completed and before installation is energised.

9.3 **Insulation Resistance Test**

The insulation resistance shall be measured between earth and the whole system conductors, or any section thereof with all fuses in place and all switches closed and except in concentric wiring all lamps in position of both poles of the installation otherwise electrically connected together, a direct current pressure of not less than twice the working pressure provided that it does not exceed 1100 volts for medium voltage circuits. Where the supply is derived from AC three phase system, the neutral pole of which is connected to earth, either direct or through added resistance, pressure shall be deemed to be that which is maintained between the phase conductor and the neutral. The insulation resistance measured as above shall not be less than 50 megohms divided by the number of points provided on the circuit the whole installation shall not have an insulation resistance lower than one megohm.

The insulation resistance shall also be measured between all conductors connected to one phase conductor of the supply and shall be carried out after removing all metallic connections between he

two poles of the installation and in those circumstances the insulation shall not be less than that specified above.

The insulation resistance between the frame work of housing of power appliances and all live parts of each appliance shall not be less than that specified in the relevant Standard specification or where there is no such specification, shall not be less than half a megohm or when PVC insulated cables are used for wiring 12.5 megohms divided by the number of outlets. Where a whole installation is being tested a lower value than that given by the above formula subject to a minimum of 1 Megohms is acceptable.

9.4 **Testing Of Earth Continuity Path**

The earth continuity conductor including metal conduits and metallic envelopes of cable in all cases shall be tested for electric continuity and the electrical resistance of the same alongwith the earthing lead but excluding any added resistance of earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm

9.5 **Testing Of Polarity of Non-Linked Single Pole Switches**

In a two wire installation a test shall be made to verify that all non-linked single pole switches have been connected to the same conductor throughout, and such conductor shall be labeled or marked for connection to an outer or phase conductor or to the non-earthed conductor of the supply. In the three of four wire installation, a test shall be made to verify that every non-linked single pole switch is fitted to one of the outer or phase conductor of the supply. The entire electrical installation shall be subject to the final acceptance of the Architect as well as the local authorities.

9.6 **Earth Resistivity Test**

Earth resistivity test shall be carried out in accordance with IS Code of Practice for earthing IS 3043.

9.7 **Performance**

Should the above tests not comply with the limits and requirements as above the contractor shall rectify the faults until the required results are obtained. The contractor shall be responsible for providing the necessary instruments and subsidiary earths for carrying out the tests. The above tests are to be carried out by the contractor without any extra charge.

9.8 **Tests And Test Reports**

The Contractor shall furnish test reports and preliminary drawings for the equipment to the Architect/owners for approval before commencing supply of the equipment. The Contractor should intimate with the tender the equipment intended to be supplied with its technical particulars. Any test certificates etc., required by the local Inspectors or any other Authorities would be supplied by the Contractor without any extra charge.

TECHNICAL SPECIFICATIONS FOR HVAC WORKS

1.0 Scope of Work

The work proposed under this tender includes providing Central Air Conditioning and Ventilation System.

2.0 CODES AND REGULATIONS

The following codes and standards have been used in the design:

- National Building Codes : Building Services 2005
- The American Society for Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) standards:
  Ventilation for acceptable indoor air quality 62.1-2007. Energy standards for buildings 90.1-2007.

  ASHRAE handbooks:

  2006 ASHRAE Handbook, Refrigeration.

  2007 ASHRAE Handbook, Applications.

  2008 ASHRAE Handbook, Systems and applications.

  2009 ASHRAE Handbook, Fundamentals.
- Air Conditioning, Heating and Refrigeration Institute (AHRI).
- Sheet Metal and Air conditioning Contractors National Association (SMACNA): HVAC duct construction standards, metal and flexible, 1995.
- Energy Conservation Building Code (ECBC 2011)
- ASHRAE 52.1-1992, 52.2-2007.
- IMD Weather Data.
- **The following IS codes shall be applicable:**

S. No.	Material/item of Work	Standard/Code
1.	Ducting Fabrication	IS : 655 (Latest Rev.)/ SMACNA
2.	Galvanised Sheets/Wires	IS : 277-1977
3.	Aluminium Sheets/Wires	IS : 737
4.	Horizontal Centrifugal Pumps	IS : 1620
5.	Mild Steel, ERW Pipes	IS : 1239, IS : 3589

6.	Pipe Fittings	IS : 1239
7.	Steel Pipe Flanges	IS : 6392
8.	Gate, Globe and Check Valves	
	a) Upto 40 mm gun metal	IS : 778
	b) Butterfly valves of 50 mm and above (cast iron)	IS : 780, IS : 2906
	c) Balancing Valves	IS : 778
	d) Non Return Valves	IS :5312
9.	Colour Code for Identifications of pipes	IS : 2379-1963
10.	3 Phase induction motors	IS : 325
11.	Burden type pressure gauges	IS : 3624
12.	PVC insulated electric cables	IS : 1554
13.	HRC cartridge fuse links	IS : 2208
14.	Starters sheets/wires	IS : 8555
15.	Specific requirements for direct switching of motors	IS : 4064 (Part II)
16.	Inspection and testing of Installation	IS : 732 (Part III)
17.	Glossary of terms used in refrigeration and air-conditioning	IS : 3615
18.	Hot die zinc coated steel pipes	IS : 4736-1968
19.	Expanded polystyrene	IS : 4671
20.	Glass wool	IS : 8183
21.	Resin bonded glass wool	IS : 8183

Safety codes

The following safety codes as laid down by ISI shall be followed :

a) Safety code for mechanical refrigeration IS : 660

b) Safety code for air-conditioning IS : 659

c) Safety code for scaffolding and ladders IS : 3696

d) Code for practice for safety and health requirements in electrical and gas welding and cutting operations IS : 3696

e) Code of safety procedures and practices in electrical works IS : 5216

3.0 BASIS OF DESIGN:

3.1 CLIMATIC DESIGN CONDITIONS

The climatic design information as given by IMD/ASHRAE is used for design, sizing, selecting, installation, and dehumidification equipment, as well as for other energy-related processes. 8760 hours (365x24) IMD weather data has been used for detailed simulation using the most advanced TRACE-700 simulation software.

3.2 INDOOR DESIGN CONDITIONS

To reach comfort conditions and proper environment, it is necessary to maintain the design at a certain temperature and humidity within different areas to acceptable levels.

As such, the indoor design temperature conditions applied in the design of the project shall be according to Table 1 below:

Location	Room Temp. (1)	Room Relative Humidity (2)	Room Noise level	Outdoor Air (10)	Ventilation
	(°C)	% rh	(NC)	cfm	a.c hr-1
Office Space	22 (±1°C)	< 60%	40	7.5 cfm/ person + 0.06 cfm / sq.ft.	

Table 1: Indoor Design Conditions

Notes:

1 The tolerance levels shown indicate the range of temperatures due to the operation of the controls systems.
2 No control of relative humidity levels will be included. The relative humidity levels shown indicates the values adopted for the purpose of design and selection of the cooling coils under design conditions.
3 With spot cooling.
4 As per facility planners requirement.
5 Temperature in heat generating equipment vicinity will be higher.

4.0 **DESIGN PARAMETERS:**

4.1 DESIGN PARAMETERS FOR SELECTION OF AIR HANDLING UNITS & ITS COMPONENTS SHALL BE:

Maximum face velocity across pre-filter : 500 Ft/Min. (152M/Min.)

Maximum face velocity across Cooling Coil : 500 Ft/Min. (152M/Min.)

Maximum fan outlet velocity : 2200 Ft/Min. (700M/Min.)

Maximum fan Speed

a) Fans above 300 mm dia. : 900 RPM

b) Fans upto & including 300 mm dia : 1440 RPM

Maximum Fan Motor Speed : 1440 RPM

4.2 PIPING SHALL BE SIZED FOR THE FOLLOWING DESIGN PARAMETERS:

Maximum Velocity : 8 Ft/Sec. (2.5 M/Sec.)

Maximum Friction : 5 Ft/100 Ft Run (5 M/100 M Run)

Maximum Velocity (Main Header) : 7 Ft/Sec. (2.2 M/Sec.)

Maximum Friction (Main Header) : 4.4 Ft/100 Ft Run (4.4 M/100 M Run)

4.3 DESIGN PARAMETERS FOR DUCT DESIGN SHALL BE:

Maximum flow velocity : 1500 Ft./Min (450 M/Min)

Maximum Friction : 0.1inch WG/100ft. Run (1cm WG/100M Run)

Maximum Velocity at Supply Air Outlet : 500 Ft./Min. (150 M/Min.

5.0 **ESTIMATED AIR CONDITIONED LOAD:**

The peak estimated cooling load is 440 TR with 10% safety factor

6.0 **PROPOSED AIR CONDITIONING SYSTEM**

6.1 AIR COOLED VRF SYSTEM:

7.0 **Chiller :**

7.1 VRF based chiller system.

7.2 Pumps:

Chilled water will be circulated using variable discharge pumps run by high efficiency motors to save energy. Secondary Variable discharge pumps will save energy by varying the discharge depending upon the demand.

A primary and secondary chilled water loop is proposed.

8.0 **DRAWINGS:**

The drawings provided to the bidder with the tender documents give a general scheme of the system and are not meant to be the working drawings. The contractor shall furnish the shop drawings to be sent to the Consultant through the Project Manager/Architect of all the equipment/ layouts within fifteen days of the award of the contract and the same shall be approved by the Consultant. No work shall be allowed to be executed without the approved shop drawings. However, the contractor may alter the scheme for improving the layout and meeting the site conditions. All such changes shall however be subject to the consultant's approval.

9.0 **Testing:**

All the equipment and the system shall be tested as specified and all the test data shall be furnished to the Consultants in the prescribed format.

10.0 **Deviations:**

Any deviations from specifications may be acceptable, provided such deviations are found necessary and appropriate for fulfilling the overall intent and purpose of the system.

11.0 **Technical Data:**

The contractor shall furnish complete technical data of the equipment offered by him as required under the heading "technical data".

12.0 **Guarantee:**

12.1 The contractor shall guarantee the system to be free from any vibrations and noise.

12.2 The contractor shall guarantee that the capacity of various components as well as the whole system shall not be less than specified.

13.0 MECHANICAL VENTILATION:
SCOPE:

The following spaces shall be provided with mechanical ventilation:

Scope of this section comprises of supplying, erection, testing and commissioning of following type of fans.

Space/Room	Type of System	Remarks
Toilets, Pantry etc.	Independent exhaust	Inline fans to be provided for mechanical exhaust.

Space/Room	Type of System	Remarks
Basement	Natural/forced intake and forced exhaust Normal @ 8 ACPH Fire @ 4 ACPH	Fresh air intake shall be natural intake through ramps/opening for Basement B1, while axial fans with ducting, grills, louvers to be Provided for exhaust. For Basement B2, fresh and exhaust air shall be with ducting, grills, louvers to be provided for fresh & exhaust air

14.0 **SMOKE CONTROL:**

14.1 Internal Staircases :
Internal staircases shall be provided with pressurization systems, so as to maintain 6mm WG positive pressure in case of fire. Pressurization fans shall be located at roof level.

15.0 **Noise Criterion:**

All air conditioning equipment and materials (like pumps, chiller, motors, ducts, grilles, acoustic lining etc.) will be selected, designed and installed in such a manner that the inside noise criterion

for all conditioned spaces will be in the range NC-30 to NC-35. The noise levels in BOH and plant area due to all air conditioning equipment will not exceed NC-65 at 125 Hz when measured at any point less than 1.5 meter above floor level and not closer than 1.5 meter from any supply air register or 60 cm from any return air grille.

When taking noise level measurements, the background noise level without the equipment operating shall be at least 7 DB below the actual background noise level when the equipment is in operation

16.0 AIR COOLED VRF CHILLER SYSTEM:

16.1 General:

The Air cooled VRF Units shall be packaged factory assembled and tested, installation, testing and commissioning complete in all respects and shall generally comply with the specifications as given in subsequent paragraphs.

16.2 Water Chilling Unit:

Each Chilling Unit shall be standard cooling model and shall comprise of:

16.2.1 Air cooled compressor, along with semi-hermetic/open motor, and flexible coupling if required.

16.2.2 Steel structure as required for assembling/mounting the above.

16.2.3 Coloured display Microprocessor based control panel with automatic controls and display module.

16.2.4 Accessories as specified/required.

16.2.5 To provide liquid level sight glass and relief device of (bursting type) to prevent excessive built of pressure

16.2.6 Full charge of R-140A.

16.2.7 Starter for the motor (Star-Delta closed transition).

16.2.8 In event of import the supplier will handle all logistics including customs clearance and safe delivery of the chillers at site .Client will hand over the EPCG license to the Indian counterpart to arrange clearance of the chillers from customs and onward delivery to the site.

16.2.9 Ex-stock availability of all spare parts in India is required for zero downtime.

16.2.10 Your proposal must mention total electric load of the machine with break up.

16.2.11 To include training of operating staff and providing in triplicate documentations i.e. operation, installation and spare part manuals and all electrical control circuit diagram, relevant for the machine and field hook up (in elec. Circuits).

16.2.12 For performance at various loads you will enclose performance parameter curve indicating KWH/ton at various loads varying starting from 100%.

16.2.13 **MICRO COMPUTER CONTROL CENTRE**

Each unit shall be furnished with microcomputer control centre in a locked enclosure, factory mounted, wired and tested. The control center shall include a colored screen displaying graphics and all system parameters in English language with numeric data in English (FPS) units.

Digital programming of essential set points through a colour coded, tactile-feel keypad shall include: entering and leaving chilled water temperature and condensing water temperature; percent loading: pull down demand limiting; seven-day time clock for starting and stopping chiller(complete with local holiday schedule); and remote reset temperature range.

All safety and cycling shutdowns shall be annunciated through the alphanumeric display and consist of day, time, cause of shutdown, and type of restart required. Safety shutdowns shall include: high oil pressure; high compressor discharge temperature: low evaporator pressure: motor controller fault: and sensor malfunction. Cycling shutdowns shall include: low water temperature; low oil temperature: chiller/condenser water flow interruption; power fault; internal time clock; and entire cycle.

System operating information shall include: return/leaving chilled water temperatures; return/leaving condenser water temperatures; evaporator/condenser refrigerant pressure; differential oil pressure; percent motor current; evaporator/condenser saturation temperatures; operating hours (Hours Run) and number of compressor starts.

Security access shall be provided to prevent unauthorized change of set points to allow local or remote control of the chiller, and to allow manual operation of the pre-rotation vanes and oil pump.

The chiller shall be provided with an RS-232 port to output all system operating data, shutdown/cycling messages and a record of the last four cycling or safety shutdowns to a remote printer or Building Automation System (BAS). The control center shall be programmable to provide data logs to the BAS/printer at a set time interval.

Microprocessor to have software stored in non-volatile memory (EPROM) to eliminate chiller failure due to AC power failure. Programme set points retained in Lithium back RTC memory for minimum 5 years.

Control center shall be able to interface with the Building Automation System (BAS) to provide remote chiller start/stop reset of chilled water temperature reset of current limit; and status messages indicating chiller is ready to start, chiller is operating, chiller is shut down on a safety requiring reset, and chiller is shut down on a recycling safety.

16.2.14 **INTERFACE WITH BUILDING AUTOMATION SYSTEM**

All necessary hardwares / software's to integrate the chiller panel to BAS system shall be provided free of cost by chiller manufacturer / supplier. BACNet /Modbus communication card shall be provided.

16.2.15 ARI / Eurovent certified chillers shall be offered.

16.2.16 CHILLER PLANT MANAGER

Chiller plant manager shall be offered for automatic operation of complete plant room, which will control chiller, chilled water pumps (primary & secondary), motorized butterfly valves at inlet / out lets of chillers etc.

Logic / software for sequencing of equipments will be defined so as to cater the building load in a most efficient manner. Not only monitoring & controlling the system shall be able to generate reports / warning alerts / messages for maintenance schedules etc.

Also detailed IO summary shall be submitted by vendor and then after approval from consultant, it will be designed. It shall consists of Computer, Supervisory controller, DDC and communication cards / routers if required any.

17.0 **Compressor:**
Each unit shall have a rotary screw semi-hermetic/open type compressor.

17.1 The rotary screw shall be manufactured from forged steel, with profiles which are as symmetrical. The profile of screws, shall permit safe operation upto a speed of 3000 RPM for 50 Hz operation.

17.2 The compressor housing shall be of high grade cast iron, machined with precision, to provide a very close tolerance between the rotors and the housing.

17.3 The rotors shall be mounted on anti-friction bearings designed to reduce friction and power input. There shall be multiple cylindrical bearings to handle the radial and axial loads.

17.4 There shall be built in oil reservoir to ensure full supply of lubricants to all bearings and a check valve to prevent back spin during shut down.

17.5 There shall be oil pump or other means of forced lubrication of all parts during startup, running and coasting for shut down. An oil header shall be provided in the casing

17.6 The units shall be complete with stepless capacity control mechanism, to permit modulation between 20% to 100% of capacity range.

17.7 An oil separator shall be included to remove oil from the refrigerant and there shall be suitable heat exchanger for oil separation, if required.

18.0 **Compressor Motor :**

18.1 The driving motor shall be double squirrel cage type or suitable hermetic/open type as required, protected against damage by means of built in protection devices.

18.2 The compressor motor shall be suction gas/air cooled.

18.3 The compressors and Motors shall be fully protected against abnormal operating conditions by high and low pressure switches , thermal relays ,overload relays and safety controls and Phase failure fuses.

18.4 The compressors shall be fitted with gauge connections for reading oil, suction and discharge pressure, and shall be fitted with sight glass, crankcase heater, muffler discharge manifold and internal motor protection .

18.5 In case of semi-hermetic motors, Motor winding temperature sensors shall be provided.

18.6 Tender to specify time frame from date of release of the order till the delivery to the site and installation time separately from the date of arrival of equipment at site. Any delay in the time frame agreed shall be subjected to penalty as per the terms and conditions agreed during the discussions .

19.0 **VRF Chiller :**

19.1 The VRF chiller shall be complete in all respects and also include :-

- Supports for mounting
- In and out connections both for the water circuit and drain connections.

20.0 **Control console :**

20.1 The unit shall be complete with a microprocessor based control console mounted directly on the unit and prewired with all operating and safety controls.

20.2 Adapter box provision for incoming armoured aluminium cable termination of chiller motor is in contractor's scope.

20.3 The control console shall have the following extended capabilities:

a) Remote indication of :
Chiller operating status

Shutdown codes

Key operating parameters

Self-diagnostics

b) Programming capabilities of :
Leaving chilled water temperature

Reset of chilled water temperature from :

Return chilled water temperature (to maintain constant return chilled water temperature)

EMS, building management system;

Remote temperature (i.e., Outside air, supply air)

Load on chiller.

1. Power demand limit
2. Reset of power demand limit from :
Stepped-position contact closure (80/60/40% selectable)

EMS, building management system ;

lead-lag operation and control.

20.4 The control console should include but not be limited to the items listed below :

- Start/stop switch and micro processor module for capacity control system with overload limit control point adjustment, oil pump and purge unit controls etc.
- Indicating lights.
- Suction, oil and discharge pressure indications.
- Safety cutouts for low chilled water temperature, high oil temperature, low oil pressure, high and low refrigerant pressures with reset buttons.
- Necessary motor protection devices
- Other time delays, relays etc. As required.

20.5 **PERFORMANCE RATING :**

The unit shall be selected for the lowest operating noise level. Capacity ratings, and power consumption with operating points clearly indicated, shall be submitted and verified at the time of testing and commissioning of the installation. Capacity shall be ascertained by measurements of chilled water flow rate and temperature of chilled water in and out of the chilling unit.

Power consumption shall be computed from measurements of incoming voltage & input current to the chilling machine.

21.0 **Lubrication system**

21.1 Necessary pipe lines for lubricants and cooling system with valves, shall be included.

22.0 **Accessories:**

22.1 Each unit shall include the following as part of unit price .

- Ribbed rubber isolation pads to eliminate transmission of vibrations upto 90%.
- Full charge of refrigerant gas and required quantity of lubrication oil.

23.0 **Miscellaneous:**

23.1 Each unit shall have the following items (priced separately).

- Water flow switches at the outlet of the chiller.
- Stem type thermometers and dial type water pressure gauges at the inlet and outlet of the chiller.
- Suitable size butterfly valves at the inlet of the chiller.
- Suitable size balancing valve at the outlet of the chiller.

23.2 Each unit shall include, but not be limited to, all the items listed in the foregoing paragraphs or in the 'schedule of equipment' and drawings for this project. In addition all such items, as may be required, shall be included whether specifically mentioned or not, if considered or found necessary to fulfill the intent and meaning for the purpose of maintaining design rations under all extreme weather conditions.

24.0 **Starter for Compressor Motor :**

Factory mounted / Free standing Star Delta closed transition starter with NEMA-1 enclosure suitable for pad mounting. A 14-gauge (minimum) steel terminal box with gasket front access cover will be provided for field connected conduit. Overload/over current protection shall be provided by the chiller micro-center control panel.

25.0 **Type of Refrigerant:**

25.1 In view of Montreal convention on CFC, units using R-140a shall be offered or other environment friendly refrigerants.

26.0 **Limitations :**

26.1 The water velocity in the condenser and the chiller shall not exceed 3 m per sec. (10 FP

27.0 **Installation and Testing:**

27.1 The complete water chilling unit shall be mounted on a R.C.C. foundation and shall be adequately isolated as per manufacturers recommendations against transmission of vibrations to the building structure.. Necessary foundation bolts, nuts, leveling shims etc., Required for mounting of the unit shall be provided by the contractor.

27.2 The complete unit shall be factory tested and witnessed by Client's Representative for performance at the rated conditions by simulating the actual design conditions.

27.3 All controls and switchgear shall be tested for proper functioning and set of design values.

27.4 On completion of installation and tests the water chilling unit shall be tested for performance. The capacity in kcal/hr (tons) shall be calculated from measurements of temperature difference and flow rate of water, in condenser and chiller. The power consumption shall be checked from current measurement of the motor. All calculated and checked results shall match the specified data

27.5 All instruments and personnel for tests shall be provided by the contractor.

TECHNICAL SPECIFICATIONS FOR FIRE FIGHTING WORKS

Section I Hand Appliances

1 Scope of work

1.1 Work under this section shall consist of furnishing all labour, material, appliances and equipment necessary and required to install fire extinguishing hand appliances.

1.2 Without restricting to the generality of the foregoing the work shall consist of the following: -

Installation of fully charged and tested fire extinguishing hand appliances CO2 foam, dry chemical powder type as required by these specifications and/drawings.

2 General requirements

2.1 Fire extinguishers shall conform to the following Indian Standard Specifications and shall be with ISI approved stamp as revised and amended up to date:-

2.2 Fire extinguishers shall be installed as per Indian Standard "Code of Practice for Selection, Installation and Maintenance of Portable First Aid Appliances" I.S.2190-1962.

2.3 Hand appliances shall be installed in readily accessible locations with the appliance brackets fixed to wall by suitable anchor fasteners.

2.4 Each appliance shall be provided with an inspection card indicating the date of inspection, testing, change of charge and other relevant data.

2.5 All appliances shall be fixed in a true workmanlike manner truly vertical and at correct locations.

3 Measurement

Fire extinguishers shall be measured by numbers and include installation and all items necessary and required and given in the specifications.

Section II SPRINKLER SYSTEM

1. Sprinkler Heads

Sprinkler heads shall be quartzoid bulb type with gunmetal body fully approved and having current certification of the fire laboratory of the C.B.R.I. Roorkee, Underwriter's laboratory (UL) and under the approved certified list of the Fire Office Committee (FOC) of U.K. or NFPA of USA. Any one of the certifications as acceptable to the local fire authorities obtained prior to the procurement and approved and accepted by the Project Manager.

Sprinkler heads shall be installed in conformity with approved shop drawings and in co-ordination with electrical fixtures, ventilation ducts, cable galleries and other services along the ceiling. Following type of sprinklers shall be used:

S.No.	Type of Sprinkler	Temp rating
a)	Pendent /Upright type	68°C
b)	Sidewall	68°C

Spacing and coverage of sprinkler shall be in accordance with risk classification of area in which they are installed, design density and TAC regulation

Spare Sprinklers

Provide a lockable enamel painted steel cabinet including following type of spare sprinklers

a)	Pendent /Upright type	20
b)	Sidewall	10

The cabinet should also contain one pair of wrenches (of each size of the same are different) for the sprinklers.

Spare sprinklers shall be of the same specifications as that of the original sprinklers specified.

Annunciation Panel

a) Provide one solid state electronic annunciation panel, fully wired with visual display unit to indicate:
b) Flow condition in any flow indicating valve
c) The panel should give a visual and audible alarm for any of the above conditions.
d) The panel should be standard manufacturer's factory made. All details shall be submitted with the tender.

Testing

All piping in the system shall be tested to a hydrostatic pressure of 1.5 times the working pressure or 14 kg/sq.cm(whichever is more) without drop in pressure for at-least 2 hours.

Rectify all leakages, make adjustments and retest as required and directed.

Cables

Contractor shall provide control cables from supervisory valves and switches to the annunciation panels.

All control cables shall be copper conductor PVC insulated armoured and PVC sheethed 1100 volt grade.

All cables shall have stranded conductors. The cables shall be in drums as far as possible and bear manufacturer's name.

All cable joints shall be made in an approved manner as per standard practice.

Cable Trays

All cables shall be routed in approved locations in coordination with all other services in a proper manner.

Cable trays shall be of galvanized steel and hung from the ceiling by galvanised rods supported by appropriate size and type of expandable expansion fasteners drilled into the slabs and walls by an electric drill.

2. **Flow Switch**

Flow switch shall have a paddle of suitable width to fit within the pipe bore. The terminal box shall be mounted over the paddle / pipe through a connecting socket. The switch shall have potential free contact of suitable rating with N O or N C position as required. The switch shall be able to trip and make / break contact on the operation of a single sprinkler head. The terminal box shall have connections for wiring to the Annunciation panel. The seat shall be stainless steel. The flow switch enclosure shall have IP:65 protection.

The flow switch shall work at a minimum flow rate of 100 LPM. Further, it shall have a 'Retard' to compensate for line leakage or intermittent flows.

3. **Installation Valve**

Installation valves shall be installed on the sprinkler circuits as shown on the drawings.

Contractor shall submit his detailed shop drawings showing the exact location, details of installation of the valve and alarm in all its respects.

Installation valve shall comprise of a cast iron sluice valve with gunmetal trim, pressure gauge, double seated clapper check valves as alarm valve with pressure gauge, test valve and orifice assembly and drain pipe with pressure gauge, bye pass on check valve to regulate differential pressure and false alarm, turbine water gong including all accessories necessary and required and as supplied by original equipment manufacturer and required for full and satisfactory performance

of the system

4. **Measurement**

Mild steel pipes shall be measured in linear metres of the finished length correct upto one cm.and shall include all fittings, flanges, welding, jointing, clamps for fixing to walls or hangers, anchor fasteners, painting and testing complete in all respects.

Sluice and fullway valves, check valves, installation valves, air valves & flow switches shall be measured by numbers and shall include all items necessary and required for fixing and as given in the specifications and bill of quantities.

Fire hydrants, hose reels, fire brigade connections, orifice flanges shall be measured by number and include all items given in the specifications and bill of quantities.

Fire hose and boxes specified shall be measured by number and include all items given in specifications and Bill of Quantities.

Cables and cable trays shall be measured in linear metre correct upto cm shall include clamps, hangers, anchor fasteners complete in all respects.

