

Tender No.: BHU/P&E/10/2024-25/29 DATED 08.10.2024



STATE BANK OF INDIA  
LOCAL HEAD OFFICE,  
III/1, Pt. J. N. MARG  
BHUBANESWAR

TENDER NO. BHU/P&E/10/2024-25/29  
DATE: 08.10.2024

Part – I (Technical Bid)

**NOTICE INVITING e-TENDER**

**TENDER DOCUMENT FOR REVAMPING/REMODELING OF HVAC  
PLANT OF LHO BUILDING AT BHUBANESWAR, ODISHA**

Name of the Tenderer : \_\_\_\_\_

Address : \_\_\_\_\_

**Date & Time of Opening of Tender: 22.10.2024 at 4:00 pm.**

**M/s Architect Narayan &  
Associates Pvt. Ltd. (ANAPL)**

304 3<sup>rd</sup> Floor, Antariksh building, Makhawana Road,  
Marol Andheri East, Mumbai-400059  
9321211705/9892216644

**Eligibility Criteria:** ENLISTED HVAC vendors found eligible vide our previous tender no. **BHU/P&E/08/2024-25/17 dated 23.08.2024** Vendor/Contractor should possess valid digital signature for this e-tender.

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**Notice Inviting Tender (e-NIT)**

**WORK: Revamping/ Remodeling of HVAC System of LHO Building at Bhubaneswar, Odisha**

Tender reference No: **BHU/P&E/10/2024-24/29**

SBI, LHO invites two bid percentage based e-Tenders from eligible enlisted HVAC contractors vide our previous tender no. **BHU/P&E/08/2024-25/17 dated 23.08.2024** for 'Pre-qualification of Contractors/Vendors/Agencies/OEMs for Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha' The other details of the tender are as under:

1.	<b>Name of Work</b>	Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha
2	<b>Eligibility criteria</b>	Contractors found eligible vide our previous Pre-qualification tender no. <b><u>BHU/P&amp;E/08/2024-25/17 dated 23.08.2024</u></b>
3	<b>Estimated cost put to tender</b>	Rs.1,98,42,240.00 (One Crores Ninety Eight lakhs Forty Two Thousand Two Hundred Forty Only) excluding GST. excluding Buy-Back
4	<b>Time of Completion</b>	<b>8 (Eight) Calendar Months</b> from the date of handover of site to the Contractor.
5	<b>Earnest Money Deposit (EMD)</b>	<b>Rs.1,98,500.00</b> (Rupees One Lakhs Ninety Eight Thousand Five Hundred Only) in the form of Demand Draft/Banker's Cheque issued by any Nationalised /Scheduled Bank Drawn in favour of " <b>State Bank of India.</b> " Payable at <b>Bhubaneswar</b> ". The EMD shall be submitted to SBI, LHO, III/1, Pt. J. N. Marg, Bhubaneswar, in a separate envelope super scribing "EMD."  <u>Vendors having NSIC/ MSME certificates, registered under that specific category are exempted to submit the EMD. Scan copy of Registration Certificate shall be submitted. However, no exemption shall be entertained towards Initial security deposit (ISD) as per T&amp;C of the contract.</u>
6	<b>Security Deposit</b>	<b>5% of the final bill value.</b>
7	<b>Availability of Tender document.</b>	<b>Contractor should download Tender documents from e-tendering portal from 08.10.2024 up to 3:00 PM on 22.10.2024</b> from e-Tender portal <a href="https://etender.sbi">https://etender.sbi</a> or Bank's website <a href="http://www.sbi.co.in">www.sbi.co.in</a> <link>SBI in the News>Show More>Procurement. But the bidder need to <b>submit digitally signed copy on-line only in the e-tendering portal only.</b>
8	<b>Pre-bid Meeting</b>	Online pre-bid meeting At 11:00 AM on <b>17.10.2024</b> at 2 <sup>nd</sup> Floor, Premises & Estate Deptt., LHO , Bhubaneswar

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9	<p><b>Last date, time, and place for submission of Online Technical Bid.</b></p>	<p>The eligible agencies/ companies are required to submit the scan copies of following documents on-line on service provider portal i.e <a href="https://etender.sbi">https://etender.sbi</a>, on or before</p> <p>Dt. 22.10.2024 up to 03:00 PM.:</p> <ul style="list-style-type: none"> <li>i) Earnest Money Deposit (EMD).</li> <li>ii) Process Compliance form (Annexure-I) in company letterhead duly signed and stamped by authorized representative.</li> <li>iii) Letter of Undertaking in company letterhead duly signed and stamped by authorized representative.</li> </ul> <p><u>The scan copy of the EMD and technical bid digitally signed are to be submitted online on or before <b>22.10.2024 up to 03:00 PM.</b> However, the aforesaid documents (original) need to be submitted physically at the aforesaid address on or before due date.</u></p> <p><u>The SBI shall not entertain EMD received late due to any delay on account of delivery by the courier agency/speed post or any other mode for the reasons whatsoever. Tenders received without any one or more documents mentioned above shall be rejected.</u></p> <p>The technical bid and price bid shall be submitted online only. Price bid of technically qualified vendors will be opened online.</p>
10	<p><b>Last date, time and Mode of submission of <u>Online Price Bid</u></b></p>	<p>The Price Bids is to be submitted <b>by enlisted vendors</b> online on the service provider portal i.e <a href="https://etender.sbi">https://etender.sbi</a> on or before <b>the 3:00 PM of 22.10.2024 as notified in the e-tendering portal. Enlisted vendors shall also be informed by mail for participating in the e-tendering process.</b></p> <p>The bidder (Company/Authorized person) should have a valid digital signature for this e-tender. E-tendering guidelines may be obtained from:</p> <p>Service provider:  <b>Sujith Nair   Dy. Manager – Client Service  e-Procurement Technologies Limited</b>  Address: B-704, Wall Street – II, Opp. Orient Club, Ellisbridge, Ahmedabad – 380006, Gujarat, India  Contact: <a href="mailto:sujith@eptl.in">sujith@eptl.in</a>   Phone: <b>9904407199</b>  <b>Mubassera@eptl.in</b>   Phone: <b>7859800621</b></p>

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		Office Hours: (Monday – Friday: 10:00 AM – 7:00 PM (IST), Saturday: 10:00 AM – 6:00 PM (IST)) (Exclusion: Sunday, Holidays and 2 <sup>nd</sup> & 4 <sup>th</sup> Saturday)
11	<b>Date, Time, and Place of opening of online Technical Bid.</b>	<b>Technical bid (Part-I): After 4.00 PM on 22.10.2024</b> at the Office of AGM(P&E), 2 <sup>nd</sup> Floor, LHO building, Kharvelnagar, Bhubaneswar. <a href="#">Click here</a> to participate in the bid opening process, through MS Teams application.
12	<b>Date, Time, and Place of the opening of Online Price Bid.</b>	<b>Price bid (Part-II): After 4.30 PM on 22.10.2024</b> , at the Office of AGM(P&E), 2 <sup>nd</sup> Floor, LHO building, Kharvelnagar, Bhubaneswar
13	<b>Defect Liability Period</b>	1 year from the date of issue of virtual completion certificate
14	<b>Validity of Offer</b>	90 days from the date of opening of the Price-Bid
15	<b>Commencement of work.</b>	As advised in the Work Order.
16	<b>Liquidated Damages (LD)</b>	LD shall be imposed at the rate 0.5 % Per week for delay subject to maximum amount of 5% of the accepted Contract/ final work Value.
17	<b>Terms and Mode of payment</b>	<p>i) No advance/mobilization payment will be entertained. However, advance against material at site may be entertained, subject to satisfaction of the Bank.</p> <p>ii) The interim/running payment of Rs.40.00 Lakhs will be entertained subject to successful execution of works.</p> <p>iii) After successful completion of entire work balance or 100% payment will be released against submission of tax invoice and work completion certificates.</p> <p>iv) Payment shall be made by way of Electronic fund transfer and the bill will be paid by the SBI. Firm should furnish details of the bank, A/c no, IFSC code.</p> <p>v) Any Tax invoice raised to the Bank, should bear the GST Number <b>21AAACS8577K1Z1</b> of State Bank of India for Bhubaneswar LHO.</p>

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18	<b>Contact Person for sending any kind of correspondence regarding this tender</b>	For any Technical queries: Architect's side: Project Architect: 9321211705/9892216644 Email: <a href="mailto:tasleem@architectnarayan.com">tasleem@architectnarayan.com</a> / <a href="mailto:rln@architectnarayan.com">rln@architectnarayan.com</a>  Bank's side Sri Sujoy Roy, AGM (Civil)-9674710327, Sri Tapan Kumar Behera, Manager (Elect.) -9867991919 Sri B V Pratap Dy. Manager (Elect)-9937337964 P & E Dept., SBI, LHO, Bhubaneswar, Email: <a href="mailto:agmpre.lhobhu@sbi.co.in">agmpre.lhobhu@sbi.co.in</a>
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- In case the date of opening of tenders is declared as a holiday, the tenders will be opened on the next working day at the same time. The bidder, who is the authorized representative and participating on behalf of the company/ Dealer/vendor, should have a valid digital signature certificate (DSC) for this e-tender or in firm's name.
- SBI reserves the right to increase or decrease the quantum of services, and manpower to be provided and also reserves the right to reject, cancel or revise or accept any or all the tenders or part of tenders without giving any reasons thereto.
- SBI reserves its rights to accept/reject any/all tender without assigning any reasons whatsoever and to increase or decrease the quantities of any item and the contractor has to execute the same at the rate quoted and no correspondence shall be entertained in this regard. The successful bidder shall sign and stamp each page of the tender document thereby ensuring the number and sequence of all pages after the completion of the tendering procedures. Conditional tenders are liable for rejection.

**(ANAPL)**

**(For and behalf of Assistant General Manager)  
SBI, LHO, Bhubaneswar**

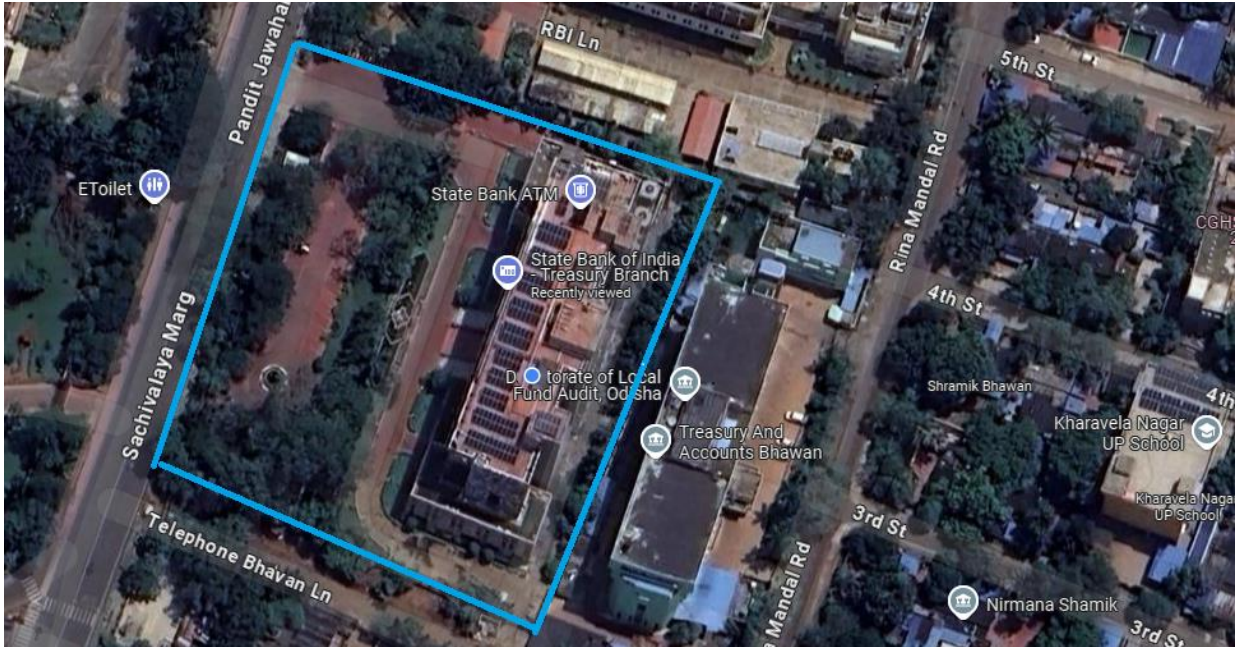
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## **INSTRUCTIONS TO THE TENDERERS**

### **1.0 Scope of Work**

Online tenders are invited by M/s. Architect Narayan & Associates Pvt. Ltd, project architect for and behalf of State Bank of India for the work of **Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha.**

### **1.1 Site and Its Location**



Local Head Office, State Bank of India, Pt. J. N Marg, Bhubaneswar-751001, Odisha. The building consists of 2 basements and ground floor plus 6 floors i.e (B1+B2+G+6) storied building, having approximate built up area of 1,60,873 Sqft (Each floor appx 15,000 sqft). The adjacent buildings to this existing SBI LHO building at Bhubaneswar are RBI office building in the right and BSNL Office building in the left side.

### **1.2 Brief Description of the work:**

- a) Replacement of GI duct of HVAC system (2<sup>nd</sup> to 5<sup>th</sup> floor) and allied works.
- b) Replacement of 6 AHUs with Starter Panel.
- c) Replacement of 6 AHU Starter Panel.
- d) Provision of Ventilation system at Washrooms, Battery Room, AC Plant Room, Both Basements.
- e) Provision of pressurization of lift well, staircase & lift lobby, Battery Room.
- f) Replacement of Chilled and Condenser Pipelines.
- g) Replacement of Dampers, valves, Grills, Insulations, Air-vent, Pressure gauge, Strainer etc.
- h) Replacement of cooling towers base structure.

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- i) Demolition works comprises such removal of existing AHUs & Starter Panel, HVAC duct, chilled water line, cooling tower base, condenser & Chilled pipeline, other accessories such as dampers, valves, Grills, Insulations, Air-vent, Pressure gauge, Strainer etc. etc. including shifting the all these items to outside building and store at a place identified by the Bank or directly handover to Composite contractor (for buy-back) as per the direction of the Bank/Architect.
- j) Supply and laying of power and control cables and necessary Electrical connections to AHUs, Starter and Control connections from Centralized control desk of all floors.
- k) Design & Drawing of the floor AC duct to maintain the required CFM in Cabins, Hall etc. all necessary test including Air-Balancing, Leakage test etc.

### **1.2.1 Co-ordinations among Vendors:**

- a) The existing HAVC (Centralized HVAC Chiller Plant having capacity 2 X 250 TR) of LHO building is under AMC with the OEM. The vendor should note as in this particular revamping work's, which has to be carried out in phases in co-ordination with floor interior works (2<sup>nd</sup> to 5<sup>th</sup> Floor) and outside works. In this connection Bank intend to engage a composite contractor to carryout interior, Civil, Electrical, LAN, Fire-Fighting etc. Accordingly, the specialized HVAC vendor has to execute this particular revamping work along with composite interior Vendor and existing HVAC AMC OEM. It is responsibility of HVAC contractor to maintain coordination with other contractors (Interior, Electrical, AC AMC etc.) to whom works will be entrusted, as time is the essence of this project. Hence, it is the responsibility of all the stakeholders to maintain co-ordination among themselves to enable them to adhere to the timeline.
- b) Presently all floors of LHO building is functional with all furniture, fixtures, electrical connections, HVAC, connectivity & washrooms etc. However, now Bank intend to undertake refurbishing works in four floors (2<sup>nd</sup> to 5<sup>th</sup>) only. Two or one floor out of four no. of floors shall be handed over to Vendor in phased manner to execute the total works. However, all other floors such as basement, Ground, 1<sup>st</sup> & 6<sup>th</sup> floor will be functioning during the renovation of remaining floors. Therefore, co-ordination and co-operation needs to be maintained among all the trades/disciplines such as HVAC, Electrical, Interior, civil & firefighting works, so that day today functioning of Bank at these floors shall be not hampered and without causing inconvenience to the Staffs

## **2.0 Tender Documents**

- 2.1 The work has to be carried out strictly according to the conditions stipulated in tender consisting the following documents and the most workman like manner,
- Instructions to tenderers
  - General Conditions of Contract
  - Special Conditions of Contract
  - Additional Conditions for Electrical Installation
  - Additional conditions for firefighting Systems
  - Technical Specifications
  - Drawings



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### ➤ Priced Bid

2.2 The above documents shall be taken as complementary and mutually explanatory of one another but in case of ambiguities or discrepancies, shall take precedence in the order given below:

- Price Bid
- Technical Specifications
- Additional Conditions for Electrical Installation
- Special Conditions of Contract
- General Conditions of Contract
- Instructions to Tenderers

2.3 Complete set of tender documents including relative drawings can be downloaded from the Bank's website, for the drawings, if required may be obtained in from the Architects Office at 304, 3<sup>rd</sup> Floor, Antariksh building, Makhawana Road, Marol, Andheri (E ), Mumbai-400059 between 10.00 to 15.00 hrs or through email on any day except holidays during the period mentioned in the NIT.

2.4 The tender documents are not transferable.

### 3.0 **Site Visit**

3.1 The tenderer must obtain himself on his own responsibility and his own expenses all information and data which may be required for the purpose of filling this tender document and enter into a contract for the satisfactory performance of the work. The Tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character quality and quantity of the materials, labour, the law & order situation, climatic conditions local authorities requirement, traffic regulations etc. The tenderer will be fully responsible for considering the financial effect of any or all the factors while submitting his/her tender.

### 4.0 **Earnest Money**

The tenderers are requested to submit the Earnest Money of aforesaid amount in the form of Demand Draft or Banker's Cheque in favour of State Bank of India drawn on any Bank India.

4.1 EMD in any other form other than as specified above will not be accepted. Tender not accompanied by the EMD in accordance with clause 4.1 above shall be rejected.

4.2 No interest will be paid on the EMD.

4.3 EMD of unsuccessful tenderers will be refunded within 30 days of award of Contract.

4.4 EMD of successful tenderer will be retained as a part of security deposit.

### 5.0 **Initial Security Deposit**

Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha.

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The successful tenderer will have to submit a sum equivalent to 2% of contract value less EMD by means of D/D drawn in favour of State Bank of India within a period of 15 days of acceptance of tender.

### **6.0 Total Security Deposit**

6.1 Total security deposit shall be 5% of contract value. Out of this 2% of contract value is in the form of initial security deposit which includes the EMD. Balance 3% shall be deducted from the running account bill of the work at the rate of 10% of the respective running account bill i.e. deduction from each running bill account will be 10% till total 3% of contract value is reached. 50% of the total security shall be paid to the contractors on the basis of architect's certifying the virtual completion. The balance 50% would be paid to the contractors after the defects liability period as specified in the contract.

6.2 No interest shall be paid to the amount retained by the Bank as Security Deposit.

6.3 **Additional Security Deposit (ASD):-** Additional Security deposit (ASD)/Additional performance Guarantee (APG) shall be applicable if the bid price is below 7.5 % of the estimated cost put to tender. The amount of such ASD/ APG shall be the difference between 92.5 % of estimated cost put to tender and the quoted price.

### **7.0 Signing of Contract Documents**

The successful tenderer shall be bound to implement the contract by signing an agreement and conditions of contract attached herewith within 15 days from the receipt of intimation of acceptance of his tender by the Bank. However, the written acceptance of the tender by the Bank will constitute a binding agreement between the Bank and successful tenderer whether such formal agreement is subsequently entered into or not.

### **8.0 Completion Period:**

The time period allowed for completion of the project shall be **Eight (8) months** from the date of commencement of work or 15 days from the date of issuance of work order, whichever is earlier.

### **9.0 Validity of Tender**

Tenders shall remain valid and open for acceptance for a period of 3 (Three) months from the date of opening price bid. If the tenderer withdraws his/her offer during the validity period or makes modifications in his/her original offer which are not acceptance to the Bank without prejudice to any other right or remedy the Bank shall be at liberty to forfeit the EMD.

### **10.0 Liquidated Damages**

The liquidated damages shall be 0.5% per week subject to a maximum of 5% of contract value.

### **11.0 Rates and Prices : Percentage rate based tender**

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11.1 The bidders should submit their price bid in the online tendering portal within the stipulated timeline, failing which tender shall be summarily rejected. As the case is of Percentage Rate Tender, contractor has to quote rate in percentage below/above against Bank's total estimated cost (in figures as well as in words) given in Schedule of Quantities, to execute the work.

**(a) The tender submitted shall be treated as invalid if:**

1. The contractor does not quote percentage above/ below on the total amount of tender or any section/ sub head of the tender.
2. The percentage above/below is not quoted in figures & words both on the total amount of tender or any section/ sub head of the tender.
3. The percentage quoted above/below is different in figures & words on the total amount of tender or any section/ sub head of the tender.
4. Tenderers, whoever propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional rebates, will be summarily rejected.