LIST OF APPROVED MAKES

LIST OF APPROVED MAKES (HVAC)

ITEM	ACCEPTED MAKE
• Air Conditioner /	TOSHIBA / DAIKIN / MITSUBUSHI ELECTRIC HITACHI / CARRIER / CARRIER MIDEA
• TFA & AHU	Edgetech / Zeco
• Copper Pipes	Mexflow / Total line
• Duct Insulation	SUPREME / K FLEX / PARAMOUNT
• Filters	Thermodyne / Purolater
• Grills/Diffusers (AL)	TRISTAR / CONAIRE / AIRCONTROL
• Propeller fans	TRISTAR / CONAIRE / RAVI AIRCON
• G.I Ducts (Factory Fabricated)	Ductofab / Dustec / MKD
• Duct Fittings	Gripple
• GI Sheets	TATA/SAIL
• Al. Sheets	Indal
• Cables	Rallison/Gloster
• Starters/Contactors	Schneider/ Siemens
• Indicating Lights/Push buttons	Teknik
• Ammeters/Voltmeters	AE/IMP
• Current Transformers	AE/IMP
• Air Circuit Breakers	Schneider/ Siemens
• Moulded Case CKT Breakers	Merlin Gerin/Siemens
• Selector Switch	Kaycee/Salzer
• V. belts	Fenner
• Aluminum tape	Johnson/Birla -3 M
• Welding rods	Adwani
Paint/Primer	ICI/Shalimar

LIST OF APPROVED MAKES- CIVIL & INTERIOR WORKS

S.No	ITEM	APPROVED MAKE
1	CEMENT	ACC, ULTRA TECH, AMBUJA, J.K
2	STRUCTURAL STEEL	TATA STEEL LTD, JINDAL POWER AND STEEL LTD., SAIL, RINL
3	VETRIFIED FLOOR TILES	KAJARIA, SOMANY, JOHNSON, EMCER
4	VETRIFIED WALL TILES	KAJARIA, SOMANY, JOHNSON, EMCER
5	3D WALL TILES	REALONDA SPAIN, PORCELENOSA, IRIS, BATHLINE
6	LAMINATED WOODEN FLOOR	KRONOSWISS, KRONOTEX, JAMES DOUGLAS,
7	RAISED FLOORING	HIFLOOR, UNITED,
8	ALUMINIUM SKIRTING	PERFECT SOLUTIONS, BOTTOM LINE, ALLOY, JEB
9	ALUMINUM GLASS PARTITION PROFILES	PERFECT SOLUTIONS, BOTTOM LINE, ALLOY, JEB
10	TILES L-PROFILE	PERFECT SOLUTIONS, BOTTOM LINE, ALLOY, JEB
11	TRANSITION PROFILES	PERFECT SOLUTIONS, BOTTOM LINE, ALLOY, JEB
12	WOOD	SEASONED TEAK WOOD, SEASONED OAK WOOD,
13	LAMINATES	MERINO, CENTURY, AMULIYA MICA,
14	PLYWOOD AND BOARDS	CENTURY, AMULIYA MICA, DURO, GREEN PLY
15	FLUSH DOORS	CENTURY, AMULIYA MICA, DURO, GREEN PLY
16	FIRE DOORS	NAVAIR, SHAKTI MET, DOORWIN,
17	MINERAL FIBRE CEILING	ARMSTRONG, USG BORAL, ECOTONE,
18	GYPSUM BOARD	BORAL, INDIA GYPSUM (GYPROC), LAFARGE,
19	FIRE RATED BOARD	BORAL, INDIA GYPSUM (GYPROC), LAFARGE,
20	GRASS WOOL/ ROCK WOOL INSULATION	SAINT GOBAIN, UP TWIGA, ANUTONE,
21	DOOR HARDWARE	KICH, DORMA, HAFELE, HITTICH
22	THOUGHENED GLASS	SAINT GOBAIN, ASAHI INDIA, MODI/ GUARDIAN,
23	LACQUERED GLASS	SAINT GOBAIN, ASAHI INDIA, MODI/ GUARDIAN,
24	TINTED GLASS	SAINT GOBAIN, ASAHI INDIA, MODI/ GUARDIAN,
25	GLASS FILMS & GRAPHICS	3M, AVERY, ,
26	TOILETS CP FITTINGS	ROCA, KOHLER, JAQUAR,
27	TOILETS CHINAWARE FIXTURES	ROCA, KOHLER, JAQUAR,
28	TOILETS ACCESSORIES	EURONICS, KRATOS, KIMBERLEY CLARKS,
29	KITCHEN SINKS & GRATINGS	NIRALI, JYANA, HINDWARE,
30	ADHISIVES	FEVICOL PIDILITE, VAMICOL, HENKEL,
31	FURNITURE	GODREJ, HNI, SPAC-TECH, GEEKEN
32	BLINDS/CURTAINS	VISTA, JAMES DOUGLAS, HUNTER DOUGLAS, CI WINDOW BLINDS
33	FABRICS	INDERPRASTA FIBERS, ATMOSPHERE, RESPONSE, F&F, ATMOSPHERE, RESPONSE, F&F

LIST OF APPROVED MAKES-PLUMBING WORKS

S.No	ITEM	APPROVED MAKE
1	RUBBER INSULATION	ARMAFLEX/ VIDEOFLEX
2	FLOWGUARD CPVC PIPES/FITTINGS	FINOLEX/ ASHIRWAD
3	G.I. PIPES /M.S.PIPES IS 1239/3589	JINDAL HISSAR / PRAKASH SURYA
4	S S. PIPES	JINDAL / VIEGA
5	G.I. FITTINGS (MALLEABLE CAST IRON)	DRP-M/UNIK /ZOLOTO / SS
6	SOIL, WASTE & RAIN WATER PIPES & FITTINGS – CI 3989	NECO /KAPILANS/RIF
7	UPVC PIPES & FITTINGS .	FINOLEX/ ASHIRWAD / ASTRAL
8	S.S. HINGED GRATING	CHILLY/JAYNA/VIJAY
9	CHECK VALVES (DUAL SLIM TYPE)	DRP /ZOLOTO/SANT/AIP
10	BUTTERFLY VALVE	DRP /AIP/SANT/ZOLOTO
11	BALL VALVES (15 TO 40MM)	DRP/ SANT /AIP/ZOLOTO
12	GATE VALVE	DRP/ AIP/SANT/ZOLOTO
13	GUNMETAL VALVE (FULL WAY VALVE) CLASS-I	DRP/ LEADER/ZOLOTO/SANT
14	C.I. DOUBLE FLANGED SLUICE VALVE	KIRLOSKAR/ SHIVA-DURGA
15	DIAPHRAM VALVE	As approved by water treatment manufacturer's
16	FOOT VALVE	DRP/ ZOLOTO/SANT
17	PRESSURE REDUCING VALVE (PRVS)	DRP/ZOLOTO/SANT
18	STONEWARE PIPES & GULLY - IS 651	Locally ISI approved
19	RCC PIPES IS 458	Locally ISI approved
20	C.I. MANHOLE COVER & FRAME IS 1726	NECO/KAPILANS /RIF
21	FRP MANHOLE & DRAIN COVERS ETC	Thermodrain / Pooja
22	ANTI CORROSIVE TAPE FOR PIPE PROTECTION	PYPKOTE/MAKPOLYKOTE
23	GARDEN IRRIGATION SYSTEM	JAIN/HARVEL
24	ANTICORROSIVE BITUMASTIC PAINT	ISI
25	EPOXY PAINT	ISI
26	HYDRO-PNEUMATIC SYSTEM	
27	PUMPS	DP-HOLAND/GRUNDFOSS/ WILLO/KSB
28	PLC	AS PER MANUFACTURERS SPEC'S
29	PRESSURE VESSEL	AS PER MANUFACTURERS SPEC'S
30	PRESSURE SENSOR	AS PER MANUFACTURERS SPEC'S
31	CLEAR WATER PUMPS	DP-HOLAND/GRUNDFOSS/WILLO/KSB
32	SUBMERSIBLE DRAINAGE PUMPS	DP-HOLAND/GRUNDFOSS/WILLO /KSB
33	FILTER/SOFTENER	Netsol Water Solutions/ BRISANZIA /ION EXCHANGE/PENTAIR
34	PH METER	VATS/ HANNA (italy)
35	WATER METER	kaycee/ kent

S.No	ITEM	APPROVED MAKE
36	ELECTRICAL SWITCHGEAR & STARTERS	L&T OR EQUIVALENT
37	CABLE TRAYS	SLOTCO OR EQUIVALENT
38	1100 VOLT GRADE XLPE CABLES	ISI
39	PVC INSULATED COPPER WIRES	ISI
40	LUGS (TINNED COPPER)	EQUIVALENT
41	POWER AUX. CONTACTORS	EQUIVALENT
42	VIBRATION ELIMINATOR PADS & CONNECTIONS	RESISTOFLEX
43	SUCTION STRAINER/POT STRAINER	VENUS/LEADER/EMARALD/ZOLOTO
44	METERS, INDICATION LAMP	ENERCON OR EQUIVALENT
45	FORGED STEEL FITTINGS	DRP /VS / ZOLOTO/SS
46	PRESSURE GAUGE	FIEBIG/GURU
47	MEASURING INSTRUMENTS	EQUIVALENT
48	ELECTRICAL PANELS	IMPACT ENGINEERS/ELEGANT
49	AIR ADMITTANCE VALVES	STUDOR/Mc ALPINE
50	AUTOMATIC AIR VENT	DANFOSS/ IBP
51	WATER LEVEL INDICATOR & CONTROLLER	ITAL/ TECHNIKA
52	PIPE CLAMPS / HANGERS / SUPPORT	CAMRY/ CHILLY
53	CLAMPS & SUPPORT	CAMRY/ CHILLY
54	PAINT	SHALIMAR/ ASIAN

LIST OF APPROVED MAKES- FIRE FIGHTING WORKS

S.No	ITEM	APPROVED MAKE
1	"C" CLASS PIPE (MS/GI)	Jindal Hissar /TATA/Prakash Surya
2	FORGED FITTINGS	ZOLOTO/VS/DRP/SS
3	2/3/4 WAY SUCTION/COLLECTION HEAD	FIRE SHIELD /NEWAGE/SAFE GUARD/ GETECH
4	GUN METAL VALVES	LEADER/SANT/ZOLOTO/DRP/AIP
5	MS/CI VALVES	SANT/ZOLOTO /IVC OR EQUIVALENT
6	FIRE HYDRANT VALVES	FIRE SHIELD / NEWAGE/SAFE GUARD/ GETECH
7	INLET BREACHINGS/BRANCH PIPE	FIRE SHIELD / NEWAGE/ GETECH/SAFEGUARD
8	FIREHOSEPIPE/RUBBERPIPE FOR HOSE REEL	NEWAGE/ GETECH / FIRE SHIELD / SAFEGUARD
9	SPRINKLERS(ALL TYPES INCLUDING ROSETTE PLATES)	TYCO/VIKING/HD/NEWAGE / GETECH
10	FIRST AID FIRE HOSE REELS(IS CODE 884)	NEWAGE/ GETECH/SAFEGUARD / FIRE SHIELD
11	RRL HOSE (IS636)	NEWAGE/ GETECH/SAFEGUARD /FIRE SHIELD
12	BUTTERFLY VALVES	AUDCO/ZOLOTO/T.B.S/ DRP
13	WATER TYPE NON RETURN VALVES	ADVANCE/INTERVALVE/ZOLOTO/SANT
14	C.I.DOUBLE FLANGED NRV (IS CODE 780)	AUDCO/LEADER/ZOLOTO/SANT
15	GATE VALVES	LEADER/ZOLOTO/SANT/SANT
16	SPRAY NOZZLE	HD/AAAG OR EQUIVALENT
17	BALL VALVE	AUDCO/ZOLOTO/T.B.S / SANT
18	VIBRATION ISOLATOR	RESISTOFLEX/DUNLOP/KANWAL/GERB/FLEN
19	FIRE PUMPS	MATHER + PLATT /KIRLOSKAR /KSB
20	PRESSURE SWITCH	INDFOSS/SWITZER/WAREE
21	PRESSURE GAUGE	FEIBIG/EMERALD/H GURU/FORBE MARSHAL
22	EXPANSION /	CANNON/FISHER/HILTI/BOSCH/TKS
23	WELDING RODS	ADANI/L&T/MARUTI OR EQUIVALENT
24	RUBBER GASKET	CIC/VARUNA/OR EQUIVALENT
25	HOSE DRUM	NEWAGE/ GETECH/SAFEGUARD / FIRE SHIELD
26	MECHANICAL SEAL	SEALOL/DURAMETALLIC OR EQUIVALENT
27	STRAINER	ZOLOTO/ AUDCO /SANT
28	WATER FLOW SWITCHES	SWITZER/SYSTEM SENSOR/POTTER/RAPIDCONTROL/VIKING/DENFOSS
29	INSTALLATION CONTROL VALVE	TYCO/HD/GRINELL/VIKING/GLOBE
30	PROTECTIVE TAPE	COATEK OR EQUIVALENT
31	PIPE CLAM / HANGERS / SUPPORT	CAMRY/ CHILLY /OR EQUIVALENT
32	DIESEL ENGINE	KIRLOSKAR/CUMMINS/GREAVES COTTON/CATER PILLAR/MAHINDRA/ASHOK LEYLAND
33	POWER CABLE	FORT GLOSTER/HAVELLS/CCI/NICCO/INCAB/POLYCAB/RPG/FINOLEX/KEI
34	FIRE EXTINGUSHERS	MINEMAX/ GETECH/SAFEGUARD / FIRE SHIELD
35	PAINT	SHALIMAR / ASIAN
36	DASH FASTENERS	HILTI/ CANON
37	AUTOMATIC AIR VENT	DANFOSS/ IBP/ZOLOTO

S.No	ITEM	APPROVED MAKE
38	FOOT VALVE	LEADER/SANT/ZOLOTO/DRP/AIP
39	ELECTRICAL SWITCHGEAR & STARTERS	L&T OR EQUIVALENT
40	CABLE TRAYS	SLOTCO OR EQUIVALENT
41	1100 VOLT GRADE XLPE CABLES	ISI
42	PVC INSULATED COPPER WIRES	ISI
43	ELECTRICAL PANELS	IMPACT ENGINEERS/ELEGANT
44	WELDING ROD	ADWANI/ VICTOR
45	ANTI-CORROSIVE TAPE FOR PIPE PROTECTION	PYPKOTE/MAKPOLYKOTE

LIST OF APPROVED MAKES-ELECTRICAL WORKS

S.No	ITEM	MANUFACTURE
1	MV/LV/ELV CABLE-XLPE INSULATED AS PER IS:7098	RR KABLE, POLYCAB, KEI, RALLISON
2	1.1KV COPPER WIRES AS PER IS:694/1990	RR KABLE, POLYCAB, KEI, RALLISON
3	MV/LV PANEL	C&S, ADLEC SYSTEMS PRIVATE LIMITED, RISHA CONTROL PRIVATE LIMITED IN DELHI, SPC ELECTOTECH PVT.LTD
4	CURRENT/POTENTIAL TRANSFORMERS	KAPPA, MINILEC, PRAGATI, L&T ELECTRICAL & AUTOMATION IC
5	TIME SWITCHES	L&T ELECTRICAL & AUTOMATION IC , SCHNEIDER, FINDER, LEGRAND
6	PUSH BUTTONS	L&T ELECTRICAL & AUTOMATION IC, TEKNIK, SCHNEIDER, KAYCEE
7	LED TYPE INDICATING LAMPS	L&T ELECTRICAL & AUTOMATION IC, SCHNEIDER, KAYCEE, TEKNIK
8	PUSH BUTTONS ACTUATOS	L&T ELECTRICAL & AUTOMATION IC, SCHNEIDER, KAYCEE, TEKNIK
9	RACEWAY	ERA CONTROL, MEM, MK HONEYWELL, INDEANA
10	CABLE TRAYS	LEGRAND, ADITYA STEEL INDUSTRIES, INDIANA GRATINGS PVT.LTD., BEC
11	LED LIGHT FIXTURES & DRIVER	BAJAJ, PHILIPS, WIPRO, POLYCAB
12	SWITCHES & SOCKET, BOXES AND FACEPLATE MODULAR TYPE	SCHNEIDER, LEGRAND(MYRIUS), ANCHOR(VISION), MK(CITRIC)
13	CRIMPING TYPE LUGS & THIMBLES	DOWELLS , COMET, ASCON, ACTION
14	CABLE GLANDS	COMET, DOWELL, HMI, ELECTROMAC
15	BRASS CABLE GLANDS	DOWELLS , COMMET, HMI, POLYCAB
16	PVC CABLE GLANDS	TRINITY, LOTUS, NEPTUNE, HAVELLS
17	CEILING/WALL FANS & EXHAUST FANS	ALMONARD, USHA, HAVELLS, ALMONARD
18	PVC CONDUIT & ACCESSARIES	AKG, BEC, INDEANA, POLYCAB
19	M.S. CONDUIT & ACCESSARIES	AKG , RM CON, BEC, STEEL KRAFTS
20	PANEL COOLING FANS	REXONARD, RITTAL, FINDER, PHILIPS
21	RELAYs	MINILEC, PROK DEVICES, PROCOM, FINDER
22	MULTIFUNCTION METERS	SIEMENS, ABB, SCHNEIDER, NEPTUNE
	DOOR MOUNTED DUAL SOURCE ENERGY METERS	
23	AIR CIRCUIT BREAKERS	SCHNEIDER MTZ, ABB EMAX2 EKIP HI-TOUCH, SEIMENS WL 76B, L & T 4.5 MTX
24	MOULDED CASE CIRCUIT BREAKER (MCCB)	LEGRAND, SCHNEIDER , L&T, HAGER
	POWER AND AUXILLARY CONTACTOR	
	Barriers, Spreder Links & Extended Rotary Handle	
25	MCB/ELCB/DB/RCCB/	LEGRAND, SCHNEIDER, HAGER, L&T
	Industrial Sockets-Sheet Metal Clad	

S.No	ITEM	MANUFACTURE
26	SFU/SDF/HRC FUSE	ABB, SCHNEIDER, SIEMENS, L&T ELECTRICAL & AUTOMATION IC
27	EARTHING	JMV, TRIPROTECT, KORS(ESTEEM), DEHN
28	UPS	NUMERIC, SOCOMEC, EATON,
29	BATTERIES FOR UPS	ROCKET, EXIDE, PANASONIC, AMARRAJA(QUANTA)
30	BATTERIES CHARGERS	STATE ON, , VOLTAMP,, LOGICSTAT, EXIDE
31	BATTERIES	AMCO, EXIDE, STANDARD, PRESTOLITE
32	FEBRICATION SHEET	TATA SHEET, BHUSHAN STEEL, JINDAL IRON & SHEET,
33	ALUMINIUM BUSBARS	HINDALCO, BANCO,
34	COPPER BUS BARS	RR COPPER, BANCO,
35	SURGE PROTECTIONS	ARGOS, SCHNEIDER, JMV, TERCEL
36	AUTOMATIC TRANSFER SWITCH	ASCO, LEGRAND, SOCOMEC, CATERPILLER
37	FIRE ALARM SYSTEM & DEVICES	NOTIFIER, JOHNSON CONTROL, HONEYWELL XLS-3000, APOLLO
38	IT/NETWORKING	LEGRAND, SCHNEIDER, AMP,
	PASSIVE COMPONENT	
39	PA & MUSIC SYSTEM	ACTIS, BOSCH, HONEYWELL, EDWARDS
40	HARD DISK	SEAGATE, WESTERN DIGITAL, TOSHIBA,
41	LED SCREEN	LG, SAMSUNG, PANASONIC , SONY
42	FIRE SURVIVAL CABLE	RR CABLE, RALLISON, AVOCAB,
43	LED'S FOR LIGHT FIXTURE	OSRAM, PHILIPS, CREE, NICHIA
	Note:	
a.	In case of non-availability of the brand specified in the above list, the contractor shall be allowed to use alternate equivalent brand of the material subject to approval of the same from Engineer/DFCCIL/Architect	
b.	The contractor has to submit catalogues of the materials before approval.	
c.	Final choice of brands/makes among the approved list shall rest with the Engineer/DFCCIL /Architect.	
d.	The contractor has to produce test certificates for equipment/material supplied with bills for certification and approval.	
e.	Submitals and samples before supply must be approved from Engineer/DFCCIL/Architect.	

PART-III
CHAPTER-I

MILESTONES AND TIME SCHEDULE

PART-III

CHAPTER - I

MILESTONES AND TIME SCHEDULE

1.1.1 Time Schedule:

1.1.1.1 Time of start and completion:

The time allowed for execution of the works is **06** ***(Six Months)*** from the date of issue of letter of acceptance from DFCCIL.

If the contractor commits defaults in commencing execution of the works as afore stated, DFCCIL shall without prejudice to any other right to remedy, be at liberty to forfeit fully the Earnest Money Deposit and performance guarantee of the contractor.

1.1.1.2 Progress of works:

The contractor shall submit a programme of work in the form of a Bar Chart of all the activities in consistence with milestone target envisaged below. In case this bar chart requires to be modified, the DFCCIL and the contractor shall agree upon a time and progress chart. The chart shall be prepared in direct relation to the time stated as 06 months for the completion of the works as the milestone targets specified below of these special conditions. It shall indicate the forecast of the dates of commencement and completion of various activities of the work and may be amended as necessary by agreements between the DFCCIL and the contractor within the limitation of 06 months as overall completion period.

PART-III

CHAPTER-II

TENDER FORMS

TENDER FORMS

FORM No.	SUBJECT
Form No. 1A	Offer Letter
Form No. 1B	Structure & Organisation
Form No. 2	Tenderer's Credentials
Form No. 2A	Technical Eligibility Criteria Details
Form No. 2B	Financial Eligibility Criteria Details
Form No. 2C	Applicant's Party Information Form
Form No. 3	**Summary of Prices**
Form No. 4	**Schedule of Prices and Total Prices**
Form No. 5	Format for Power of Attorney for Authorized representative
Form No. 6	Pre-Contract Integrity Pact
Form No. 7	No deviation Certificate
Form No. 8	Format of Bank Guarantee for performance security
Form No. 9	Contract Agreement
Form No. 10	Indemnity Bond
Form No. 11	GUARANTEE BOND for water proofing works/Anti Termite Treatment Works
Form No. 12	ECS / NEFT / RTGS Mandate form
Form No. 13	Performa for Time Extension
Form No.14	Certificate of Fitness
Form No.15	Performa of 7-day Notice
Form No.16	Performa of 48 Hours Notice
Form No.17	Performa of Termination Notice
Form No. 18	Performa of 48 Hours notice for part of the work

Form No. 19	Performa of Termination Notice for part of the work
Form No. 20	Final Supplimentary agreement
Form No. 21	Agreement toward Waiver under section 12 (5) and section 31A (5) of Arbitation and Conciliation (Amendment) Act
Form No. 22	Certification by Arbitrators appointed under Clause 63 & 64 of Indian General Conditions of Contract

FORM No. 1A

OFFER LETTER

Tender No: **CGM/DFCCIL/NOIDA UNIT/INTERIOR & SERVICES/RENOVATION/DFCCIL H. Q. BUILDING/PRAGATI MAIDAN/2019/04**

Name of work: Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi.

To,

The Chief General Manager/Noida,
DFCCIL,

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda;

(b) We offer to execute the Works in conformity with the Bidding Documents and within Specified Time.

(c) Our bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

(d) A sum of **Rs. 7,90,680/-** in the form of Demand Draft / Banker's Cheque /FDR (from any Nationalized or Indian Scheduled Commercial Bank made in favor of DFCCIL payable at Delhi/Noida), has been deposited in original in the office of CGM/Noida on or before schedule date & time of submission of bid. The Scanned copy of the submitted EMD instrument has also been uploaded on E-tender portal.

(e) We have not been blacklisted/banned in accordance with para.1.3.13 (ii)(vi)(a) of Preamble and General Instructions to tenderers.

(f) We are neither Bankrupt/Insolvent nor in the process of winding-up nor there is a case pending before any Court on deadline of submission of the Bid in accordance with para. 1.3.13 (ii) (vi) (b) of Preamble and General Instructions to tenderers.

(g) If our bid is accepted, we commit to obtain a Performance Guarantee in accordance with the Bidding Documents;

(h) If our bid is accepted, we commit to deploy key equipment and key personnel consistent with the requirements of the work.

(i) We understand that this bid, together with your written acceptance thereof included in your notification of award/Letter of Acceptance (LOA), shall constitute a binding contract between us, until a formal contract is prepared and executed.

(j) All information, statements and description in this bid are in all respect true, correct and complete to the best of our knowledge and belief and we have not made any tampering or changes in the bidding documents on which the bid is being submitted and if any tampering or changes/incorrect information are detected at any stage, we understand the bid will invite summarily rejection and forfeiture of bid security, the contract will be liable to be terminated along with forfeiture of performance security, even if LOA has been issued.

(k) I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in DFCCIL in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge/DFCCIL shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

(l) I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

(m) We understand that you are not bound to accept the lowest bid or any other bid that you may receive.

Name .....In the capacity of .....Signed…..
.....Duly authorized to sign the Bid for and on behalf of.....
Date.....

FORM No. 1B

STRUCTURE & ORGANISATION

1	Name & address of the bidder	
2	Telephone no./Telex no./Fax no.	
3	Legal status of the bidder (attach copies of original document defining the legal status): a) An Individual b) A proprietary firm c) A firm in partnership d) A limited company or Corporation	
4	Particulars of registration with various Government Bodies (attach attested photocopy)	
	Organization /Place of registration	Registration No.
	1. 2. 3.	
5	Names and titles of Directors & Officers with designation to be concerned with this work.	
6	Designation of individuals authorized to act for the organization	
7	Has the bidder, or any constituent partner in case of partnership firm, Limited Company /Joint Venture ever been convicted by the court of law? If so, give details.	
8	In which field of E & M Engineering construction the tenderer has specialization and interest?	
9	Any other information considered necessary but not included above.	

Signature of bidder(s)

FORM No. 2

TENDERER'S CREDENTIALS

	Description
1.	For technical experience/competence, give details of similar completed works during the last 07 (seven) financial years, ending last day of month previous to the one in which tender is invited in the proforma given in "**Form-2A"**
2.	For financial capacity and organizational resources, give details of contractual payments received for the last three financial years *(i.e current Financial year and three previous financial years)* as per audited balance sheet certified by Chartered Accountant in the proforma given in "**Form-2B"**
3.	Give constitution of your firm. Attach certified copies of legal documents in support thereof. "**Form-2C"**

FORM No. 2A

TECHNICAL ELIGIBILITY CRITERIA DETAILS

Details of similar works completed *(as per para 1.3.13 (i) of Preamble and general Instructions to Tenderers)* **by the contractor during last 07 (seven) years, ending last day of month previous to the one in which tender is invited**

S.No.	Name of place of work	Authority/agency/company/for which work was carred out	Date of award & agreement No.
1	2	3	4

Date of completion (original/actual)	Agreement cost / completion cost	Scope of work in brief	S. No. at which relevant certificate / documents are attached
5	6	7	8

Note: The bidder shall attach Certified completion certificates issued by the client duly attested by Notary as per Eligibility Criteria of the tender documents.

Signature of the

Tenderer with Seal

FORM No. 2B

FINANCIAL ELIGIBILITY CRITERIA DETAILS

Details of contractual payments received by the tenderer during the last three financial years and current financial year

Contractual payments received		
Year	**Value of gross contractual payment received in Rs.**	**Value of contractual payment received from Govt. Organization/PSU/Public listed Company**
Current Year *(2019-2020)*		
2018-2019		
2017 – 2018		
2016 – 2017		
Total Contractual Payment		

Note: The details should be extracted from the audited balance sheet Certified by the Chartered Accountant or Form 16-A issued by the Employer as per Clause 1.3.13(ii)(v) of Preamble and General Instructions to Tenderers.

The bidder shall attach necessary documents in support of the above.

Signature of the

Tenderer with Seal

FORM No. 2C

APPLICANT'S PARTY INFORMATION FORM

Applicant name: *[insert full name]*
Applicant's Party name: *[insert full name of Applicant's Party]*
Applicant's Party country of registration: *[indicate country of registration]*
Applicant Party's year of constitution: *[indicate year of constitution]*
Applicant Party's legal address in country of constitution: *[insert street/ number/ town or city/ country]*
Applicant Party's authorized representative information Name: *[insert full name]* Address: *[insert street/ number/ town or city/ country]* Telephone/Fax numbers: *[insert telephone/fax numbers, including country and city codes]* E-mail address: *[indicate e-mail address]*
1. Attached are copies of original documents of ☐ Articles of Incorporation *(or equivalent documents of constitution or association)*, and/or registration documents of the legal entity named above. ☐ In case of a Government-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and absence of dependent status. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Signature of the Tenderer with Seal

FORM No. 3

SUMMARY OF PRICES

Name of work: - Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi

S. No	DESCRIPTION OF SCHEDULES	COST (in Rs.)
1	Execution of all works as per Schedule-'A' (items as per CPWD DSR 2016/2018/2019)	1,49,84,891/-
2	Execution of all works as per Schedule-'B' (non-scheduled items other than CPWD DSR 2016/2018/2019)	1,85,18,521/-
	GRAND TOTAL	**3,35,03,412/-**

Notes:

1) This proforma is just for information and perusal. However, the rates are to be filled in Online mode in Financial Bid, Packet-B.

2) **Schedule-'A':** The cost of items given above are as per CPWD DSR 2016/2018/2019. The rates of items for CPWD DSR 2016 are already exclusive of GST. However, the rates of items for CPWD DSR 2018/2019 as mentioned in BOQ have been worked out after deducting GST component from the CPWD DAR 2018/2019.

3) **Schedule-'B':** The cost of items given above are non-scheduled items *(other than CPWD DSR 2016/2018/2019)* **as per current market rate analysis *(excluding GST, as GST would be paid extra by DFCCIL).***

4) The rates quoted by the tenderer shall be inclusive of all taxes and levies but **excluding GST**. The ***GST as legally leviable and payable by the Bidder*** under the provisions of applicable law/act ***shall be paid extra by DFCCIL***. Therefore, the **Bidders should quote their rates after considering the Input Tax Credits on their input materials and services.** Hence, ***Bidders should ensure*** that, ***full benefit of Input Tax Credit (ITC) likely to be availed by them is duly considered while quoting their rates.***

5) ***Price variation will not be applicable*** in this tender.

6) The bidder has to be registered under CGST/IGST/UTGST/SGST Act and should submit GSTIN along with other details required under CGST/IGST/UTGST/SGST Act to the Employer, without which, no payment shall be released to the contractor.

FORM No. 4

(Schedule of Prices and Total Prices)

Form- 4

SCHEDULED – "A"
Schedule of Prices & Total Prices

Name of Work: Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi

S. NO.	ITEM NO OF DSR 2016	DESCRIPTION	QTY	UNIT	RATE (RS.)	AMOUNT (RS.)
		CIVIL & INTERIOR WORKS				
1		**DEMOLISHING WORKS**				
		Rates Quoted shall include:				
		All heights, all depths, all level and all shape, all lead & all lifts				
1.1	15.7.4	Demolishing brick work manually / mechanical including stacking of serviceable material and disposal of cement mortar of unserviceable material from site to till disposal point as specified by Local authorities or as directed by engineer in charge.	76.36	Cum	842.75	64,349.04
1.2	15.3	Demolishing the RCC Work manually / by mechanical means including stacking of steel bars and disposal of material from site to outside till disposal point as specified by Local authorities or as directed by engineer in charge.	4.05	Cum	1454.55	5,894.18
1.3	15.2	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge.				
	15.2.1	Nominal concrete 1:3:6 or richer mix (i/c equivalent design mix)	98.99	Cum	997.05	98,700.93
1.4	15.25	Dismantling stone slab flooring laid in cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 metres lead.	873.50	Sqm	109.35	95,516.91
1.5	15.23.1	Dismantling tile work in floors and roofs laid in cement mortar including stacking material within 50 metres lead. For thickness of tiles 10 mm to 25 mm	1534.90	Sqm	31.55	48,425.96

1.6	15.60	Disposal of building rubbish / malba / similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge, beyond 50 m initial lead, for all leads including all lifts involved.	420.24	Cum	120.55	50,659.99
		SUB TOTAL				**3,63,547.01**
2		**CONCRETE WORK**				
2.0	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level:				
2.1	4.1.3	"1:2:4 (1 cement: 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size).	100.12	Cum	5481.95	5,48,866.45
2.2	4.1.8	1:4:8 (1 Cement: 4 coarse sand (zone-III): 8 graded stone aggregate 40 mm nominal size)	68.10	Cum	4478.15	3,04,969.47
		SUB TOTAL				**8,53,835.92**
3		**REINFORCED CEMENT CONCRETE**				
3.0	5.33	Providing and laying in position specified grade reinforced cement concrete. machine batched, machine mixed and machine vibrated design mix M-25 cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions. (As per IS 9103) to accelerate, retard setting of concrete improves workability without impairing strength and durability as per direction of Engineer-in-charge. charge. "(Note:- Cement content considered in this item is @ 330 kg/cum."Excess/ less cement used as per design mix is payable/recoverable separately).				
3.1	5.33.1	All works upto plinth level (Foundation, Footing, raft, pedestals, stitching slab, slab on grade, plinth beam, sumps, Lift Pits etc.)	R. O.	Cum	6446.45	0.00
3.2	5.33.2	All works above plinth level upto floor V level (Columns, pillars, shear walls, lift walls, OHT walls, Lintels, RCC bands, Floor beams, PT beams, pergola beams, girders, bressumers, cantilevers, Suspended floors, flat slab, Coffer Beam and Slab drop panels, PT Slab, column capitals, facias, lintels roofs, staircases waist slab, steps, riser, shelves, Notch, Ramps beam and slab, Chajjas Coping, Walls of any	3.28	Cum	7250.05	23,780.74

		thickness (Retaining wall, Ramp wall, Panel Wall, STP, UGT, Trenches etc.)				
3.3	5.15	Providing, hoisting and fixing above plinth level up to floor five level precast reinforced cement concrete in lintels, windows sills, beams and bressumers, including setting in cement mortar 1:3 (1 cement : 3 coarse sand), cost of required centering and shuttering but , excluding the cost of reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size)	0.41	Cum	8683.55	3,560.34
3.4	5.13	Providing, hoisting and fixing up to floor five level precast reinforced cement concrete in small lintels not exceeding 1.5m clear span up to floor five level, including the cost of required centering, shuttering but , excluding the cost of reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20mm nominal size).	0.41	Cum	9330.2	3,825.48
4.0		**REINFORCED STEEL**				
		Rates Quoted shall include:				
4.1		All heights, all depths, all level and all shape, all lead & all lifts				
	5.22A	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete below and above plinth level.				
4.1.1	5.22A.6	Thermo-Mechanically Treated bars of grade Fe-500 D or more.	205.01	KG	56.6	11,603.28
		SUB TOTAL				**42,769.84**
4.2		**STRUCTURAL STEEL**				
4.2.1	10.25	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
	10.25.1	In stringers, treads, landings etc. of stair cases, including use of chequered plate wherever required, all complete	50.00	KG	65.8	3,290.00
	10.25.2	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	25.00	KG	85.95	2,148.75
		SUB TOTAL				**5,438.75**
5		**CENTERING & SHUTTERING**				

5.1		Providing, erecting, fixing in position and striking Ply wood shuttering & centering for form work in plane / slopes at all levels, all heights & all locations for all shapes including strutting, propping, chamfers, splays, keys, wedges, props, bracings, bolting, brackets, cuttings holes for pipes and removal of the same etc. complete. allow for forming grooves, drops, throats, arises, chamfers, cutouts, openings, MS/PVC sleeves, removing the shuttering etc. wherever called for. Providing and applying approved oil on all surfaces of form work coming in contact with concrete including close hacking of all exposed concrete work after removal of form work all materials, fixing nosing angles, switch boxes, labor etc. complete as per specifications, drawings and as directed.(Area of form work in contact with concrete shall only be measured for payment & stop boards for construction joints will not be measured for payment). (Note: Ply shall be Film faced dandified and adequate thickness or as approved by the engineer in charge)				
5.1.1	5.9.1	Footing, raft, pedestals, stitching slab, sumps, Lift pit, Plinth Beam, etc.	RO	Sqm	193.95	0.00
5.1.2	5.9.6	Columns, pillars, shear walls, lift walls, OHT tank walls etc.	RO	Sqm	467.85	0.00
5.1.3	5.9.15	Small lintels not exceeding 1.5 m clear span, moulding as in cornices, window sills, string courses, bands, copings, bed plates, anchor blocks and the like (For lintels, RCC bands, Copings etc.)	15.00	Sqm	193.95	2,909.25
5.1.4	5.9.21	Floor beams, PT beams, pergola beams, girders, bressumers, cantilevers, Suspended floors, flat slabs, Coffer Beam and Slab drop panels, PT Slab, column capitals, facias, lintels roof, staircases waist slab, steps, riser, shelves, Notch, ramps / Ramps beam and slab, Chajjas coping etc.	25.00	Sqm	418.95	10,473.75
5.1.5	5.9.2	Walls of any thickness (Retaining wall, Ramp wall, Panel Wall, STP, UGT, Trenches etc.)	RO	Sqm	378.6	0.00
		SUB TOTAL				**13,383.00**
6		**BRICK WORK**				
6.1	6.1	Brick work with common burnt clay F.P.S. (non				

		modular) bricks of class				
		designation 7.5 in foundation and plinth in:				
6.2	6.1.2	Cement mortar 1:6 (1 cement: 6 coarse sand)	8.00	Cum	4751.65	38,013.20
6.3	6.4	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in:				
	6.4.2	Cement mortar 1:6 (1 cement: 6 coarse sand)	11.85	Cum	5582.85	66,148.09
6.4	6.12	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in:				
	6.12.2	cement mortar 1:4 (1 cement: 4 coarse sand)	556.58	Sqm	593.5	3,30,329.64
6.5	6.15	Extra for providing and placing in position 2 Nos 6mm dia. M.S. bars at every third course of half brick masonry.	556.58	Sqm	56.85	31,641.52
		SUB TOTAL				**4,66,132.45**
7		**PLASTERING/ PAINT AND POINTING WORKS**				
		Internal Plastering				
7.1	13.1	12 mm cement plaster of mix:				
	13.1.2	1:6 (1 cement: 6 fine sand)	278.29	Sqm	160.35	44,623.72
7.2	13.4	12 mm cement plaster of mix:				
	13.4.2	1:6 (1 cement: 6 coarse sand)	834.87	Sqm	168.25	1,40,466.63
7.3	13.2	15 mm cement plaster of mix:				
	13.2.2	1:6 (1 cement: 6 fine sand)	20.00	Sqm	185.2	3,704.00
7.4	13.16	6 mm cement plaster of mix:				
	13.16.1	1:3 (1 cement: 3 fine sand)	20.00	Sqm	143.8	2,876.00
8.0		**WATERPROOFING**				
8.1	22.23	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & water treatment plant, tunnels/ subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry : 2 parts water) for vertical surfaces and 3 : 1 (3 parts integral crystalline slurry : 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber				

		brush. The material shall meet the requirements as specified in ACI- 212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineer-in-charge. The product performance shall carry guaranteed for 10 years against any leakage.				
	22.23.1	For vertical surface two coats @0.70 kg per sqm per coat	120.00	Sqm	468.1	56,172.00
	22.23.2	For horizontal surface one coat @1.10 kg per sqm	360.00	Sqm	362.35	1,30,446.00
9		**PAINT**				
9.1	13.82	Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour.				
	13.82.2	Two coats	1100.25	Sqm	73.9	81,308.24
9.2	13.80	Providing and applying white cement-based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete. Per Coat	2200.49	Sqm	87.35	1,92,213.12
9.3	12.50	Providing and fixing precoated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05 %) total coated thickness with zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 metre or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.	15.60	Sqm	550.4	8,586.24
9.4	12.51	Providing and fixing precoated galvanised steel sheet roofing accessories 0.50 mm (+ 0.05 %)				

		total coated thickness, Zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15- 18 microns using self drilling/ self tapping screws complete:				
	12.51.1	Ridges plain (500 - 600mm)	24.00	Mtr	360.45	8,650.80
		SUB TOTAL				**6,69,046.75**
10		**FLOORING & SKIRTING**				
10.1		**VITRIFIED / CERAMIC TILES FLOORING**				
	11.41	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joints with white cement and matching pigments etc., complete.				
a	11.41.2	Size of Tile 600x600 mm (Base ratre Rs. 600/ Sqm)	133.92	Sqm	1119.4	1,49,909.86
b	11.41.3	Size of Tile 800x800 mm or 600 x 600 mm digital printed tile (Base ratre Rs. 850 / Sqm)	321.83	Sqm	1414.95	4,55,372.15
c	11.41.4	Size of Tile 1000x1000 mm / 600 x 1200 mm (Base /rate Rs. 1390 per sqm)	382.54	Sqm	2057.85	7,87,218.01
10.2	11.47	Providing and laying Vitrified tiles in different sizes (thickness to be specified by the manufacturer), with water absorption less than 0.08% and conforming to IS: 15622, of approved brand & manufacturer, in all colours and shade, in skirting, dado, riser of steps, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS: 15477, in average 6 mm thickness, including grouting of joints (Payment for grouting of joints , if any to be made separately).				
a	11.47.2	Size of Tile 600x600 mm (Base rate Rs. 600/ Sqm)	13.39	Sqm	1240.6	16,614.09
b	11.47.3	Size of Tile 800x800 mm or 600 x 600 mm digital printed tile (Base rate Rs. 850 / Sqm)	32.18	Sqm	1538.25	49,505.37
c	11.47.4	Size of Tile 1000x1000 mm / 600 x 1200 mm (Base /rate Rs. 1390 per sqm)	1249.00	Sqm	2181.1	27,24,202.26
10.3	8.13	Providing and laying Polished Granite stone flooring in required design and patterns, in				

		linear as well as curvilinear portions of the building all complete asper the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing , curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge.				
	8.13.1	Polished Granite stone slab jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent.	27.33	Sqm	2937.7	80,301.44
		ITALIAN MARBLE STONE FLOORING				
10.4	11.51	Providing and laying machine cut, mirror polished, Italian Marble stone flooring laid in required pattern in linear portion of the building all complete as per architectural drawings, with 18 mm thick stone slab laid over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with white cement slurry @ 4.4 kg/sqm, including pointing with white cement slurry admixed with pigment to match the marble shade including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge.				
	11.51.1	18 mm thick Italian Marble stone slab, Perlato, Rosso verona, Fire Red or Dark Emperadore etc.	168.83	Sqm	5006.1	8,45,165.45
10.5	11.26	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1: 4 (1 cement: 4 coarse sand):				
	11.26.1	25 mm thick	20.00	Sqm	1158.2	23,164.00
10.6	11.27	Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	5.00	Sqm	1238.2	6,191.00
		I.P.S. FLOORING				

10.7	11.3.1	Cement concrete flooring 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete. 40 mm thick with 20 mm nominal size stone aggregate	104.80	Sqm	362.6	38,001.68
10.8	11.13.1	Providing and fixing glass strips in joints of terrazo/ cement concrete floors.	104.80	Mtr	52.5	5,502.17
		SCREEDING				
10.9		Providing and laying in position cement concrete screed of specified grade including the cost of centering and shuttering				
	4.1.3	1:2:4 (1 Cement: 2 coarse sand: 4 graded stone aggregate 20mm nomiROl size)	RO	Cum	5481.95	0.00
10.10		**RAISED FLOOR**				
	11.54	Providing and fixing removable raised/false access flooring with system and its components of approved make for different plenum height with possible height adjustment upto 50 mm, comprising of modular load bearing floor panels supported on G.I. rectangular stinger frame work and G.I. Pedestal etc. all complete, as per the architectural drawings, as specified and as directed by Engineer-in-charge consisting of				
		a) Providing at required spacing to form modular framework, pedestals made out of GI tube of thickness minimum 2 mm and 25 mm outer diameter, fully welded on to the G.I. Base plate of size 100mm x 100mm x 3mm at the bottom of the pedestal tube, G.I. pedestal head of size 75mmx75mmx3.5 mm welded with GI fully threaded stud 16mm outer diameter with two GI Check nuts screwed on the stud for level adjustment upto 50mm, locking and stabilizing the pedestal head in position at the required level. The pedestals shall be fixed to the subfloor (base) through base plate using epoxy-based adhesive of approved make or the machine screw with rawl plug.				
		b) Stringers system in all steel construction hot dipped galvanized of rectangular size 570x20x30x0.80mm thick having holes at both ends for securing the stringers on to the pedestal head using fully threaded screws ensuring maximum lateral stability in all directions, the grid formed by the pedestal and stringer assembly shall receive the floor panel, this system shall provide adequate solid, rigid support for access floor panel, the system shall				

		provide a minimum clear uninterrupted clearance between the bottom of the floor for electrical conduits and wiring etc. all complete as per the architectural drawings, as specified and as directed by the Engineer-in-charge.				
		c) Providing and fixing Access Floor panel of 600x600x32 mm medium grade Filled Steel anti static high-pressure Lamination of 800H grade (FS800H). Access Floor panel shall be steel welded construction with an enclosed bottom pan with uniform pattern of 64 hemispherical cones. The top and bottom plates of Steel Gauges: top 0.6 mm and bottom 0.7 mm fused spot welded together (minimum 64 welds in each dome and 20 welds along each flange). The panel should be corrosion resistant epoxy coated for lifetime rust protection and cavity formed by the top and bottom plate is filled with Pyrogrip noncombustible Portland cementitious core mixed with lightweight foaming compound. The access floor shall be factory finished with Anti-static High Pressure laminate with Non Warp technology upto 1mm thickness for superior adhesion and Surface flatness within 0.75mm.The panel is to withstand a Concentrated Load of 363 kgs applied on area 25mm x 25mm without collapse in the centre of the panel which is placed on four steel blocks. The panel will withstand and Uniformly Distributed Load (UDL) minimum 1250 kg/sqm and, an impact load of 50kg all complete as per the approved manufacturers specification and as per the direction of Engineer-in-charge. All specification must be printed on the side of the panel to ensure the quality of the product.				
	11.54.1	300 mm Finished Floor Height (FFH)	12.00	Sqm	4024.5	48,294.00
		SUB TOTAL				**52,29,441.47**
11.0		**DRY WORK**				
11.1	9.154	Providing and fixing frame work for partitions/ wall lining etc. made of 50x50x1.6 mm hollow MS tube, placed along the walls, ceiling and floor in a grid pattern with spacing @ 60 cm centre to centre both ways (vertically & horizontally) or at required spacing near opening, with necessary welding at junctions and fixing the frame to wall/ ceiling/ floors with steel dash fasteners of 8 mm dia, 75 mm long bolt, including making provision for opening for doors, windows, electrical conduits, switch boards etc., including providing with two coats of approved steel primer etc. complete, all as per direction of Engineer-in-charge.	331.78	Sqm	706.05	2,34,250.44

		Weight per sqm of panelling should be minimum 9kgs				
		SUB TOTAL				**2,34,250.44**
11.2		**FALSE CEILING**				
		Note: - Only False ceiling area will be measured from wall to wall. No deduction shall be made for exposed frames/opening (cut outs) having area less than 0.30 sqm. The calcium silicate ceiling tile shall have NRC value of 0.50 (Minimum), light reflection > 85%, non - combustible as per B.S. 476-part IV, 100% humidity resistance and also having thermal conductivity <0.043 w/m 0 KC.				
a		**GYPSUM BOARD FALSE CEILING**				
	12.45.2	Providing and fixing at all height false ceiling of 12.5 mm thick, of Saint Gobain/US Boral / Armstrong / Gyp India including frame work made of special sections power pressed from M.S. sheet and galvanized in accordance with zinc coating consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 22 mm and 37 mm at 1200 mm c/c to center one flange fixed to the ceiling with dash fastener 12.5 mm dia x 40 mm long with 6 mm dia. bolts to the angle hangers of 25 x 25 x 0.55 mm of required length, and other end of angle hanger being fixed with nut and bolts to G.I. channels 45 mm x 15 mm x 0.9 mm running at the rate of 1200 mm center to center to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having clips of 10.5 mm at 450 mm center to center shall be fixed in a direction perpendicular to G.I channel with connecting clips made out of 2.64 mm dia. x 230 mm long G.I. wire at every junction including fixing the Lagyp gypsum board with ceiling section and perimeter channels 0.5 mm thick 27 mm high				
		having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm center to center with 25 mm long drive-all screws @ 230mm interval including jointing and fixing to a flush finish of tapered and square edges of the Lagyp board with standard Lagyp easy joint compound (3 layer) , paper tapes, finisher and two coats of primer suitable for gypsum board as per manufactures specification	615.92	Sqm	806.2	4,96,553.37

		and also including the cost of making opening for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, Fastener of Hilti / fisher make all complete as per drawing and specification and direction of the Architect . The rates includes the cost of painting with acrylic Emulsion Premium range paint of Asian make or equivalent brand (ICC / Berger), over and including water thinROble priming coat to get desired finish and shade and Drops, making cutout for services, etc.. complete in al respect for all lead & lift, all levels & height, all floors.				
b		Same As item No. B4.1.1 but in circular shape as designer ceiling	0.00	Sqm	1350	0.00
c		**GRID CEILING**				
		Grid ceiling with Mineral Fiber board tiles *(Make: Dune Max of Armstrong) or Saint Gobain /US Boral / Gyp India*				
		Providing & Fixing of Armstrong Mineral Fibre Acoustical Suspended Ceiling System with Dune MaxBeveled Tegular Edge Tiles with Armstrong Silhouette 15mmExposedgrid.				
	26.27.1	The tiles should have Humidity Resistance (RH) of 99%, NRC 0.7, Light Reflectance ≥84%, Thermal Conductivity k = 0.052 - 0.057 w/m K, Colour White, Fire Performance UK Class 0 / Class 1 (BS 476 pt - 6 &7) with sand texture finish Dune Maxin module size of 600x600x20mm, suitable for Green Building application, with Recycled content of 49%.	233.28	Sqm	1535	3,58,084.80
		The tile shall be laid on Armstrong Silhouette profile grid system with 15mm white flanges incorporating a 6mm central reveal in white/black colour and with a web height of 38mm and a load carrying capacity of minimum 7.90 Kgs/M2 (as per standard installation layout mentioned below) & pull out strength of 100Kgs. Silhouette, Main Runners & Cross Tees to have mitred ends & "birdsmouth" notches to provide mitred cruciform junctions. The T Sections have a Galvanizing of 90 grams per M2 and need to be installed with Suspension system of Armstrong make.				
d	26.27.2	Providing & Fixing of Armstrong Mineral Fibre Acoustical Suspended Ceiling System with OPTRA (Bevelled Tegular) Edge Planks with Armstrong 15mm Exposed GRID.				
		The tiles should have Humidity Resistance (RH) of 95%, NRC 0.9 - 1.0, Light Reflectance ≥85%, Colour White, Fire Performance UK Class 0 / Class 1 (BS 476 pt - 6 &7) in module size of 1200 x 300 x 20mm with, suitable for	73.44	Sqm	1783.80	1,31,002.27

		Green Building application, with Recycled content of 63%.				
		The tile shall be laid on Armstrong Suprafine 38 with 15 mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main Runner & 1200 mm Cross Tees with a web height of 38mm and a load carrying capacity of 12.67 Kgs/M2 & pull out strength of 100 Kgs. The T Sections have a Galvanizing of 90 grams per M2 and need to be installed with suspension system of Armstrong make.				
e		**UNDER DECK INSULATION**				
	12.34	Providing fixing thermal insulation of ceiling (under deck insulation) with Resin Bonded Fibre glass wool conforming to IS : 8183, density 24kg / m3, 50mm thick, wrapped in 200 G Virgin Polythene bags, fixed to ceiling with metallic cleats (50x50x3 mm) @ 60 cm and wire mesh of 12.5 mm x 24 gauge wire mesh, for top most ceiling of building.	485.87	Sqm	425.1	2,06,543.34
		SUB TOTAL				**11,92,183.78**
12		**DOORS & DOOR FRAMES**				
		Laminate Finish Door Shutter				
12.1	9.20	Providing and fixing ISI marked flush door shutters conforming to IS: 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well-matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
	9.20.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws.	140.72	Sqm	2,488.95	3,50,240.07
12.2	9.23	Extra for providing lipping with 2nd class teak wood battens 25 mm minimum depth on all edges of flush door shutters (over all area of door shutter to be measured).	140.72	Sqm	365.85	51,481.68
12.3	9.53	Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 30x10x15cm 1:3:6 mix (1 cement: 3 coarse sand: 6 graded stone aggregate 20mm nominal size)	320.00	Each	118.60	37,952.00
12.4	9.76	Providing and fixing bright finished brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete.	80.00	EACH	556.45	44,516.00

12.5	9.74	Providing and fixing bright finished brass tower bolts (barrel type) with necessary screws etc. complete:				
	9.74.1	250x10	80.00	EACH	313.20	25,056.00
12.6	9.82	Providing and fixing stainless steel hanging type floor door stopper with necessary screws, etc. complete.	80.00	EACH	85.85	6,868.00
12.7	21.18	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).	38.88	Sqm	4,608.85	1,79,192.09
		Wooden Door Frame				
12.8	9.1.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately). Second class teak wood	4.52	Cum	92743.05	4,19,569.56
		SUB TOTAL				**11,14,875.39**
		TOTAL OF CIVIL & INTERIOR WORKS				**1,01,84,904.80**
3		**PLUMBING WORKS**				
a)		**SANITARY INSTALLATIONS**				
1	8.10	Providing & fixing stone slab table rubbed, edges rounded and polished of size 75 X 50cm deep and 1.8 cm thick fixed in urinal patitions by cutting chase of appropriate width with chase cutter and embedding the stone in chase with epoxy grout or with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregste 6mm nominal size) as per Engineer-in-charge and finished smooth				
1.1	8.10.1	White Agaria Marble Stone	22.00	sqm	2,831.95	62,302.90
2	17.10	Providing and fixing Stainless Steel an ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless-steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required:				

	17.10.1	Kitchen sink with drain board				-
2.1	17.10.1.3	510X1040mm bowl depth 200mm.	1.00	Each	3,772.35	3,772.35
3	17.28	Providing & fixing PVC waste pipe for sink including PVC waste fitting Complete				
	17.28.2	Flexible Pipe				
3.1	17.28.2.1	32 mm Dia	0.00	Each	73.25	0.00
3.2	17.28.2.2	40 mm Dia	1.00	Each	75.60	75.60
4	17.32	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing:				-
4.1	17.32.2	Rectangular shape 453x247 mm	39.00	Each	752.80	29,359.20
4.2	17.32.4	Rectangular shape 1500x450 mm	2.00	Each	1,323.10	2,646.20
						-
5	18.51	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms.				-
5.1	18.51.1	15mm nominal bore	6.00	Each	492.55	2,955.30
						-
		TOTAL C/F TO SUMMARY				**1,01,111.55**
b)	-	**INTERNAL DRAINAGE INSTALLATIONS**	-	-	-	-
-	-	-	-	-	-	-
1	17.60.	Providing and fixing cast iron trap of self cleansing design with cast iron screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors.				
	17.60.1.3	100 mm inlet and 100 mm outlet Hubless centrifugally cast-iron pipes epoxy coated inside & outside IS: 15905	66.00	Each	677.60	44,721.60
	17.60.2.3	100 mm inlet and 75 mm outlet Hubless centrifugally cast-iron pipes epoxy coated inside & outside IS: 15905	18.00	Each	496.40	8,935.20
2	17.35	Providing and fixing soil, waste, vent and rain water pipes				
	17.35.1	100mm dia				
	17.35.1.3	Hubless centrifugally cast-iron pipes epoxy coated inside & outside IS: 15905	345.00	metre	925.55	3,19,314.75
3	17.37	Providing and fixing MS holder bat clamps of approved design to cast iron (spun) pipe				

		embedded in and Including cement concrete blocks 10 x10 x10cm of 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20mm nominal size) including cost of cutting holes and making good the walls etc.				
	17.37.1	For 100mm dia. Pipe	35.00	Each	167.35	5,857.25
4	17.38	Providing and fixing bend of required degree with access door, insertion rubber washer 3mm thick, bolts and nuts complete.				
	17.38.1	100mm				
	17.38.1.3	Hubless centrifugally cast iron epoxy coated inside & outside IS : 15905	35.00	Each	489.45	17,130.75
5	17.39	Providing and fixing plain bend of required degree.				
	17.39.1	100mm dia				
	17.39.1.3	Hubless centrifugally cast iron epoxy coated inside & outside IS : 15905	35.00	Each	307.10	10,748.50
6	17.42	Providing and fixing double equal plain junction of required degree.				
	17.42.1	100x100x100x100 mm				
	17.42.1.3	Hubless centrifugally cast iron pipes epoxy coated inside & outside IS : 15905	35.00	Each	645.10	22,578.50
7	17.44	Providing and fixing single equal plain junction of required degree :				
	17.44.1	100X100X100mm				
	17.44.1.3	Hubless centrifugally cast iron epoxy coated inside & outside IS : 15905	35.00	Each	503.40	17,619.00
8	17.48	Providing and fixing single unequal plain junction of required degree				
	17.48.1	100x 100x75 mm				
	17.48.1.3	Hubless centrifugally cast iron epoxy coated inside & outside IS : 15905	35.00	Each	482.45	16,885.75
9	17.54.A	Providing and fixing Hubless cast iron offsets epoxy coated inside & outside as per IS : 15905				
	17.54A.1	130 mm offsets				
	17.54A.1.1	With 100 mm dia	35.00	Each	557.95	19,528.25
10	17.56	Providing and fixing terminal guard:				
	17.56.1	100mm				
	17.56.1.3	Hubless centrifugally cast iron epoxy coated inside & outside IS : 15905	35.00	Each	355.85	12,454.75
11	17.57A	Providing and fixing shielded coupling for Hubless centrifugally cast iron pipe				
	17.57A.1	100mm				