(b) The intending bidders shall be asked to quote their offers in terms of "specific Percentage numerical value" (only up to two decimal places) above (+) / below (-) / at par (=) with the total Estimated Cost published for the project.

(c) After taking into account the Percentage Rebate/ Addition Offered by all the bidders on the Estimate Cost, "Net Tender Value" of each bidder shall be evaluated (Mostly by the online system itself) and the bidder offering Lowest Tender Amount for projects pertaining to Procurement Purchase Contract and Highest Tender Amount for Sales Contracts shall be declared as "Successful Bidder".

(d). The "Percentage Offer" shall be uniformly applicable to each and every item including all sections/ sub sections/sub heads of the Tender.

(e). In case, the Lowest Tendered Amount (i.e. Estimated cost +/- Percentage Bid quoted) of two or more contractors is same, such lowest contractors will again be asked to submit sealed /online "Revised +/- Percentage (%)" offers" on the original Estimated cost of tender including all sub sections/sub heads excluding fixed rate items as the case may be, but the revised percentage quoted shall, in no case, be higher than the percentage quoted during their initial offer for the project. The lowest tender shall be decided on the basis of revised offers.

(f). The process of online re-bidding amongst two or more contractors offering same percentage rates tendering process shall continue till L-1 bidder is discovered, which may be conducted in same or next working day. However, revised offer cannot be more than initial/previous offer.

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(g). In case, any of such contractor(s) (quoted same tender amount during initial bidding or subsequent re-bidding) refuses to submit revised offer, it shall be treated as "**withdrawal of tender**" by the Contractor before acceptance and the EMD of such contractors shall be forfeited.

(h) In case all the lowest contractors who have quoted same tendered amount, refuse to participate in online revised bidding process for the project, the EMD of all such Contractors shall be forfeited and the tenders for the project shall be invited afresh.

(i). The Contractor(s), whose earnest money is forfeited because of non-submission of revised offer, shall not be allowed to participate in the re-tendering process for the said project.

11.1.1 The tenderers need not quote their rates for which no quantities have been given. In case the tenderers quote their rates for such items those rates will be ignored and will not be considered during execution.

11.1.2 The tenderers should not change the units as specified in the tender. If any unit is changed the tenders would be evaluated as per the original unit and the contractor would be paid accordingly.

The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he/she should immediately bring to the knowledge of the Architect/ Bank.

11.1.3 The rate quoted shall be firm and shall include all costs, allowances, transportation, loading, unloading, labour, erection, crane, hydra, taxes, cess, royalties, levies, excluding GST etc.

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### **E-TENDERING INSTRUCTIONS TO BIDDERS**

#### **General:**

State Bank of India hereby publishes the TENDER on the e-tendering Portal (Website) <https://etender.sbi> in Electronic mode hereinafter referred as “e Tendering” and TENDER will be hereunder called “e-Tender”. The e-tender published online through the above portal (website) consists standard tender conditions, specifications, schedule of quantities, drawings (if any) for above referred work. Please note that copy of the above e-tender can be downloaded from above portal (website) and should be mandatorily submitted in online Electronic Mode hereinafter referred as “Online Offer”. The submission of the online offer duly Encrypted & Digitally signed on above portal should be in prescribed Electronic Forms (Online) available on above portal for respective tender in Online Envelope(s) on or before as per the key Dates mentioned in the Tender Notice in this document and online portal for above tender.

#### **Instructions:**

##### **1. Tender Bidding Methodology:**

Electronically Sealed Bid System – Two - Stage – Technical Bid and Price Bid, in percentage rate tendering process on price bid. Firstly, a technical bid will be opened and after technical evaluation, suitable agencies will be shortlisted. The Price bid (Financial bid) will be opened to only those agencies who qualify in the technical bid.

##### **2. Broad outline of activities from Bidders prospective:**

- 1.0 Procure a Digital Signing Certificate (DSC)
- 2.0 Register on the e-Procurement portal <https://etender.sbi>
- 3.0 (The contractors need to upload scan copy of their valid empanelment letter in the portal otherwise their registration would be cancelled)
- 4.0 Create Users and assign roles on the above portal
- 5.0 View Notice Inviting Tender (NIT) on the above portal
- 6.0 Download Official Copy of Tender Documents from the above portal
- 7.0 Clarification to Tender Documents on the above portal
- 8.0 Bid-Submission on the above portal
- 9.0 Attend Public/Limited Online Tender Opening Event (TOE) on the above portal-Opening of Technical-Part
- 10.0 Post-TOE Clarification on the above portal (Optional) – Respond to SBI's Post-TOE queries
- 11.0 Attend Public/Limited Online Tender Opening Event (TOE) on the above portal – Opening of Financial-Part (Only for Technical Responsive Bidders)

##### **3. Digital Certificates**

For integrity of data and authenticity/ non-repudiation of electronic records, and to be complaint with IT Act 2021, it is necessary for each user to have a Digital Certificate (DC). also

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referred to as Digital Signature Certificate (DSC), of Class II or above, issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA) [refer <http://www.cca.gov.in>].

### **4. Registration**

To use the Electronic Tender portal <https://etender.sbi> vendors need to register on the portal. Registration of each organization is to be done by one of its senior persons vis-a-vis Authorised Signatory who will be the main person coordinating for the e-tendering activities. In the above portal terminology, this person will be referred to as the Super User (SU) of that organization. For further details, please visit the website/portal, and follow further instructions as given on the site.

Note: After successful submission of Registration details please contact to the Helpdesk of the portal to get your registration accepted/activated.

#### **Help Desk:**

**Sujith Nair | Dy. Manager – Client Service  
e-Procurement Technologies Limited**

Address: B-704, Wall Street – II, Opp. Orient Club, Ellisbridge, Ahmedabad – 380006, Gujarat, India

Contact: [sujith@eptl.in](mailto:sujith@eptl.in) | Phone: **9904407199**

[mubassera@eptl.in](mailto:mubassera@eptl.in) | Phone: **7859800621**

Office Hours: (Monday – Friday: 10:00 AM – 7:00 PM (IST), Saturday: 10:00 AM – 6:00 PM (IST))

(Exclusion: Sunday, Holidays and 2<sup>nd</sup> & 4<sup>th</sup> Saturday)

To Know eTender submission Process – Click Here : - **[eTender Submission Guidance Video](#)** . (Note : This is General Process of eTender, It may be Vary As per Tenderer Requirement).

### **5. Bidding related Information for this Tender (Sealed Bid)**

The entire bid-submission would be online on the portal. Broad outline of submissions are as follows:

- Submission of Bid Security/ Earnest Money Deposit (EMD).
- Submission of digitally signed copy of Tender Documents/ Addendum
- Power of Attorney, • Two Envelopes, - Technical-Part, Each of the above electronic envelopes consists of Main bid and Electronic form (both mandatory) and bid Annexure (Optional).

NOTE: Please note that above e-Tendering system is an automatically time locked system which will be locked immediately as soon as due date and time is over and will not accept any offer after that. So, the tenderers are strictly advised to do their process well before the due date and time to avoid any such instances.

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### 6. Tender Opening Event (TOE):

The e-Procurement portal offers a unique facility for 'Public/Limited Online Tender Opening Event (TOE)'. Tender Opening Officers as well as authorized representatives of bidders can attend the Public/Limited Online Tender Opening Event (TOE) from the comfort of their offices. For this purpose, representatives of bidders (i.e. Supplier organization) duly authorized are requested to carry a Laptop and Wireless Connectivity to Internet. Every legal requirement for a transparent and secure 'Public/Limited Online Tender Opening Event (TOE)' has been implemented on the portal. As soon as a Bid is decrypted with the corresponding 'Pass-Phrase' as submitted online by the bidder himself (during the TOE itself), salient points of the Bids are simultaneously made available for downloading by all participating bidders. The tedium of taking notes during a manual 'Tender Opening Event' is therefore replaced with this superior and convenient form of 'Public/Limited Online Tender Opening Event (TOE)'. The portal has a unique facility of 'Online Comparison Chart' which is dynamically updated as each online bid is opened. The format of the chart is based on inputs provided by the Buyer for each Tender. The information in the Comparison Chart is based on the data submitted by the Bidders. A detailed Technical and/ or Financial Comparison Chart enhance Transparency. Detailed instructions are given on relevant screens. The portal has a unique facility of a detailed report titled 'Minutes of Online Tender Opening Event (TOE)' covering all important activities of 'Online Tender Opening Event (TOE)'. This is available to all participating bidders for 'Viewing/ Downloading'. There are many more facilities and features on the portal. For a particular tender, the screens viewed by a Supplier will depend upon the options selected by the concerned Buyer.

**IMPORTANT NOTE:** In case of internet related problem at a bidder's end, especially during 'critical events' such as – a short period before bid-submission deadline, during online public/limited tender opening event, during e-tender, it is the bidder's responsibility to have backup internet connections. In case there is a problem at the e-procurement/ e-tender service-provider's end (in the server, leased line, etc) due to which all the bidders face a problem during critical events, and this is brought to the notice of SBI by the bidders in time, then SBI/SBI will promptly re-schedule the affected event(s).

### 7. Minimum Requirements at Bidders end:

In order to operate on the electronic tender management system, the user's machine is required to be set up. The machine must have running XP service Pack 3 or higher version of Windows like Vista or Window 7. Also need to install Mozilla Fire fox web browser and latest Version of Java.

8. Please follow below steps to open Internet Explorer mode in Microsoft Edge.

- Open Microsoft Edge > click on "settings" > click on Default browser
- Let Internet Explorer open in Microsoft Edge change it from "**Always**" to "**Incompatible sites only (Recommended)**".
- Allow sites to be reloaded in Internet Explorer mode > "**Allow**"
- Internet Explorer mode pages > click on "Add" > Enter a URL: <https://etender.sbi>
- After make changes reopen Microsoft Edge & log in.

**Tender No.: BHU/P&E/10/2024-25/29 DATED 08.10.2024**

**(For and behalf of Assistant General Manager)  
SBI, LHO, Bhubaneswar**

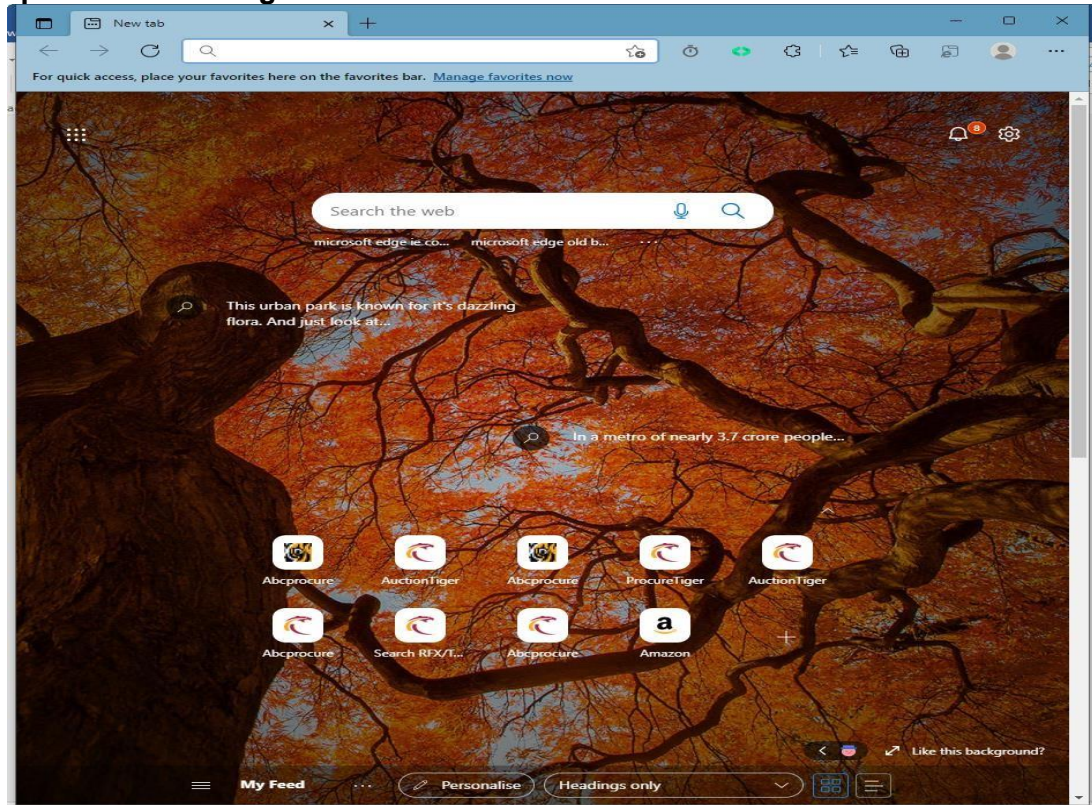
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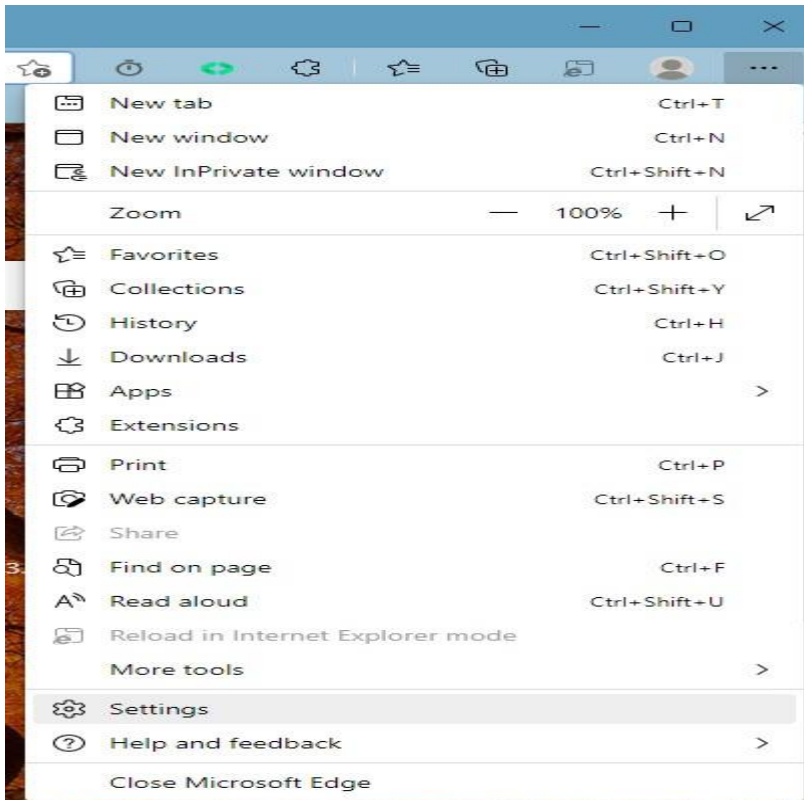
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**Step 1. Open Microsoft Edge browser**



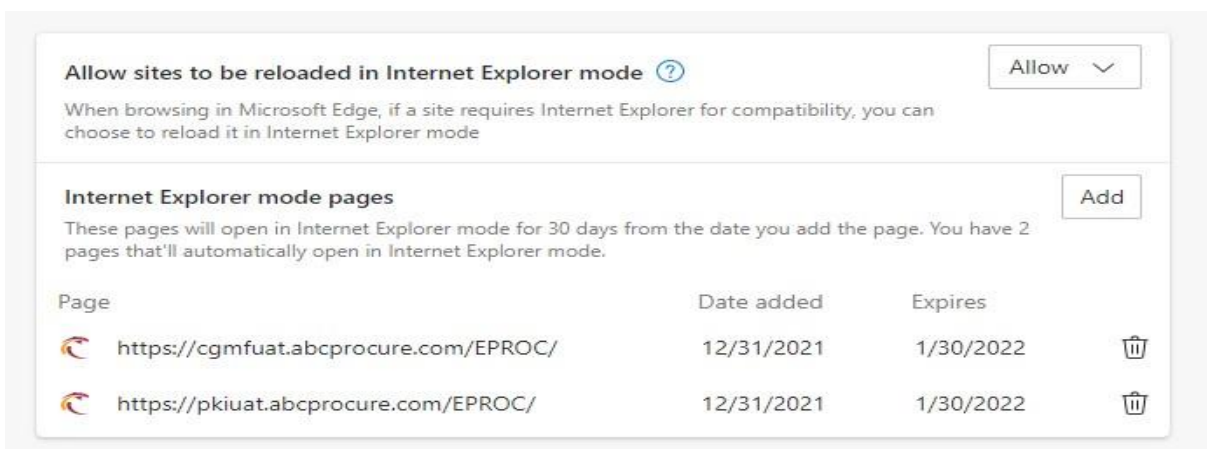
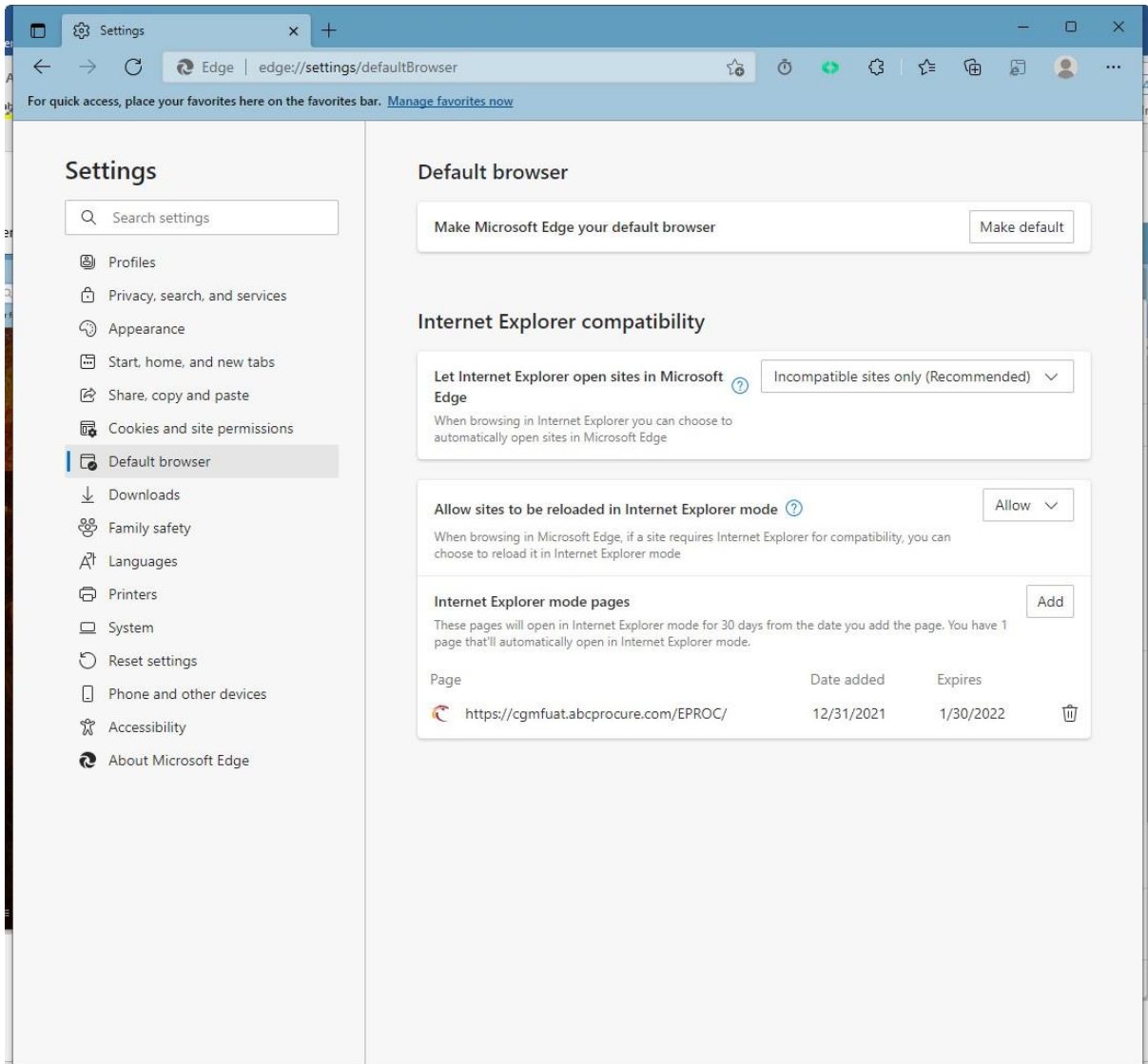
**Step 2. Click on Settings**