	17.57A.1.1	SS 304 grade coupling with EPDM rubber gasket	35.00	Each	360.50	12,617.50
12	18.58	Providing and fixing PTMT grating of approved quality and colour				
	18.58.1	Circular type				
	18.58.1.2	125 mm nominal dia	84.00	Each	45.55	3,826.20
13	AS PER 19.2	Providing and laying cement concrete 1:5:10 (1 cement: 5 coarse sand: 10 graded stone aggregate 40 mm nominal size) alround CI HUBLESS including bed concrete as per standard design				
		Note: This work shall be done all-round PIPE AT ground floor's toilet.				
	19.2.1	100mm diameter	390.00	metre	622.95	2,42,950.50
14	19.19	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality				
	19.19.3	H D - 20				
	19.19.3.1	Circular shape 560 mm internal diameter	2.00	Each	1300.95	2,601.90
18	7760	P/F M.S. cap 100 mm dia	20.00	Each	120.00	2,400.00
		TOTAL C/F TO SUMMARY				**7,60,170.40**
c)		**WATER SUPPLY INSTALLATIONS**				
1	17.30	Providing and fixing in position 25 mm diameter mosquito proof coupling of approved municipal design.	2.00	Each	38.50	77.00
2	18.7	Providing and fixing CPVC pipes having thermal stability for hot and cold-water supply including all CPVC plain and brass threaded fittings including fixing the pipe with clamps at 1.00 mt spacing. this includes jionting of pipes and fittings with one step CPVC solvent cement and testing of joints complete as per direction of engineer in charge.				
		Internal work -Exposed on Wall				
2.1	18.7.1	15 mm nominal outer dia pipes	70.00	Rm	142.95	10,006.50
2.2	18.7.2	20 mm nominal outer dia pipes	225.00	Rm	179.95	40,488.75
2.3	18.7.3	25 mm nominal outer dia pipes	69.00	Rm	216.20	14,917.80
2.4	18.7.4	32 mm nominal outer dia pipes	46.00	Rm	289.05	13,296.30
2.5	18.7.5	40 mm nominal outer dia pipes	63.00	Rm	385.50	24,286.50
2.6	18.7.6	50 mm nominal outer dia pipes	20.00	Rm		10,971.00

					548.55	
3	18.8	Providing and fixing CPVC pipes having thermal stability for hot and cold-water supply including all CPVC plain and brass threaded fittings including fixing the pipe with clamps at 1.00 mt spacing. this includes jionting of pipes and fittings with one step CPVC solvent cement and the cost of cutting chases and making good the wall same including testing of joints complete as per the direction of engineer incharge				
	-	Concealed work including cutting chases and making good the wall etc.		-		-
3.1	18.8.1	15 mm nominal outer dia pipes	50.00	Rm	246.20	12,310.00
3.2	18.8.2	20 mm nominal outer dia pipes	285.00	Rm	284.85	81,182.25
3.3	18.8.3	25 mm nominal outer dia pipes	44.00	Rm	333.60	14,678.40
3.4	18.8.4	32 mm nominal outer dia pipes	50.00	Rm	412.90	20,645.00
			-	-		
4	18.10	Providing and fixing G.I. pipes complete with GI fittings and clamps including cutting and making good the walls etc. (internal work)				
		For roof level				
4.1	18.10.1	15 mm dia, nominal bore	0.00	Rm	186.40	0.00
4.2	18.10.2	20 mm dia, nominal bore	10.00	Rm	224.15	2,241.50
4.3	18.10.3	25 mm dia, nominal bore	10.00	Rm	247.85	2,478.50
4.4	18.10.4	32 mm dia, nominal bore	10.00	Rm	308.35	3,083.50
4.5	18.10.5	40 mm dia, nominal bore	0.00	Rm	394.15	0.00
4.6	18.10.6	50 mm dia, nominal bore	0.00	Rm	472.40	0.00
5	13.61	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade				
5.1	13.61.1	Two more coast on new work	39.00	sqm	78.40	3,057.60
6	18.17	Providing and fixing of gun metal gate valve with CI wheel of approved quality (screwed ends)				
6.1	18.17.1	25mm dia, nominal bore	9.00	Each	428.20	3,853.80
6.2	18.17.2	32 mm dia, nominal bore	4.00	Each	500.75	2,003.00

6.3	18.17.3	40 mm dia, nominal bore	11.00	Each	584.70	6,431.70
6.4	18.17.4	50 mm dia, nominal bore	1.00	Each	749.90	749.90
7	10.2	Structual steel work welded in built up sections, trusses and framed work including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	55.00	kg	67.60	3,718.00
8	18.46	Providing and fixing G.I. union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (new work)				
8.1	18.46.1	15mm nominal bore	4.00	Each	147.75	591.00
8.2	18.46.2	20mm nominal bore	4.00	Each	170.95	683.80
8.3	18.46.3	25mm nominal bore	4.00	Each	205.80	823.20
8.4	18.46.4	32mm nominal bore	4.00	Each	240.65	962.60
8.5	18.46.5	40mm nominal bore	4.00	Each	298.75	1,195.00
8.6	18.46.6	50mm nominal bore	4.00	Each	384.90	1,539.60
9.00	18.48	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, ISI: 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	1500.00	per litre	7.25	10,875.00
		TOTAL C/F TO SUMMARY				**2,87,147.20**
d)		**EXTERNAL DRAINAGE INSTALLATIONS**				
1	2.10	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
		All kinds of soil				
		up to 1.50 m depth				
1.1	2.10.1.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia	20.00	metre	225.45	4,509.00

2.0	4.1	Providing and laying in position cement concrete of grade excluding the cost of centering and shuttering - all work up to plinth level				
2.1	4.1.10	1:5:10 (1 cement: 5 coarse sand: 10 graded ston aggregate 40 mm nominal size)	5.00	CUM	4,209.05	21,045.25
3.0		Constructing brick masonry manhole with F.P.S. bricks in **cement mortar 1 : 4** (1 cement : 4 coarse sand) RCC top slab with 1 : 2 : 4 mix (1 cement : 2 coarse sand : 4 grade stone aggregate 20mm nominal size); foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size) inside plastering 12 mm thick with cement mortar 1:3 (1cement 3 coarse sand) finished with a floating coat of neat cement and making channels in cement concrete 1:2:4 (1cement : 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) finishd with a floating coat of neat cement complete as per standard design				
3.1	19.7.1.1	Inside size **90 x 80 cm & 45 cm** deep including CI cover with frame (light duty) 455 x 610mm internal dimension total wt. of cover & frame to be not less than 38 kg (wt. of cover 23 kg and wt. of frame 15 kg)	2.00	each	8,634.10	17,268.20
4	19.16	Providing orange colour safety **foot rest** of minimum 6 mm thick plastic encapsulated as per IS : 10910, on 12 mm dia steel bar conforming to IS : 1786, having minimum cross section as 23 mmx25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.	6.00	each	327.90	1,967.40
5		Providing and fixing square mouth SW gully trap grade 'A' complete CI grating brick masonry chamber with bricks of class designation 75 and water tight CI cover with frame of 300 x 300 mm size (inside) the weight of cover to be not less than 13.00 kg and frame to be not less than 5 kg. as per standard design.				

		(COVER MIN. 4.5 KG & FRAME MIN.2.7 KG)				
5.1	19.4.3.1	180x150 mm size P type With FPS bricks	2.00	each	1706.55	3,413.10
6		Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement: 1 fine sand) including testing of joints etc. complete :				
6.1	19.1.2	150 mm diameter	5.00	metre	327.05	1,635.25
6.2	19.1.3	200 mm diameter	20.00	metre	423.35	8,467.00
6.3	19.1.4	250 mm diameter	5.00	metre	692.50	3,462.50
7	19.2	Providing and laying cement concrete 1:5:10 (1 cement: 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round S.W. pipes including bed concrete as per standard design :				
7.1	19.2.2	150 mm diameter	5.00	metre	761.85	3,809.25
7.2	19.2.3	200 mm diameter	20.00	metre	888.10	17,762.00
7.3	19.2.4	250 mm diameter	5.00	metre	1027.00	5,135.00
8	19.21	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement cincrete 1:2:4 mix (1cement: 2 coarse sand : 4 graded stone aggregate 20mm nominal size) cement plastered on both sides with cement mortar 1:3 (1cement : 3 coarse sand) finished with a floating coat of neat cement and making necessary channels for the drain etc. complete	1.00	Item	391.15	391.15
8.1	19.21.1	For pipes 100 to 250 mm dia.				
		TOTAL C/F TO SUMMARY				**88,865.10**
		TOTAL OF PLUMBING WORKS				**12,37,294.25**
1		**ELECTRICAL WORKS**				
1		**WIRING**				
1.1	1.3	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.				
1.1.1	1.3.3	Group C	312.00	Point	1037	3,23,544.00
1.2	1.54	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single				

		core cable etc. as required.				
1.2.1	1.54.3	Group C	329.00	Point	601	1,97,729.00
1.3	1.7	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.				
1.3.1	1.7.2	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	390.00	meter	206	80,340.00
1.3.2	1.7.3	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	1252.00	meter	237	2,96,724.00
1.3.3	1.7.4	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	145.00	meter	324	46,980.00
1.3.4	1.7.7	4 X 2.5 sq. mm + 2 X 2.5 sq. mm earth wire	335.00	meter	312	1,04,520.00
1.3.5	1.7.8	4 X 4 sq. mm + 2 X 4 sq. mm earth wire	1163.00	meter	374	4,34,962.00
1.4	1.17	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.				
1.4.1	1.17.3	3 x 1.5 sq. mm	50.00	Meter	50	2,500.00
1.4.2	1.17.12	3 x 2.5 sq. mm	28.00	Meter	75	2,100.00
1.4.3	1.17.21	3 x 4 sq. mm	149.00	Meter	111	16,539.00
1.4.4	1.17.30	3 x 6 sq. mm	109.00	Meter	162	17,658.00
1.5	1.20	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
1.5.1	1.20.2	25 mm	300.00	meter	147	44,100.00
1.5.2	1.20.3	32 mm	200.00	meter	198	39,600.00
1.5.3	1.20.4	40 mm	80.00	meter	293	23,440.00
1.6	1.21	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.				
1.6.1	1.21.1	20 mm	100.00	Meter	57	5,700.00
1.6.2	1.21.2	25 mm	3072.00	Meter	69	2,11,968.00
1.6.3	1.21.3	32 mm	395.00	Meter	89	35,155.00
1.6.4	1.21.4	40 mm	20.00	Meter	114	2,280.00
1.7	1.22	Supplying and fixing metal box of following sizes (nominal size) on surface or in recess with suitable size of phenolic laminated sheet cover				

		in front including painting etc. as required.				
1.7.1	1.22.2	100 mm X 100 mm X 60 mm deep	16.00	Each	114	1,824.00
1.7.2	1.22.4	150 mm X 150 mm X 60 mm deep	20.00	Each	168	3,360.00
1.7.3	1.22.9	200 mm X 250 mm X 60 mm deep	15.00	Each	255	3,825.00
1.7.4	1.22.15	250 mm X 300 mm X 60 mm deep	10.00	Each	337	3,370.00
1.8	1.26	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	43.00	Each	24	1,032.00
1.9	1.31	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	19.00	Each	313	5,947.00
1.10	1.56	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providng and fixing 2 Nos. 3 pin 5/6 A modular socket outlet and 2 Nos. 5/6 A modular switch, connections etc. as required. (For light plugs to be used in non residential buildings).	17.00	Each	504	8,568.00
1.11	1.32	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 A & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	139.00	Each	406	56,434.00
1.12	1.24	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
1.12.1	1.24.1	5/6 A switch	43.00	Each	84.00	3,612.00
1.12.2	1.24.4	3 pin 5/6 A socket outlet	129.00	Each	81.00	10,449.00
1.12.3	1.24.6	Telephone socket outlet	63.00	Each	96.00	6,048.00
1.12.4	1.24.7	TV antenna socket outlet	2.00	Each	97.00	194.00
1.13	1.27	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required.				
1.13.1	1.27.1	1 or 2 Module (75 mmX75 mm)	73.00	Each	175.00	12,775.00
1.13.2	1.27.5	8 Module (125 mmX125 mm)	43.00	Each	297.00	12,771.00
						0.00

1.14	1.19	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	40.00	Meter	29	1,160.00
1.15	1.53	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required.				
1.15.1	1.53.1	1 run of cable	439.00	meter	34	14,926.00
1.15.2	1.53.2	2 run of cable	658.00	meter	59	38,822.00
1.15.3	1.53.3	3 run of cable	878.00	meter	84	73,752.00
1.16	1.57	Supplying & fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc. as required.	6.00	Each	533	3,198.00
		TOTAL CARRIED TO SUMMARY				**21,47,906.00**
2		**DISTRIBUTION BOARDS**				
2.1	2.3	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
2.1.1	2.3.3	12 way, Double door	4.00	Each	1151	4,604.00
2.1.2	2.3.4	16 way, Double door	1.00	Each	1364	1,364.00
2.2	2.4	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/ Isolator)				
2.2.1	2.4.3	8 way (4 + 24), Double door	4.00	Each	3171	12,684.00
2.3	2.10	Supplying and fixing 5A to 32A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
2.3.1	2.10.1	Single pole	110.00	Each	173	19,030.00
2.3.2	2.10.3	Double pole	4.00	Each	463	1,852.00

2.4	2.12	Supplying and fixing following rating, double pole, 240 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
2.4.1	2.12.1	40 A	9.00	Each	222	1,998.00
2.5	2.11	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	4.00	Each	7	28.00
2.6	2.13	Supplying and fixing following rating, four pole, 415 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
2.6.1	2.13.1	40 amps	6.00	Each	667	4,002.00
2.7	2.14	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				0.00
2.7.1	2.14.2	40 A	13.00	Each	1719	22,347.00
2.8	2.23	Supplying and fixing Cable End Box (Loose wire box)(IP 43) suitable for following single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with testing and commissioning etc.as required.				
2.8.1	2.23.4	For 14 way, Double door SPN MCBDB	5.00	Each	488	2,440.00
2.9	2.24	Supplying and fixing Cable End Box (Loose wire box)(IP 43) suitable for following triple pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with testing and commissioning etc.as required.				
2.9.1	2.24.3	For 8 way, Double door TPN MCBDB	4.00	Each	728	2,912.00
2.10	2.18	Supplying and fixing 20 A, 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top alongwith 20 A, "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	9.00	Each	980	8,820.00
		TOTAL CARRIED TO SUMMARY				**82,081.00**
3		**INSTALLATIONS OF LIGHT FIXTURES AND FANS**				

3.1	1.49	Numbering of ceiling fan/ exhaust fan/ fluorescent fittings as required.	160.00	Each	28	4,480.00
		TOTAL CARRIED TO SUMMARY				**4,480.00**
4		**L.T./ CONTROL CABLES**				
4.1		**LAYING OF CABLES**				
4.1.1		**LAYING OF CABLES ON CABLE TRAY**				
	7.8	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size on cable tray as required.				
4.1.1.1	7.8.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	729.00	Metre	21	15,309.00
4.1.1.2	7.8.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	88.00	Metre	49	4,312.00
4.2		**CABLE JOINTING & END TERMINATION**				
		TERMINATIONS FOR LT ALUMINIUM CABLES				
	9.1	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required				
4.2.1	9.1.22	3½ X 50 sq. mm (35 mm)	4.00	Each	354	1,416.00
4.2.2	9.1.21	3½ X 35 sq. mm (32mm)	4.00	Each	282	1,128.00
		TOTAL CARRIED TO SUMMARY				**22,165.00**
5		**EARTHING SYSTEM**				
5.1	5.6	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required.	1.00	Set	8289	8,289.00
5.2	5.15	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	352.00	Meter	129	45,408.00
						0.00
5.3	5.16	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	88.00	Meter	37	3,256.00

		TOTAL CARRIED TO SUMMARY				**56,953.00**
6		**CABLE TRAY**				
6.1	4.6	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.1.1	4.6.4	300 mm width X 50 mm depth X 1.6 mm thickness	154.00	Meter	703	1,08,262.00
6.1.2	4.6.2	150 mm width X 50 mm depth X 1.6 mm thickness	77.00	Meter	504	38,808.00
6.2	4.7	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.2.1	4.7.4	300 mm width X 50 mm depth X 1.6 mm thickness	2.00	Each	1447	2,894.00
6.2.2	4.7.2	150 mm width X 50 mm depth X 1.6 mm thickness	4.00	Each	976	3,904.00
6.3	4.8	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.3.1	4.8.4	300 mm width X 50 mm depth X 1.6 mm thickness	1.00	Each	1695	1,695.00
6.3.2	4.8.2	150 mm width X 50 mm depth X 1.6 mm thickness	2.00	Each	976	1,952.00
6.4	4.10	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Reducer" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.4.1	4.10.4	300 mm width X 50 mm depth X 1.6 mm thickness	2.00	Each	2954	5,908.00
		TOTAL CARRIED TO SUMMARY				**1,63,423.00**

7		**SAFETY EQUIPMENTS**				
7.1	2.21	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	1.00	Nos.	149	149.00
		TOTAL CARRIED TO SUMMARY				**149.00**
8		**FIRE ALARM SYSTEM**				
8.1	DSR-2018 17.1.1	Supplying, installation, testing & commissioning of heat detector operating at 54c/ 57C with rate of rise cum fixed temperature (dual thermistor) type with mounting base complete with all connection etc. as required.	1.00	Each	927.50	927.50
8.2	DSR-2018 17.1.2	Supplying, installation, testing & commissioning of smoke detector with builtin LED and mounting base complete with all connections etc. as required.	82.00	Each	1000.10	82,008.20
8.3	DSR-2018 17.1.3	Supplying, installation, testing & commissioning of manual call boxes of MS construction in surface/recess with stainless steel chain & hammer assembly complete with glass and push button etc. as required.	2.00	Each	404.85	809.70
8.4	DSR-2018 17.1.5	Supplying, installation, testing & commissioning of response indicator on surface/recesss MS box having two LEDs metallic cover complete with all connections etc. as required.	99.00	Each	160.95	15,934.05
8.5	DSR-2018 17.1.6	Supplying, installation, testing & commissioning fire alarm sounder with facility to make announcement, mounted in M.S. box (16SWG) with hinged cover plate & suitable for operation with amplifier i/c line matching transformer etc. complete as required.	2.00	Each	477.45	954.90

8.6	DSR-2018 17.1.11	Supplying, installation, testing & commissioning of main control and indicating panel made out of 16 SWG MS sheet to accommodate the following items duly powder coated in approved colour with louvers for ventilation, locking arrangement, audio and visual indication for fire alarm and public address system, monitoring system including connections, interconnections etc complete as required. 6 Zone panel for fire alarm system 100 watt amplifier racks suitable for operation on 230V AC/24V DC supply conforming to IEC-268-3 complete with all Talk back master station with LED PTT (press to talk) push button for operation on 230V AC/24 V DC supply conforming to IEC-268 for simplex mode of operation/communication suitable for 20 Nos.talk back unit -1 set. Annoucement control desk suitable for selection of different zones selectively and ON ALL CALL switch with visual indication etc., complete as required- 1 set. Amplifier change over switch for inter changing amplifier- 1 No. Monitor panel for loudspeaker complete output selector ON/OFF switch, fuse visual indications etc. complete as required- 1 No. Gooseneck microphone with stand and ON/OFF switch -1 No. Mains ON/OFF switch, fuse indication lamps, DC and AC voltmeters & ammeters terminal blocks etc. complete as required -1 set. Battery charger trickle cum boost to take complete load of fire alarm & PA system complete with all accessories including providing & fixing of 2 nos. 12 volt,30 AH each sealed maintenance free batteries -1 set.	1.00	Each	41851.65	41,851.65
8.7	DSR-2018 17.5.1	Supplying & laying of 2x1.5 sqmm fire survival armoured cable, 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer sheath complete as required.	980.00	Metre	287.25	2,81,505.00
		TOTAL CARRIED TO SUMMARY				**4,23,991.00**
9		**PA SYSTEM**				
9.1	DSR-2018 17.3.1	Supplying, installation, testing & commissioning of 6 zone, voice alarm controller with USB, MP3 player (including 6 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required.	1.00	Each	110827.25	1,10,827.25

9.2	DSR-2018 17.3.2	Supplying, installation, testing & commissioning of 1.5/3/6W ceiling speaker complete as required.	23.00	Each	834.60	19,195.80
9.3	DSR-2018 17.3.3	Supplying, installation, testing & commissioning of 1.5/3/6W metal box ceiling/wall speakers complete as required.	5.00	Each	1560.55	7,802.75
9.4	DSR-2018 17.5.1	Supplying & laying of 2x1.5 sqmm fire survival armoured cable, 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer sheath complete as required.	209.00	Metre	287.25	60,035.25
		TOTAL CARRIED TO SUMMARY				**1,97,861.05**
10		**OCCUPENCY SENSOR**				
10.1	**DSR-2016** 15.1	Supplying, installation, testing and commissioning of Passive Infrared (PIR) technology-based occupancy sensor having high preformance, non regulating programmable type, suitable for connected load upto 10 A, for mounting height up to 2.8 meter and for 5-meter diameter coverage area along with necessary fixing arrangements i/c programming at site etc. complete as required.	36.00	Each	3193	1,14,948.00
		TOTAL CARRIED TO SUMMARY				**1,14,948.00**
		TOTAL OF ELECTRICAL WORKS				**32,13,957.05**
		FIRE FIGHTING SYSTEM				
		DSR 2019 Wet Riser & Sprinkler System				
1	**DSR 2019** 9	Supplying and fixing single headed internal hydrant valve with instantaneous Gunmetal/Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required:				
1.1	9.1	Single headed Gunmetal	1.00	Each	6,571.04	6,571.04
2	17	Supplying and fixing first-aid Hose Reel with MS construction spray painted in post office red, conforming to IS 884 complete with the following as required. 20 mm nominal internal dia water hose thermoplastic (Textile reinforced) type -2 as per IS: 12585				
		20 mm nominal internal dia gun metal globe valve & nozzle. Drum and brackets for fixing the equipmets on wall.				

		Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket.				
2.1	17.1	30 M	1.00	Each	7,376.32	7,376.32
3	16	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female couplings duly bound with GI wire, rivets etc. conforming to IS 636 (type-A) as required:				
3.1	16.1	Gun Metal	2.00	Each	4,548.72	9,097.44
4	18	Supplying & fixing 63 mm dia gun metal short branch pipe with 20 mm nominal internal diameter size nozzle conforming to IS903 suitable for instantaneous connection to interconnect hose pipe coupling as required:				
4.1	18.1	Gun metal	1.00	Each	2,106.09	2,106.09
5	11	Supplying, fixing, testing and commissioning of **butterfly valve** of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required:				
5.1	11.5	100 mm dia	2.00	Set	5,659.21	11,318.42
6	13	Supplying and fixing orifice plate made out of 6 mm thick stainless steel (Grade 304) with orifice of required size to be fitted between flange & landing valve of external and internal hydrants to reduce pressure at the outlet to the level of 3.5 kg/cm2 complete as required.	4.00	Each	1,131.85	4,527.40
7	7	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :				
		Note:				
A		Threaded joint upto 50mm diameter pipe.				
B		Welded joint above 50mm diameter pipe.				
7.1	7.1	25 mm dia.	100.00	Rm	412.66	41,266.00
7.2	7.2	32 mm dia.	10.00	Rm	462.40	4,624.00
7.3	7.3	40 mm dia.	60.00	Rm	570.72	34,243.20

7.4	7.4	50 mm dia.	30.00	Rm	689.96	20,698.80
7.5	7.5	65 mm dia.	25.00	Rm	880.30	22,007.50
7.6	7.6	80 mm dia.	28.00	Rm	984.08	27,554.24
7.7	7.7	100 mm dia.	55.00	Rm	1,314.18	72,279.90
8	23	Providing & fixing flow switch in following sizes M.S. pipe including connection etc as required.				
8.1	23.1	100mm dia	2.00	Set	6,454.89	12,909.78
9	21	Providing, fixing, testing & commissioning of 15mm dia quartzoid bulb type sprinklers of rating 68 degree centigrade with required accessories:				
9.1	21.1	Pendent Sprinkler	85.00	NOS	424.44	36,077.40
9.2	21.2	Upright Sprinkler	85.00	NOS	424.44	36,077.40
		TOTAL OF FIRE FIGHTING SYSTEM				**3,48,734.93**
		TOTAL OF SCHEDULE 'A'				**1,49,84,891.03**

Explanatory Notes for BOQ:

(i) All DSR items contain item nos. and, if any discrepancy is found in nomenclature, then scheluded nomenclature of CPWD DSR 2016/2018/2019 will prevail.

(ii) The rates of all CPWD DSR Items are already exclusive of GST. However, the rates of all items of DSR 2018 & 2019 are evaluated excluding GST component on DAR basis.

(iii) The quantity mentioned in the Schedules is approximate and the DFCCIL reserves the right to increase / decrease the same as per site requirement.

Form - 4

SCHEDULED – "B"
Schedule of Prices & Total Prices

Name of Work: Complete Interior & Services work – Flooring, Partitioning, Falseceiling, Plumbing, Electrical, HVAC, Communication Cabling etc. for Ground Floor and Renovation of common & executive Toilets at 3rd, 4th and 5th floor of DFCCIL H. Q. Building at Pragati Maidan, New Delhi

S. No.	Item No.	Description of Items	QTY.	UNIT	RATE (Rs.)	AMOUNT (Rs.)
		SCHEDULED 'B' - (Non–Scheduled Items other than CPWD DSR -2016)				
	II.	**NON-SCHEDULED ITEMS -1 (CIVIL WORK)**				
A		**CIVIL WORK**				
1		**DEMOLISHING WORKS**				
		Rates Quoted shall include:				
a		All heights, all depths, all level and all shape, all lead & all lifts				
1.4	NS-1	Dismantelling of ACP cladded over walls, beams and columns, rolling shutters, metal grid ceiling and metal sheets in roof by mechanical means including stacking of stutters and disposal of material from site to outside till disposal point as specified by Local authorities or as directed by engineer in charge.	1.00	LS	299615	2,99,615.00
1.4	NS-2	Making holes of required size and shape in post RCC work at designated locations if not mentioned in the drawings but required by Engineer in charge including cutting of reinforcement, finishing edges smooth with 1:3 (1 Cement : 3 Coarse Sand) cement mortar and plugging the open spaces around sleeves/puddle flanges with concrete 1:1.5 :3 (1 Cement : 1.5 Coarse Sand : 3 graded stone aggregate 20 mm nominal size) admixed with waterproofing compound of Grace / CICO or equivalent make etc. complete. for all leads lift and heights.				
1.4.1	NS-2 a	Size of opening up to 150 mm x 150 mm x 150 mm dia.	RO	Each	4390	0.00
1.4.2	NS-2 b	Size of opening above 150 mm x 150 mm & up to 300 mm x 300 mm or 300 mm dia.	RO	Each	6342	0.00
1.4.3	NS-2 c	Size of opening above 300 mm x 300 mm & up to 500 mm x 500 mm or 500 mm dia.	RO	Each	8293	0.00
1.5	NS-3	Core Cutting of 100mm dia in RCC with Diamond Cutter of following R.C.C. thickness				
1.5.1	NS-3 a	100mm	5.00	Each	2927	14,635.00

1.5.2	NS-3 b	150mm	4.00	Each	3415	13,660.00
1.5.3	NS-3 c	200mm	RO	Each	4390	0.00
1.5.4	NS-3 d	300mm	RO	Each	4878	0.00
1.6	NS-4	Core Cutting of 150mm dia in RCC with Diamond Cutter of following R.C.C. thickness				
1.6.1	NS-4 a	100mm	RO	Each	3415	0.00
1.6.2	NS-4 b	150mm	RO	Each	4390	0.00
1.6.3	NS-4 c	200mm	2.00	Each	4878	9,756.00
1.6.4	NS-4 d	300mm	2.00	Each	5854	11,708.00
		SUB TOTAL				**3,49,374.00**
B		**INTERNAL FINISHING WORK**				
i		The tender rates should include supply of all materials unless mentioned otherwise including the cost of transportation, loading, unloading, stacking and storing and all types of taxes, duties, levies, wastage etc. required for execution of work.				
ii		The tender rates shall hold good for all works of every section at all levels, leads and heights including multiple staging/scaffolding wherever required etc. complete. Nothing extra shall be payable unless or otherwise specified				
iii		Contractor shall ensure for safety norms, particularly basements, wherever required during excavation, shoring, strutting, planking etc. Shall be carried out as directed by engineer in charge, at no additional cost.				
iv		Prior to submission of the bid it is advised that Contractor must visit site and acquaint with prevailing site conditions, nothing shall be paid extra on this account.				
v		The rate shall be for all heights, depths, level and shape, lead & lifts				
vi		All Basic rates mentioned in the BOQ are F.O.R. at site, inclusive of transportations, loading unloading, royalties, delivered at site, all applicable taxes, duties and levies but excluding wastage. The contractor shall get approval of material and rate from the Engineer-in-charge before procurement. Only the differential of the basic rate from that mentioned in the boq and approved rate of material shall be paid / deducted.				
vii		Item Description of B.O.Q is summary only. The BOQ, Technical Specifications and tender Drawings are to be read in conjunction for pricing.				
viii		Rates quoted shall include all leads, all lift, all heights/ depths, all levels and all shapes.				
1.7	NS-5	**LAMINATED WOODEN FLOORING**				