**Tender No.: BHU/P&E/10/2024-25/29 DATED 08.10.2024**



**Step.3 Click on 'Default browser'**

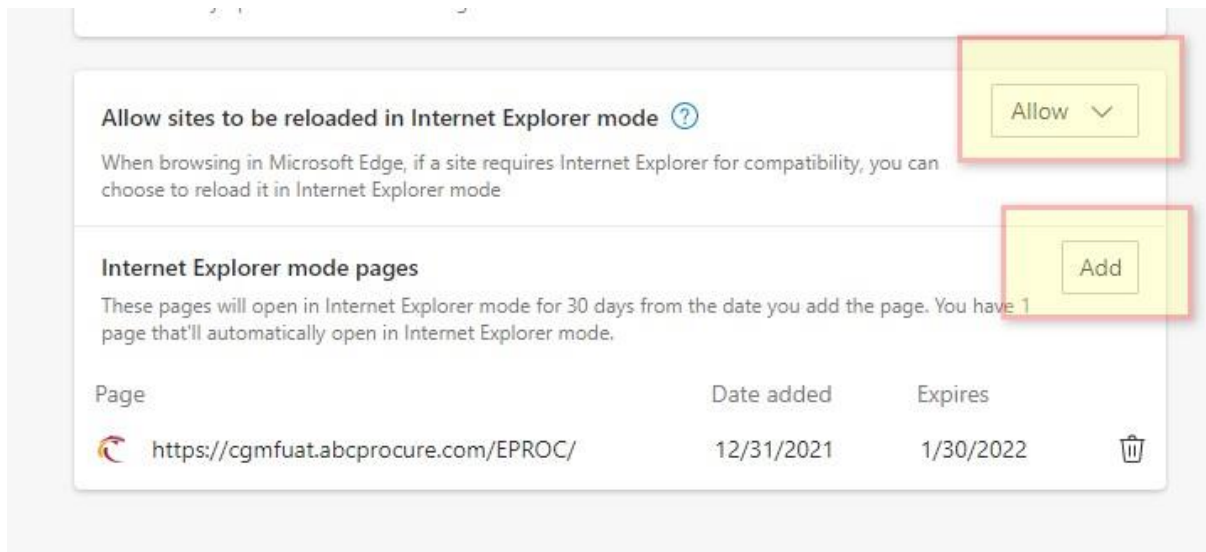
## Tender No.: BHU/P&E/10/2024-25/29 DATED 08.10.2024



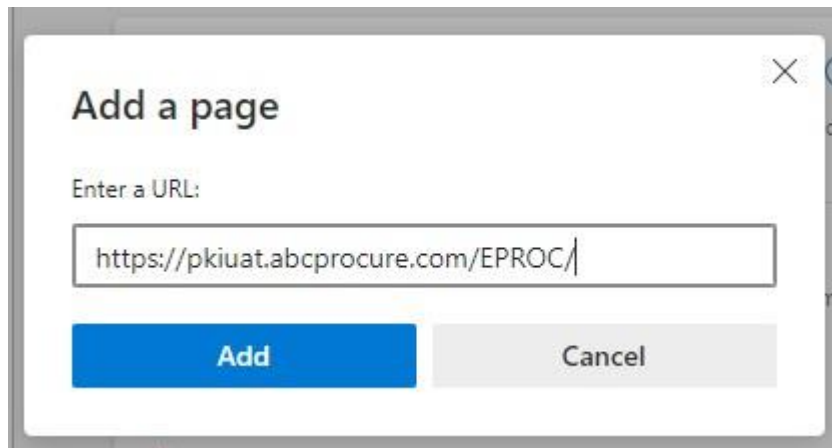
### Step 4. Configure URL in Internet Explorer mode

- Allow sites to be reloaded in Internet Explorer mode = Allow
- Click on Add button

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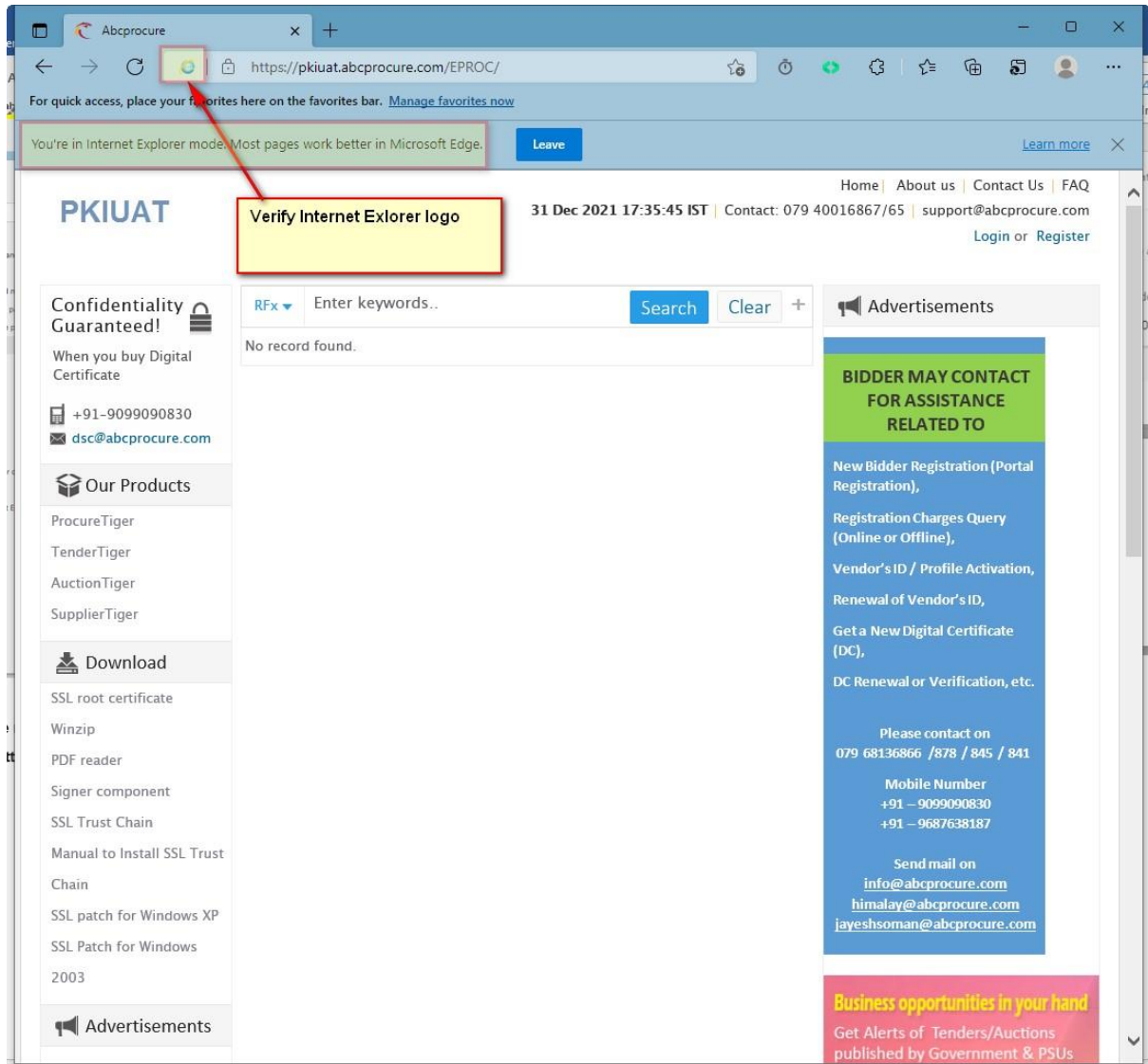
- Add URL



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### Step 5. Restart the browser and open URL.

Verify it is opened in Internet Explorer mode by logo and notification

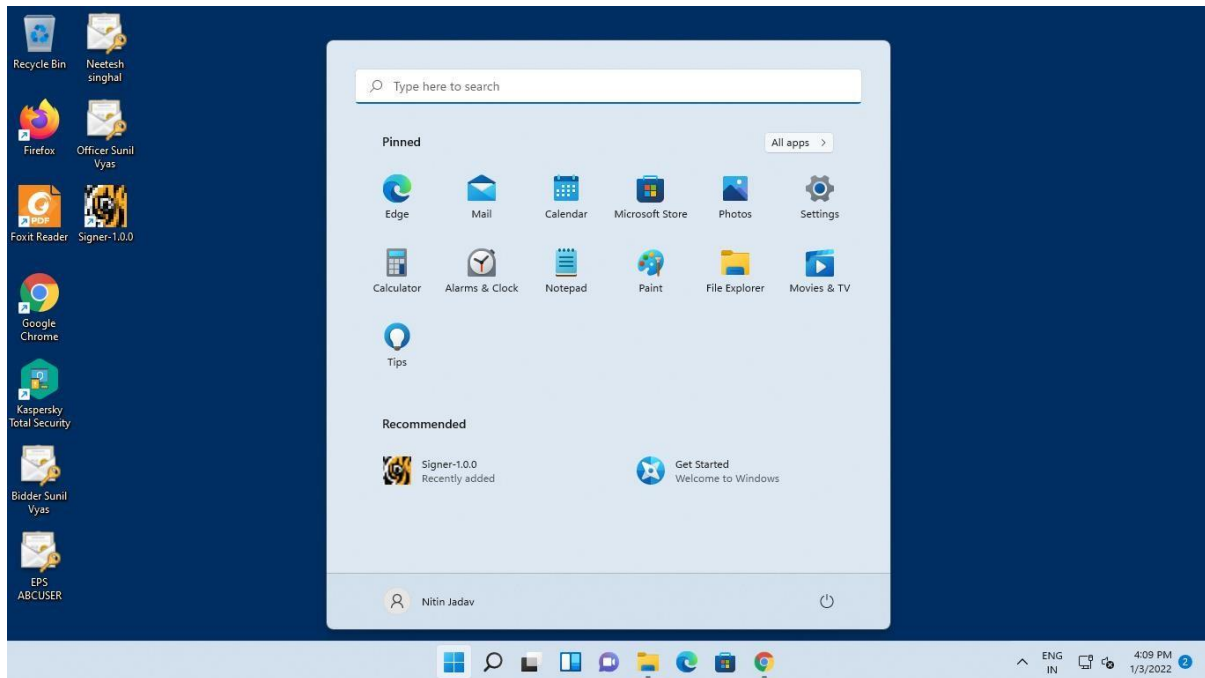




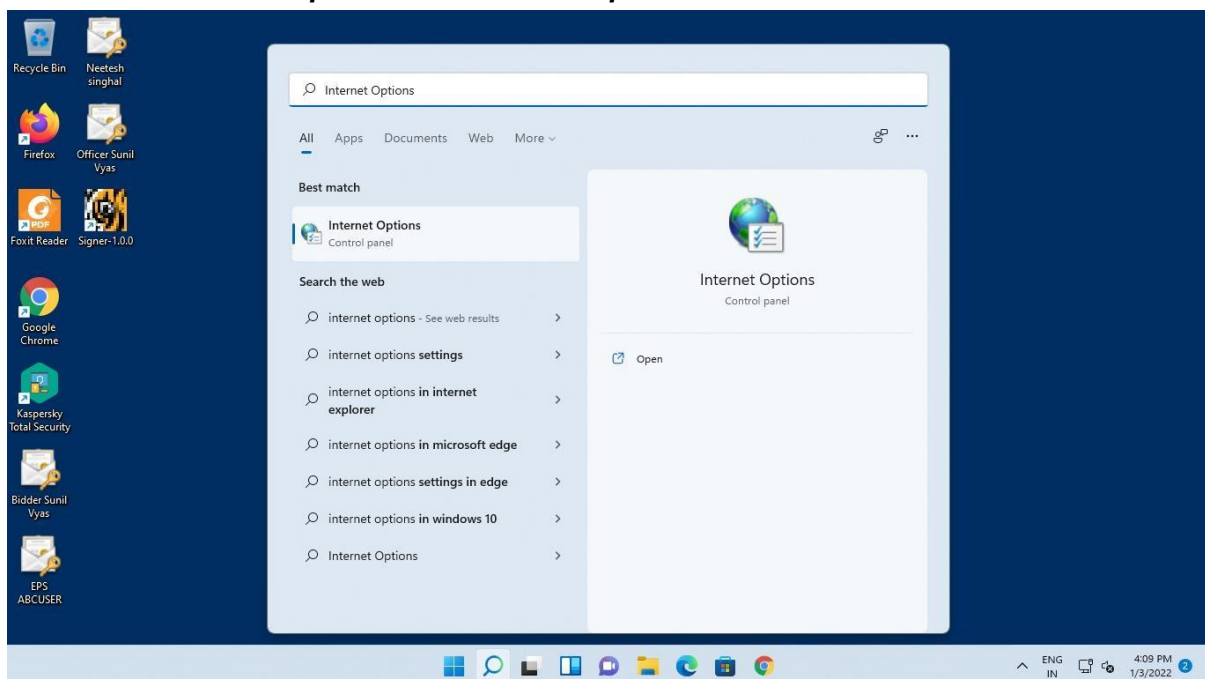
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### Step 6. Configure Internet Option:

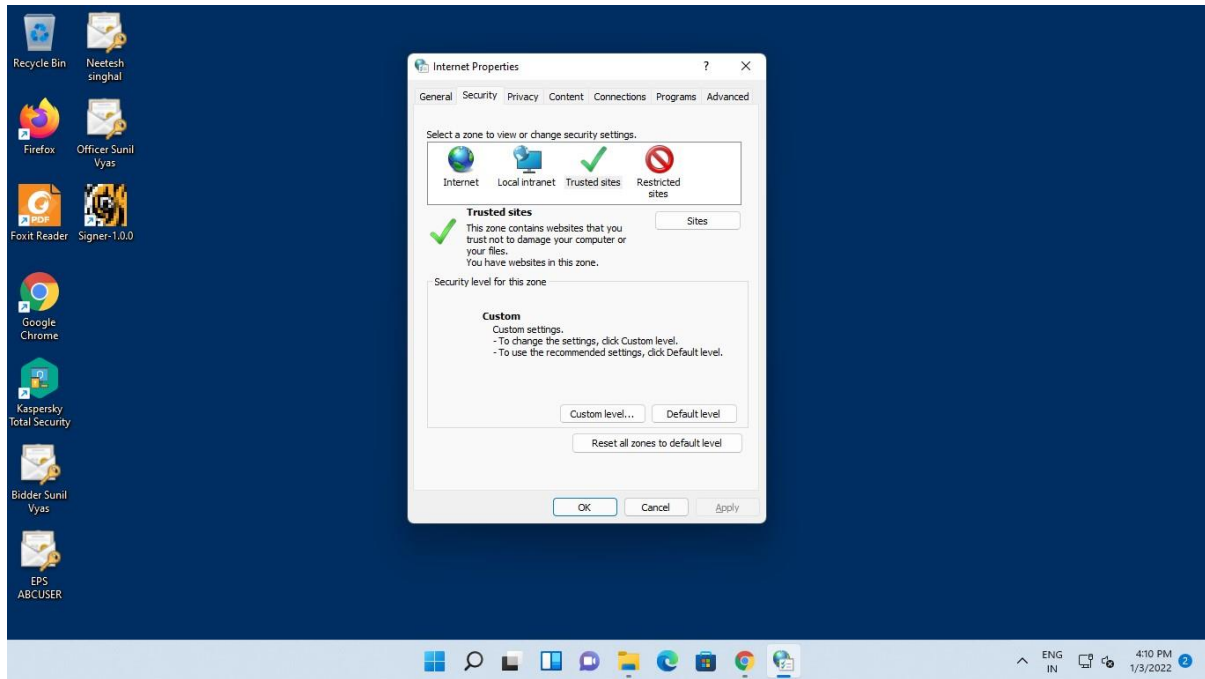
#### 6.1 Click on Windows button / Start Menu



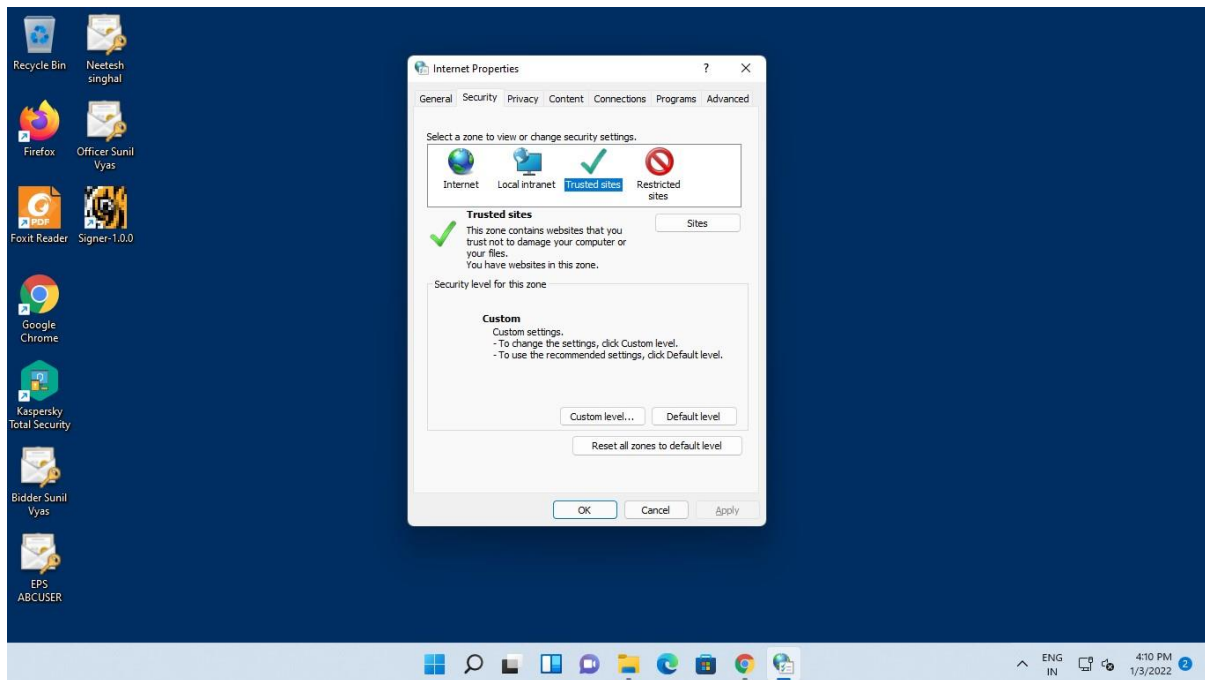
#### 6.2 Search "Internet option" and Click on Open



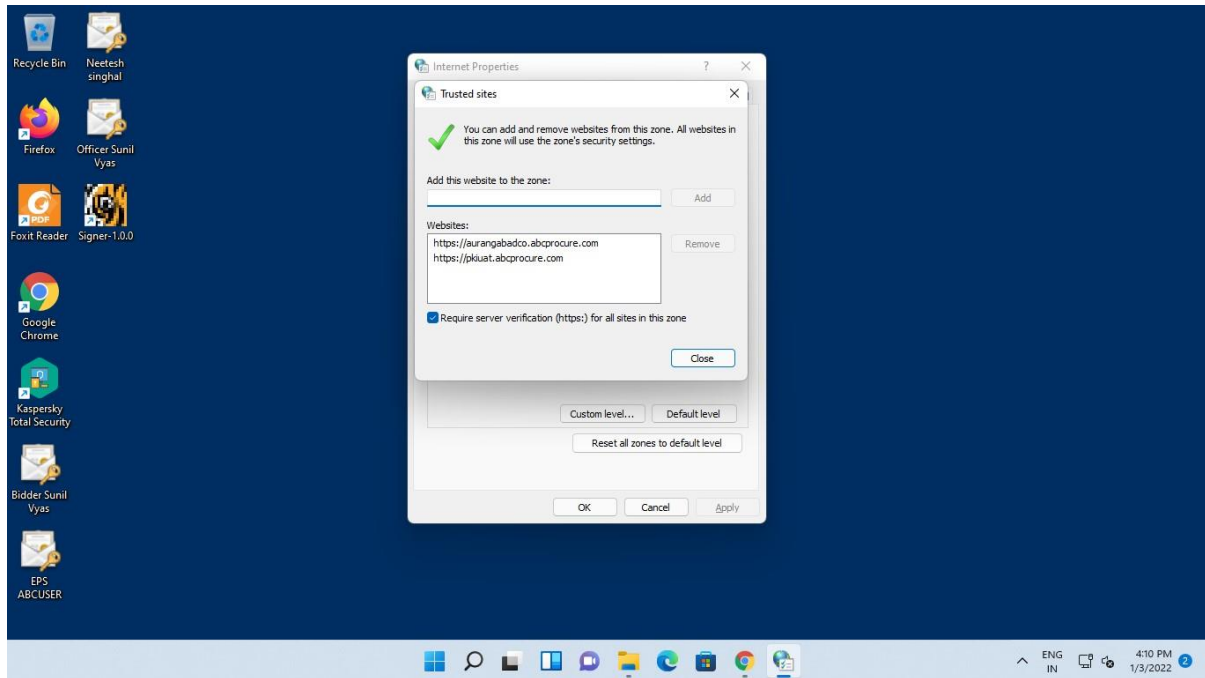
### 6.3 Click on "Security" Tab



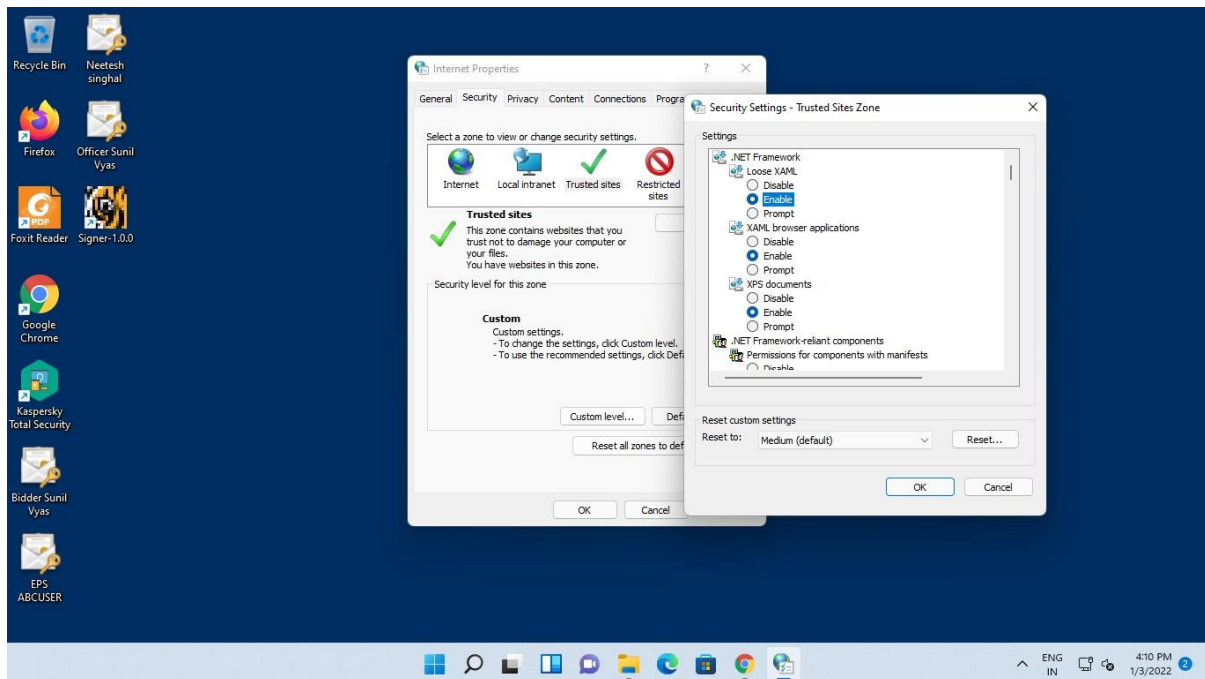
### 6.4 Select "Trusted site" Icon and Click on "Sites" Button



6.5 Click on "Add" button to Enter "Web URL" in Trusted List

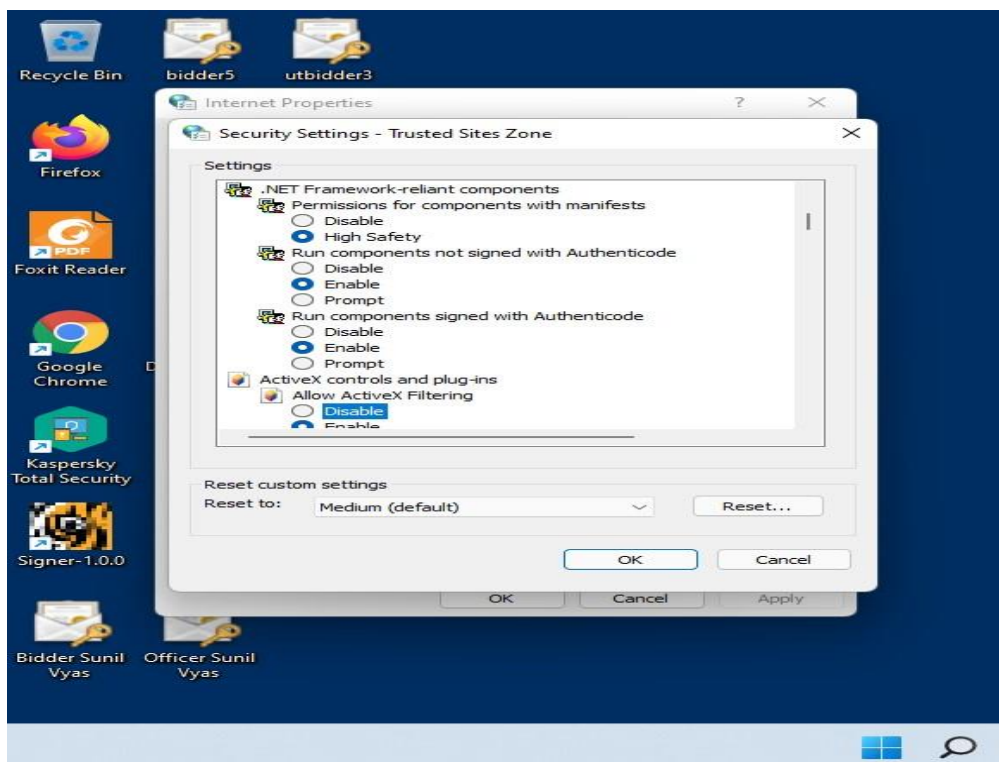
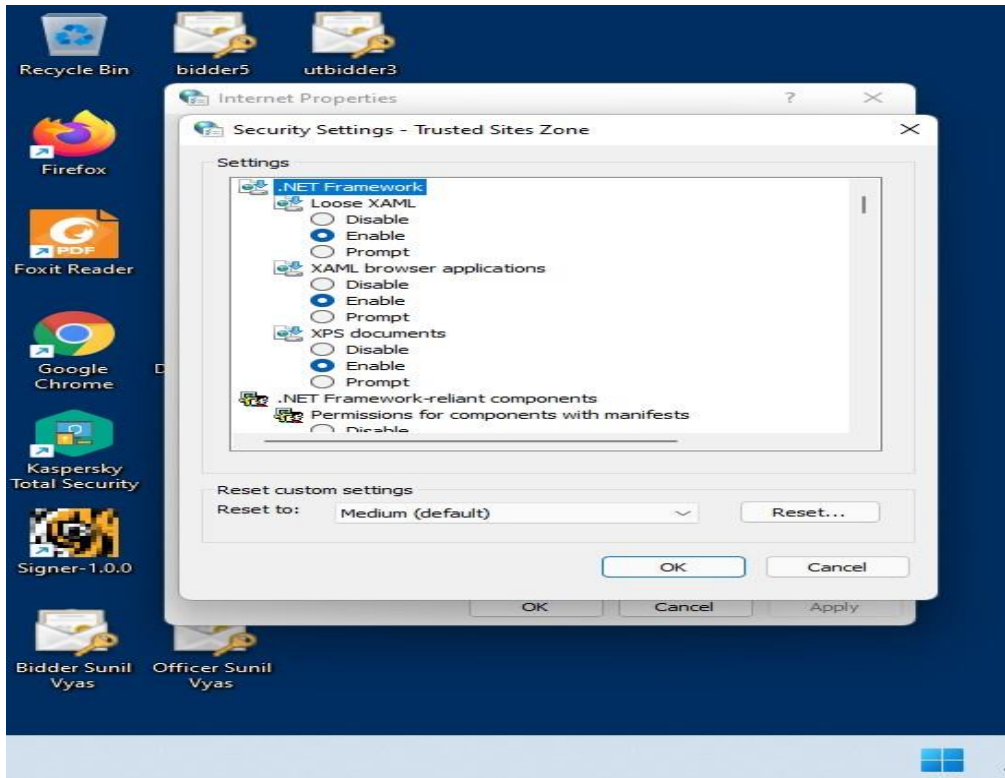


6.6 Click on "Custom Level" Button

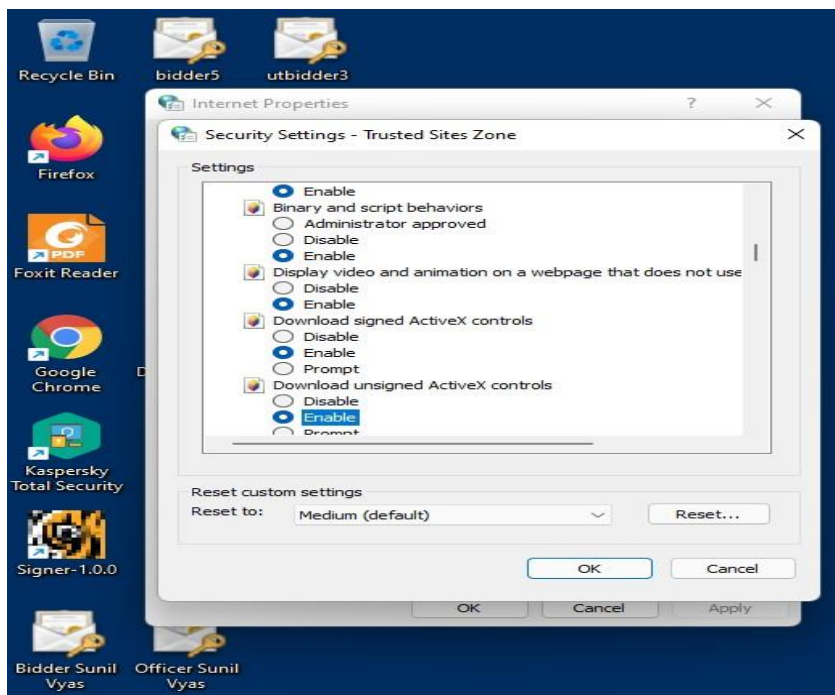
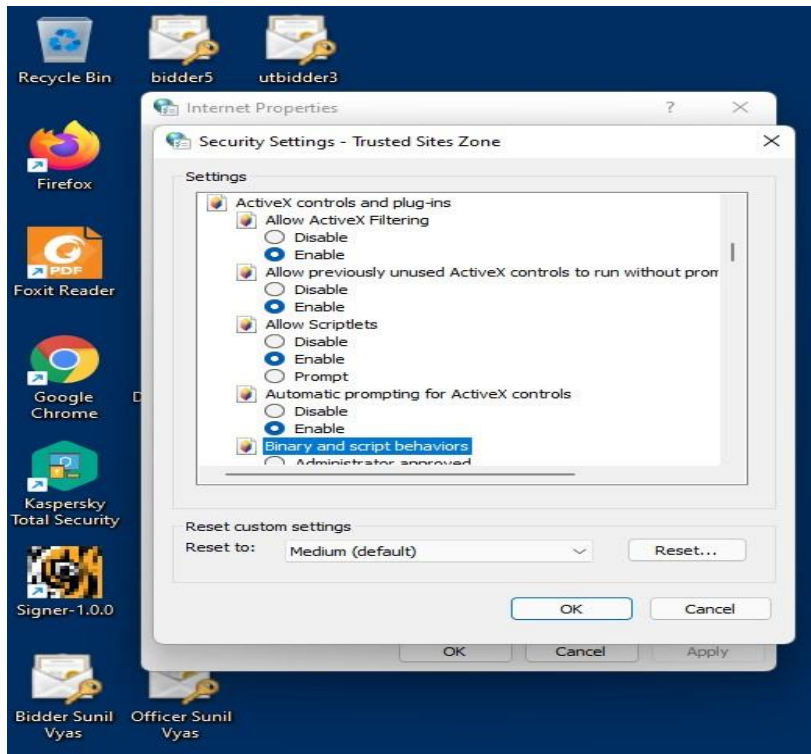


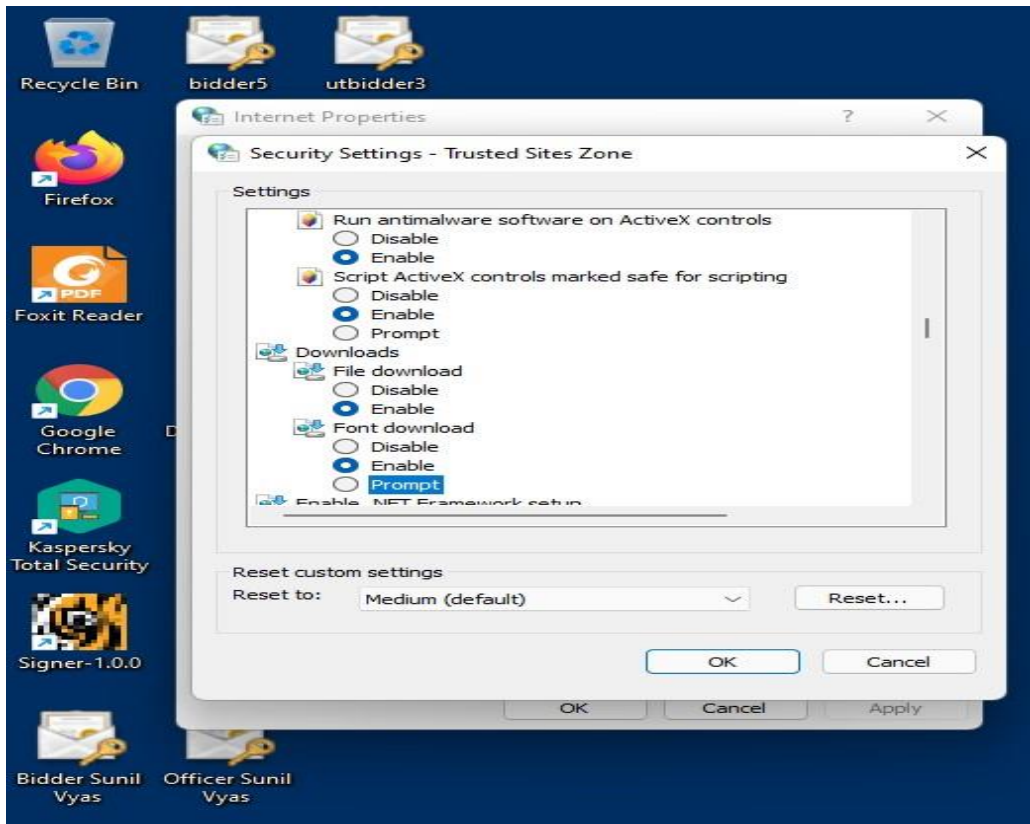
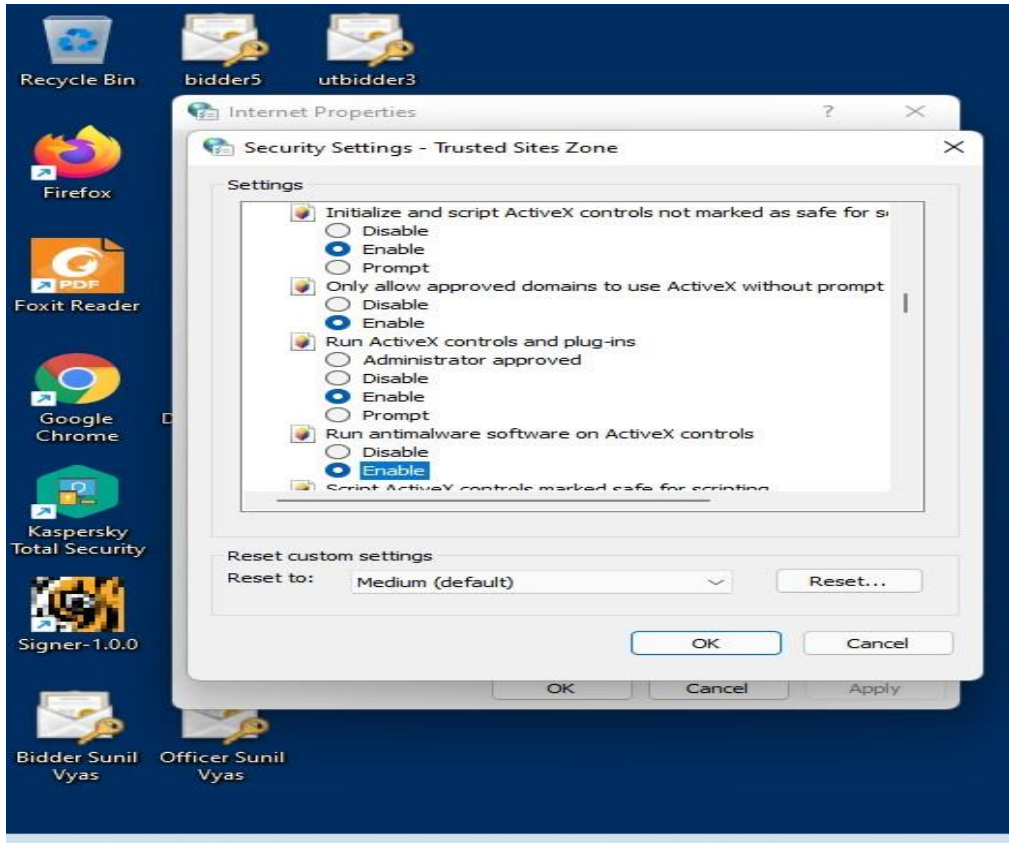


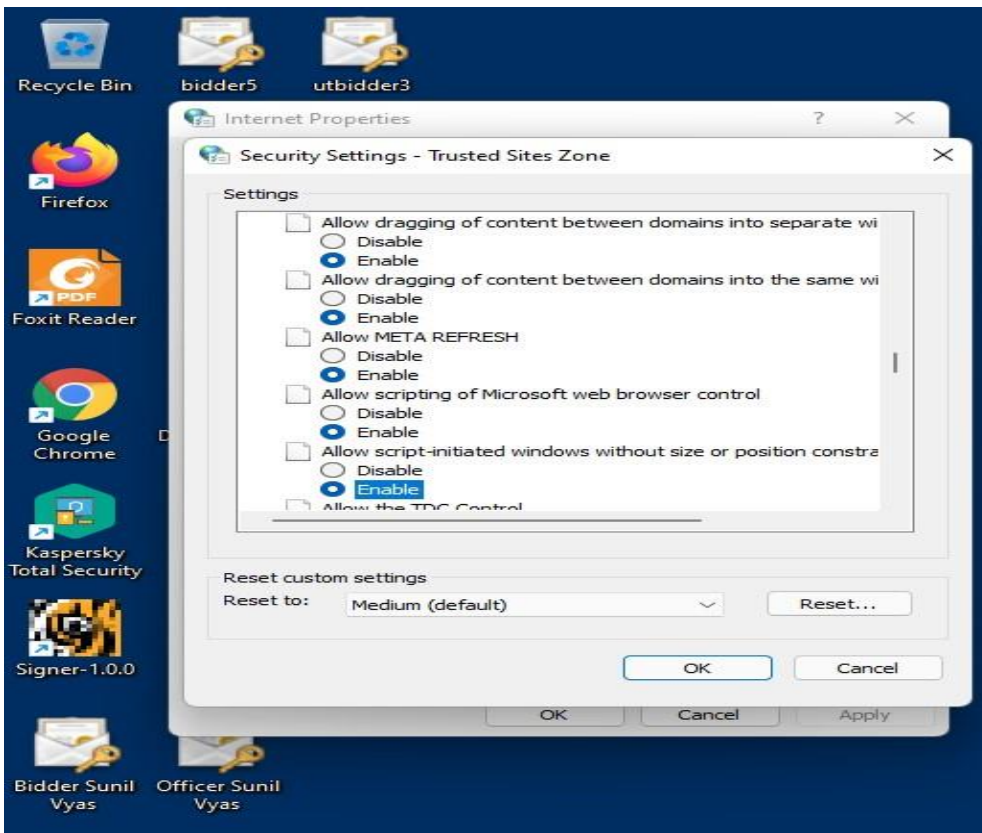
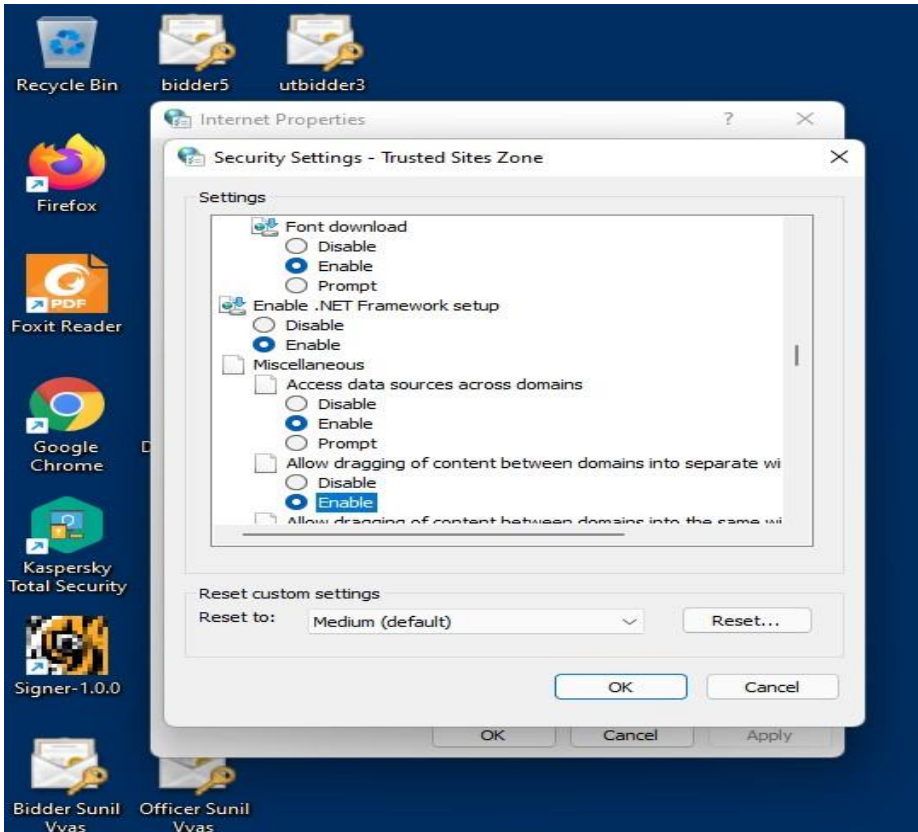
6.7 Configure settings of choice and Click on 'OK' button