1.7.1		Wooden Laminated Flooring - Providing and laying pre-approved laminated wood flooring with backing foam to be laid as per design and detail at locations as indicated on the drawings and as per the instruction of the Architect/Project Manager. The cost to be inclusive of all necessary accessories like trims, transition profiles etc. Base Rate of Wooden Laminated Flooring - INR 100/-SqFt (Sample to be submitted for approval before placing order to Supplier)				
1.6.1.1		Over IPS Flooring but excluding the cost of IPS floori	104.80	Sqm	1771	1,85,606.64
1.11	NS-6	**TERMINATION PROFILE**				
1.11.1		Providing and fixing termination profile (floor & wall) of Bottomline make or equivalent make complete as approved by the architect.	6.00	Rmt	355	2,130.00
1.12	NS-7	**ALUMINIUM SKIRTING**				
1.12.1		Providing and fixing 100 mm high 1.5 mm thick anodized modular Aluminium skirting from specialized vendor (Harmony systems / Bottom Line or equivalent make) as per sample approved. (Base rate of Aluminium skirting 295/-Rs per Rmt F.O.R. at Site .)	262.47	Rmt	343	90,027.21
		SUB TOTAL				**2,77,763.85**
3	NS-8	**DRY WORK**				
	NS-8 a	Plasterboard and finishing: 1 x 12.5 mm Standard board (conforming to IS 2095 Part1 1996; BS 1230: Part1: 1985 for Gypsum Board Type 1 & BS EN 520: 2004 Type A) is screw fixed to metal system on both sides using “type S” Self tapping 3.5 x 25mm corrosion resistant drywall screws spaced at 200mm centers on all joints and 300mm centers in the field of boards. Screw fixing is done mechanically. FiROlly, boards and screw heads are to be jointed and finished so as to have a flush look which includes filling tapered edge and square edges of board with Rapid Joint Compound, Paper Tape (As per recommended practice of Manufacturer, All perimeters and penetrations to be sealed with Acrylic sealant as per manufacturer’s specifications.	156.77	Sqm	1297	2,03,327.45
3.1.1	NS-8 b	Same As Item No. B3.1 but with one Side 12.5mm thick gypsum board & one side Fire rated Gypsum Board	32.24	Sqm	1399	45,096.77
3.1.2	NS-8 c	Same As Item No. B3.1 but with one Side 12.5mm thick gypsum board & one side 12mm thk BWR Ply Board	61.18	Sqm	1959	1,19,851.62
3.1.3	NS-8 d	Same As Item No. B3.1 but with one Side 12mm thick BWR Ply Board & one side Fire rated Gypsum Board	11.06	Sqm	2061	22,794.66

3.1.4	NS-8 e	Same As Item No. B3.1 but with both side Fire rated Gypsum Board	11.90	Sqm	1501	17,861.90
3.1.4	NS-8 f	Same As Item No. B3.1 but with both side 12mm thick BWR Ply Board	42.81	Sqm	2772	1,18,655.46
3.1.2	NS-9	**100/102 MM THICK GYPSUM BOARD PARTITION:-** P/F gypsum partition with two layer of 12.5mm thick gypsum board, both side on G.I. frame. Partition to be filled with 50mm thick Glass Wool insulation of 24 kg / cum. Rates includes of G.I. frame , screw, taping & jointing required for gypsum work, closing of opening made for duct and other piping work etc. (excluding plastic emulsion / texture Paint)				
		Metal System: Providing and fixing USGBORAL Ultraframe metal system up to ceiling height, which includes frame work made of special section power pressed/ roll form G.I. sheet with zinc coating of 120 GSM, consisting of USGBORAL U track 52mm wide having equal flanges of 30mm and 0.55mm thick (Base metal thickness) fastened to the floor slab and ceiling soffit using rawl plugs with screw/expansion fasteners at 600mm centers, with first & last fixing point at not greater than 50 mm from either end. USGBORAL C studs 50mm wide having one flange of 34mm, other flange 36mm, lip size 6 mm and 0.55mm thick installed perpendicularly within the flanges of floor and ceiling channels located directly opposite to each other at not more than 610mm centers. Maintain 5 to 10mm gap between C Stud and web of U Track. 50mm thick @ 20 kg/cum density Glass wool Insulation of Twiga to be suspended with USGBORAL Insulation Holder Strip positioned at 1200mm vertical centers within the stud cavity. Plasterboard and finishing: 2 x 12.5 mm Standard board (conforming to IS 2095 Part1 1996; BS 1230: Part1: 1985 for Gypsum Board Type 1 & BS EN 520: 2004 Type A) is screw fixed to metal system on both sides using “type S” USGBORAL Self tapping 3.5 x 25mm/38mm corrosion resistant drywall screws spaced at 200mm centers on all joints and 300mm centers in the field of boards. Screw fixing is done mechanically. . Install USGBORAL Flat Strap 90mm x 0.55mm behind horizontal board joints. Finally, boards and screw heads are to be jointed and finished so as to have a flush look which includes filling tapered edge and square edges of board with USGBORAL Rapid Joint Compound, USGBORAL Paper Tape (As per recommended practice of USGBORAL Gypsum India Pvt Ltd). All perimeters and penetrations to be sealed with				

		Intumescent sealant as per manufacturer's specifications.				
	NS-9 a	Plasterboard and finishing: 2 x 12.5 mm Standard board (conforming to IS 2095 Part1 1996; BS 1230: Part1: 1985 for Gypsum Board Type 1 & BS EN 520: 2004 Type A) is screw fixed to metal system on both sides using "type S" Self tapping 3.5 x 25mm corrosion resistant drywall screws spaced at 200mm centers on all joints and 300mm centers in the field of boards. Screw fixing is done mechanically. FiROlly, boards and screw heads are to be jointed and finished so as to have a flush look which includes filling tapered edge and square edges of board with Rapid Joint Compound, Paper Tape (As per recommended practice of Manufacturer, All perimeters and penetrations to be sealed with Acrylic sealant as per manufacturer's specifications.	RO	Sqm	1580	0.00
3.1.3	NS-9 b	Same As Item No. B3.1.2 but with Fire rated Gypsum Bard Partitions	RO	Sqm	1800	0.00
3.2	NS-10	**GLAZED PARTITIONS**				
		Supply and Installation of 75 mm thick Glass Partition with 12 mm thick toughened Glass and Bottomline 100mm Partition System of matt black finish of 80 X 20mm thick ALUMINIUM SECTION of four sides using 100.01 as horizontal top and as verticals, 100.02 & 100.03 as horizontal bottom for installation glass and other required accessories.	144.33	Sqm	6330	9,13,583.26
3.4	NS-11	**SOLID WOOD BATTENS PANELLING**				
3.4.1		Providing and fixing WOOD BATTENS 25mmX25mm fixed over 12mm thick BWP ply over hard wood framing including BATTENS in the pattern as approved by the architect. Using termite treated Marandi wool of section 50 mm X30 mm for hard wood frame @ 600 mm c/ c both ways including polishing complete .	14.12	Sqm	4878	68,898.82
3.5	NS-12	**LAMINATE PANELLING**				
3.5.1		Same as item No. B.3.4 with 1 mm thick LamiROte.	259.37	Sqm	2927	7,59,172.18

		(Base Rate of LamiROte 40/- Rs / Sft)				
3.6	NS-13	**LACQUERED GLASS PANELLING**				
3.6.1		Providing and fixing 6 mm thick lacquered glass paneling fixed to 12mm thick BWP ply with 3M structural tape cost to include all necessary ROils, screw, fire retardant and preservative paint as per design, 10 mm thick beading finished with Duco paint, etc. complete in all respect for all lead & lift, all levels & height, all floors .	23.00	Sqm	5808	1,33,577.61
3.8	NS-14	**GRAPHICS**				
3.8.1		Providing and fixing graphic 3 M / Avery make film pasted over MDF board / wall / 12 mm thick bwp Ply surface complete in all respect for all lead & lift, all levels & height, all floors .	81.58	Sqm	2146	1,75,074.97
3.10	NS-15	**WALL PAPER**				
3.10.1		Providing and fixing wall paper of Eden Enterprises / MARSHALL / ELEMENTO or equivalent make as per approval of Architect on oil based surfaces over wall / Gypsum board with suitable adhesive as per manufacturers specification. The item rates includes for all lead & lift, all levels & height, all floors. (Vendors' Rate of Wall Paper 100/- Rs / Sft F.O.R. at Site .	108.24	Sqm	1268	1,37,253.98
		SUB TOTAL				**27,15,148.69**
4		**FALSE CEILING WORKS**				
4.5	NS-16	**WOODEN CEILING**				
4.5.1		Providing and fixing wooden ceiling finished in 1mm thk lamiROte over 12mm thk bwp ply with hardwood frame. The item rate includes the suspension system, fire retardant and termite treatment on hard wood frame. All cutting for lights/smoke detectors/sprinklers etc. to be included. The quoted rate shall be inclusive of suspenders at all heights, cove / vertical drops up to 300mm high for horizontal & vertical surfaces, etc.. complete in al respect for all lead & lift, all levels & height, all floors . Base Rate of LamiROte 40/- Rs / Sft	9.96	Sqm	4390	43,720.01
4.6	NS-17	**BAFFLE CEILING**				
4.6.1		Providing & fixingArmstrong Vertical Linear Baffle Ceiling made out of Aluminum Extrusion in Aluminum alloy grade 6063. The baffle blade shall be in size of 100x25x3600mm in powder coated Black finish. The baffle blade shall be				

		suspended using Slotted U-profile at on-center spacing in multiples of 25mm.Longer lengths of Baffle to be connected by Baffle Joiner and the ends to be fixed with End caps. Installation of U-Grid: The U profile to be suspended at every 1200mm on-centre using 6mm threaded rod from the structural soffit using U-profile hanger. U-profile splice to be used to join more than one U profiles of length 3.75M. 1st U-Grid Channel must be no more than 400mm from the perimeter.				
		Installation of Armstrong Baffles: Locate the slot for Baffle Hangers in U Profile section at 1200mm centres. Hangers are inserted into the slot, then rotated 90° and fixed into position by tightening the grub screw. Baffle to be lifted into position and hangers engage over lip of U-Grid Channel. Each Hanger to be secured into position by inserting the Locking Clip. When doing continuous installation, Baffles blades are to be connected at ends with Baffle Joiner, which are inserted into the top and bottom slots of the Baffle closed profile for alignment only. The bottom Joiner to be located first and fastened on one side only. The top Joiner to be fitted then and secured with grub screws on one side. Then the two Baffle sections shall be joined and the top Joiner is screw fastened on the 2nd Baffle profile. End Caps to be located by pushing the End Cap tongues into open Baffle slots. Installation to be carried out by Armstrong Trained Installation team & Installation should be carried out as per Armstrong recommended procedure.	38.10	Sqm	10454	3,98,328.76
4.7	NS-18	**TRAP DOOR**				
		Providing and fixing moisture resistant Gypsum Board Access Panel / trap door- upto 600mmx1200mm with frame made from stable aluminium profile for vertical and horizontal area . The item cost includes of rust proof screws, spring loaded snap lock etc. complete.	9.00	Each	6634	59,706.00
		SUB TOTAL				**5,01,754.77**
5		**DOOR AND DOOR FRAME**				
5.1	NS-19	Providing and fixing pull Handle TGDI-H 450 back to back with 350mm CTC, adjustable fixing for glass, wood and metal doors in satin stainless steel. The pull handles should have supporting washer with raised bevelling on the outer surface.	10.00	Nos	2671	26,710.00

		Length =450mm, 25mm dia, -SS304 of Dorma or equivalent.				
5.2	NS-20	Providing and fixing Corner patch lock with a euro profile cylinder and strike plate of SAP Code 9117697 product code 3108 of Dorma or equivalent.	10.00	Nos	2172	21,720.00
5.3	NS-21	Providing and fixing floor stopper half dome with 50mm dia with fixing accessories, in satin stainless steel of SAP Code 20670099 product code US10 of Dorma or equivalent.	14.00	Nos	168	2,352.00
5.4	NS-22	**Fire Door With Frame**				
5.4.1		Providing and fixing 55mm thick Single leaf/double leaf Fire door shutter of 2 Hr. rating (confirming to BS 476 PART 22 / IS : 3614 Part 2 - ISO : 834 -1975 PROTO Type Tested and certified at CBRE Roorkee) complete with door frame of Navair / Shakti / Sukhri make in staircase finished with 1 mm thick laminate of approved make fixed in pattern to both faces (to make overall thickness of shutter as 57mm) including required hardwares(locking system as per approved sample, Leaver handles, 4 or 8 Nos. (5" x 3 mm) SS Ball bearing hinges fixed with counter sunk SS screws, Door lock , Door stopper, Back rubber, door closer of Dorset make or equivalent make as per approved sample Panic bar as per approved make. complete as per approval of architect.. complete as per drawings. (Basic Rate of Laminate is Rs. 40/- Rs per Sft F.O.R. at Site .) The required certificate of approval to be provided for the doors by the vendor,				
5.4.1.1		For 120 minutes rating				
5.4.1.1.1	NS-22 a	Double Leaf door closer with panic bar and vision panel - 200 mm x 1550 mm with wired glass	0.00	Sqm	25412	0.00
5.4.1.1.2	NS-22 b	Single leaf door closer with panic bar and with vision panel - 200 mm x 1550 mm	5.04	Sqm	29985	1,51,124.40
		SUB TOTAL				**2,01,906.40**
6		**FINISHING**				
		Rates Quoted shall include:				
a)		Materials or samples shall be approved by the Architect / Engineer-in-charge before fixing.				
b)		Finishing the edges of electric fittings, chases cutting boxes etc.				
c)		Use of scaffolding, trestles, ladders etc. necessary				

		for execution of work and for inspection.				
d)		Cleaning painting splashes, dirt, glass, joinery including washing the floors, windows and cleaning premises neat and clean.				
e)		Putting, sand papering and dusting of surface in between coats where applicable.				
f)		Work on cornices, narrow widths, bands etc.				
g)		All Levels, Lift, Shape and Height				
9	NS-23	Glass Wool Roof Panel (50mm)				
9.1		Providing and fixing The Roof shall be constructed of 50mm+30mm thick GLASSWOOL insulated panels having 48+2 Kg/m3 density lined with top covering of trapezoidal pre coated GI sheet with 30±1mm,crest width 24±1mm and pitch 200±1mm & bottom covering on roof panels shall be micro ribbing Pre-coated galvanized iron sheet made by lamella Technology. Cost to include scaffolding, hydra as per requirement	182.00	Sqm	2184	3,97,488.00
6.5	NS-24	**POP**				
6.5.1		Providing and applying 6-8 mm thick P.O.P. plaster over the plastered surface in line and level in plumb to prepare the surface even and smooth including scraping and removing the existing finish, hacking the surface of walls/ columns, providing necessary bands, drip moulds, tapak, groove, chicken wire mesh 300 wide at junction of dissimilar materials, scaffolding etc.. After leveling, the surfaces to be finished to receive paint etc. the item rate complete as per instructions of Engineer-in charge. for all leads, lifts and heights, Scaffolding.				
6.5.1.1		On Wall and ceiling in	118.58	Sqm	117	13,874.33
		SUB TOTAL				**4,11,362.33**
7		**MISCELLANEOUS. WORK**				
7.1	NS-25	**MIRROR**				
a	NS-25 a	Providing and fixing 6 mm thick looking mirror pasted over 12mm thick bwp ply with SS studs, the item cost includes of Duco painted 15 mm thick hard wood beading of teak wood as per detail, anti termite treatment of base ply, SS Studs, LED lighting if required etc. complete with all respect.	26.54	Sqm	6969	1,84,943.32
b	NS-25 b	Providing and fixing circular mirror of dia 1150mm with 25mm thick border duco pinted in black colour.	3.00	Nos	10454	31,362.00

c	NS-25 c	Providing and fixing circular mirror of dia 700mm with 25mm thick border duco pinted in black colour.	3.00	Nos	5808	17,424.00
d	NS-25 d	Providing and fixing circular mirror of dia 560mm with 25mm thick border duco pinted in black colour.	3.00	Nos	4065	12,195.00
e	NS-25 e	Providing and fixing mirror of size 1050mm x 900mm with border of 85mm with led cove light on all four sides.	30.00	Nos	19165	5,74,950.00
f	NS-25 f	Providing and fixing mirror of size 1450mm x 500mm with border of 85mm with led cove light on all four sides.	6.00	Nos	14461	86,766.00
7.2	NS-26	**FROSTED FILM**				
7.2.1		Providing and fixing Frosted film '3M' make or equivalent make (contractor has to provide 15 years MCS warranty) on glass surfaces in approved design & pattern as per manufactures specification all complete. The item rates includes for all lead & lift, all levels & height, for all floors . Note only film surface area shall be measured and paid	108.24	Sqm	1366	1,47,861.94
7.3	NS-27	**URINAL/ BASIN SEPERATOR PARTITION**				
a	NS-27 a	Providing and fixing of 12mm thick toughened glass urinal partition of size 2000mm x 400mm fixed on SS fittings	18.00	Nos	9292	1,67,256.00
b	NS-27 b	Providing and fixing of 12mm thick toughened glass urinal partition of size 900mm x 400mm fixed on SS fittings	4.00	Nos	6156	24,624.00
7.6	NS-28	**ROLLER BLINDS - SCREEN FABRIC PHIFER INFINITY**				
7.6.1		Providing and fixing **Chain Operated Roller Blinds in Screen Fabric of PHIFER (Equilibrium)of approved colour** with roller system utilizing a bidirectional, wrap spring clutch. The system must be capable of smoothly raising and lowering the blind to any desired height and width **as per drawing**, and maintaining that height with no slippage. Clutch size is adjusted based on the weight of fabric. Clutch must not require any adjustment after installation. Clutch may be mounted in either end of the roller tube. The clutch shall be of nylon in White or approved colour. Operating loop may be 10 nos plastic bead chain or qualified 10 nos plated steel ball chain, with upper and lower stops. Plastic chain shall coordinate with the clutch colour selected. End plug shall be a spring loaded for easier installation. They shall be available in white or approved colour and fit tightly into the tube. Universal mounting brackets				

		must be capable of mounting inside, outside, or to the ceiling, with the clutch on either the right or left end of the roller. All brackets shall be made of 0.060" plated steel. . Roller tube shall be extruded aluminium, made with alloy 6063-T5. Tube diameter to correspond with clutch size, and provided in the correct diameter as per the manufacturer's recommendations. Tubes shall in 38 mm dia. Fabric shall be attached to the tube with an adhesive strip. A minimum of one turn of fabric must be placed on the roller before the working section of fabric starts. Bottom options shall include both internal and external bottom bars. External bottom bars shall be extruded aluminum in a flat shape. including the cost of Fabric as per following specifications .				
		Compositions of Fabric - Make- PHIFER USA (Equilibrium) ,100 % TPO Thermoplastic Olefin 20 % TPO Fiber Yarn 80 % TPO coating on TPO Yarn, Width & Height as per drawing, Mesh Weight - 12.82 oz. / Sq. yard (434.67 gm / sqm), Fabric thickness 0.03 inch (0.762 mm), Openness Factor- 5 %, UV Blockage - Approximately 95%, Fire Classification NFPA 701-2004 TM#1 (small scale), NFPA 101 (class A Rating), CAN / ULC-S 109-03 (large and small scale, ASTM E 84 (Class 1), Bacteria and fungal resistance - ASTM E 2180, ASTM G21, Lead free- RoHS / Directive 2002 / 95 / EC, ANSI / WCMA A100.1-2007 for lead content, REACH (EC 1907 / 2006) compliant, US consumer Product Safety Commission Section 101, Warranty - 5Year, PVC free - yes. The item rates includes for all lead & lift, all levels & height, for all . Vendor's rate with installation 110/- Rs per Sqft F.O.R at site all inclusive	80.19	Sqm	976	78,265.44
7.7	NS-29	Providing and fixing 3d imported tiles with 6mm thick adhesive on walls in executive toilets as per manufacturer's specifications and guidlines. Item is complete with necessary grouting, cutting and making good the edges. (Base price of tile INR 2500/-per sqm)	28.66	Sqm	4239	1,21,472.78
7.8	NS-30	Extra for making Cove of Size up to 200mm for cove lights in false ceiling as per drawings & instructions & finishing smooth with three coats of plastic emulsion paint of approved quality.	215.04	Rmt	987	2,12,244.48
7.9	NS-31	Providing and fixing aluminium L profile on the edges of walls with tile joints.Item includes cutting and pasting of the profile to the satisfaction of the engineer in charge.	208.80	Rmt	190	39,672.00

		SUB TOTAL				**16,99,036.96**
2.00		**INTERNAL SIGNAGES**				
1	NS-32	**Room & Toilet Signage**				
		Providing and fixing Room & toilet signages made of aluminium frame with name insert options as per approved sample				
		Size 167mm x167mm	56.00	Each	836	46,816.00
2	NS-33	**Exit and Fire Exit signages**				
		Providing and fixing Exit and Fire exit sigROges made up of rigid plastic of size 350mmx 150mm Glow in the dark with computer cut vinyl letters pasted on it - hanging type. The sigROge need to be fixed with 3M double side tape as per approved sample	15.00	Each	836	12,540.00
4	NS-34	Providing and fixing Exit and Fire exit sigROges made of aluminium frame with lads and battery backup of two hours and acrylic glows as per approved sample	12.00	Each	613	7,356.00
		SUB TOTAL				**66,712.00**
2.00		**FURNITURE**				
1	NS-35	**Workstation**				
		Providing and placing of **120 degrees Curvilinear Workstations 1050mmW x 1050mm D with pedestal, KBPT and CPU trolley. Including the following items: -**				
		Aluminium Trims, Wire Management, Legs, End/Separator Partitions, Wooden Worktop, Metal Keyboard Tray, Mobile Pedestal	31.00	Nos	34148	10,58,588.00
2	NS-36	**LOW HEIGHT STORAGE (900 x 1200 x 450)**				
		Body : Body is made from 18mm PLB with all the edges sealed with 0.8 mm thick PVC Edgeband. The Back panel is 9mm White PLT. The entire construction is ready to assemble unit and is assembled with suitable KD fittings. The shelves and separator panels (if available) is made from 18 mm white PLT and edges are sealed with 0.8 mm edge band. The bottom shelf is fixed and other shelves have one step adjustment for optimizing the space. Doors : Door Panels ae made from 18 mm PLB with 2 mm Edge band on all edges ad a flush Plastic handle is fitted vertically at the center of the door. The doors shall be sliding has suitable hardwares	17.00	Nos	16029	2,72,493.00

		fitted with an adjustable fitting for height adjustment. The SDU runs in a PVC track mounted on the TOP and Bottom panel of the All the storages are fitted with a 6 mm leveler at bottom for leveling.				
3	NS-37	**FULL HEIGHT STORAGE (1200 x 2400 x 450)**				
		Body : Body is made from 18mm PLB with all the edges sealed with 0.8 mm thick PVC Edgeband. The Back panel is 9mm White PLT. The entire construction is ready to assemble unit and is assembled with suitable KD fittings. The shelves and separator panels (if available) is made from 18 mm white PLT and edges are sealed with 0.8 mm edge band. The bottom shelf is fixed and other shelves have one step adjustment for optimizing the space. Doors : Door Panels ae made from 18 mm PLB with 2 mm Edge band on all edges ad a flush Plastic handle is fitted vertically at the center of the door. The doors shall be sliding has suitable hardwares fitted with an adjustable fitting for height adjustment. The SDU runs in a PVC track mounted on the TOP and Bottom panel of the All the storages are fitted with a 6 mm leveler at bottom for leveling.	8.00	Nos	34648	2,77,184.00
4	NS-38	**CONFERENCE TABLE (14 SEATER)**				
		Supplying and placing in position Conference table of the following specifications. 14 Seater Boat Convex size shall be 4200 Width mm x 1200 Depth mm x 750 Height mm . Top shall be 32 mm thick Base material shall be 18 + 12 mm MDF board. There shall be natural veneer 0.5 mm on top surface plus 0.6 mm balancing laminate on bottom surface Chamfer edges - PU Matt painted and veneer portion of worksurface is finished in PU Matt paint . The Veil and cross member shall be 18 mm thick base material shall be 16 mm plain particle board plus post - laminated work - surface with 0.6 mm laminate on eithe side . 2 mm thick and 0.8 mm thick PVC edge banding of matching colour on outer edges of Veil 0.8 mm thick PVC edge banding of matching colour on outer edges of cross member . The legs shall be made from 1.6 mm Matt silver Anodized Aluminium extrusion . Legs assembeled together with a plastic glide holder at bottom and 5 mm thick MS powder coated sheet at top . The plastic glide holder is having provision for wire entry and glide fixing . The wire carrying is facilited through the hollow space between two leg extrusions and the wires are concealed between removable rigid PVC extrusion in the leg .	1.00	Nos	172486	1,72,486.00

		Access Flap and Switch Mounting Tray shall be made of matt silver anodized aluminium extrusion and plastic moulded components . Powder coated switch mounting tray made from 0.8 mm and 1.2 mm MS sheet .Switches to be mounted on tray as per requirement and Provision for mounting a module anchor roma swtch plate on switch mounting tray.				
5	NS-39	**RECEPTION TABLE**				
		Width (W): 300 CM. Depth (D): 75.0 CM. Height (H): 90.0. Made of 25mm Thick Pre-laminated twin board, Edge banded with matching 2 mm thick PVC lipping.Gromet provided on work surface for wire management.Modesty Panel-Made of 25mm Thick Pre-laminated twin board , Edge banded with matching 2 mm thick PVC lipping. Integrated Pedestal, Drawers have a soft closing & anti slam mechanism.Handles are provided for ease of opening.Pedestal is provided with lock for security.	1.00	Nos	92680	92,680.00
6	NS-40	**THREE SEATER SOFA**				
		Width (W): 210.0 CM. Depth (D): 80.0 CM. Height (H): 75.0 CM. Seat Height (SH): 45.0 CM. seat foam: the seat should be made of pu foam with density 32 ± 2 kg/cu.mtr having an additional top layer of j pu foam with density 28 ± 2 kg/cu. seat should be upholstered with fabric or leatherette. 2) back foam: the back should be made of pu foam with density 28 ± 2 kg/cu. mtr with two additional top layer of supersoft foam of density 23±2 kg/cu. mtr, upholstered with fabric or leatherette.	1.00	Nos	28457	28,457.00
6	NS-41	**THREE SEATER SOFA - CABIN**				
		Width (W): 180.0 CM. Depth (D): 70.0 CM. Height (H): 75.0 CM. Seat Height (SH): 45.0 CM. seat foam: the seat should be made of pu foam with density 32 ± 2 kg/cu.mtr having an additional top layer of j pu foam with density 28 ± 2 kg/cu. seat should be upholstered with fabric or leatherette. 2) back foam: the back should be made of pu foam with density 28 ± 2 kg/cu. mtr with two additional top layer of supersoft foam of density 23±2 kg/cu. mtr, upholstered with fabric or leatherette.	4.00	Nos	25553	1,02,212.00
7	NS-42	**CENTER TABLE**				
		Providing center table of size - 1100mm X 600mm. Made out of BWR ply board, stone, glass, MDF with PU pant / polish.	1.00	Nos	12777	12,777.00
8	NS-43	**SIDE TABLE**				

		Providing side table of size - 600mm dia. Made out of BWR ply board, stone, glass, MDF with PU pant / polish.	7.00	Nos	8131	56,917.00
9	NS-44	**EXECUTIVE CABIN TABLE AGM/JGM/DGM/CABIN**				
		Width (W): 210 CM. Depth (D): 75.0 CM. Height (H): 75.0 CM, Side Board - Width (W): 90 CM. Depth (D): 40.0 CM. Height (H): 75.0 CM. Made of 25mm Thick Pre-laminated twin board, Edge banded with matching 2 mm thick PVC lipping.Gromet provided on work surface for wire management.Modesty Panel-Made of 25mm Thick Pre-laminated twin board , Edge banded with matching 2 mm thick PVC lipping. Integrated Pedestal, Drawers have a soft closing & anti slam mechanism.Handles are provided for ease of opening.Pedestal is provided with lock for security.	4.00	Nos	52848	2,11,392.00
10	NS-45	**CHAIRS**				
A	NS-45 a	EXECUTIVE CHAIRS	19.00	Nos	10126	1,92,394.00
B	NS-45 b	VISITOR CHAIRS	12.00	Nos	9071	1,08,852.00
C	NS-45 c	WORKSTATION CHAIRS	31.00	Nos	5472	1,69,632.00
11	NS-46	**KD Optimizer 18-(2745 mm W x 457mm D x 1980mm H)**				
		Overall Dimensions of SD - 3 and LD3 (U/C + Fittings + Cover) shall be 2745mm(W)x457mm(D)x2080mm(H) and for Twin Mobile TD3 (U/C + Fittings + Cover) shall be 2745mm(W)x915mm(D)x2080mm(H) (Height with undercarriage and rails in mm: 1980+65+35=2080) . The Construction shall be knockdown Construction sheet tickness is 0.8 mm for back & shelves and 0.9 mm for sides & top . Finish shall be Epoxy polyester powder coated thickness of 40 microns . Shelf construction shall be made from CRCA steel 0.8 mm thick IS :513 .Uniformly distributed load capacity of 80 Kg . Undercarriage shall have construction in welded frame made of HR sheet 3.15 mm thick conforming to IS : 10748 . Finish shall be epoxy polyester powder coat of approved color & shade with a dry film thickness of minimum 40 microns .The Movements shall be Drive Type configuration : In case of D2 & D3 movement of units is achieved mechanically through a PU Drive Wheel and Sprocket -Chain-Tensioner arrangement mounted rigidly onto body size .For D3 each movable undercarriage shall be provided with 2 rollers on the shaft for driving , 2 antifriction ball bearing for rolling and				