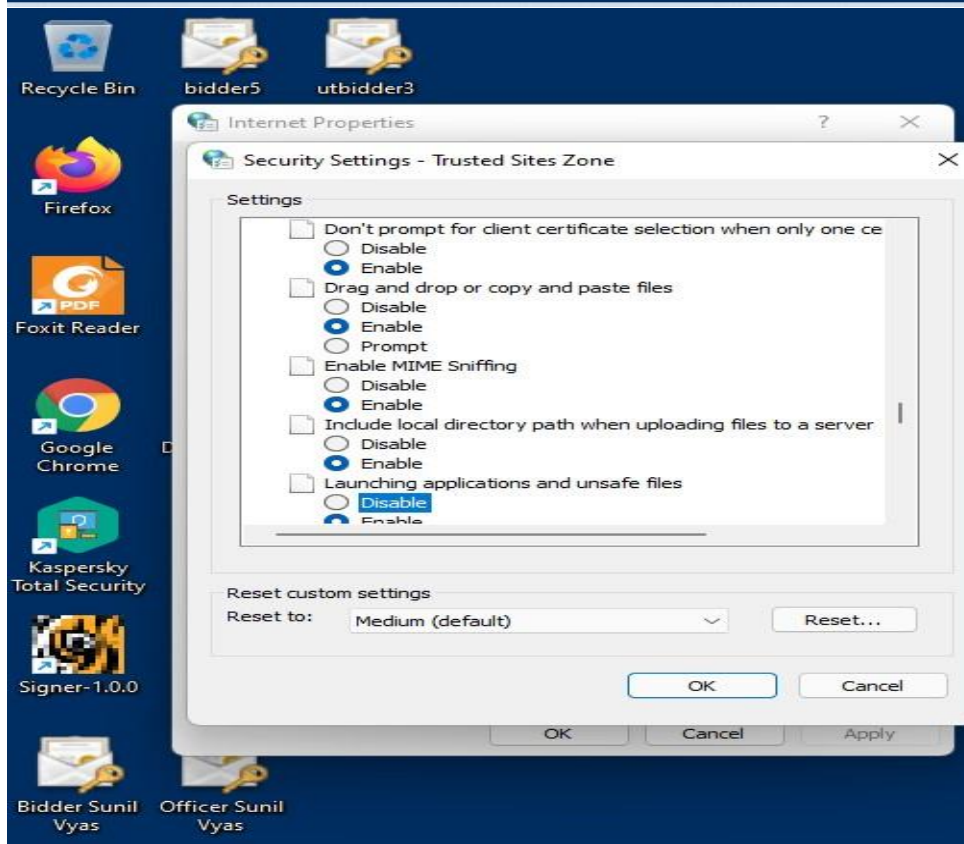
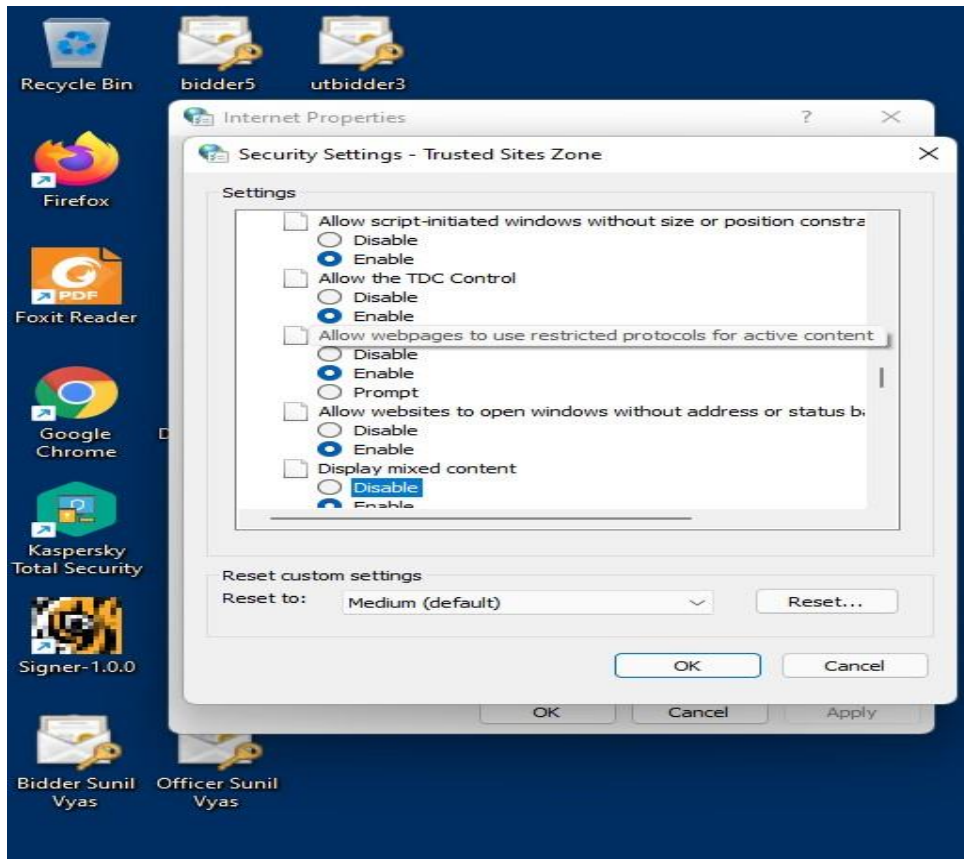
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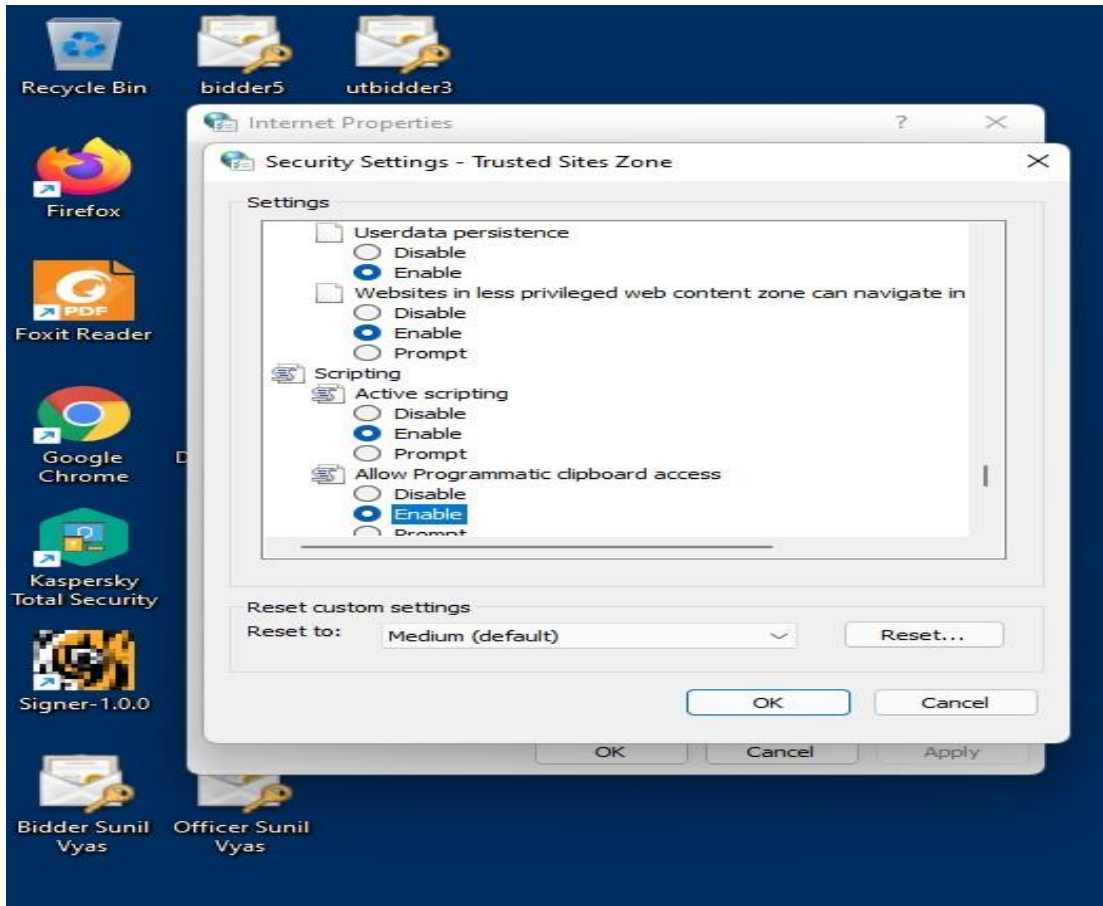
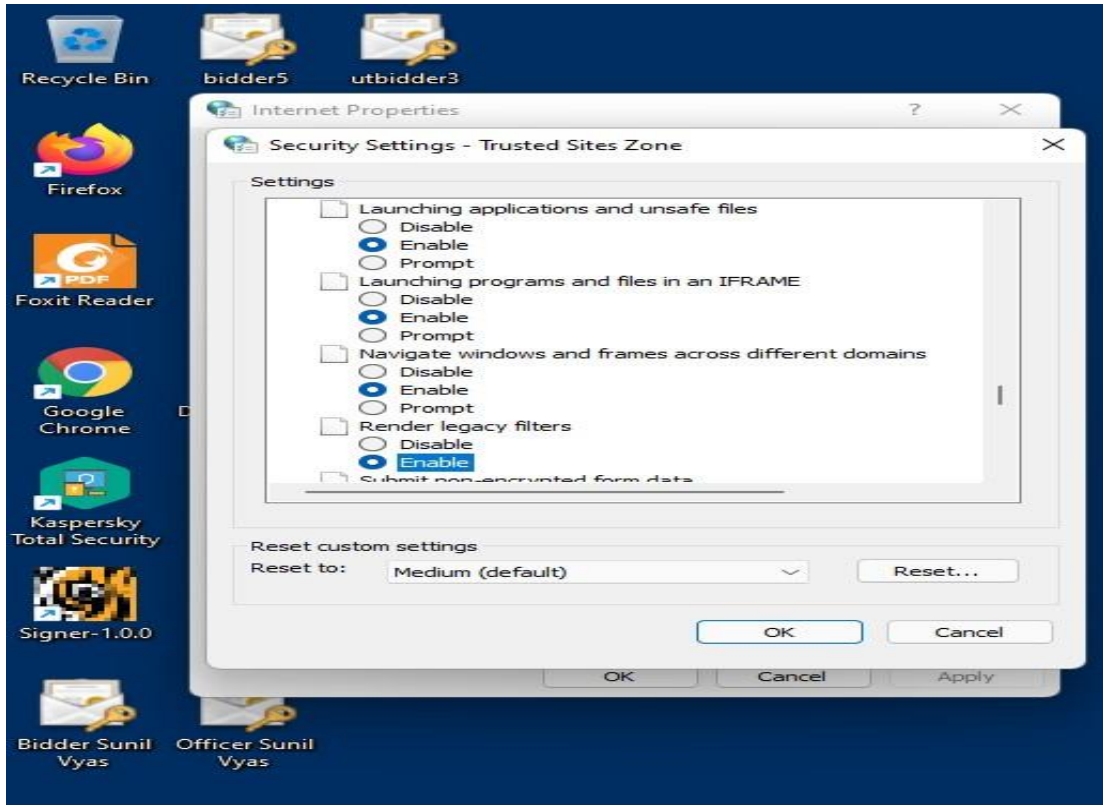












**PROCESS COMPLIANCE STATEMENT**

**(Annexure- I)**

(The bidders are required to print this on their company's letterhead and sign, stamp it before emailing/submission online.)

**M/s e-Procurement Technologies Limited**  
B-704, Wall Street – II, Opp. Orient Club,  
Ellisbridge, Ahmedabad – 380006, Gujarat, India  
Email ID: [sujith@eptl.in](mailto:sujith@eptl.in)

**Agreement to the Process Related Terms and Conditions for the on-line e – tendering for Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha**

Dear Sir,

This has reference to the Terms & Conditions for the E-tendering mentioned in the Tender Document. This letter is to confirm that:

- 1) The undersigned is authorized representative of the company.
- 2) We have studied the Commercial Terms and the Business rules governing the E-tendering as mentioned in Tender of SBI as well as this document and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the E-tendering tool and have understood the functionality of the same thoroughly.
- 4) We confirm that SBI and M/s. **e-Procurement Technologies Limited** shall not be liable & responsible in any manner whatsoever for my/our failure to access & bid on the e-E-tendering platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the E-tendering event.
- 5) We confirm that we have a valid digital signature certificate issued by a valid Certifying Authority.
- 6) We, hereby confirm that we will honour the Bids placed by us during the E-tendering process.

With regards,

Date:

Name:

Company / Organization:

Designation within Company / Organization: Address of Company / Organization:

Scan it and send to this Document on -----

**FORM OF TENDER**

**(Annexure-II)**

To,  
Asst General Manager (P&E),  
State Bank of India,  
Local Head Office,  
III/1, Pt. J.N.Marg,  
Bhubaneswar.  
Dear Sir,

**REVAMPING/REMODELING OF HVAC SYSTEM OF LHO BUILDING AT BHUBANESWAR, ODISHA**

I/We refer to the tender notice issued by you for Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha, in connection with above subject.

1. I/we have satisfied myself/ourselves as to the site conditions examined the drawings and all aspects of the tender conditions subject to above, I/We do hereby agree should this tender be accepted in whole or part of:
  - a. Abide by and fulfil all the terms and provisions of the said conditions annexed hereto:
  - b. Complete the work within the timeline as stipulated in two or three shifts if considered necessary by the consultants/ architects at no extra cost to the bank,
2. I/we have deposited the earnest money of Rs. **1,98,500.00** which we note will not bear any interest and is liable to forfeiture,
  - i. If the offer is withdrawn within the validity period of acceptance or
  - ii. If the contract is not executed within 15 days from award of contract, or
  - iii. The acceptance of this tender shall constitute a breach of contract by us & the tender accepting authority shall be entitled to have the work executed at our risk and cost and to claim extra cost/expenditure incurred by then from us
3. Unless and until a formal agreement is prepared and executed, this tender together with your written acceptance thereof shall constitute as a binding contract,
4. I/We understand that you are not bound to accept the lowest any tender received,
5. I/we have independently considered the amount of liquidated damages in the Appendix the General Conditions of contract and agree that it represents fair estimate of the loss likely to etc to be suffered by you in the event of the works not being completed in time,
6. Our bankers are: \_\_\_\_\_

The name of partners/ directors of the firm authorized to sign or name of persons having power of attorney to sign the contract (certified true copy of the power of attorney should be attached).

Yours faithfully

Signature of contractor/ authorized representative

Signature and address of witness (Mobile No and e mail address if any)

1.

2.



**Notes to schedule items**

1. Tenderers shall include their rates quoted for preliminary and general items required for the execution of work such as tools, plants, workman's shed, temporary offices, cleaning site, scaffolding up to the required height etc. The description of each item shall unless otherwise stated be held to include conveyance, labour, finishing to required shape and size, setting, fitting and fixing in position, straight cutting and wastes, return of packings, overheads, profits and other unless otherwise stated, be held to include the consequent waste.
2. The rates quoted by the contractor should cover for work at any height for all items of work under this contract. List of all materials will not form a criterion for any extra payment unless other contractors used in the particular item.  
In the event of arithmetical error/errors being discovered in the contract document, the rates mentioned in the words in tender copy marked original will only be taken as Bonafide.
3. Contractor should note that the tender **is strictly percentage rate based** and their attention is drawn to the fact that their rates for each and every item should be correct, workable and self-supporting. If called upon by architect/ Employer details analysis of any or all rates shall be bound to recognise contractors' analysis.
4. Contractor should note that their rates should be inclusive of all attendance on their sub-contractors and also for making good any holes and chases left by the sub-contractor before the building work is completed.
5. The Contractor shall be responsible for procuring all required materials sufficiently in advance and see that the work is never hindered for want of materials or due to any other reason or restriction.
6. The contractor shall have to carry out all connected work within the boundary of proposed work and inside the building if ordered to do so by the architect/ employer at the rate quoted in the schedule items.
7. The contractor is to study HVAC drawings before commencing work. In case of discrepancy, the contractor must report to the architect/ employer immediately and shall get the same rectified before proceeding it.
8. The rate quoted for Electrical installation works shall include all necessary charges/requirements complying with Indian electricity act and rules in force for the work.
9. All works which shall be used in the work must be from the list of the approved materials as mentioned in the specification. Samples of materials proposed to be used shall be submitted to the Consultant/Bank for Approval.
10. General spirit of the technical specification and method of measurement shall be as laid down in the latest edition of I S code of practice. Rates quoted for all items shall include for the cost of supplying labour and materials fixing and erection complete with all the application necessary for proper execution and carrying out of the work to the truest sense of drawing and specification through this may not be mentioned in particular item of the schedule items.
11. The quoted rates shall include clearing site from all shrubs, vegetation, bushes, tress, before commencement of work even if not otherwise specified. Trees with girth of above 4500mm and measured 300mm above GL shall be cut with prior permission from Bank / consultant adhere to statutory norm/NOC from local Authority/Forest department, as applicable.
12. The quoted rate shall be deemed inclusive of costs, of all labour, materials, tools, plants Equipment, curing cost at lead and lift and all taxes, duties octroi even if these are not otherwise mentioned in items. GST shall be paid extra as applicable.

13. Products with ISI sample, if available shall be use with prior approval of the consultant/ employer reserves the right to select any particular brand between different state products of the same category.

**ARTICLES OF AGREEMENT (DRAFT)**

This agreement made the .....day of ..... between Assistant General Manager (Premises & Estate), State Bank of India, Local Head Office, Bhubaneswar (hereinafter called the Bank or SBI) which expression shall include the successors and assigns) of the one part and M/s. .... company / partnership for registered under the Indian Companies Act/ Partnership Act having its registered office..... (hereinafter called 'the Contractors' which expression shall include the present directors / partners and also the directors / partners from time to time as also their respective heirs, legal representatives, administrators and assigns) of the other part.

WHEREAS the employer is desirous of execution of Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha. (Name of work) and has caused drawings and specifications describing the works to be done prepared by Project Architects M/s Architect Narayan & Associates Pvt. Ltd. (ANAPL) having their offices at 304, 3<sup>rd</sup> Floor, Antariksh building, Makhawana Road, Marol, Andheri (E ), Mumbai-400059 (hereinafter called "the Architect")

AND WHEREAS THE SAID Drawings numbered as mentioned in the tender documents hereinafter mentioned and to be issued from time to time, the specifications and the Schedule of items and quantities have been signed by or on behalf of the parties hereto.

AND whereas the contractors have agreed to execute upon and subject to the condition set forth herein and Schedule of items and quantities, General & special Conditions of Contract, specification etc. contained in the tendered documents including all correspondences exchanged by or between the parties from the submission of tender till the award of work, both letters inclusive, (all of which are collectively hereinafter referred to as "the said conditions"). The works shown upon the said drawing and /or described in the said specification and included in the schedule of Items and Quantities at the respective rates therein set forth amounting to the sum of Rs. .... (Rupees ..... in words ..... ) as there in arrived at or such other sum as shall become payable there under (hereinafter referred to as "the said Contract Amount").

**NOW IT IS HEREBY AGREED AS FOLLOWS:**

1. In consideration of the said Contract amount to be paid at the times and the manner set forth in the said Conditions, the Contractors shall upon and subject to the said conditions execute and complete the work shown upon the said drawings and described in the said specifications and the schedule of items and quantities.
2. The employer shall pay the Contractors the amount or such other sum as shall become payable, at the times and in the manner specified in the said conditions.
3. The term "the Architect" in the said condition shall mean the said "M/s Architect Narayan & Associates Pvt. Ltd. (ANAPL)" or in the event of their ceasing to be the Architect for the purpose of this contract for whatever reason, such other person or persons as shall be nominated for that purpose by the Employer, not being a person to whom the Contractor shall object for reasons considered to be sufficient by the Employer provided always that no person or persons subsequently appointed to be Architect under this contract shall be entitled to disregard or over rule any previous decisions or approval or direction given or expressed in writing by the architect for the time being.
4. The said conditions and appendix thereto shall be read and construed as forming part of this agreement, and the parties hereto shall respectively abide by / submit themselves to

**Tender No.: BHU/P&E/10/2024-25/29 DATED 08.10.2024**

the said conditions and perform the agreements on their part respectively in the said conditions contained.

5. The plans, agreement and documents mentioned herein shall form the basis of this contract.
6. This contract is neither a fixed Lump sum contract nor a piece work contract but is a contract to carry out the work in respect of the entire project on percentage rate basis to be paid for according to actual measured quantities at the rates contained in the schedule of quantities and rates or as provided in the said conditions.
7. The Bank / Employer reserves to itself the rights of altering the specifications and nature of work by adding to or omitting any item of work or having portions of the same carried out without prejudice to the contract.
8. Time shall be considered as the essence of this contract and the contractor here by agrees to commence the work soon after the site is handed over to him or from the 14<sup>th</sup> day after date of issue of formal work order as provided for in the said conditions of contractor whichever is later and to complete the entire work within \_\_\_\_ (period of contract) months subject never the less to the provisions for extension of time.
9. All payments by the Employer under this contract will be made only at Bhubaneswar.
10. Any dispute arising under this Agreement shall be referred to arbitration in accordance with the stipulations laid down in the tender.
11. That all the parts of this contract have been read by the contractor and fully understood by the contractor. They further agree to complete the said work to fullest satisfaction of architect / Employer.
12. IN WITNESS WHEREOF the Employer and the contractors have set their respective hands to these present through their duly authorized official and the said two duplicates hereof to be executed on its behalf of the day and year first herein above written.

Signed on behalf of the

Signed on behalf of the

**STATE BANK OF INDIA**

**CONTRACTORS**

In the presence of:

In the presence of:

1. Signature :

1. Signature :

Name :

Name :

Address :

Address :

In the presence of:

In the presence of:

2. Signature :

2. Signature :

Name :

Name :

Address :

Address :

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**GENERAL CONDITIONS OF THE CONTRACT**

**1.0 Definitions**

“**Contract**” means the documents forming the tender and the acceptance thereof and the formal agreement executed between SBI and the contractor, together with the documents referred therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Architects/SBII and all these, documents taken together shall be deemed to form one contract and shall be, complementary to one another.

1.1 In the contract the following expressions shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

1.1.1 ‘**SBI / Bank**’ shall mean State Bank of India (client) a body Corporate created under SBI Act 1955, having one of its Circle Office at State Bank of India, III/1 Pandit Jawaharlal Nehru Marg, Bhubaneswar- 01 and includes the client’s representatives, successors and assigns.

1.1.2 ‘**Architects/Consultants**’ shall mean **M/s Architect Narayan & Associates Pvt. Ltd. (ANAPL), Mumbai**

1.1.3 ‘**Site Engineer**’ shall mean an Engineer appointed by the Bank/Architect as their representative to give instructions to the contractors.

1.1.4 ‘**The Contractor**’ shall mean the individual or firm or company whether incorporated or not, undertaking the works and shall include legal personal representative of such individual or the composing the firm or company and the permitted assignees of such individual or firms of company.

1.1.5 The expression ‘**works** or ‘work’ shall mean the permanent or temporary work described in the ‘Scope of Work’ and/or to be executed in accordance with the contract and includes materials, apparatus, equipment, temporary supports, fittings and things of all kinds to be provided, the obligations of the contractor hereunder and work to be done by the contractor under the contract.

1.1.6 ‘**Engineer**’ shall mean the representative of the Architect/consultant.

1.1.7 ‘**Drawings**’ shall mean the drawings prepared and issued by the Architects duly approved by the Bank and referred to in the specifications and any modifications of such drawings as may be issued from time to time ‘Contract value shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions thereto or deductions there from as may be made under the provision hereinafter contained.

1.1.8 ‘**Specifications**’ shall mean the specifications referred to in the tender and any modifications thereof as maybe time to time be furnished or approved by the architect/ consultant  
“Month” means calendar month.

1.1.9 “**Week**” means seven consecutive days.

1.1.10 “**Day**” means a calendar day beginning and ending at 00 Hrs and 24 hrs respectively.

1.1.11 “**SOQ/BOQ**” means Schedule or Bill of Quantities.

1.1.12 The project/work as stated in the tender means “Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha”.

**CLAUSES:**

**1.0 Total Security Deposit:** Total Security deposit comprises of:

- Earnest Money Deposit
- Initial Security Deposit
- Retention Money
- Additional Security Deposit

c) **Retention Money:** Total security deposit shall be 5% of the final value of the work. Out of this 2% of tender value (i.e. tender amount) is in the form of initial security deposit (ISD) which includes the EMD. Balance security deposit (i.e. 5% of final value of work less 2% of tender value already deposited as ISD) towards the work shall be deducted from the running account bill of the work as Retention money at the rate of 10% of the respective running account bill i.e. deduction from each running bill account will be 10% till total 5% of final value of work as per final bill is reached. 50% of the total security i.e. 2.5% of the final value of work shall be paid to the contractors on the basis of Project Engineer-in-Charge certifying the virtual completion and its approval by SBI. The balance 50% i.e. 2.5% of final value of work would be paid to the contractors after the defects liability period as specified in the contract.

**d) Additional Security Deposit:**

Additional Security deposit (ASD)/Additional performance Guarantee (APG) shall be applicable if the bid price is below 7.5 % of the estimated cost put to tender. The amount of such ASD/ APG shall be the difference between 92.5 % of estimated cost put to tender and the quoted price.

**2.0 Language Errors, Omissions and Discrepancies:** In case of errors, omissions and/or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc, the following order shall apply.

- i) Between scaled and written dimension (or description) on a drawing, the latter shall be adopted.
- ii) Between the written or shown description or dimensions in the drawings and the corresponding one in the specification the former shall be taken as correct.
- iii) Between written descriptions of the item in the specifications and descriptions in bills of quantities of the same item, the latter shall be adopted.
- iv) In case of a difference between rates written in figures and words, the rate in words shall prevail.



v) Between the duplicate/subsequent copies of the tender, the original tender shall be taken as correct.

**3.0 Scope of Work:** The contractor shall carry out, complete, and maintain the said work in every respect strictly in accordance with this contract and with the directions of and to the satisfaction of the SBI /architect. The architect at the directions of the Bank from time to time issue further drawings and/or written instructions, details directions and explanations which are hereafter collectively referred to as SBI/Architect's instructions in regard to the variation or modification of the design, quality or quantity of work or the addition or omission or substitution of any work, any discrepancy in the drawings or between the BOQ and/or drawings and/or specifications, the removal from the site of any material brought thereon by the contractor and the substitution of any other materials thereof, the demolition, removal and/or re-execution of any work executed by him, the dismissal from the work of any person employed/engaged thereupon.

**4.0 (i) Letter of Acceptance:** Within the validity period of the tender the SBI shall issue a letter of acceptance either directly or through the architect by registered post/e-mail/speed post or otherwise depositing at the address of the contractor as given in the tender to enter into a Contract for the execution of the work as per the terms of the tender. The letter of acceptance shall constitute a binding contract between the SBI and the contractor.

**ii) Contract Agreement:** On receipt of intimation of the acceptance of tender from the SBI/Architect the successful tenderer shall be bound to implement the contract and within fifteen days thereof, he shall sign an agreement in a non-judicial stamp paper of appropriate value (as per the Article of Agreement format earlier given in this document) with SBI.

**5.0 Ownership of drawings:** All drawings, specifications and copies thereof furnished by the SBI, through its architect/ consultants are the properties of the SBI. They are not to be used on other work.

**6.0 Detailed drawings and instructions:** The SBI through its architects/consultants shall furnish with reasonable promptness additional instructions by means of drawings or otherwise necessary for the proper execution of the work. All such drawings and instructions shall be consistent with the contract documents, true developments thereof and reasonably inferable there from.

The work shall be executed in conformity therewith and the contractor shall prepare a detailed programme schedule (i.e. BAR/PERT Chart) indicating therein the date of start and completion of various activities on receipt of the work order and submit the same to the SBI through the Architect/Consultant.

**7.0 Copies of Agreement:** Out of Six copies, two copies of agreement/tender document duly signed by both the parties with the drawings shall be handed over to the contractors, two copies to SBI and one copy each shall be for the use of SBI and Architect.

**8.0 Liquidated Damages:** If the contractor fails to maintain the required progress in terms of contract or to complete the work and clear the site including vacating their office on or before the contracted or extended date or completion without justification in support of the cause of delay, he may be called upon without prejudice to any other right of remedy available under

the law to the SBI on account of such breach to pay a liquidated damages at the rate of 0.5% of the final value of work per week subject to a maximum of 5% of the final value of work.

**9.0 Materials, Appliances, and Employees:** Unless or otherwise specified the contractor shall provide and pay for all materials, labour, water, power, tools, equipment transportation and any other facilities that are required for the satisfactory execution and completion of the work. Unless or otherwise specified all materials shall be new and both workmanship and materials shall be best quality. The contractor shall at all times enforce strict discipline and good order among his employees/workers and shall not employ on the work any unfit person/worker or anyone not skilled in the work assigned to him. Workman whose work or behaviour is found to be unsatisfactory by the SBI /Architect, he shall be removed from the site immediately.

**10.0 Permits, Laws and Regulations:** Permits and licences required for the execution of the work shall be obtained by the contractor at his own expenses. The contractor shall give notices and comply with the regulations, laws/ labour laws, and ordinances rules, applicable to the contractor. If the contractor observes any discrepancy between the drawings and specifications, he shall promptly notify the SBI in writing under intimation of the Architect/Consultant. If the contractor performs any act which is against the law, rules and regulations he shall meet all the costs arising there from and shall indemnify the SBI any legal actions arising there from.

**11.0 Setting out Work:** The contractor shall set out the work and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions, and alignment of all parts thereof and get it approved by the architect/consultant before proceeding with the work. If at any time any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout had been approved by the architect/consultant the contractor shall be responsible for the same and shall at his own expenses rectify such error, if so, required to satisfaction of the SBI.

**12.0 Protection of works and property:** The contractor shall continuously maintain adequate protection, of all his work from damage and shall protect the SBI's properties from injury or loss arising in connection with contract. He shall make good any such damage, injury, loss due to his fault or negligence except which are due to causes beyond his control.

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protection of his employees on the works and shall comply with all applicable provisions of Government and local bodies' safety laws and relevant building codes to prevent accidents, or injuries to persons or property of about or adjacent to his place of work. The contractor shall take insurance covers as per clause 25.0 at his own cost. The policy may be taken in joint names of the contractors and the SBI and the original policy may be lodged with the SBI.

**13.0 Inspection of Work:** SBI/Architect/Consultant or their representatives shall at all reasonable time have free access to the work site and/or to the workshop, factories or other places where materials are lying or from where they are obtained and the contractor shall give every facility to the /SBI/Architect/Consultant and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorized by the

SBI/Architect/Consultant except the representative of Public authorities shall be allowed on the work at any time.

**14.0 Assignment and subletting:** The whole of work included in the contract shall be executed by the contractor and he shall not directly entrust and engage or indirectly transfer assign or underlet the contract or any part or share thereof or interest therein without the written consent of the SBI /SBI through the architect and no undertaking shall relieve the contractor from the responsibility of the contractor from active superintendence of the work during its progress.

**15.0 Quality of Materials, Workmanship & Test:** All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with SBI/Architect's instructions and shall be subject from time to time to such tests as the SBI/Architect may direct at the place of manufacture or fabrication or on the site or an approved testing laboratory.

The quantity given in SOQ are intended to cover the entire new structure indicated in the drawing but the employer reserves the right to execute only a part or the whole or any excess thereof without assigning any reason thereof. Additional items not described in the SOQ may be required to execute as per the site condition. All additional items as required are necessary to complete the work. The rate shall be derived as per prevailing market rate including Contractor's Profit and Over Head 15%. The contractor shall provide such assistance, instruments, machinery, labour and materials.

**(ii) Samples:** All samples of adequate numbers, size, shades & pattern as per specifications shall be supplied by the contractor without any extra charges. If certain items proposed to be used are of such nature that samples cannot be presented or prepared at the site detailed literature/test certificate of the same shall be provided to the satisfaction of the SBI/Architect. Before submitting the sample/literature the contractor shall satisfy himself that the material/equipment for which he is submitting the samples/literature meet with the requirement of tender specification. Only when the samples are approved in writing by the SBI /Architect the contractor shall proceed with the procurement and installation of the particular material/equipment.

The approved samples shall be signed by the SBI /Architect for identification and shall be kept on record at site office until the completion of the work for inspection/comparison at any time. The SBI/Architect shall take reasonable time to approve the sample. Any delay that might occur in approving the samples for reasons of its not meeting the specifications or other discrepancies inadequacy in furnishing samples of best qualities from various manufacturers and such other aspects causing delay on the approval of the materials/equipment etc. shall be to the account of the contractor.

**(iii) Cost of tests:** The cost of making any test shall be borne by the contractor if such test is intended by or provided for in the specifications or BOQ.

**(iv) Cost of test not provided for:** If any test is ordered by the SBI/Architect which is either:

- (a) If so intended by or provided for or (in the cases above mentioned) is not so particularized or through so intended or provided for but ordered by the SBI/ Architect which is either to be carried out by an independent person at any place other than the site or

the place of manufacture or fabrication of the materials tested or any Government/approved laboratory, then the cost of such test shall be borne by the contractor.

**16.0 Obtaining Information related to execution of work:** No claim by the contractor for additional payment shall be entertained which is consequent upon failure on his part to obtain correct information as to any matter affecting the execution of the work nor any misunderstanding or the obtaining incorrect information or the failure to obtain correct information relieve him from any risks or from the entire responsibility for the fulfilment of contract.

**17.0 Contractor's superintendence:** The contractor shall give necessary personal superintendence during the execution of the works and as long, thereafter, as the SBI/Architect may consider necessary until the expiry of the defect liability period, stated hereto.

**18.0 Quantities:** i) The bill of quantities (BOQ) unless or otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurements

The rate quoted shall remain valid for variation of quantity against individual item to any extent subject to maximum variation of the contract value by 25%. The entire amount paid under Clause 20 hereof as well as amounts of prime cost and provisional sums, if any, shall be excluded.

ii) Variation exceeding 25%: The items of work executed in relation to variation exceeding 25% shall be paid on the basis of provisions of clause 21(e) hereof. Rate of this item will not exceed the tender rate.

**19.0 Works to be measured:** The SBI/Architect may from time to time intimate to the contractor that he required the work to be measured and the contractor shall forthwith attend or send a qualified representative to assist the SBI/Architect in taking such measurements and calculation and to furnish all particulars or to give all assistance required by any of them. Such measurements shall be taken in accordance with the Mode of measurements detailed in the specifications. The representative of the SBI/ Architect shall take joint measurements with the contractor's representative and the measurements shall be entered in the measurement book.

The contractor or his authorized representative shall sign all the pages of the measurement book in which the measurements have been recorded in token of his acceptance. All the corrections shall be duly attested by both representatives. No writings shall be made in the measurement book. Should the contractor not attend or neglect or omit to depute his representative to take measurements then the measurements recorded by the representative of the SBI/ Architect shall be final. All authorized extra work, omissions and all variations made shall be included in such measurements.

**20.0 Variations:** No alteration, omission or variation ordered in writing by the SBI/Architect shall vitiate the contract.

In case the SBI /SBI/Architect thinks proper at any time during the progress of works to make any alteration in, or additions to or omission from the works or any alteration in the kind or quality of the materials to be used therein, the Architect/Consultant shall give notice thereof in writing to the contractor or shall confirm in writing within seven days of giving such oral instructions the contractor shall alter to, add to, or omit from as the case may be in accordance with

such notice but the contractor shall not do any work extra to or make any alteration or additions to or omissions from the works or any deviation from any of the provisions of the contract, stipulations, specifications or contract drawings without previous consent in writing of the Architect/Consultant and the value of such extras, alterations, additions or omissions shall in all cases be determined by the Architect/Consultant and the same shall be added to or deducted from the contract value, as the case may be.

**21.0 Valuation of Variations:** No claim for an extra shall be allowed unless it shall have been executed under the authority of the Architect with the concurrence of the SBI as herein mentioned. Any such extra is herein referred to as authorized extra and shall be made in accordance with the following provisions.

a. The net rates or prices in the contract shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced herein. Rates for all items, wherever possible should be derived out of the rates given in the priced BOQ.

b. The net prices of the original tender shall determine the value of the items omitted, provided if omissions do not vary the conditions under which any remaining items of works are carried out, otherwise the prices for the same shall be valued under sub clause (c) hereunder.

c. Where the extra works are not of similar character and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items or works are carried out, then the contractor shall within 7 days of the receipt of the letter of acceptance inform the SBI/Architect of the rate which he intends to charge for such items of work, duly supported by analysis of the rate or rates claimed and the SBI/Architect shall fix such rate or prices as in the circumstances in his opinion are reasonable and proper, based on the market rate.

d. Where extra work cannot be properly measured or valued the contractor shall be allowed day work prices at the net rates stated in the tender of the BOQ or, if not, so stated then in accordance with the local day work rates and wages for the district; provided that in either case, vouchers specifying the daily time (and if required by the SBI /SBI/Architect) the workman's name and materials employed be delivered for verifications to the Architect/Consultant at or before the end of the week following that in which the work has been executed.

e. It is further clarified that for all such authorized extra items where rates cannot be derived from the tender, the contractor shall submit rates duly supported by rate analysis worked on the "market rate basis" for material, labour, hire/running charges of equipment and wastages etc. plus 15% towards establishment charges, contractor's overheads and profit. Such items shall not be eligible for escalation.

**22.0 Final Measurement:** The measurement and valuation in respect of the contract shall be completed within **one month** of the virtual completion of the work.

**23.0 Virtual Completion Certificate (VCC):** On successful completion of entire works covered by the contract to the full satisfaction of the SBI, the contractor shall ensure that the following works have been completed to the satisfaction of the SBI-

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- a) Clear the site of all scaffolding, wiring, pipes, surplus materials, contractor's labour, equipment and machinery.
- b) Demolish, dismantle and remove the contractor's site office, temporary works, structures including labour sheds/camps and constructions and other items and things whatsoever brought upon or erected at the site or any land allotted to the contractor by the SBI and not incorporated in the permanent works.
- c) Remove all rubbish, debris etc from the site and the land allotted to the contractor by the SBI and shall clear, level and dress, compact the site as required by the SBI.
- d) Shall put the SBI in undisputed custody and possession of the site and all land allotted by the SBI.
- e) Shall hand over the work in a peaceful manner to the SBI.
- f) All defects/imperfections have been attended and rectified as pointed out by the SBI to the full satisfaction of SBI.

Upon the satisfactory fulfilment by the contractor as stated above, the contractor shall be entitled to apply to the Architect/Consultant for the certificate. If the SBI/Architect/Consultant is satisfied of the completion of the work, relative to which the completion certificate has been sought, the SBI/Architect/Consultant shall within fourteen (14) days of the receipt of the application for virtual completion certificate, issue a VCC in respect of the work for which the VCC has been applied.

This issuance of a VCC shall be without prejudice to the /SBI's rights and contractor's liabilities under the contract including the contractor's liability for defects liability period nor shall the issuance of VCC in respect of the works or work at any site be construed as a waiver of any right or claim of the SBI against the contractor in respect of works or work at the site and in respect of which the VCC has been issued.