		4 antifriction ball bearing for guiding between rail . Fittings shall be centralized locking arrangement through locking stiffener mounted onto back of single last unit so that it gets locked on channels when all the units are brought together . The Recess handle lock is of Godrej make & placed at suitable height . This arrangement occupies a space of 90.0 mm . When the last unit is twin movable , hinged doors are provided for the end bodies, so in this case locking stiffener is mounted onto drive unit cover ; and with tile fascia option , it will be mounted in the recess of vertical trim .				
		Each Drive Type units shall have Locking Knob near the drive wheel for manual locking of individual units when a person is using those units . Knob shall be rotated to unlock position when units are to be moved . End stoppers shall be provided to prevent derailment . Door locking shall be having hinged doors of recessed die cast handle cum lock giving 3 way locking through a lever & shooting bolts . Guide channels shall have 'J' section 2 mm thick HR & 25 mm Square bright bar . Easteners shall be galvanized/blackodized/Zn plated .The label holder shall be made from 2 mm thick clear transparent acrylic sheet . Also total no. of loading levels per understructure shall be 15 for SD3 and LD3, and 30 for TD3. Fascia(tiling) . Approved Makes:Godrej, Hermanmiller, Steelcase, Dellform or Vitra only. Manufacturer should be ISO9001, ISO14001, ISO18001, Greenguard, BIFMA and AIOTA Certified. Product should be having Greenguard Certificate on its name.				
	NS-46 a	**SD3-Single Static Drive Cover Unit 3 Bay**	1.00	Nos	69,878	69,878.00
	NS-46 b	**LD3-Single Last Drive Unit 3 Bay**	1.00	Nos	84,086	84,086.00
	NS-46 c	**TD3-Twin Mobile Drive Unit 3 Bay**	4.00	Nos	125,788	5,03,152.00
12	NS-47	**CHANNELS**				
		9'0"-Overall Dimensions of Channel 9'0" shall be 9 feet (L) . Guide channels shall consist of 'J' section 2 mm thick & 25 mm square bright bar - both connected by screws . Prior to the embedding of the guide channels with the help of raul plug & screw , the ground has to be in proper leveled condition .	3.00	Nos	15,924	47,772.00
13	NS-48	**KD Optimizer 18 – (915 mm W x 457mm D x 1980mm H)**				
	NS-48 a	**SS1-Single Static Push Pull 1 Bay**	1.00	Nos		24,695.00

					24,695	
	NS-48 b	**SL1-Single Last Push Pull 1 Bay**	1.00	Nos	27,739	27,739.00
	NS-48 c	**TM1-Twin Mobile Push Pull 1 Bay**	1.00	Nos	42,449	42,449.00
		TOTAL				**35,55,835.00**
3.0		**PLUMBING WORKS**				
-	-	**SANITARY FIXTURES AND FITTINGS INSTALLATIONS (As Per Market Rates)**	-	-	-	-
1	NS-49	Providing and fixing of vitreous china single trap syphonic pattern having back inlet, supporting chair **wall hung** water closet with flush valve and CP brass flush bend (European type) water closet with seat and lid, with C.P. brass hinges and rubber buffers, adapter, rubber joints fixed to W.C., C.P. brass screwed washers including cutting, seat and cover and making good the walls and floors wherever required and HDPE wc pan connector including jointing with white cement coomplete in all respects. **(EWC With seat and cover -)**	30.00	Each	9567	2,87,010.00
		Make Hindware, **Catalogue No. 92054 "Star White"**				
2	NS-50	Providing and fixing of vitreous china single trap syphonic pattern having back inlet, supporting chair **wall hung** water closet with flush valve and CP brass flush bend (European type) water closet with seat and lid, with C.P. brass hinges and rubber buffers, adapter, rubber joints fixed to W.C., C.P. brass screwed washers including cutting, seat and cover and making good the walls and floors wherever required and HDPE wc pan connector including jointing with white cement coomplete in all respects. **(EWC With seat and cover) (For Executive Toilets)**	6.00	Each	13478	80,868.00
		Make Hindware, **Catalogue No. 92559 "Essence Neo Star White"**				
3	NS-51	Providing and fixing of vitreous china single trap syphonic pattern having back inlet, supporting chair **wall hung** water closet with flush valve and CP brass flush bend (European type) water closet with seat and lid, with C.P. brass hinges and rubber buffers, adapter, rubber joints fixed to W.C., C.P. brass screwed washers including cutting, seat and cover and making good the walls and floors wherever required and HDPE wc pan	6.00	Each	9567	57,402.00

		connector including jointing with white cement coomplete in all respects. **(EWC With seat and cover) (For Handicap Toilets)**				
		Make Hindware, **Catalogue No. 92054 "Cornice Star White"**				
4	NS-52	Providing and Fixing of low noise Concealed cistern without frame, mounting module for brick work with actuation plate with water saving: delayed filling process saves appr. 0,5 l/flush ; Dual Flush - 3 litre and 6 Litre.	42.00	Each	11108.40	4,66,552.80
		Make : Geberit Sigma concealed cistern 8 cm ; Geberit actuator plate Sigma21 for dual flush, metal colour chrome-plated				
5	NS-53	Providing and fixing white color vitreous China Under Counter, rectangular wash basin with R.S. or CI bracket and 32 mm dia outlet, with 32 mm dia C.P. bottle trap with brass C.P. wall cap and extension pieces, 15 mm dia C.P. brass angle stop cock with 10mm dia C.P. brass connection pipe etc. CP brass chain, CP wall flange, rubber adopter for waste connection complete, CP brass chain CP waste and CP pipe to wall with CP wall flange and rubber adopter for waste connection complete, with pedestal of matching model below wash basin, including cutting and making good the walls wherever required.	30.00	Each	7025	2,10,750.00
		Make Hindware, **Catalogue No. 10080 Garnet Under Counter "Star White"**				
6	NS-54	Providing and fixing white color vitreous China Counter Top, rectangular wash basin with R.S. or CI bracket and 32 mm dia outlet, with 32 mm dia C.P. bottle trap with brass C.P. wall cap and extension pieces, 15 mm dia C.P. brass angle stop cock with 10mm dia C.P. brass connection pipe etc. CP brass chain, CP wall flange, rubber adopter for waste connection complete, CP brass chain CP waste and CP pipe to wall with CP wall flange and rubber adopter for waste connection complete, with pedestal of matching model below wash basin, including cutting and making good the walls wherever required.	9.00	Each	9066	81,594.00
		Make Hindware, **Catalogue No. 91012 ENIGMA Counter Top "Star White"**				
7	NS-55	Providing and Fixing **wash basin** for handicap toilet complete with brackets, tracks, waste pipes and other accessories complete as required.	6.00	No.	3968	23,808.00
		Make Hindware, **Catalogue No. 10040 Michelangelo Pedestal Basin**				

8	NS-56	Providing and fixing of Pressmatic wash basin tap Material: Housing material: brass DIN EN	30.00	Each	1626.20	48,786.00
		Make Jaquar, Product No. PRS-CHR-061				
9	NS-57	Providing, fixing, testing and commissioning of C.P. brass **single hole basin mixer with pop-up waste** and brass nuts complete as required. **(For Executive Toilet)**	9.00	Each	6145.90	55,313.10
		Make Jaquar, PRODUCT CODE: ARC-CHR-87233K				
10	NS-58	Providing, fixing, testing & commissioning of C.P. brass **eurometic self closing Pressmatic pillar tap. (For Handicap Toilet)**	6.00	No.	1626.20	9,757.20
		Make Jaquar, PRODUCT CODE: PRS-CHR-031				
11	NS-59	Supply, installation, testing and commissioning vitreous china flat back large urinal complete with concealed wall hangers, fully automatic photoelectric cell operated No-touch urinal flushing system (Battery/electrical operated vandal proof- twin flush (pre & post use) operation), flush mounted sensors complete in all respects in fully operational conditions, C.P. brass flush pipe with C.P. clamps and screws, C.P. flange with spreader, 32 mm C.P. cast brass bottle trap and pipe to wall with wall flange complete including cutting and making good the walls and floors where required.	24.00	Each	23869.30	5,72,863.20
		Urinals Make Hindware, **Catalogue No. 60010 Dyna Standrad "Star White" ; Urinals Sensors Make Jaquar PRODUCT CODE: SNR-STL-51087**				
12	NS-60	Providing and fixing Towel ring with brackets fixed to wooden cleats with C.P. brass screws.	30.00	Each	900.30	27,009.00
13	NS-61	Providing and fixing soap container with brackets fixed to wooden cleats with C.P. brass screws.	45.00	Each	1186.70	53,401.50
14	NS-62	Providing and fixing CP Bottle Trap for basin, sink and urinal.	45.00	Each	1759.20	79,164.00
		Make Jaquar, PRODUCT CODE: ALD-CHR-769 L300X190; PRODUCT RANGE: ALLIED				
15	NS-63	Providing and fixing of Regulating Angle valve with Comfort handle, with extended push rod, push rosette Ø 54 mm ; Material – Brass DIN EN / Noise Class I ; Connection: 1/2“/DN 15, Outlet: 1/2“/DN 15 ; Chrome / Weight 0.130 KG	102.00	Each	698.90	71,287.80

		per piece				
		Make Jaquar, PRODUCT CODE: ARI-CHR-39053 **PRODUCT RANGE: ARIA**				
16	NS-64	Supplying, storing, handling, shifting, installation, testing and commissioning of CP Toilet paper Holder, wall flange etc. complete.	42.00	Each	2784.60	1,16,953.20
		Make Jaquar, Model No. ACN-CHR-1155S				
17	NS-65	Providing and fixing C.P. brass health faucet with 8mm dia 1m long PVC tube and wall hook complete in all respects. all complete as directed by Engineer-in-charge.				
		Make Jaquar, Model No. ALD-563	42.00	Each	951.70	39,971.40
18	NS-66	Providing, Fixing, testing and commissioning of 15 mm dia C.P. brass 2 way bib cock with C.P. wall flange of approved quality and making good.				
		Make Jaquar, Model No. FLR-5041N	42.00	Each	1654.10	69,472.20
19	NS-67	Providing, Fixing, testing and commissioning of C.P. brass wall / counter mounted **sink mixer** with C.P. wall flange, overhead swinging spout complete as required and making good.	1.00	No.	4082.00	4,082.00
		Make Jaquar, Model No. FLR-5165				
20	NS-68	Providing and fixing solid state, no touch operting, fully hygienic **hand drier** of approved shade **with single blower,** with time delay, summer & winter control, music while drying, volume ON/OFF controls including providing necessary brackets, cable from drier to Plug, Plug top key and lock etc, complete as required.	6.00	Each	8894.40	53,366.40
21	NS-69	Providing & fixing C.P. brass **twin coat hook** with PVC rawl plug & C.P. brass screw complete as required.	42.00	Each	647.70	27,203.40
22	NS-70	Providing and Fixing high quality 5 Liters stainless steel rust proof dustbin 202 grade stainless steel Anti skid scratch resistant rubber bumper	87.00	Each	693.60	60,343.20
23	NS-71	Providing & fixing horizontal/vertical storage type **water heater** of approved shade with copper container with multi-function safety valve for high pressure operation without additional pressure reducing valve, glasswool insulation, stove enamelled M.S jacket, thermostatically controlled inner heater with pilot neon lamps, angle valve on inlet connection, 15mm dia C.P				

		flexible connection pipe in inlet & outlet suitable for working pressure of 5 kg/sqcm complete as required.				
23.1		Capacity 15 litres	3.00	No.	9184.20	27,552.60
		Make A.O. Smith, price should not be less than Rs. 6500, Model as per engineer in charge.				
24	NS-72	Providing, Fixing, testing and commissioning PCA Spray SLC Aerators for good water dispersion at low flow rates (Make - Neoperl)				
24.1		Wash Basin **(2.2 GPM)**	45.00	No.	240.70	10,831.50
25	NS-73	Providing and Fixing Vertical Swing Grab Bar, Satin for handicap toilet complete as required. (For Handicap WC)				
		(Make: jaquar, Product Code : WAC-SAP-BG0800CS)	6.00	No.	13830.20	82,981.20
26	NS-74	Providing and Fixing 842 MM Long Grab Bar, Satin for handicap toilet complete as required. (For Handicap WC)				
		(Make : Jaquar, PRODUCT CODE: WAC-SAP-BR0750CS)	6.00	No.	6309.50	37,857.00
27	NS-75	Providing and Fixing 600 MM Long Grab Bar, Satin for handicap toilet complete as required. (For Wash Basin)	6.00	No.	1187.30	7,123.80
		Make: Jaquar, PRODUCT CODE: AHS-1507				
		TOTAL C/F TO SUMMARY				**26,63,304.50**
4		**FIRE PUMPS AND HYDRANT WORKS**				
1	NS-76	**Fire Hose Cabinet**				
1.1		Providing and fixing angle iron (40 mm x 40 mm x 5 mm) MS door frame 900x2100 door capable of accommodating fire hose reel, landing valve, hose pipes, fittings & accessories. The door shall have a front glass with lock and key arrangement & shall be painted with post office red colour (approval shall be taken on the basis of submitted sample before ordering) Cost of fire extinguishers not included in item rate. (Liasioing with civil contractor for making 900x600x2100 Recessed type mansoary box (by civil contractor).	1	Each	3,622.50	3,622.50
2	NS-77	Providing, storing, handling, shifting, installation, testing and commissioning of portable fire Extinguishers as described below:				

2.1	NS-77 a	4.5 kg carbon dioxide extinguisher, IS marked, with high pressure discharge tube, horn, control valve, CCE approved cylinder	4	Each	13,168.70	52,674.80
2.2	NS-77 b	6 kg Mono Ammonium Phosphate (ABC) type cartridge operated extinguishers	4	Each	9,183.90	36,735.60
3	NS-78	Providing and Fixing Fire Axe complete as required	1	Each	573.56	573.56
4	NS-79	Providing and fixing in position **Pressure Gauges** with gun metal / brass valves complete as required	4	Each	777.975	3,111.90
		TOTAL C/F TO SUMMARY				**96,718.36**
5		**ELECTRICAL WORKS**				
1		**WIRING**				
1.1	NS-80	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
1.1.1		Data Outlet	63	Each	383.0	24,129.00
		SUB TOTAL				**24,129.00**
2		**DISTRIBUTION BOARDS**				
2.1	NS-81	Supplying and fixing of 63 A Four Pole 300mA, 415 V,Current sensitivity of 300 mA, residual current breaker with over current protection (RCBO) suitable for Isolation, conforming to IS: 12640-2 and IEC 61009-1 in the existing MCB DB complete with connections, testing and commissioning etc. as required.	3	No	3371.0	10,113.00
2.2	NS-82	Design, fabrication, assembling, wiring, supply, installation, testing & commissioning of (IP:30, IK 08) minimum 1.2mm thick sheet steel FP MCB with overload trip mechanism & flag indiation/ Isolator enclosure conforming to IS: 8623-1 & 3 & IEC 61439- 1&3, made out of pre-treated and powder coated (minimum 60-80 micron), 240/415 V, mount on surface / recess, complete with din bar including earthing stud etc. as standard or as suggested by Architect/Consultant. (But without MCB/RCCB/Isolator).	3	No	654.0	1,962.00
		SUB TOTAL				**12,075.00**

3		**INSTALLATIONS OF LIGHT FIXTURES AND FANS**				
3.1	NS-83	Installation, testing and commissioning of pre-wired, LED fitting of all types and wattages, complete with all accessories etc. directly on ceiling/ wall including connections with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and earthing etc. as required.	404	Each	160.0	64,640.00
3.2	NS-84	Installation, testing and commissioning of LED strip with driver light fixtures complete with all fixing accessories as required.	330	Mtr.	35.0	11,550.00
		SUB TOTAL				**76,190.00**
4		**L.T./ CONTROL CABLES**				
4.1		**SUPPLY OF CABLES**				
4.1.1	NS-85	Supply of following sizes of Power Cables, Solid Aluminum conductor up to 10 sqmm balance stranded conductor, XLPE Insulated, cores laid up, PVC tape / Extruded Inner sheathed , Armour (Aluminium wire for single core up to 70 sqmm balance Aluminium strip, Glavanised wire for cables up to 2x10 sqmm, 3x10 sqmm, 4x6 sqmm balance all galvanised steel strip), extruded PVC Type ST2 sheathed, FRLS insulation at outer sheath, 1100V grade as per IS 7098(Part 1) 1988				
		3.5 CORES				
4.1.1.1	NS-85 a	3.5 x 50 sq.mm.	88	RM	227.0	19,976.00
4.1.1.2	NS-85 b	3.5 x 35 sq.mm.	88	Meter	175.0	15,400.00
4.1.2	NS-86	Supply of following sizes of Power Cables, Solid copper conductor up to 10 sqmm balance stranded conductor, XLPE Insulated, cores laid up, PVC tape / Extruded Inner sheathed , Armour (Aluminium wire for single core up to 70 sqmm balance Aluminium strip, Glavanised wire for cables up to 2x10 sqmm, 3x10 sqmm, 4x6 sqmm balance all galvanised steel strip), extruded PVC Type ST2 sheathed, FRLS insulation at outer sheath, 1100V grade as per IS 7098(Part 1) 1988				
		4 CORES				
4.1.2.1	NS-86 a	6 sq.mm. Cu Ar. XLPE cable	143	Meter	227.0	32,461.00
4.1.2.2	NS-86 b	10 sq.mm. Cu Ar. XLPE cable	139	Meter	365.0	50,735.00
4.1.2.	NS-86 c	16 sq.mm. Cu Ar. XLPE cable	187	Meter	526.0	98,362.00

3						
		3 CORES				
4.1.2.4	NS-86 d	6 sq.mm. Cu Ar. XLPE cable	172	Meter	176.0	30,272.00
4.3		**CABLE JOINTING & END TERMINATION**				
4.3.1	NS-87	**TERMINATIONS FOR LT COPPER CABLES**				
		Supplying and making end termination with brass compression gland and copper lugs for following size of PVC insulated and PVC sheathed / XLPE copper conductor cable of 1.1 KV grade as required.				
4.3.1.1	NS-87 a	3C X 6 sq. mm (19mm)	14	Set	188.0	2,632.00
4.3.1.2	NS-87 b	4C X 10 sq. mm (25mm)	8	Set	212.0	1,696.00
4.3.1.3	NS-87 c	4C X 16 sq. mm (28mm)	6	Set	238.0	1,428.00
4.3.1.4	NS-87 d	4C X 6 sq. mm (22mm)	6	Set	194.0	1,164.00
4.4	NS-88	Supply,laying, connection, testing and commissioning of 10 sq.mm. of 1.1kV grade Single core FRLS PVC insulated Single core unsheathed Industrial Flexible Cable conferming to IS:694/1990 and IS: 732 for installation with Flexible Bright annealed copper conductor for 1.1kV voltage grade. It should include both ends terminal joints providing tinned copper terminal lugs, single compression PVC cable glands upto 16 sqmm cable and double compression PVC cable glands for above, insulation tape, effecting terminal connections to the equipment complete as required.	50	Meter	78.0	3,900.00
		-				
4.5	NS-89	Supply of **6 core x 2.5 sq. mm** Control Cables, Solid Copper conductor single stranded conductor, XLPE Insulated, cores laid up, PVC tape / Extruded Inner sheathed , Glavanised round wire Unarmour, extruded PVC Type ST2 sheathed, FRLS insulation at outer sheath, 650V grade.	200	Meter	137.0	27,400.00
4.6	NS-90	Unloading, shifting, Storing, Laying, Fixing, Testing & Commissioning of **6 core x 2.5 sq. mm cable** 650V grade LT XLPE insulated, HR PVC sheathed, stranded copper conductor, Armoured control cables as per IS:1255/1983 on existing cable trays/ in existing hume pipes/ PVC pipes/ GI pipes/ on surface of slabs, walls or masonary/ RCC trenches/ ducts including cables ties, GI saddles, clamps and necessary hard ware.	200	Meter	31.0	6,200.00

4.7	NS-91	Supplying and making indoor Control Cable end Termination of **6 core x 2.5 sq. mm cable** 650V grade LT XLPE insulated, HR PVC sheathed, stranded copper conductor, Armoured cables, including cost of tinned copper heavy duty crimpping lugs, Single compression heavy duty glands, insulation tape, Name Plate at Both Ends and all necessary material to complete the termination.	4	No	184.0	736.00
		SUB TOTAL				**2,92,362.00**
5		**EARTHING SYSTEM**				
5.1	NS-92	Supply, laying, connection, testing and commissioning of following sizes of 1.1kV grade Single core FR PVC insulated Single core unsheathed Industrial Flexible Cable confirming to IS:694/1990 and IS: 732 for installation with Flexible Bright annealed copper conductor for 1.1kV voltage grade. It should include both ends terminal joints providing tinned copper terminal lugs, single compression PVC cable glands up to 16 sqmm cable and double compression PVC cable glands for above, insulation tape, effecting terminal connections to the equipment complete as required.				
5.1.1	NS-92 a	2.5 sq.mm. Cu. Flexible cable	20	Meter	19.0	380.00
5.1.2	NS-92 b	6.0 sq.mm. Cu. Flexible cable	55	Meter	42.0	2,310.00
		SUB TOTAL				**2,690.00**
6		**RACEWAY**				
6.1	NS-93	**G.I. SHEET IN FLOOR/ SCREED RACEWAY**				
		Supply & Fixing of factory fabricated pre-galvanized G.I. sheet steel raceway in 1.2mm thickness for bottom & sides and 1.6/2mm thick top Cover as called for including necessary civil work such as chase cutting in screed, fixing/ jamming the raceway, aligning & levelling and finishing with sand cement plaster & chicken wire mesh:				
6.1.1	NS-93 a	100mm x 40mm (1.6mm top Cover)	44	Meter	318.0	13,992.00
6.1.2	NS-93 b	150mm x 40mm (1.6mm top Cover)	33	Meter	426.0	14,058.00
6.1.3	NS-93 c	250mm x 40mm (2mm top Cover)	39	Meter	789.0	30,771.00
6.2	NS-94	**FLOOR JUNCTION BOXES**				
		Supply & Fixing of openable top Cover floor Junction Boxes made from 1.6mm thick pre-galvanised GI sheets for bottom & sides & 2mm thick GI top Cover complete with rubber gasketing beneath the top Cover. The Junction				

		Boxes shall be suitable to accommodate hot dipped GI raceways as specified above, including necessary civil work such as chase cutting in screed, fixing/ jamming the raceway, aligning & levelling and finishing with sand cement plaster & chicken wire mesh				
6.2.1	NS-94 a	100 x 100 x 50	11	No	174.0	1,914.00
6.2.2	NS-94 b	150 x 150 x 50	10	No	256.0	2,560.00
6.2.3	NS-94 c	200 x 200 x 50	6	No	343.0	2,058.00
6.2.4	NS-94 d	300 x 300 x 50	4	No	505.0	2,020.00
		Important Notes for raceways:-				
a.		Contractor to get the samples of floor and ceiling raceways to be approved from the Architect/ Project Manager/ Consultant/ Client before supply & erection.				
b.		Depth of the floor raceway is to be decided by the contractor after checking/ examining screed depth available at site. For this purpose chipping to be carried out at various places on the floor/ floors to carefully assess the depth/ floor margin available. Final approval is to be obtained from the Architect/ Project Manager/ Client before ordering/ fabricating raceway. The sizes & depths of raceways given in the BOQ are only tentative & indicative.				
c.		Contractor is also supposed to check and confirm the adequacy of raceway sizes by calculating the exact number of electrical circuit wires & N/W wires for respective Electrical & N/W raceways.				
		SUB TOTAL				**67,373.00**
7		**SAFETY EQUIPMENTS**				
		-				
7.1	NS-95	Providing & fixing in position 1000 mm wide , Electrical Insulating Mats as per IS 15652:2006, 2mm thick, suitable upto 3.3 KV , fire retardant, no effect of acids, alkalies and transformer oils, moisture proof, high tensile strength and texture finish / cloth impression (Anti slip , marking on top) .	5	RM	1847.0	9,235.00
		SUB TOTAL				**9,235.00**
8		**UPS**				
8.1	NS-96	Supply, installation, testing and commissioning of **10kVA/ 8kW (Input 3Phase / output 1 Phase)** Floor Mount Type, Compact & modulate design, Conforming to IEC EN 62040 (All Parts), ISO 9001 certified, True On-Line, double conversion,	1	Each	320109.0	3,20,109.00

		IGBT on the input and output with multiple digital signal processor controlled for Rectifier/ charger, Battery, 2 Level IGBT Inverter, Static Switch, with parallel redundent, compatible with 0.7 lagging to 0.7 leading PF loads without deration, power factor >0.8, THDi< 3-5%, Input voltage 380-415V, Output voltage 230V, 50Hz frequency, efficiency >95%, 0-40 deg C, with inbuilt overload, short circuit, Input low voltage, output over voltage, battery over charging, battery over discharging protections, 30 min battery back-up with 12 V Maintenance Free Sealed Lead Acid batteries alongwith Powder Coated M.S. Rack with unidirectional wheels for housing the Batteries alongwith all accessories including interconnecting cables, lugs, Base Frames, Battery Rack & Battery Circuit breaker complete as required.				
		SUB TOTAL				**3,20,109.00**
9		**CCTV SYSTEM**				
		Note- All the bidders must attach authorization certificate and each product's technical sheet & cat. number of any one make from the OEM alongwith bid. This is must unless otherwise bid will be rejected without MAF.				
3.5	NS-97	Supply, installation, testing and commissioning of 2MP IP Fixed Dome Camera: 1/2.8"Progressive Scan CMOS, 1920 × 1080 at 25fps, 2.8 mm fixed lens, 0.01 Lux at F1.2, ICR, ONVIF, support H.265, MJPEG, 120dB Wide Dynamic Range, BLC, 3D Digital Noise Reduction, 12 VDC & PoE, IR range: 30m, Support on-board storage up to 128 GB (SD card not included), IP67, IK10, Edge Anlalytics- Line crossing detection, intrusion detection, Motion detection, face detection, video tampering, UL, CE ,FCC certified.	3	No.	18052.0	54,156.00
4.2	NS-98	Supply, installation, testing and commissioning of 16ch Network Video Recorder: Connect Up to 16 IP Cameras, Linux OS, Up to 12 Megapixels Resolution, 1 HDMI 4k/ 1 VGA 2MP Output , Support H.265/MJPEG, Incoming Bandwidth 160Mbps, 4 SATA Hard Disks, ANR Technology, 4 SATA interfaces for 4 HDDs and capacity of each HDD upto 6TB, front panel: 2 × USB 2.0 rear panel: 1 × USB 3.0, Alarm I/O 16/4,RS-485, RS-232, 2 RJ-45 10 /100/1000 Mbps self-adaptive Ethernet interface, Multiple network monitoring: Web viewer, CE, FCC, UL	1	Set	61221.0	61,221.00

		certified.				
4.4	NS-99	Supply, installation, testing and commissioning of (24/7) working VIDEO SURVELLIANCE HARD DISK 6TB.	1	No	18314.0	18,314.00
4.6	NS-100	Supply and installation of 32" Full HD LED Professional Display for Monitoring with mounting accessories	1	No	20407.0	20,407.00
		SUB TOTAL				**1,54,098.00**
10		**IT/ NETWORKING WORKS**				
6.1	NS-101	Supplying, installing, testing and commissioning of 24 port Cat 6 loaded patch panels	6	No	13081.0	78,486.00
6.3	NS-102	Supplying, laying, dressing, ferruling and terminations at both ends of following length of Cat - 6 patch cord. 4 Feet : CAT6 UTP 23 AWG Patch Cord - 1 mtr - Rack End. Factory crimped LCS2 Patch cord complete as required.	132	No	235.0	31,020.00
6.5	NS-103	Supplying, laying, dressing, ferruling and terminations at both ends of following length of Cat - 6 patch cord. 7 Feet : CAT6 UTP 23 AWG Patch Cord - 2 mtr - User End. Factory crimped LCS2 Patch cord complete as required.	126	No	361.0	45,486.00
7.1	NS-104	Documentation & Certification, Penta sanning of Cat6 cable compling following tests as Physical Check, Connectivity Check, Length Test, Wire Map Test, Insertion Loss Test, NEXT Test and compliance of EIA/TIA standards.	126	No	105.0	13,230.00
		SUB TOTAL				**1,68,222.00**
11		**ELECTRICAL PANELS**				
1	NS-105	Design, Manufacture, Supplying, Transport to the site, Receiving, Unloading, Shifting to Sub-Station at various locations, handling, assembling, installation in correct aligned position, grouting with dash fasteners, GI nuts-bolts, testing and commissioning of the following bolted fabricated in compartmentalized (Form-3B construction) conform to IS: 8623/1993, Suitable for 415V, 3Phase, 4 Wire 50 Hz Ac supply, are housed in design from CRCA sheet steel of 2mm thick for frame work and door covers, 3mm thick for gland plate, i/c cleaning & finishing complete, having extensible type bus bars of high conductivity, SMC bus bar supports, the manufacturer shall be certified from CPRI for short circuit withstand				

		capacity of min. 70kA for 1 Sec., fabrication shall be done in transportable sections and all front and back doors shall be hinged type and earth with frame, Entire panel shall have a common earth bar as specified below at the rear with 2 Nos. earth stud each side, bus bars and control wiring with suitable size of FRLS PVC insulated copper conductor cable, cable alleys, cable gland plates in two half, i/c providing following switch gears:				
		The Bus bars will be Copper purity 99.9% / electrolytic grade E91 Aluminium duly sleeved with Helogen Free heat shrink coloured Insulated tube confirming to IEC 6068-3-247 Standard. The powder coating (70-80micron as per IS:13871 for indoor and 100-120 micron for outdoor), include one size higher terminal block in cable alley and interconnecting wires between bus bars and terminals via MCB.				
a		**General Notes for site visit report for Panels/ Rising Main before submitting GA.**				
		The Manufacturer must visit the site before submitting GA drawings and submit a report consisting following:				
i.		Possible height for Panel.				
ii		Possible width for Panel				
iii		Back access will be possible or not.				
iv		Cable entry will be from top or bottom.				
v		If entry from bottom whether MS. Stand is required or not.				
vi		If the panel is wall mounted whether the wall is available or not.				
vii		Path for movement of transportation of panel is possible or not i.e length, width etc. and the transportation sections shall be designed accordingly.				
viii		Sufficient space available at front & back after door opening.				
ix		Sufficient height available above panel for cable drop.				