### **23A. Defects after Completion:**

The contractor shall make good at his own cost and to the satisfaction of the employer all defects, shrinkages, settlement or other faults which may appear **within 12 months** after virtual completion of work. In default, the employer may employ and pay other persons to amend and make such damages, losses and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages, loss and expenses shall be recoverable from him by the employer or may be deducted by the employer in lieu of such amending and making good by the contractor deduct from any money due to the contractor a sum of equivalent to the cost of amending such work and in the event of the amount retained being insufficient, recover that balance from the contractor from the amount retained under relevant clause together with any expenses the employer may have incurred in connection therewith

**24.0 Work by other agencies:** The SBI/Architect reserves the rights to use premises and any portion of the site for execution of any work not included in the scope of this contract which it may desire to have carried out by other persons simultaneously and the contractor shall not

only allow but also extend reasonable facilities for the execution of such work. The contractor however shall not be required to provide any plant or material for the execution of such work except by special arrangement with the SBI. Such work shall be carried out in such manners not to impede the progress of the works included in the contract.

## **25.0 Insurance of Works**

25.1 Without limiting his obligations and responsibilities under the contract the contractor shall ensure in the joint names of the SBI and the contractor against all loss or damages from whatever cause arising other than the excepted risks, for which he is responsible under the terms of the contract and in such a manner that the SBI and contractor are covered for the period stipulated in clause 28 of GCC and are also covered during the period of maintenance for loss or damage arising from a cause, occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the contractor in the course of any operations carried out by him for the purpose of complying with his obligations under the clause.

a) The works for the time being executed to the estimated current Contract value thereof, or such additional sum as may be specified together with the materials for incorporation in the works at their replacement value.

b) The constructional plant and other things brought on to the site by the contractor to the replacement value of such constructional plant and other things.

c) Such insurance shall be effected with an insurer and in terms approved by the SBI which approval shall not be unreasonably withheld and the contractor shall whenever required produce to the SBI/Architect the policy of insurance and the receipts for payment of the current premiums.

**25.2 Damage to persons and property:** The contractor shall, except if and so far as the contract provides otherwise indemnify the SBI against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the works and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation of damages for or with respect to :

a) The permanent use or occupation of land by or any part thereof.

b) The right of SBI to execute the works or any part thereof, on, over, under, in, or through any lands.

c) Injuries or damages to persons or properties which are an unavoidable result of the execution or maintenance of the works in accordance with the contract.

d) Injuries or damage to persons or property resulting from any act or neglect of the SBI, their agents, employees or other contractors not being employed by the contractor or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the

extent of the responsibility of the SBI, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

**25.3 Contractor to indemnify SBI:** The contractor shall indemnify the SBI against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the provision sub-clause 25.2 of this clause.

**25.4 Contractor's superintendence:** The contractor shall fully indemnify and keep indemnified the SBI/SBI against any action, claim, or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claim made under or action brought against SBI in respect of such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expenses to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the SBI if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the SBI/Architect in this behalf.

The contractor shall employ at least the following technical staff besides other personal: One graduate engineer / Sr Diploma holder having experience of 5yrs or more. The above technical staff should be available at site to take instructions whenever required by the architect/employer. In case the contractor fails to comply the technical staff as aforesaid he shall be liable to pay a sum of RS. 5000 each month or part thereof for default. The decision of architect/employer so as to the period will be final and binding on the contract.

### **25.5 Third-Party Insurance**

25.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 25 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of SBI, or to any person, including any employee of the SBI, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the matters referred to in the provision to clause 25 thereof.

25.5.2 Minimum Amount of Third-Party Insurance: Such insurance shall be affected with an insurer and in terms approved by the SBI which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the SBI/Architect the policy or policies of insurance cover and receipts for payment of the current premiums.

The minimum insurance cover for physical property, injury, and death is Rs.5.0 lacs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay the additional premium necessary to make insurance valid for four occurrences always.

### **25.7 Accident or Injury to Workmen**

25.7.1 The SBI shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workmen or other person in the employment of the contractor or any sub-contractor, save and except an accident or



injury resulting from any act or default of the SBI or their agents, or employees. The contractor shall indemnify and keep indemnified SBI against all such damages and compensation, save and except as aforesaid and against all claims, proceedings, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

**25.7.2 Insurance against accidents etc to workmen:** The contractor shall insure against such liability with an insurer approved by the SBI during the whole of the time any person employed by him on the works and shall, when required, produce to the architect/consultant such policy of insurance and receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-contractor the contractor's obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that SBI is indemnified under the policy but the contractor shall require such sub-contractor to produce to the SBI/Architect when required such policy of insurance and the receipt for the payment of the current premium.

**25.7.3 Remedy on Contractor's failure to insure:** If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case the SBI may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the SBI as aforesaid and also deduct 15% of contract value from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

Without prejudice to the other rights of the SBI against contractors, in respect of such default, the SBI shall be entitled to deduct from any sums payable to the contractor the amount of any damage costs, charges, and other expenses paid by the SBI and which are payable by the contractors under this clause. The contractor shall upon settlement by the insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with due diligence to rebuild or repair the works destroyed or damaged. In this event all the monies received from the insurer in respect of such damage shall be paid to the contractor and the contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged.

**26.0 Commencement of Works:** The date of commencement of the work will be reckoned as the recorded date of handing over site by the SBI/SBI or **14 days** from the date of receipt of Letter of Acceptance from SBI, whichever is later.

**27.0 Time for completion:** Time is the essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period of **Eight Calendar month from the date of commencement**. If required in the contract or as directed by the SBI/Architect, the contractor shall complete certain portions of work before completion of the entire work. However, the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

**28.0 Extension of Time:** If, in the opinion of the Architect/Consultant, the work be delayed for reasons beyond the control of the contractor, the Architect/Consultant may submit a recommendation to the SBI to grant a fair and reasonable extension of time for completion of work as per the terms of contract. If the contractor needs an extension of time for the completion of

work or if the completion of work is likely to be delayed for any reasons beyond the due date of completion as stipulated in the contract, the contractor shall apply to the SBI through the Architect/Consultant in writing at least 15 days before the expiry of the scheduled time and while applying for extension of time he shall furnish the reasons in detail and his justification if any, for the delays. The architect/consultant shall submit their recommendations to the SBI in the prescribed format for granting extension of time. While granting extension of time the contractor shall be informed the period extended time which will qualify for levy of liquidated damages. For the balance period in excess of original stipulated period and duly sanctioned extension of time by the SBI the provision of liquidated damages as stated under clause 8 of GCC shall become applicable. Further contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

**29.0 Rate of progress:** Whole of the materials, plant and labour to be provided by the contractor and the mode, manner and speed of execution and maintenance of the works are to be of a kind and conducted in a manner to the satisfaction of the SBI/Architect. Should the rate of progress of the work or any part thereof be at any time be in the opinion of the SBI /Architect too slow to ensure the completion of the whole of the work by the prescribed time or extended time for completion the SBI /Architect shall thereupon take such steps as considered necessary to expedite progress so as to complete the works by the prescribed time or extended time. Such communications from the SBI /Architect neither shall relieve the contractor from fulfilling obligations under the contract nor he shall be entitled to raise any claims arising out of such directions.

**30.0 Work during nights and holidays:** Subject to any provision to the contrary contained in the contract no permanent work shall save as herein provided be carried on during the night or on holidays without the permission in writing of the SBI/Architect, save when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the work in which case the contractor shall immediately advise the SBI/Architect. However, the provision of the clause shall not be applicable in the case of any work which becomes essential to carry by rotary or double shifts in order to achieve the progress and quality of the part of the works being technically required and continued with the prior approval of the SBI/Architect at no extra cost to the SBI.

All work at night after obtaining approval from competent authorities shall be carried out without unreasonable noise and disturbance so as to avoid disputes with the neighbours.

**31.0 No compensation for restrictions of work:** If at any time after acceptance of the tender SBI shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not require the whole or any part of the work to be carried out, the SBI Architect shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work fully but which he did not derive in consequence of the foreclosure of the whole or part of the work. Provided that the contractor shall be paid the charges on the cartage only of materials actually and bona fide brought to the site of the work by the contractor and rendered surplus as a result of the abandonment, curtailment of the work or any portion thereof and then taken back by the contractor, provided however that the SBI /Architect shall have in such cases

the option of taking over all or any such materials at their purchase price or a local current rate whichever is less. In case of such stores having been issued from SBI stores and returned by the contractor to stores, credit shall be given to him at the rates not exceeding those at which were originally issued to the contractor after taking into consideration and deduction for claims on account of any deterioration or damage while in the custody of the contractor and in this respect the decision of SBI /SBI/Architect shall be final.

**32.0 Suspension of work:** The contractor shall, on receipt of the order in writing of the SBI/Architect (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as SBI /Architect may consider necessary so as not cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons.

- a) On account of any default on the part of the contractor, or
- b) For proper execution of the works or part thereof for reasons other than the default of the contractor, or
- c) For the safety of the works or part thereof.

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the SBI/Architect.

i. If the suspension is ordered for reasons (b) and (c) in sub-Para (i) above:

The contractor shall be entitled to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account.

**33.0 Action when the whole security deposit is forfeited:** In any case in which under any clause or clauses of this contract, the Contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit the Architect/Consultant shall have the power to adopt any of the following course as they may deem best suited to the interest of the SBI.

- a) To rescind the contract (of which rescission notice in writing to the contractor by the Architect/Consultant shall be conclusive evidence) and in which case the security deposit of the contractor shall be forfeited and be absolutely at the disposal of SBI.
- b) To employ labour paid by the SBI and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour, materials (the cost of such labour and materials as worked out by the SBI/Architect shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract the certificate of Architect/Consultant as to the value of work done shall be final and conclusive against the contractor.
- c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess

the certificates in writing of the Architects/ Consultant shall be final and conclusive) shall be borne by original contractor and may be deducted from any money due to him by SBI under the contract or otherwise, or from his security deposit or the proceeds of sale thereof, or sufficient part thereof.

In the event of any of above courses being adopted by the SBI the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any material or entered into any engagements or make any advances on account of, or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescinded under the provision aforesaid, the contractor shall not be entitled to recover or to be paid any sum or any work thereto for actually performed under this contract, unless, and until the Architect/Consultant/SBI will have certified in writing the performance of such work and the value payable in respect thereof, and he shall only be entitled to be paid the value so certified.

**34.0 Owner's Right to Terminate the Contract:** If the contractor being an individual or a firm commit any 'Act of Insolvency' or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Government and of the Official Assignee of the liquidator in such acts of insolvency or winding up shall be unable within seven days after notice to him to do so, to show to the reasonable satisfaction of the SBI /Architect that he is able to carry out and fulfil the contract, and to give security therefore if so required by the SBI.

Or if the contractor (whether an individual firm or incorporated Company) shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or sublet this contract without the consent in writing of the SBI through the Architect/Consultant or shall charge or encumber this contract or any payment due to which may become due to the contractor there under.

a) Has abandoned the contract; or

b) Has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving from the SBI through the Architect/Consultant written notice to proceed, or

c) Has failed to proceed with the works with such diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or has failed to remove the materials from the site or to pull down and replace work within seven days after written notice from the SBI through the Architect/ Consultant that the said materials were condemned and rejected by the Architect/ Consultant under these conditions; or has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contractor to observe or perform the same or has to the detriment of good workmanship or in defiance of the SBI /SBI's or Architect's/Consultant's instructions to the contrary subject any part of the contract. Then and in any of said cases the SBI and or the

Architect/Consultant, may not withstanding any previous waiver, after giving seven days' notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the SBI or the Architect/Consultant or the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been so determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the SBI through the Architect/Consultant, their agents or employees may enter upon and take possession of the work and all plants, tools, scaffoldings, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads, use the same by means of their own employees or workmen in carrying on and completing the work or by engaging any other contractors or persons to complete the work and the contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or as soon thereafter as convenient to the SBI or the Architect/Consultant shall give a notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within 14 days after receipt thereof by him the SBI. /SBI sell the same by public auction after due publication and shall adjust the amount realized by such auction. The contractor shall have no right to question any of the acts of the SBI incidental to the sale of the materials etc.

**35.0 Certificate of Payment:**

The contractor shall be entitled under the certificates to be issued by the Architect/ Consultant to the contractor within 10 working days from the date of certificate to the payment from SBI from time to time. The SBI shall recover the statutory recoveries and other dues including the retention amount from the certificate of payment.

Provided always that the issue of any certificate by the Architect/Consultant during the progress of works or completion shall not have effect as certificate of satisfaction or relieve the contractor from his liability under clause.

The Architect/Consultant shall have power to withhold the certificate if the work or any part thereof is not carried out to their satisfaction.

The Architect/Consultant may by any certificate make any corrections required in previous certificate.

The SBI shall modify the certificate of payment as issued by the Architect/Consultant from time to time while making the payment.

The contractor shall submit interim bills only after taking actual measurements and properly recorded in the Measurement book (M.B).

The contractor shall not submit interim bills when the approximate value of work done by him is less than the amount as mentioned in NIT and the minimum interval between two such bills shall be one month, subject to satisfaction of Bank.

The final bill may be submitted by contractor within a period of one month from the date of virtual completion and Architect/Consultant shall issue the certificate of payment within a period of two months. The SBI shall pay the amount within a period of three months from the date of issue of certificate provided there is no dispute in respect of rates and quantities.

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The contractor shall submit the interim bills in the prescribed format with all details

### 35.1. Certification of bills & payments

Normally the agreement stipulates the value of works for interim bills. When the gross payment due to the contractor against work done including secured advance against the value of materials collected at site exceeds the amount of interim amount of bill specified in the tender, the contractor is entitled to submit a bill as explained below:

- i) The contractor shall prepare the bill (Refer Annexure-15) in triplicate on the basis of the item wise abstract of the total measured quantities as recorded in the MBs. The tender items shall be serially reproduced in the bill. The extra or variation items which have been approved shall only be included in the bill. Such extra items shall be shown in the bill in separate sub-head along with references for approvals. The bills in triplicate shall be submitted to the Bank's Site Engineer/Architect.
- ii) The Bank's Site Engineer/Architect on receipt of the bill in triplicate from the contractors shall verify the following:
  - a) The bill of quantities is as per the measurements recorded in the MBs.
  - b) The rates for different items are as per accepted tender/quotation and/or the approved rates for variation.
  - c) The part rates are commensurate with the actual stage of work done, and reasons for allowing part rates are briefly mentioned.
  - d) Quantities of materials for which secured advance has been claimed have actually been collected at site and necessary undertaking as per prescribed proforma (Refer Annexure-11 & 12) is furnished by the contractor along with manufacture test certificate.
  - e) Rates allowed for advance against materials brought to site are based on the admitted percentage as provided in the contract or invoice amount or pro-rata amount for such material relating to the respective tender item rate, whichever is lower.
  - f) Deductions/rebate on account of retention money, mobilization advance, or any item of work have correctly been shown in the bill.
  - g) Proper insurance cover as provided for in the contract and for proper value has been taken by the contractor.
  - h) Test certificates for the materials used, concrete etc. required as per the contract have been enclosed.
- iii) The bill after due verification as above and after incorporating necessary corrections shall be certified by the Site Engineer/Architect. The bill in triplicate shall then be sent to the architects for certification, who will also give a statement for the following:

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- a) Statement giving reasons for excessive variations i.e. above 20% in the quantities as compared to the tender quantities.
- b) Statements showing the theoretical and actual consumption of materials.
- iv) The bill shall be thoroughly scrutinized and checked by the architects and sent to the Premises/ Estate Department along with a certificate of payment in duplicate as per Annexure-16. The architects shall satisfy about compliance of all requirements as per the terms of contract. Necessary test check measurements shall be done by the Bank Engineer.
- v) Where tender provides for adhoc payment of R.A. bills, adhoc payment shall be made by the Bank after due certification by the Architects after observing the following formalities:
  - a) A certificate for adhoc payment representing the percentage mentioned in the contract of the net amount payable shall be obtained from the architects.
  - b) The Premises Department shall exercise a preliminary check on the bill including recovery statement for any materials supplied, and all other recoveries to be made from the bill as per agreement.
  - c) It shall be ensured that the payment of bills including adhoc payments are made within the time stipulated in the contract.
- vi) The bill along with measurement books duly certified by the architects received in the Premises & Estate Departments shall be processed for payment on priority basis:
  - a) The Concerned Engineer shall carry out arithmetical check of the bill in addition to complete verification of all relevant facts in regard to both tendered and non-tendered items, rates, advances, recoveries, rebates, insurance cover, and validity of Bank Guarantees etc. After satisfying himself about the correctness of the bill, he has to prepare Memorandum of payment.
  - b) He shall also ensure that (1) only approved extra/variation items are considered in the bill, (2) necessary certificates are recorded and (3) necessary test check measurements are done by the architects and Bank's Engineer.
  - c) The payment shall thereafter be released after taking into account the adhoc payment made, if any. After the bill is passed for payment, the contractor shall be advised of the details like gross amount of the bills paid so far, gross amount of particular bill passed along with details of recoveries.
  - d) While passing a bill for payment, if the gross amount of the bill exceeds the sanctioned cost including the contingencies, the payment shall be restricted to the sanctioned amount and after obtaining the additional sanction from the earlier sanctioned authority the balance amount may be released.

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- vii) In terms of the relevant provision of the Income Tax Act 1961, all payments made against the bills shall be subject to the recovery of income Tax and surcharge as specified by the I.T. Department. The amount so deducted shall be credited to the Government account and a certificate of deductions shall be given to the contractor. All statutory recoveries including labour cess etc. are affected from the gross values of the bill.
- viii) The Architect shall ensure that the final bills are obtained from the contractors as early as possible after the virtual completion certificate with a view to settle the bill within the stipulated period of three months/contractual conditions.
- ix) While scrutinizing the final bill, the following checks shall be exercised:
  - a) That the architects have issued the virtual completion certificate for the work.
  - b) That extension of time, if any, beyond scheduled date of completion has been granted by the competent authority.
  - c) That where the invocation of Liquidity damages clause has been decided upon, the recovery of liquidated damages has been affected.
  - d) That the contractors have submitted the necessary guarantees/undertakings/test certificates as required in terms of contract.
  - e) That all advances including mobilization advance are recovered in full. The interest component as applicable shall also be recovered.
  - f) That there are no outstanding recoveries against the contractors on account of water, electricity, telephone charges or damages to fittings/fixtures or any other account as specifically provided for in the agreement.
  - g) That all receipt for refundable deposits, if any, paid by the contractors on behalf of the Bank, have been submitted by the contractor to the Bank, so that the Bank may pursue with the concerned authorities, for obtaining refund of the same.
  - h) That the required check measurements have been carried out in the MBs and the fact recorded in the MB.
  - i) That the contractors have been given a certificate to the effect that "Accepted in full and final settlement of all claims".
  - j) Income Tax, Sales tax on works contract, Labour cess or any other tax as per terms of contract are recovered as per the statutory regulations.
  - k) That the total cost of work is within the sanction, If not, revised sanction has to be obtained before releasing the payment to the contractor.
  - l) Two sets of executed plans.

**36.0 Settlement of Disputes and Arbitration:**



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Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the work or the execution or failure to execute the same, whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter :

- i) If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Architect or in case the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the Contractor shall forthwith give notice in writing of his claim, or dispute to the Assistant General Manager (Premises& Estate)/Dy. General Manager (Premises)and endorse a copy of the same to the Architect, within 30 days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the contractor shall not be entitled to raise any claim nor shall the Bank be in any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to the Assistant General Manager (Premises& Estate)/Dy. General Manager (premises) in the manner and within the time as aforesaid. The contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to the Assistant General Manager (Premises & Estate) / Dy. General Manager (Premises) in writing in the manner and within the time aforesaid.
- ii) The Assistant General Manager (Premises & Estate) / Dy. General Manager (Premises) shall give his decision in writing on the claims notified by the contractor. The contractor may within 30 days of the receipt of the decision of the Assistant General Manager (Premises& Estate) / Dy. General Manager (Premises) submit his claims to the conciliating authority namely the Circle Development Officer/General Manager (Official Language & Corporate Services) for conciliation along with all details and copies of correspondence exchanged between him and the Assistant General Manager (Premises& Estate)/Dy. General Manager (Premises)
- iii) If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned Chief General Manager/Dy. Managing Director (HR) & Corporate Development Officer of the Bank for appointment of an arbitrator to adjudicate the notified claims failing which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.
- iv) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the Chief General Manager at LHO /Dy. Managing Director &Corporate Development Officer at CC/CCEs. It will also be no objection to any such appointment that the Arbitrator

so appointed is a technically competent person not below the rank of Superintending Engineer or equivalent position in Public Sector Banks / CPSEs, CPWD, LIC, RBI etc. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said Chief General Manager/ Dy. Managing Director (HR) & Corporate Development Officer. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

- v) It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.
- vi) It is also a term of this contract that no person other than a person appointed by such Chief General Manager aforesaid should act as arbitrator.
- vii) The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any statutory modification or re-enactment thereof and the rules made there under. viii) It is also a term of the contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties.
- ix) It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid.