x		Actual floor to floor height for rising mains.				
b		**Also, refer to General Notes and Specifications for Panels/ Boards.**				
i.		All Panels shall be considered Indoor type unless specified.				
ii		The degree of protection for all indoor type panels shall be of IP:52 ("5" Indicates Dust Protected limited ingress of dust permitted. Will not interefere with operation of the equipment and "2" indicates protection against vertically falling drops of water with enclosure tilted upto 15 deg from vertical.) and all outdoor type panels shall be of IP:55 ("5" indicates Dust Proof and "5" indicates protection against jets of water)				
iii		Provide thermostat controlled panel mounted heavy duty exhaust fan in each Vertical for all Main L.T Panel and Capacitor Panels. For all other panels a proper ventilation louvers shall be provided.				
iv		Fully automatic control thermotate with strip heater shall be provide in each Bus-Bar alley and relay compartments to control the humidity				
v		Contractor to submit manufacturer's selection charts from approved list of make along with each component part number, Discrimination check certificate throughout the HV/MV network, insulation material & corners cover on bus-bars for approval.				
vi		Contractor shall submit a set of handing over document consisting operational and maintenance manuals, installation guidelines of all product's along with data sheets come with product, GA drawings with wiring diagram and product part code etc. shall be arranged and also place a laminated copy in a pocket inside the respective panel body.				
vii		If mentioned fault rating of bus-bar and circuit breaker is unavailable consider next available upside rating				
viii		Mimic diagram shall be provided on all panels.				
ix		It is recommended that only one make of switchgear to be used in a board / Panel.				
x		All live accessible parts shall be shrouded and all equipment shall be finger touch proof. SMC shrouds busbar supports shall be used. Padlocking facility shall be provided on all MCCB feeders doors and switch handles shall be lockable in OFF position.				
xi		**Equipments will be offered for following routine test only:-** i). Check of Bill of Materials as per approved drawing, ii). Visual and Dimensional Check, iii) Functional Check, iv)				

		HV/Megger test as per relevant IS, v) Busbar Density and Conductivity test, vi) Powder Coating thickness test				
xii		Third Party test report as required by the consultant/ Client/ PMC from the one of the selected vendors from approved list of make for IP rating, IS/ IEC Compliance and CPRI Compliance tests etc.				
xiii		**Minimum/Maximum Operating height-** 300/1800 respectively				
xiv		**Sealing Arrangement**:- PE Foam Rubber/ Neoprene Rubber Gasket				
xv		**Bus Bars Supports** - Non-Hygroscopic, Non Carbonising, Corrosinn Resistant, SMC Supports				
xvi		1 Set of connector (Phase+Neutral) shall be provided in cable alley for all outgoing with interconnection wires between MCB and Connector.				
xvii		All electrical panel shall have two nos. common G.I. earth bar of 50X6mm for the panels having incomer fault of 50kA and rest all with 32X6mm or as specified conductor throughout of the panel length as per the fault kA rating of main Incomer, at the rear and for wall mounted panel with 2Nos. earth stud at top one at each side.				
xviii		Bottom base channel of MS section not less than 100mmx 50mmx50mmx 5mm thick for Main L.T. Panel and capacitor panels and 40mmx25mmx25mmx 5mm thickplates for all floor mounted MDB/MCC and SDBs etc.				
xix		All outdoor use panel shall have bottom base stand of minimum 600mm or as mentioned below with M.S. angle iron 32mmx 32mmx6mm with fixing arrangement in RCC foundation.				
xx		No derating shall be applicable upto ambient temp. 50ºC for all breakers and selected components.				
xxi		Each door other than bus bar section shall be 2 numbers wing knob cabinet cam lock with master key lock made of zinc alloy powder coated housing, handle and chrome plated cylinder and nut CL001.				
xxii		**Minimum Air Clearances** between bus bars; (Calculation with required supporting document shall be submitted by Panel manufacturer along with GA diagram).				
		P-P=32mm, P-N=32mm,P-E=26mm and N-E=26mm				
xxiii		**Panel Power and control Wiring all FRLS PVC insulated min. conductor to be used as follows:**				
		AC voltage circuit-1.5 sqmm Red, Yellow,Blue &Black				
		Current circuit-1.5 sqmm Red, Yellow, Blue				

		&Black				
		AC Control circuit-1.5 sqmm White for Phase & Black for Neutral				
		DC Control circuit-2.5 sqmm Grey				
		Power circuit- Red, Yellow, Blue for Phase &Black for Neutral				
xxiv		**Phase-Neutral Terminology:**				
		TP: Three Phase				
		TPN: Three Phase and Neutral (Neutral shall be Half of Phase Capacity)				
		TP+2N: Three Phase and Neutral (Neutral shall be 200% of Phase Capacity)				
		4P: Three Phase and Neutral (Neutral shall be 100% of Phase Capacity)				
xxv		**Labelling**- Computerised Laminated Aluminium Name Plate with White letters on Blue/Black Background For Each Feeder and Panel Itself.				
xxvi		The treatment of Panel Shall be Fully automatic 9-tank process for metal treatment which consists of Solvent/ Alkaline Degreasing, Activation, Water Rinsing, De-rusting, Phosphating, Passivation and Water drying.				
xxvii		A separate compartment for Minimum 20% spare space of Panel shall be provided for outgoings in future and busbars shall be drilled accordingly.				
xxviii		During inspection of the panel, the manufacturer of major products shall be available at factory to validitate that the used products are original. Certification shall be given by OEM's on their company letter head.				
xxix		All incoming/outgoing MCB shall be mounted on din channel inside closed chambers shall have Acrylic sheet infront and front door should be a glass for see thru.				
xxx		In Meter boards all copper flexible wiring shall be provied with suitable copper lugs and ferruling at both ends and earthing shall be provided for individual meter with 2.5sqmm green insulated wire.				
xxxi		Earthing of rising main mounted meter boards shall be connected with rising main earth bar by 2Nos. 20x3 mm GI strips.				
11.1		**MDB (GROUND FLOOR)**				
		INCOMER-1				
		1 Nos. 100A, 415V, 4P fixed type ATS (Automatic transfer switch) eq. to ASCO 300 Series in open frame with live to live transfer time <70ms confirming to AC-33A/33iA utilization category. All the four poles should fully rated and simultaneously operating or				

		Overlapping neutral if neutral pole withstand capacity is not equal to phase poles. The controller should be built-in / external microprocessor based for priroty, AMF and RS:485 communication port for BMS compatibility with tested EMC/EMI or as per UL-1008 no external wiring harness shall be acceptable. ATS Shall be complying to Standard IEC 60947-6-1 for transfer and 60947-3 for disconnection function.				
		1 Nos. 100A 4P MCCB built in thermal magnetic based release (adjustable O/L & adjustable S/C) of fault breaking capacity 25KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides in metal encloser. MCCB shall conforming to IS-1397-2 1993 as amended.				
		METERING, INDICATOR AND RELAYs				
		Provide 3 Nos. Resin cast CTs, Class-1.0 and MFM True RMS type digital with min. features of measurements covering A,V,Hz, PF, kW, kVA, kVAR, kWH, kVAH, kVARH, RS-485 Port, LCD display with class-1.0 accuracy for all incomer feeder. Refer to Cat no. - Trinity-NF29				
		1 Set of R,Y,B phase indication lamps with control 3X2A SP+NL MCB as per fault requirement for each incomer.				
		Earth leakage protection relay with 300mA to 3000mA with ZCT in incoming.				
		TVSS AND BUS BARS				
		150 Amps TP+50%N, 25kA, 500volts grade busbar chamber of suitable length with **Copper busbars** mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 200Amp Copper Bus-bars and c). 201Amp and above Aluminium Bus-bars , current density of bus-bars shall not be less than 1Amps/sq.mm for Aluminium and 2Amps/sq.mm for copper cross sectional area of Bus Bar.				
		1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. Make & Model: Argos-AG-230-40T2-E or eq. SPD with 63A 4P HRC fuses of 100kA breaking				

		capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection with each busbar including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O..				
		OUTGOINGS				
		4 Nos. 63A, 4P 'C' Curve 10kA MCB with central overload trip mechanism and flag indication				
		1 Nos. 40A, 4P 'C' Curve 10kA MCB with central overload trip mechanism and flag indication				
		2 Nos. 40A, DP 'C' Curve 10kA MCB with central overload trip mechanism and flag indication				
		MDB (GROUND FLOOR) as described above.	1	Set	231464.0	2,31,464.00
11.2	NS-106	**HVAC PANEL (GROUND FLOOR)**				
		INCOMER-1				
		1 Nos. 125A, 415V, 4P fixed type ATS (Automatic transfer switch) eq. to ASCO 300 Series in open frame with live to live transfer time <70ms confirming to AC-33A/33iA utilization category. All the four poles should fully rated and simultaneously operating or Overlapping neutral if neutral pole withstand capacity is not equal to phase poles. The controller should be built-in / external microprocessor based for priroty, AMF and RS:485 communication port for BMS compatibility with tested EMC/EMI or as per UL-1008 no external wiring harness shall be acceptable. ATS Shall be complying to Standard IEC 60947-6-1 for transfer and 60947-3 for disconnection function.				
		1 Nos. 125A 4P MCCB built in thermal magnetic based release (adjustable O/L & adjustable S/C) of fault breaking capacity 25KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides in metal encloser. MCCB shall conforming to IS-1397-2 1993 as amended.				
		METERING, INDICATOR AND RELAYs				
		Provide 3 Nos. Resin cast CTs, Class-1.0 and MFM True RMS type digital with min. features of measurements covering A,V,Hz, PF, kW, kVA, kVAR, kWH, kVAH, kVARH, RS-485				

		Port, LCD display with class-1.0 accuracy for all incomer feeder. Refer to Cat no. - Trinity-NF29				
		1 Set of R,Y,B phase indication lamps with control 3X2A SP+NL MCB as per fault requirement for each incomer.				
		Earth leakage protection relay with 300mA to 3000mA with ZCT in incoming.				
		TVSS AND BUS BARS				
		150 Amps TP+50%N, 25kA, 500volts grade busbar chamber of suitable length with **Copper busbars** mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 200Amp Copper Bus-bars and c). 201Amp and above Aluminium Bus-bars , current density of bus-bars shall not be less than 1Amps/sq.mm for Aluminium and 2Amps/sq.mm for copper cross sectional area of Bus Bar.				
		1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. Make & Model: Argos-AG-230-40T2-E or eq. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection with each busbar including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O..				
		OUTGOINGS				
		5 Nos. 63A, 4P 'C' Curve 10kA MCB with central overload trip mechanism and flag indication				
		2 Nos. 40A, 4P 'C' Curve 10kA MCB with central overload trip mechanism and flag indication				
		3 Nos. 25A, 4P 'C' Curve 10kA MCB with central overload trip mechanism and flag indication				
		HVAC PANEL (GROUND FLOOR) as described above.	1	Set	246238.0	2,46,238.00
Note: -		1. All Starters shall be High Performance Star Delta / DOL Motor Starters as specified (Type 2 Co-ordination chart shall be followed of selected OEM but contactor shall be used one rating higher for IE3 efficiency motors with MPCB/MCCB at 415 V).				
		Provide 1 Set of 220 VAC/ 24 VDC transformer				

		with 5A output current and 10A Miniature Relay with 4Nos. Changeover Contacts and bridge rectifier controlled by solid state devices like SCR, MOSFET, IGBT etc. for automatically trigger On/Off the motor/ fan in case of receiving single from Fire Alarm Device/ Panel/ CO2 Sensor including necessary wiring				
11.3	NS-107	1 Set of TP MPCB with inbuilt over load relay of 50kA breaking capacity each with **3.70kW (7000 CFM)** DOL motor starter type ii co-ordination along with TP power contactors (AC3Duty) with inbuilt 1NO + 1NC contact single phase Ammeter with single CT with selector switch, Red, Green & Yellow Indicating Lamps each with control SP HRC Fuses, Start/Stop Push buttons, Auto/Manual/off selector switch, On delay Time for delayed automatic restart of fan motor (0-180 Sec) and SPP Complete as required, **For 2Nos Exhaust Fan**	2	Set	24624.0	49,248.00
11.4	NS-108	1 Set of TP MPCB with inbuilt over load relay of 50kA breaking capacity each with **2.00kW** DOL motor starter type ii co-ordination along with TP power contactors (AC3Duty) with inbuilt 1NO + 1NC contact single phase Ammeter with single CT with selector switch, Red, Green & Yellow Indicating Lamps each with control SP HRC Fuses, Start/Stop Push buttons, Auto/Manual/off selector switch, On delay Time for delayed automatic restart of fan motor (0-180 Sec) and SPP Complete as required, **For 1Nos TFA Unit**	1	Set	18098.0	18,098.00
		SUB TOTAL				**5,45,048.00**
12		**SUPPLY OF LIGHT FIXTURES AND FANS**				
		Note:-The model numbers specified below are only for references for Shape of the product requirement. The product shall supplied, must match the technical specifications. The technical data sheets shall be arranged before the material dispatch and got approved from engineer-in-charge.				
12.1	NS-109	Supply of **12W LED Recess Mounted Round Led Downlighter** with 6500K CCT .Similar to Wipro- LD90-141-XXX-65-XX or equivalent as per approved list of make.	162	Each	1385.0	2,24,370.00
12.2	NS-110	Supply of **18W LED Recess Mounted Round Led Downlighter** with 6500K CCT .Similar to Wipro- LD90-231-XXX-65-XX or equivalent as	143	Each	1568.0	2,24,224.00

		per approved list of make.				
12.3	NS-111	Supply of **36W LED Recess mounted LED 2'x2' luminaire** with 6500K CCT .Similar to Wipro- CRCO10R038HP57GL1 or equivalent as per approved list of make.	74	Each	5227.0	3,86,798.00
12.4	NS-112	Supply of **20W LED Recess mounted LED square shaped** COB downlighter with 6500K CCT .Similar to Wipro- LD58-251-060-40-XX or equivalent as per approved list of make.	24	Each	3650.0	87,600.00
12.5	NS-113	Supply of **300mm dia sweep wall fan** with Oscillating type complete with built in String type speed regulator and mounting arrangement. Similar to HAVELLS SWING HS or equivalent.	10	Each	1934.0	19,340.00
12.6	NS-114	Supply of **LED light strip 5W** complete with driver complete as required.	330	Mtr.	170.0	56,100.00
12.7	NS-115	Supply of **Customized derorative light in conference room** approved by client or archiitect.	1	Set	25000.0	25,000.00
		SUB TOTAL				**10,23,432.00**
		TOTAL OF ELECTRICAL WORKS				**26,94,963.00**
		HVAC WORKS				
1.0	NS-116	Supply, Installation, Testing & Commissioning (referred to as "SITC" here after) of following Equipment; Materials & Accessories as per specifications including supply, installation, testing & commissioning of any materials & accessories required to make the system complete in all respects:				
		Supply, Instalaltion, testing and Commissioning of Modular Type VRV/VRF Outdoor Units Equipped with Highly Efficiency Scroll Compressors with Inverter Technology, Heat Exchanger, Refrigerant Cooled Inverter PCB Module, Centrifugal Fan for Condenser, Outdoor units having Front Suction & Top Discharge, with Y-branch as required, Outdoor unit shall support Auto Check Function for Connection Error, Auto Address Setting and Capacity as mentioned below.				
		Supply, Instalaltion, testing and Commissioning of VRV/VRF Outdoor Units multi unit air-conditioning system complete with indoor and				

		outdoor units with individual controller **for heating & cooling application** as per the specifications and drawings. VRV Shall have cut off arrangement after a particular set value of Supply air Temperature. Outdoor unit shall support Auto Check Function for Connection Error, Auto Address Setting and Capacity as mentioned below.				
		VRV/VRF System shall be suitable for working on Ambient Temperature, with Refrigerant R-410A. Unit price shall be inclusive of full charge of Refrigerant Gas & Oil, Freight, Insurance, all Taxes & Duties etc. as applicable In INR. All interconnecting piping, joints and U bends within the condensing unit shall be painted with two coats of clear transparent polymer coating for protection against corrosion from ambient air pollution before installation. (Submit GA drawings / selection documents before start the work).				
1.1		**OUTDOOR UNITS VRF TYPE:**				
	NS-116A	Ground Floor: VRV ODU : 40 HP	**1**	Set	788246.05	7,88,246.05
	NS-116B	Ground Floor: VRV ODU : 18 HP For TFA UNIT	**1**	Set	344736.00	3,44,736.00
1.2	**NS- 117**	**VRV INDOORS UNIT**				
		Supply of variable refrigerant volume modular type indoor units comprising of EEV & all accessories as per the specifications. **The indoor units shall be suitable to work on cooling / heating mode**. The indoor units shall be suitable for operation on 220 ±6% volts, 50Hz, 1 phase AC power supply except floor standing units suitable for operation on 415 ±10% volts, 50Hz, 3 phase AC power supply. Ductable indoor units shall be suitable to handle extent of ductwork as shown in the design drawings and dehumidified air quantity as mentioned in the heat load summary sheet under "Special Conditions" and the indoor units shall be of following capacities. **All CM Indoor Units shall have inbuilt Drain Pumps. (Submit GA drawings / selection documents before start the work).**				
1.2.1		**WALL MOUNTED VRF INDOOR AC**				
a	NS-117A	VRV type Hi wall 1.59 TR	**5**	**No**	28438.20	1,42,191.00

b	NS-117B	VRV type Hi wall 2.0 TR	**2**	**No**	40138.00	80,276.00
1.2.2	NS-118	**VRV CASSETTE AC**				
a	NS-118A	VRV type Cassette 1.28 TR	**2**	**No**	40650.40	81,300.8
b	NS-118B	VRV type Cassette 1.59 TR	**2**	**No**	41162.80	82,325.6

c)	NS-118C	VRV type Cassette 2.55 TR	8	No	47567.80	3, 80,42.4
d)	NS-118D	VRV type 2 Way type Cassette 2.0 TR	2	No	46970.00	93,940.00
2.0	NS-119	**FITTINGS & CONTROLLERS**				,
a)	NS-119A	Imported fittings Y-joints and headers etc. (Refer HVAC Drawings).	22	Set	3928.40	86,424.8
b)	NS-119B	Corded remote controllers	22	No	2732.80	60,121.6
c)	NS-119C	Touch screen type centrallised controller suitable for indoor units as mentioned above	1	No	85390.00	85,390.00
		Central remote Controller (Touch Screen Type) : Supply, installation, testing & commissioning of the Graphic central remote Controller. It must act as an advanced air conditioning management system to facilitate complete control of VRF air conditioning equipment, It should be user friendly through its touch screen, icon display and color LCD display. Integratable upto 64 remote controller groups (including TFAs) and BMS compatible with ethernet/Wi-Fi communication protocol for remote monitoring. In addition to basic controls such as settings for on/stop,the operation mode & temperature,the air quantity and auto louver can be set.If a problem occurs, an alarm code immediately shows the details of the problem. An external input terminal is provided as standard. External signals enable the following function: central operation/stop,demand control,emergency stop,central operation output,& central alarm output. **Note: VRV Control panel connected to existing BMS at 4th floor level include in scope.**				
3	NS-120	**DX TYPE UNIT : Standby mode: 3 Star Fixed Speed R-32 Refrigerant Cooling Only Split Units**				

a		Supply,Installation,testing and Commissioning of DX type ceiling mounted ductable / wall mounted Split Air conditioner with refrigerent outdoor unit with matching capacity of indoor unit.				
		Capacity: 1.5 TR (wall mounted split ac)	3	No	28548.00	85,644.00
B		**REFRIGERATION PIPING & MS WORKS**				
1	Ns-121	**ELECTRICAL WORKS**				
a	NS-121A	Providing & Fixing control cum transmission wiring of 2 core x 1.5 sq. mm copper in suitable conduit between Indoor and Outdoor unit and for remote control insulation. (Refer HVAC Drawings).	350	RMT	142.74	49,959.00
b	NS-121B	Supply, Fabrication & fixing of MS iron works with painting complete as per approval & instruction. (Refer HVAC Drawings).	400	Kgs	115.29	46,116.00
2		**REFRIGERENT PIPING WORK**				
	NS-122	Supply, fabrication, installation, testing of Interconnecting refrigerant pipe work with Armacell insulation (19 mm / 13 mm thick) closed cell elastomeric nitrile rubber tubular insulation between each set of indoor & outdoor units as per specifications, all piping inside the room shall be properly supported with Gripple hanger and all external piping shall run in covered cable tray.				
a	NS122A	41.3 mm O.D (insulation : 19 mm)	10	MTR	1339.56	13,395.6
b)	NS-122B	34.9 mm O.D.(insulation : 19 mm)	15	MTR	1136.43	17,046.45
c)	NS-122C	28.4 mm O.D.(insulation : 19 mm)	20	MTR	1043.10	20,862.00
d)	NS-122D	22.2 mm O.D.(insulation : 13 mm)	35	MTR	916.83	32,089.05
e)	NS-122E	19.1 mm O.D.(insulation : 13 mm)	25	MTR	878.40	21,960.00
f)	NS-122F	15.9 mm O.D.(insulation : 13 mm)	40	MTR	807.03	32,281.20
g)	NS-122G	12.7 mm O.D.(insulation : 13 mm)	30	MTR	741.15	22,234.5
h)	NS-122H	9.5 mm O.D.(insulation : 13 mm)	40	MTR	631.35	25,254.00

i)	NS-122 I	6.4 mm O.D.(insulation : 13 mm)	25	MTR	521.55	13,038.75
3.0	123.00	Supply & installation of Rigid cPVC piping complete with fittings, supports as per specifications and duly insulated with 6 mm thick closed cell nitrile rubber insulation.				
a)	NS-123A	40 mm dia	150	RMT	229.48	34,422.30
b)	NS-123B	32 mm dia	125	RMT	182.27	22,783.50
c)	NS-123C	25 mm dia	150	RMT	168	25,200.00
C		**VENTILATION WORKS**				
1.0		**Inline Fans**				
	NS - 124	Supply, installation, testing and commissioning of Inline fans with motor complete in all respect & of following capacities. The casing of inline fans shall be acoustically lined & shall be selected for lower noise level. Fan motor shall have inbuilt speed controller.				
a)	NS-124A	Capacity : 200 cfm (Inline exhaust fans Dia 160 mm / 12 mm S.P)	1	No	5709.60	5709.60
b)	NS-124B	Capacity : 250 cfm (Inline exhaust fans Dia 160 mm / 12 mm S.P)	0	No	6368.40	0
c)	NS-124C	Capacity : 300 cfm (Inline exhaust fans Dia 200 mm / 12 mm S.P)	2	No	7960.50	15,921.00
d)	NS-124D	Capacity : 400 cfm (Inline exhaust fans Dia 400 mm / 12 mm S.P)	15	No	9333.00	1,39,995.00
e)	NS-124E	Capacity : DIA 200 MM (Propeller exhaust fans- Handicap)	6	No	2854.80	17,128.80
2.0	NS-125	**Horizontal/ Vertical Floor Mounted VRV TYPE Fresh Air Treatment Units**				
		Double skin Horizontal/ Vertical Floor mounted VRV type treated Fresh Air Treatment Units made of 46 mm thick PUF insulated panels of density not less than 40 Kg/CuM, Hollow extruded aluminum profiles with 0.8 mm thick pre-coated GI Outer Sheet & 0.8 mm thick Plain GI inner sheet comprising of filter section with G4 filter, F-7 filter, Chemical Filter & F-9 filter with 8 rows deep DX cooling/heating coil of copper tube & aluminium fin construction. Blower section with SISW Backward curved plug type EC Fans, with Factory fitted VFD				

		and MCB/ MCCB of appropriate rating with cable termination box, IE-02 squirrel cage induction motor, belt drive package, insulated stainless steel drain pan and vibration isolation pads all complete as per specifications. AHUs shall be selected for a maximum face velocity of 500 FPM. The units shall be compatible with VRF outdoor units. The unit shall be supplied with electronic expansion valve/s (Dx), thermostats, control wiring & all accessories as required for completing installation.				
		Fan outlet velocity shall not exceed 2000 FPM (10.1 MPS).				
		Spring type vibration isolators, wire guard on Fan section access door, fire retardant canvass connection at fan suction & LED lamps for blower section, limit switch for the fan section access door with a view port and damper at the outlet of unit. Units shall be supplied without LED lamp, View Port, Limit Switch & Wire Guards.				
		All dampers shall be low leakage aluminum aerofoil design and suitable for manual / motorised operation				
		All Floor Mounted units shall be provided with intake section with louvers and units shall be provided with intake flanges for fresh air duct connection				
		Units exposed to open sky shall have weather proof canopy.				
		AHU Capacity SP No. of Motor Ref				
		No. (CFM) (mm WG) Rows Rating(KW) Load Nom.				
		TFA -1 1800 80 6/8 2.5 16HP				
a		TFA UNIT 1800 CFM	1	No	247050.00	2,47,050.00
3	NS-126	**TUBE AXIAL FANS**				
		Providing, fixing, testing and commissioning tube axial flow fan of M.S.contruction. All the fans are synthetic enamelled panited/hot dip galvanized with minimum 220 GSM Zinc Coating and complete with bird screen at inlet.				

		The electric motor coupler shall be squirrel cage induction motor.				
3.1		Capacity: 7000 CFM Fire rated fans for Exhaust air	2	No	82350.00	1,64,700.00
		TOTAL OF HVAC				**32,84,641.52**
		TOTAL OF SCHEDULE "B"				**1,85,18,521.38**

Explanatory Notes for BOQ:

i) The quantity mentioned in the Schedules is approximate and the DFCCIL reserves the right to increase / decrease the same as per site requirement.

Form No. 5

Format for Power of Attorney for Authorized representative

Know all men by these presents, We, *[name of organization and address of the registered office]* do hereby constitute, nominate, appoint and authorize Mr/Ms *[name],* son /daughter/ wife of *[name],* and presently residing at *[address],* who is presently employed with/retained by us and holding the position of *[designation]* as our true and lawful attorney *(herein after referred to as the "Authorized Representative"),* with power to sub-delegate to any person, to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our Bid for *[name of assignment],* to be developed by Dedicated Freight Corridor Corporation of India Ltd. *(the "Authority")* including but not limited to signing and submission of all applications/bids, proposals and other documents and writings, participating in pre-bid and other conferences and providing information/responses to the Authority, representing us in all matters before the Authority, signing and execution of all contracts and undertakings consequent to acceptance of our bid and generally dealing with the Authority in all matters in connection with or relating to or arising out of our Bid for the said Project and/or upon award thereof to us until the entering into of the Contract with the Authority.

AND, we do hereby agree to ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Authorized Representative pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Authorized Representative in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE, *[name of organization]*, THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS *[date in words]* DAY OF *[month] [year in 'yyyy' format].*

For *[name and registered address of organization] [Signature]*

[Name]

[Designation]

Witnesses:

1. *[Signature, name and address of witness]*

2. *[Signature, name and address of witness]*

Accepted

[Signature]

[Name]

[Designation] [Address]

Notes:

1. The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants(s) and when it is so required, the same should be under seal affixed in accordance with the required procedure.

2. Wherever required, the Bidder should submit for verification the extract of the charter documents and other documents such as a resolution/power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

Form No. 6

PRE-CONTRACT INTIGRITY PACT

GENERAL:

This pre-bid contract Agreement *(hereinafter called the Integrity Pact)* is made on _____ day of the month_____ 2016, between, on one hand, the DFCCIL acting through Shri _____ Designation of the officer, *(hereinafter called the CLIENT, which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns)* of the First Part and M/s _____ represented by Shri _____ Chief Executive Officer *(herein after called the "BIDDER/SELLER" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns)* of the Second Part.

WHEREAS, the CLIENT proposes to procure *(Name of the Stores/Equipment/Item, Name of the Consultancy Service, Name of Works Contract, Name of Services)* and the [A] is willing to offer/has offered for stores or works.

WHEREAS, the [A] is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the CLIENT is a PSU performing its functions on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the CLIENT to obtain the desired said *(Name of the Stores/Equipment/Item, Name of the Consultancy Service, Name of Works Contract, Name of Services)* at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure [B] by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the CLIENT will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this integrity pact and agree as follows:

1.0 Commitments of the CLIENT:

1.1 The CLIENT undertakes that no official of the CLIENT, connected directly or indirectly with the [B], will demand, take a promise for or accept, directly or

through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the [A] either for themselves or for any person, organization or third party related to the [B], in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the [B].

1.2 The CLIENT will, during the pre-contract stage, treat all BIDDERs alike, and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular [A] in comparison to other BIDDERs.

1.3 All the officials of the CLIENT will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2.0 In case any such preceding misconduct on the part of such officials(s) in reported by the [A] to the CLIENT with full and verifiable facts and the same is prima facie found to be correct by the CLIENT, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the CLIENT and such a person shall be debarred from further dealings related to the [B] process. In such a case while an enquiry is being conducted by the CLIENT the proceedings under the [B] would not be stalled.

3.0 Commitments of BIDDERS:

The [A] commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the [B] contract or in furtherance to secure it and in particular committee itself to the following:-

3.1 The [A] will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the CLIENT, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the [B] in exchange for any advantage in the bidding, evaluation, contracting and implementation of the [B].

3.2 The [A] further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the CLIENT or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the [B] or any other [B] with the Government for showing or forbearing to show favour or disfavour to any person in relation to the [B] or any other [B] with the Government.

3.3* [A] shall disclose the name and address of agents and representatives and Indian [A] shall disclose their foreign principals or associates.

3.4* [A] shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

3.5 The [A] further confirms and declares to the CLIENT that the [A] is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the CLIENT or any of its functionaries, whether officially or unofficially to the award of the [B] to the [A] nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation:

3.6 The [A] either while presenting the bid or during pre-contract negotiations or before signing the [B] shall disclose any payments he has made, is committed to or intends to make to officials of the CLIENT or their family members, agents, brokers or any other intermediaries in connection with the [B] and the details of services agreed upon for such payments.

3.7 The [A] will not collude with other parties interested in the [B] to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the [B].

3.8 The [A] will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The [A] shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the CLIENT as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The [A] also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The [A] commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The [A] shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the [A] or any employee of the [A] or any person acting on behalf of the [A], either directly or indirectly, is a relative of any of the officers of the CLIENT, or alternatively, if any relative of an officer of the CLIENT has financial

interest/stake in the BIDDER's firm, the same shall be disclosed by the [A] at the time of filling of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The [A] shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the CLIENT.

4.0 Previous Transaction:

4.1 The [A] declares that no previous transgression occurred in the last three years immediately before signing of this integrity pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER'S exclusion from the tender process.

4.2 The [A] agrees that if it makes incorrect statement on this subject, [A] can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5.0 Earnest Money *(Security Deposit):*

5.1 While submitting commercial bid, the [A] shall deposit an amount _____ *(to be specified in RFP)* as Earnest Money/Security Deposit, with the CLIENT through any of the following instruments:

(i) Bank Draft or a Pay order in favour of _____

(ii) A confirmed guarantee by an Indian Nationalized Bank, promising payment of the guaranteed sum to the CLIENT on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the CLIENT shall be treated as conclusive proof or payment.

(iii) Any other mode or through any other instrument *(to be specified in the RFP).*

5.2 The Earnest Money/Security Deposit shall be valid upto a period of five years ***or*** the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the CLIENT, including warranty period, whichever is later.

5.3 In case of the successful [A] a clause would also be incorporated in the Article pertaining to Performance Guarantee in the [B] that the provisions of Sanctions

for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the CLIENT to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

5.4 No interest shall be payable by the CLIENT to the [A] on Earnest Money/Security Deposit for the period of its currency.

6.0 Sanctions for violations:

6.1 Any breach of the aforesaid provisions by the [A] or any one employed by it or acting on its behalf (whether with or without the knowledge of the [A] shall entitle the CLIENT to take all or any one of the following actions, wherever required: -

(i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the [A]. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit *(in pre-contract stage)* and/or Security Deposit/performance Bond *(after the [B] is signed)* shall stand forfeited fully and the CLIENT shall not be required to assign any reason therefore.

(iii) To immediately cancel the [B], if already signed, without giving any compensation to the [A].

(iv) To recover all sums already paid by the CLIENT, and in case of an Indian [A] with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a [A] from the country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the [A] from the CLIENT in connection with any other [B], such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the [A], in order to recover the payments, already made by the CLIENT, along with interest.

(vi) To cancel all or any other Contracts with the [A]. The [A] shall be liable to pay compensation for any loss or damage to the CLIENT resulting from such cancellation/rescission and the CLIENT shall be entitled to deduct the amount so payable from the money(s) due to the [A].

(vii) To debar the [A] from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the CLIENT.

(viii) To recover all sums paid in violation of this Pact by [A] to any middleman or agent or broker with a view to securing [B] the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any [B] signed by the CLIENT with the [A], the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the CLIENT to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

6.2 The CLIENT will entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this pact also on the Commission by the [A] or any one employed by it or acting on its behalf (whether with or without the knowledge of the [A], of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988 or any other stature enacted for prevention of corruption.

6.1 The decision of the CLIENT to the effect that a breach of the provisions of this Pact has been committed by the [A] shall be final and conclusive on the [A]. However, the [A] can approach the independent monitor(s) appointed for the purposes of this pact.

7.0 Fall Clause:

7.1 The [A] undertakes that it has not supplied / is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the [A] to any other Ministry/Department of the Government of India or a PSU at a lower price, then that vary price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the [A] to the CLIENT, if the [B] has already been concluded.

8.0 Independent Monitors:

8.1 The CLIENT has appointed independent Monitors *(hereinafter referred to as Monitors)* for this Pact in Consultant with the Central Vigilance Commission *(Name and Addresses of the Monitors to be given).*

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the CLIENT.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all project documentation of the CLIENT including that provided by the BIDDER. The [A] will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the [A] with confidentiality.

8.7 The CLIENT will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

1.8 The Monitor will submit a written report to the MD/DFCCIL within 8 to 10 weeks from the date of reference or intimation to him by the CLIENT/BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9.0 Facilitation of Investigation:

In case of any allegation of violation of any provisions of this Pact or payment of commission, the CLIENT or its agencies shall be entitled to examine all the documents including the Books of Accounts of the [A] and the [A] shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10.0 Law and Place of Jurisdiction:

This pact is subject to Indian Law. The Place of performance and jurisdiction is the seat of the CLIENT.

11.0 Other Legal Actions:

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12.0 Validity:

12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the [B] to the satisfaction of both the CLIENT and the [A] including warranty period, whichever is later. In case [A] is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the [B].

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13.0 The parties hereby sign this Integrity Pact at_____on _____.

CLIENT:	BIDDER:
Name of the Officer	CHIEF EXECUTIVE OFFICER
Designation	
Deptt/Ministry/PSU	
Witness:	Witness:
1._____	1._____
2._____	2._____

Note:

[A] To be replaced by BIDDER/Seller/Consultant/Consultancy firm/Service Provider as the case was may be.

[B] To be replaced by Contract/Supply Contract/Consultancy Contract/Works Contract as the case was may be.

Form No. 7

NO DEVIATION CERTIFICATE

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

To,

(Write Name & Address of Officer of DFCCIL inviting the Tender)

Dear Sir,

Sub: No Deviation Certificate.

Ref: 1) NIT/Tender Specification No: …….,

2) All other pertinent issues till date

We hereby confirm that we have not changed/ modified/materially altered any of the tender documents as downloaded from the website/ issued by DFCCIL and in case of such observance at any stage, it shall be treated as null and void.

We also hereby confirm that we have neither set any Terms and Conditions and nor have we taken any deviation from the Tender conditions together with other references applicable for the above referred NIT/Tender Specification.

We further confirm our unqualified acceptance to all Terms and Conditions, unqualified compliance to Tender Conditions, Integrity Pact.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized

representative of the bidder)

FORM No. 8

Format of Bank Guarantee for Performance Security

Bank Guarantee no……. Dated……..…

To,
Chief General Manager,
Dedicated Freight Corridor Corporation of India Ltd/Noida Unit
D-89, 1st Floor, Sector-2,
Noida-20 1301

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

This deed of Guarantee 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 construction of ……*(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)* only.

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…… *(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:

FORM No. 9

SAMPLE
A G R E E M E N T
CONTRACT AGREEMENT

THIS AGREEMENT *("Agreement")* is made at Noida on the __day of __

BETWEEN

(1) Dedicated Freight Corridor Corporation of India Limited, incorporated under the laws of India and having its principal place of business at, Pragati Maidan Metro Station Building Complex, New Delhi, India – 110001 *(hereinafter called **'the Employer'**)*, and ----------**,** a company / corporation / JV incorporated under the laws of ----------having its principal place of business at ---------- *(hereinafter called "**the Contractor**").*

WHEREAS in reference to a call for Tender for ***" Construction of HHRI*** COMPRISING OF ADMINISTRATIVE & HOSTEL BLOCK AND GENERAL LAB including ***Related Allied Facilities at Noida"*** as per ***Tender paper No.*** CGM/DFCCIL/NOIDA UNIT/CONSTRUCTION OF **HHRI COMPRISING OF ADMINISTRATIVE & HOSTEL BLOCK AND GENERAL LAB/2019/**

At Annexure "A" here to, the Contractor has submitted a Tender hereto and whereas the said Tender of the contractor has been accepted for Construction of ---------- as per copy of the Letter of Acceptance of Tender No-------- dated ----_complete with enclosure at the accepted rates and at an estimated contract value of Rs._____*(Rupees only)*. Now the agreement with witnesses to that in consideration of the premises and the payment to be made by the Employer to the Contractor provided for herein below the Contractor shall supply all equipments and materials and execute and perform all works for which the said Tender of the Contractor has been accepted, strictly according to the various provisions in Annexure 'A' and 'B' hereto and upon such supply, execution and performance to the satisfaction of the Purchaser, the Purchaser shall pay to the contractor at the several rates accepted as per the said Annexure 'B' and in terms of the provisions therein.

IN WITNESS WHEREOF the parties hereto have caused their respective Common Seals to be hereunto affixed/ *(or have hereunto set their respective hands and seals)* the day and year first above written.

For and on behalf of the Contractor	For and on behalf of the Employer
Signature of the authorized official	Signature of the authorized official

Name of the official

Stamp/seal of the Contractor

Name of the official

Stamp/Seal of the Employer

SIGNED, SEALED AND DELIVERED

By the said

_____Name

_____

on behalf of the Contractor in the presence of:

Witness _____
Name _____
Address _____

By the said

_____Name

_____

on behalf of the Employer in the presence of:

Witness _____
Name _____
Address _____

Enclosures: -

1. Annexure 'A' - Tender Papers No.

2. Annexure 'B' - Letter of Acceptance of Tender No._____Dated_____

along with Summary of Prices

3. Other enclosures -

FORM No. 10

INDEMNITY BOND

This deed of Indemnity Bond is made at NOIDA, on this day of , we, ……through its Authorized Signatory (hereinafter called 'Contractor) AND M/s DFCCIL, D-89, Sector-2, Noida, District Gautam Budh Nagar, U.P., (Hereinafter called 'Client').

We, indemnify and save harmless the Railway/DFCCIL from and against all actions, suit proceedings losses, costs, damages, charges, claims and demands of every nature and description brought or recovered against the Railways/DFCCIL by reason of any act or omission of----------(Contractor), his agents or employees, in the execution of the works or in his guarding of the same. All sums payable by way of compensation under any of these conditons shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

IN WITNESS WHEREOF the Contractor has executed this Bond of Indemnity at Noida, on this……. of 2019.

For and Behalf of
Signature of Witness-1
Name of Witness-1
(in Block Letter)
Address-1

Authorized Signatory

for and Behalf of
Signature of Witness-1
Name of Witness-1
(in Block Letter)
Address-1

Authorized Signatory

Form No.11

GUARANTEE BOND BY THE CONTRACTOR

FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF

WATER-PROOFING WORKS/ANTI TERMITE TREATMENT

(All Water Proofing Items/Anti Termite items)

The agreement made this..... day of ..... *(Two Thousand only)* ……. **……. DFCCIL/NOIDA UNIT** between …… S/o……. *(hereinafter called the GUARANTOR of the one part)* and the PRESIDENT OF INDIA *(hereinafter called the Government of the other part)*

WHEREAS THIS agreement is supplementary to a contract *(hereinafter called the Contract)* dated ..... and made between the GUARANTOR OF THE ONE PART AND the Government of the other part whereby the contractor inter alia undertook to render the building and structures in the said contract recited completely water and leak-proof, Termite Proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain water and leak proof, Termite Proof for ten years from the date of completion of work.

NOW THE GUARANTOR hereby guarantees that work executed by him will render the structures completely leak proof, Termite Proof and the minimum life of such water proofing treatment/Anti Termite Treatment shall be ten years to be reckoned from the date of completion of work.

The decision of the Engineer with regard to nature and cause of defect shall be final and binding on Guarantor.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect being found render the building ***water proof/anti termite(as per clause no. 5.8.1.b)*** to the satisfaction of the Engineer calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the water proofing/anti termite treatment and fails to control all kinds of leakage and seepage or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and / or cost incurred by the Government, the decision of the Engineer will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator **…….** and DFCCIL/Noida by … … … … … … … …

DFCCIL/ Noida Unit for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of: -

1.....

2. .....

SIGNED FOR AND BEHALF OF THE PRESIDENT OF INDIA BY ..... in

the presence of:-

1.....

2.....

FORM No. 12

ECS / NEFT / RTGS

MANDATE FORM

Date: -

To,
Chief General Manager/Noida
DFCCIL, New Delhi.
Sub: ECS / NEFT / RTGS payments

We refer to the ECS / NEFT / RTGS set up by DFCCIL for remittance of our payments using RBI's NEFT / RTGS scheme, our payments may be made through the above scheme to our under noted account.

Name of Bank	
Name of City	
Bank Code No	
Name of Bank Branch	
Branch Code No	
Address of Bank Branch	
Telephone Number of Bank Branch	
Fax No of Bank Branch	
Name of customer / Tenderer as per account	
Account Number of Tenderer appearing on cheque book	
Type of Account *(S. B. / Current / Cash credit)*	
IFSC code for NEFT	
IFSC code for RTGS	
9-Digit-code number of the bank and branch appearing on the MICR cheque issued by the bank.	
Details of Cancelled Cheque leaf	
Telephone no of tenderer	
Cell Phone Number of the tenderer to whom details with regard to the status of bill submitted to Accounts Office i.e Co6 & Co7 & Cheque Purchase Orders particulars can be intimated through SMS	
Tenderer's E - mail ID	

Confirmed by Bank signature of tenderer with stamp and address

Enclose a copy of crossed cheque.

FORM No. 13

Reference Para 17(B)

Registered Acknowledgement Due

PROFORMA FOR TIME EXTENSION

No. _____ Dated: _____

Sub: (i) _____*(name of work)*.

(ii) Acceptance letter no. _____

(iii) Understanding/Agreement no. _____

Ref: _____ *(Quote specific application of Contractor for extension to the date received)* _____

Dear Sir,

1. The stipulated date for completion of the work mentioned above is _____. From the progress made so far and the present rate of progress, it is unlikely that the work will be completed by the above date (or 'However, the work was not completed on this date').

2. Expecting that you may be able to complete the work if some more time is given, the competent authority, although not bound to do so, hereby extends the time for completion from _____ to _____.

3. Please note that an amount equal to the liquidated damages for delay in the completion of the work after the expiry of _____ *(give here the stipulated date for completion with/without any liquidated damage fixed earlier)* will be recovered from you as mentioned in Clause 17-B of the Standard General Conditions of Contract for the extended period, notwithstanding the grant of this extension. You may proceed with the work accordingly.

4. The above extension of the completion date will also be subject to the further condition that no increase in rates on any account will be payable to you.

5. Please intimate within a week of the receipt of this letter your acceptance of the extension of the conditions stated above.

6. Please note that in the event of your declining to accept the extension on the above said conditions or in the event of your failure after accepting or acting upto this extension to complete the work by _____ (*here mention the extended date*), further action will be taken in terms of Clause 62 of the Standard General Conditions of Contract.

Yours faithfully

FORM No. 14

Reference Para 60.(2)

CERTIFICATE OF FITNESS

1. (a) Serial Number_____
   (b) Date _____
2. Name of person examined _____
3. Father's Name: son/daughter of _____
   Residing at _____
4. Sex _____
5. Residence: _____
6. Physical fitness
7. Identification marks _____
8. Date of birth, if available, and/or certified age _____
   I certify that I have personally examined (name) _____who is desirous of being employed in a factory or on a work requiring manual labour and that his/her age as nearly as can be ascertained from my examination, is _____ years.

   I certify that he/she is fit for employment in a factory or on a work requiring manual labour as an adult/child.

9. Reasons for :
   (a) Refusal to grant certificate, or _____
   (b) Revoking the certificate _____

Signature or left hand

Thumb impression of the person examined.

Signature of Certifying Surgeon

Note: In case of physical disability, the exact details and cause of the physical disability should be clearly stated.

FORM No. 15
(Reference Clause 62.(1)

Registered Acknowledgement Due

PROFORMA OF 7 DAYS NOTICE FOR WORKS AS A WHOLE/ IN PARTS

(DETAILS OF PART OF WORK TO BE MENTIONED)

DFCCIL

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

In spite of repeated instructions to you by the subordinate offices as well as by this office through various letters of even no. _____, dated _____; you have failed to start work/show adequate progress and/or submit detailed programme for completing the work/ part of work (details of part of work to be mentioned).

2. Your attention is invited to this office/Chief Engineer's office letter no. _____ _____, dated _____ in reference to your representation, dated _____.

3. As you have failed to abide by the instructions issued to commence the work /to show adequate progress of work you are hereby given 7 days' notice in accordance with Clause 62 of Standard General Conditions of Contract to commence works / to make good the progress, failing which further action as provided in Clause 62 of the Standard General Conditions of Contract viz. to terminate your Contract and complete the balance work without your participation will be taken.

Kindly acknowledge receipt

Yours faithfully

FORM No. 16

Reference Para 62(1)

Registered Acknowledgement Due

PROFORMA OF 48 HRS. NOTICE FOR WHOLE WORK

DFCCIL

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

Seven days' notice under Clause 62 of Standard General Conditions of Contract was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the work.

2. You are hereby given 48 hours' notice in terms of Clause 62 of Standard General Conditions of Contract to commence works / to make good the progress of works, failing which and on expiry of this period your above contract will be rescinded and the work under this contract will be carried out independently without your participation and your Security Deposit shall be forfeited and Performance Guarantee shall also be encashed and any other consequences which may please be noted.

Kindly acknowledge receipt.

Yours faithfully

FORM No. 17

Reference Para 62.(1)

Registered Acknowledgement Due

PROFORMA OF TERMINATION NOTICE

DFCCIL

(Without Prejudice)

No. _____ Dated _____

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

Forty eight hours (48 hrs.) notice was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the work.

Since the period of 48 hours' notice has already expired, the above contract stands rescinded in terms of Clause 62 of Standard General Conditions of Contract and the balance work under this contract will be carried out independently without your participation. Your participation as well as participation of every member/partner in any manner as an individual or a partnership firm/JV is hereby debarred from participation in the tender for executing the balance work and your Security Deposit shall be forfeited and Performance Guarantee shall also be encashed.

Kindly acknowledge receipt.

Yours faithfully

FORM No. 18

Reference Para 62.(1)

Registered Acknowledgement Due

PROFORMA OF 48 HRS. NOTICE FOR PART OF THE WORK…….

(DETAILS OF PART OF WORK TO BE MENTIONED)

DFCCIL

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

1. Seven days' notice under Clause 62 of Standard General Conditions of Contract was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the part of work……..(details of part to be mentioned).

2. You are hereby given 48 hours' notice in terms of Clause 62 of Standard General Conditions of Contract to commence works / to make good the progress of works, failing which and on expiry of this period your above part of work…… (Details of part to be mentioned) in contract will be rescinded and the work will be carried out independently without your participation.

3. Your full Performance Guarantee for the contract shall be forfeited and you shall not be issued any completion certificate for the contract. However, no additional Performance Guarantee shall be required for balance of work being executed through the part terminated contract.

4. The contract value of part terminated contract shall stands reduced to ……..

Kindly acknowledge receipt.

Yours faithfully

Form No. 19

Reference Para 62.(1)

Registered Acknowledgement Due

PROFORMA OF TERMINATION NOTICE FOR PART OF THE WORK……. (DETAILS OF PART OF WORK TO BE MENTIONED)

DFCCIL

(Without Prejudice)

No. _____ Dated _____

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

1. Forty eight hours (48 hrs.) notice was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the part of work……..(details of part to be mentioned).

2. Your above part of work in contract ……..(details of part to be mentioned) stands rescinded in terms of Clause 62 of Standard General Conditions of Contract and the same will be carried out independently without your participation. Your participation as well as participation of every member/partner in any manner as an individual or a partnership firm/JV is hereby debarred from participation in the tender for executing the balance work

3. Your full Performance Guarantee for the contract shall be forfeited and you shall not be issued any completion certificate for the contract. However, no additional Performance Guarantee shall be required for balance of work being executed through the part terminated contract.

4. The contract value of part terminated contract stands reduced to ……..

Kindly acknowledge receipt.

Yours faithfully

Form No. 20

Reference Para 48.(3)

FINAL SUPPLEMENTARY AGREEMENT

1. Articles of agreement made this day _____ in the year _____ between the President of India, acting through the _____ Railway Administration having his office at _____ herein after called the Railway of the one part and _____ of the second part.

2. Whereas the party hereto of the second part executed an agreement with the party hereto of the first part being agreement Number _____dated ____for the performance _____herein after called the 'Principal Agreement'.

3. And whereas it was agreed by and between the parties hereto that the works would be completed by the party hereto of the second part on _____ date last extended and whereas the party hereto of the second part has executed the work to the entire satisfaction of the party hereto of the first part.

4. And whereas the party hereto of the first part already made payment to the party hereto of the second part diverse sums from time to time aggregating to ₹ _____ including the Final Bill bearing voucher No._____ dated _____of value _____ duly adjusted as per price variation clause, if applicable (the receipt of which is hereby acknowledged by the party hereto of the second part in full and final settlement of all his /its claims under the principal agreement.

   And whereas the party hereto of the second part have received sum of ₹ _____ through the Final Bill bearing voucher No._____ dated _____duly adjusted as per price variation clause (PVC), if applicable (the receipt of which is hereby acknowledged by the party thereto of the second part) from the party hereto of the first part in full and final settlement of all his/its disputed claims under principal agreement.

   Now, it is hereby agreed by and between the parties in the consideration of sums already paid by the party hereto of the first part to the party hereto of the second part against all outstanding dues and claims for all works done under the aforesaid principal agreement excluding the security deposit, the party hereto of the second part have no further dues of claims against the party hereto of the first part under the said Principal Agreement. It is further agreed by and between the parties that the party hereto of the second part has accepted the said sums mentioned above in full and final satisfaction of all its dues and claims under the said Principal Agreement.

   (Applicable in case Final Supplementary Agreement is signed after release of Final Payment)

   Or

   And whereas the party hereto of the first part already made payment to the party hereto of the second part diverse sums from time to time aggregating to ₹ _____ through various On Account Bills (the receipt of which is hereby acknowledged by the party hereto of the second part).

   And whereas the party hereto of the second part have received sum of ₹ _____ through various On Account Bills (the receipt of which is hereby acknowledged by the party thereto of the second part) from the party hereto of the first part and party hereto of the second part have accepted final measurements recorded on Page No….. to Page No…. of Measurement Book No……..and corresponding Final Bill duly adjusted as per price variation clause (PVC), if applicable, for full and final settlement of all his/its disputed claims under principal agreement.

   Now, it is hereby agreed by and between the parties in the consideration of sums already paid through various On Account Bills and sums to be paid through Final Bill duly adjusted as per price variation clause (PVC), if applicable, based on accepted final measurements including the security deposit by the party hereto of the first part to the party hereto of the second part against all

outstanding dues and claims for all works done under the aforesaid principal agreement, the party hereto of the second part have no further dues of claims against the party hereto of the first part under the said Principal Agreement.

(Applicable in case Final Supplementary Agreement is signed before release of Final Payment)

5. It is further agreed and understood by and between the parties that the arbitration clause contained in the said principal agreement shall cease to have any effect and/or shall be deemed to be non-existent for all purposes.

Signature of the Contractor/s

Witnesses

_____

ADDRESS: _____

Form No. 21

Reference Para 64.3 & 64.6

Agreement towards Waiver under Section 12(5) and Section 31A (5) of Arbitration and Conciliation (Amendment) Act

I/we..... (Name of agency/Contractor) with reference to agreement no..... raise disputes as to the construction and operation of this contract, or the respective rights and liabilities, withholding of certificate and demand arbitration in respect of following claims :

Brief of claim:

(i) Claim 1- Detailed at Annexure-
(ii) Claim 2 –
(iii) Claim 3 –

I/we..... (post of Engineer) with reference to agreement no..... hereby raise disputes as to the construction and operation of this contract, or the respective rights and liabilities, withholding of certificate and demand arbitration in respect of following claims:

I/we.....do/do not agree to waive off applicability of section 12(5) of Arbitration and Conciliation (Amendment) Act.

Signature of Claimant_____ Signature of Respondent _____

Agreement under Section 31(5)

I/we..... (Name of claimant) with reference to agreement no..... hereby waive off the applicability of sub section 31-A (2) to 31-A (4) of the Arbitration and Conciliation (Amendment Act. We further agree that the cost of arbitration will be shared by the parties as per Clause 64(6) of GCC.

Signature of Claimant_____ Signature of Respondent_____

*Strike out whichever not applicable.

Form No. 22

Reference Para 64.(3)

Certification by Arbitrators appointed under Clause 63 & 64 of Indian Railways General Conditions of Contract

1. Name:

2. Contact Details:

3. Prior experience (Including Experience with Arbitrations):

4. **I do not have more than ten on-going Arbitration cases with me**.

5. I hereby certify that I have retired from Railways w.e.f. _____ and empanelled as Railway Arbitrator as per 'The Arbitration and Conciliation Act- 1996'.

6. I have no any past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind.

   Or

   I have past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind. The list of such interests is as under:

7. I have no any past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality in terms of The Arbitration and Conciliation Act-1996.

   Or

   I have past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality in terms of The Arbitration and Conciliation Act-1996. The details of such relationship or interests are as under:

8. There are no concurrent Circumstances which are likely to affect my ability to devote sufficient time to the arbitration and in particular to finish the entire arbitration within twelve months.

   There are Circumstances which are likely to affect my ability to devote sufficient time to the arbitration and in particular to finish the entire arbitration within twelve months. The list of such circumstances is as under.

PART-IV

DRAWINGS

(Drawings have been uploaded separately in the E-Tender portal)

****END of Tender Document****