**37.0 Water Supply:** The contractor shall make his own arrangement for the water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions:

i.. The contractor shall make alternative arrangements for the supply of water if the arrangement made by the contractor for procurement of water in the opinion of the Architect / Consultant is unsatisfactory. If the contractor uses water for the execution of the work, from the source of the employer, recover @0.5% of the bill for water charge shall be affected from the running bill of the contractor from time to time, as applicable.

**38.0 Power supply:** The contractor shall make his own arrangements for power and supply/distribution system for driving plant or machinery for the work and for lighting purpose at his own cost. The cost of running and maintenance of the plants are to be included in his tender prices. He shall pay all fees and charges required for the power supply and include the same in his tendered rates and hold the owner free from all such costs. He has to obtain necessary approvals from the appropriate authorities, if required. If the contractor uses electrical power from the source of the employer, recover 0.5% of the bill for electricity consumption shall be affected from the running bill of the contractor from time to time.

**39.0 Treasure Trove etc.:** Any treasure trove, coin or object antique which may be found on the site shall be the property of SBI and shall be handed over to the SBI immediately.

**40.0 Method of Measurement:** Unless otherwise mentioned in the schedule of quantities or in mode of measurement, the measurement will be on the net quantities or work produced in accordance with up to date. Rules laid down by the Bureau of Indian standards. Measurement shall be as per units of measurement in specification. IS 1200 may be followed if there is any discrepancy. **For steel**, it shall be measured in weight in kg and no allowance is made in the weight for rolling margin. Wastage, binding wires shall not be measured.

**41.0 Maintenance of Registers:** The contractor shall maintain the following registers as per the enclosed format at site of work and should produce the same for inspection of SBI /Architect whenever desired by them. The contractor shall also maintain the records/registers as required by the local authorities/Government from time to time.

**42.0 PRICE VARIATION ADJUSTMENT (PVA) FOR ALL MATERIALS (INCLUDING CEMENT & STEEL) & LABOUR**

**(NOT APPLICABLE FOR THIS PROJECT)**

**43.0 Force Majeure:**

43.1 Neither contractor nor SBI shall be considered in default in performance of their obligations if such performance is prevented or delayed by events such as war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of god or for any other cause beyond the reasonable control of the party affected or prevented or delayed. However a notice is required to be given within 30 days from the happening of the event with complete details, to the other party to the contract, if it is not possible to serve a notice, within the shortest possible period without delay.

43.2 As soon as the cause of force majeure has been removed the party whose ability to perform its obligations has been affected, shall notify the other of such cessation and the actual delay incurred in such affected activity adducing necessary evidence in support thereof.

43.3 From the date of occurrence of a case of force majeure obligations of the party affected shall be suspended during the continuance of any inability so caused. With the cause itself and inability resulting there from having been removed, the agreed time of completion of the respective obligations under this agreement shall stand extended by a period equal to the period of delay occasioned by such events.

43.4 Should one or both parties be prevented from fulfilling the contractual obligations by a state of force majeure lasting to a period of 6 months or more the two parties shall mutually decide regarding the future execution of this agreement.

**44.0 Local Laws, Acts, Regulations:** The contractor shall strictly adhere to all prevailing labour laws inclusive of contract labour (regulation and abolition act of 1970) and other safety regulations. The contractor shall comply with the provision of all labour legislation including

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the latest requirements of all the Acts, laws, any other regulations that are applicable to the execution of the project.

- i) Minimum Wages Act, 1948 (Amended)
- ii) Payment of Wages Act 1936 (Amended)
- iii) Workmen's Compensation Act 1923 (Amended)
- iv) Contract Labour Regulation and Abolition Act 1970 and Central Rules 1971(Amended)
- v) Apprentice Act 1961 (Amended)
- vi) Industrial Employment (Standing Order) Act 1946 (Amended)
- vii) Personal Injuries (Compensation Insurance) Act 1963 and any other modifications
- viii) Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof
- ix) Shop and Establishment Act
- ix) Any other Act or enactment relating thereto, and rules framed there under from time to time.

### **45.0 SAFETY CODE & MEASURES AT SITE:**

1. All personnel at site should be provided with Helmets and Safety Boots with some Identification Mark. Visitors also should be provided with Helmets. It should be ensured that these are used properly.
2. First Aid Box should be kept at site with all requisite materials.
3. No one should be allowed to inspect / work at a height without Safety Belt.
4. Suitable scaffolds should be provided for workmen for all Works that cannot safely be done from the ground, or from solid construction except such short period Work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well as suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than  $\frac{1}{4}$  to 1 ( $\frac{1}{4}$  horizontal and 1 vertical).
5. Scaffolding or staging more than 3.5 meters above the ground or floors, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 Meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
6. Working platforms, Gangways, and Stairways should be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Gangway or the

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Stairway is more than 3-5 Meters above ground level or floor level they should be closely boarded, should have adequate width and should be suitably fenced, as described.

7. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 Meter.
8. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 Meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder up to and including Meters in length. For longer ladders this width should be increased at least 6mm for each additional 30 CMS. Uniform step spacing shall not exceed 30 CMS.
9. Adequate precautions shall be taken to prevent danger from electrical equipment. For electrical on line works gloves, rubber mats, and rubber shoes shall be used.
10. All trenches 1.2 Meters or more in depth shall at all times be supplied with at least one ladder for each 30 Meters length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 Meter above the surface of the ground. The sides of the trenches, which are 1.5 Meters or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 Meters of the edge of the trench or half of the depth of the trench whichever is more cuttings shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.
11. Before any demolition work is commenced and also during the process of the work: -
  - a) All roads and open areas adjacent to the Work Site shall either be closed or suitably protected;
  - b) No electrical cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
  - c) All practical steps shall be taken to prevent danger to persons employed from risk or fire or explosion or flooding. No floor, roof or other part of the building shall be so over-loaded with debris or materials as to render it unsafe.
  - d) All necessary personal safety equipment as considered adequate by the Site Engineer should be kept available for the use of the persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.
  - e) Workers employed on mixing Asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
  - f) Those engaged in white washing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.
  - g) Those engaged in welding works shall be provided with Welder's protective eye-shields.

h) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

i) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals and boards to prevent accident to the Public.

12. Use of hoisting machines and tackle including their attachments, anchorage and support shall conform to the following standard or condition: -

a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repairs and in good working order.

b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

c) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffold, winch or give signals to the operator.

d) In the case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension the safe working load shall be ascertained by adequate means.

e) Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load of the conditions under which it is applicable shall be clearly indicated. No part of any machine or of any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

f) Motor, Gearing, Transmission, Electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load, adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.

g) When workers are employed on electrical installation, which is already energized, insulating mats, wearing apparel such as gloves, rubber footwear etc.

**46.0 Accidents:** The contractor shall immediately on the occurrence of any accident at or about the site or in connection with the execution of the work report such accident to the Architect/Consultant. The contractor shall also report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

**47. Assignment Subletting:** The whole of the works included in the contract shall be executed by the composite contractor and the same shall not directly or indirectly transfer, assign or underlet therein without the written permission of the bank and no undertaking shall relieve the contractor from any liability or obligation under the contract. No subletting of the work is permitted.

**48. BANK'S BUILDING PROJECTS-MAINTENANCE OF RECORDS AT SITE OFFICE**

<b>A.</b>	<b>Registers at the site office</b>
1	Measurement Books.
2	GI sheet/Steel Pipe/Materials Register at site
3	Drawings register
4	Hindrance Register.
5	File and Register for extra / variation items.
6	Materials test Register and File.
7	Site Order Book (in triplicate).
8	Labour Reports and progress Reports Register.
9	Site Visit & Instructions Register.
10	Certified true copies of the contracts.

**SPECIAL CONDITIONS OF THE CONTRACT (SCC)**

1	<b>Dimensions and levels:</b> All dimensions and levels shown on the drawings shall be verified by the contractor on the site and he will be held responsible for the accuracy and maintenance of all the dimensions and the levels. Figured dimensions are in all cases to be accepted and no dimension shall be scaled. Large-scale details shall take precedence over small-scale drawings. In case of discrepancy, the contractor shall ask for clarification from the Architect / Consultant before preceding the work.
2	<b>Notice of Operation:</b> The contractor shall not carry out any important operation without the consent in writing from the Architect / Consultant.
3	<b>Construction/Erection Records:</b> The contractor shall keep and provide to the Architect / Consultant full and accurate records of the dimensions and positions of all new work and any other information necessary to prepare complete drawings recording details of the work as constructed.
4	<b>Safety of Adjacent Structures and Trees:</b> The contractor shall provide and erect to the approval of the Architect / Consultant such supports as may be required to protect effectively all structures and protective guards to trees which may be endangered by the execution of the works or otherwise take such permanent measures as may be required by the Architect to protect the trees and structures.
5	<b>Site Order Book:</b> A site order book shall be maintained at the site for the purpose of quick communication between the Architect / Consultant. Any communication relating to the works may be conveyed through records in the site order book. Such a communication from one party to the other shall be deemed to have been adequately served in terms of the contract. Each site order book shall have machine numbered pages in triplicate and shall be carefully maintained and preserved by the contractor and shall be made available to the Architect / Consultant as and when demanded. Any instruction which the Architect / Consultant may like to issue to the contractor or the contractor may like to bring to the Architect / Consultant two copies of such instructions shall be taken from the site order book and one copy will be handed over to the party against proper acknowledgement and the second copy will be retained for their record.
6	<b>Temporary Works:</b> Before any temporary works are commenced the contractor shall submit at least 7 days in advance to the Architect / Consultant for approval complete drawings of all temporary works he may require for the execution of the works. The contractor shall carry out the modifications relating to strength, if required by the Architect / Consultant may require in accordance with the conditions of the contract at his own cost. The contractor shall be solely responsible for the stability and safety of all temporary works and unfinished works and for the quality of the permanent works resulting from the arrangement eventually adopted for their execution.
7	<b>Water, Power and Other Facilities:</b>
7.a	The rate quoted by the contractor shall include all expenses that are required for providing all the water required for the work and the contractor shall make his own arrangements for the supply of good quality water suitable for the construction and good quality drinking water for their workers. If necessary, the contractor has to sink



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	a tube well / open well and bring water by means of tankers at his own cost for the purpose. The SBI will not be liable to pay any charges in connection with the above.
7.b	The rate quoted in the tender shall include the expenses for obtaining and maintaining power connections and shall pay for the consumption charges.
7.c	The contractors for other trades directly appointed by the SBI shall be entitled to take power and water connections from the temporary water and power supply obtained by the contractor. However, the concerned contractor shall make their own arrangements to draw the supply and pay directly the actual consumption charges at mutually agreed rates between them. All municipal charges for drainage and water connection for construction purposes shall be borne by the contractor and charges payable for permanent connections if any, shall be initially paid by the contractor and the SBI will reimburse the amount on the production of receipts.
7.d	The SBI as well as the Architect / Consultant shall give all possible assistance to the contractors to obtain the requisite
7.e	Permission from the various authorities, but the responsibility for obtaining the same in time shall be of the contractor
7.f	If the contractor uses water/ electrical power from the source of the employer, recover @0.5% for water charge and 0.5% for electricity consumption shall be affected from the running bill of the contractor from time to time
<b>8</b>	<b>Office Accommodation</b>
8.a	A site office, if possible, for the use of SBI / Consultant shall be provided by the contractor at his own expense.
8.b	All the expenses for obtaining statutory approvals and maintenance of the above facilities as well as running expenses shall be borne by the contractor at no extra cost. It is also the responsibility of the contractor to obtain statutory approvals for providing the above facilities.
<b>9</b>	<b>Facilities for Contractor's employees:</b> The contractor shall make his own arrangement for the housing and welfare of his staff and workmen including adequate drinking water facilities. The contractor shall also make the arrangements at his own cost for transport where necessary for his staff and workmen to and from site of work at his own cost.
<b>10</b>	<b>Lighting of works:</b> The contractor shall at all times provide adequate and approved lighting as required for the proper execution and supervision and inspection of work.
<b>11</b>	<b>Firefighting arrangements</b>
11.a	The contractor shall provide a suitable arrangement for firefighting at his own cost. For this purpose, he shall provide requisite number of fire extinguishers and adequate number of buckets, some of which are to be always kept filled with sand and some with water. This equipment shall be provided at suitable prominent and easily accessible places and shall be properly maintained.

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11.b	Any deficiency in the fire safety or unsafe conditions shall be corrected by the contractor at his own cost and with the approval of the relevant authorities. The contractor shall make the following arrangements at his own cost but not limited to the following.
11.c	Proper handling, storage, and disposal of combustible materials and waste. Work operations that can create fire hazard. Access to firefighting equipment, type, number and location of containers for the removal of surplus materials and rubbish. Type, size, number, and location of fire extinguishers or other firefighting equipment. General housekeeping.
12	<b>Temporary Fencing / Barricading:</b> The contractor shall provide and maintain a suitable temporary fencing / barricading and gates at his cost to adequately enclose all boundaries of the site for the protection of the public and for the proper execution and security of the work and in accordance with the requirement of the Architect / Consultant and regulations of local authorities. These shall be altered, relocated and adopted from time to time as necessary and removed on completion of the work.
13	<b>Site Meetings:</b> Site meetings will be held to review the progress and quality evaluation. The contractor shall depute a senior representative along with the site representative and other staff of approved sub-contractors and suppliers as required to the site meetings and ensure all follow up actions. Any additional review meetings shall be held if required by the Architect / Consultant.
14	<b>Disposal of Refuse:</b> The contractor shall cart away all debris, refuse etc. arising from the work from the site and deposit the same as directed by the Architect / Consultant at his own cost. It is the responsibility of the contractor to obtain from the local authorities concerned to the effect that all rubbish arising out of contractor's activities at the construction site or any other off-site activities borrow pits has been properly disposed of.
15	<b>Contractor to Verify Site Measurement:</b> The contractor shall check and verify all site measurements whenever requested by other specialists' contractors or other sub-contractors to enable them to prepare their own shop drawings and pass on the information with sufficient promptness as will not in any way delay the works.
16	<b>As-built drawings:</b>
16.a	The Architect / Consultant will issue two sets of drawings to the contractor for the items for which some changes have been made from the approved drawings as instructed by the SBI / Architect. The contractor will make the changes made on these copies and return these copies to the Architect / Consultant for their approval. In case any revision is required or the corrections are not properly marked the Architect / Consultant will point out the discrepancies to the contractor. The contractor will have to incorporate these corrections and / or attend to discrepancies either on the copies as directed by the Architect / Consultant and resubmit to him for approval. The Architect / Consultant will return one copy duly approved by him.
16.b	For the drawings prepared by the contractor. The contractor will modify the drawing prepared by him wherever the changes are made by the SBI / Architect / Consultant and submit two copies of such modified drawings to the Architect / Consultant for approval. The Architect / Consultant will return one copy of the approved drawing to the contractor.

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17	<b>Approved make:</b> The contractor shall provide all materials from the list of approved makes at his own cost and also appoint the specialized agency for the waterproofing anti-termite, aluminum doors and windows and any other item as specified in the tender. The Architect / Bank may approve any make / agency within the approved list as given in the tender after inspection of sample / mock up.
18	<b>Procurement of materials:</b> The contractor shall make his own arrangements to procure all the required materials for the work. All wastage and losses in weight shall be to the contractor's account.
19.	<b>Excise duty, taxes, levies etc.:</b> The contractor shall pay and be responsible for payment of all taxes, duties, levies, royalties, fees, cess or charges in respect of the works including but not limited to sales tax, tax on works contract excise duty, and octroi, payable in respect of materials, equipment plant and other things required for the contract. All of the aforesaid taxes, duties, levies, fees and charges shall be to the contractor's account. Variation of taxes, duties, fees levies etc. if any, till completion of work shall be deemed to be included in the quoted rates and no extra amount on this account. Variation of taxes, duties, fees, levies etc if any, till completion of work shall be deemed to be included in the quoted rates and no extra claim on this account will in any case be entertained. If a new tax or duty or levy or cess or royalty or octroi is imposed under as statue or law during the currency of contract the same shall be borne by the contractor.
20	<b>Acceptance of Tender:</b> The SBI shall have right to reject any or all tenders without assigning any reason. They are not bound to accept the lowest or any tender and the tenderer or tenderers shall have no right to question the acts of the SBI.
21	<b>Progress report shall be submitted monthly:</b> The contractor shall furnish Bar chart/PERT chart for completion of work within stipulated time that is within 7 days of issue of LOI/ WO. This will be got approved from architect/Bank. The approved bar/PERT chart shall form a part of agreement. Achievement of miles stones as well as total completion has to be within the time period allowed, that is 8 calendar months.  Contractor shall mobilize and employ sufficient resources for completion of all the works as indicated in the agreed BAR chart/ Network. During the currency of the work, the contractor is expected to adhere to the time schedule on miles stone and total completion and his adherence will be a part of contractor's performance under the contract..
22	<b>Photograph:</b> Site photographs of works substantiating the progress to be preserved and shall be submitted to the architect/ EIC (one copy shall be attached during submit of bills).
23	<b>Reports and returns:</b> The contractor shall maintain at-site records of the progress of work with regard to the works carried out. Contractor shall submit fortnightly / monthly (as directed by architect/ EIC) progress reports (Two copies) highlighting status of various activities and physical completing of the work. These will be used as the basis for the preparation of measurements which are to be furnished to the architect / employer regularly in the form of progress report forms (Bar chart including %age of completion, hurdles, etc. Enlarged site photographs shall also be submitted.
24	<b>Government and local rules:</b> The contractor shall conform to the provisions of all local bye-laws and acts relating to the work and to the regulations etc., of the govt and local authorities and of any

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	company with whose system the structure is proposed to be connected. The contractor shall give all notices by said act, rules, regulations and bye-laws etc and pay all fees payable to such authority/authorities for execution of work involved.
26	<b>Provisional Sum (PS):</b> All provisional sum described in the schedule of quantities as P.S. shall be exclusively allotted to the purchase of materials and not for handling and fixing to be done by the contractor. Such cost of handling and fixing with profit including transportation charge required shall be separately included in the contract price as described in SOQ. The disposal of the amounts covered under the head will be absolutely at the discretion of the employer. Contractor is to make payments for these materials to the suppliers on certificate basis or order issued by the employer /architect and realize then through his bills from the employer.
27	<b>Removal of improper works:</b> The employer shall during the progress of work have power to order in writing from time to time. The removal from the works within such reasonable time or times as may be specified in the order of any materials which in the opinion of architect/employer are not in accordance with the specification or the instructions the substitution or proper execution of any work executed with materials or workmanship not in accordance with the drawings and specifications or instructions. No certificate which may be given by the architect shall relieve the contractor from his liability in respect of unsound work.
29	<b>Account receipt and vouchers:</b> The contractor shall upon the request of the employer furnish them with all the invoices, accounts, receipts and other vouchers that they may require in connection with the works under this contract. If the contractor uses materials less what is required under the contract, the value of difference in the quantity of materials he was required to use and that he actually used shall be deducted from his dues. Similarly, if the contractor uses material more than the requirement, the excess material used (5% wastage will be considered) will be reimbursed to contractor upon production of vouchers (excluding GST). The employer decision shall be final and binding on the contractor as to the mount of materials the contractor is required to use for any work under this contract.
30	<b>Escalation:</b> The rate quoted shall be firm throughout the tenure of the contract (inclusive of extension of time If any granted) and will not be subject to any fluctuation due to increase in cost of materials, labour, taxes, octroi, transportation on work contract unless specifically provided in these documents.
31	<b>Drawings and specifications:</b> The contractor shall be furnished by the architect free of cost one sets of each of the drawings, specifications, descriptions of schedules and other details necessary for execution of work. The contractor shall provide all his cost everything for the proper execution of works according to the intents and meaning of drawing, schedule, specification taken together whether same may or may not be shown or described therein provided that the same reasonably inferred therefrom and if the contractor finds any discrepancy in the drawings or between drawings, schedule of quantities and specifications, he shall immediately and in writing refer the same to the architect. The decision of architect/ employer shall be final and binding.
32	<b>Abandonment- curtailment of work:</b>

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	<p>If at any time after issue of WO, the employer for any reason whatsoever not required part or whole of the work as specified in the contract to be carried out, the architect/employer shall give notice in writing of the fact to the contractor who shall have no claim to payment of any compensation whatsoever on account of profit or advantage which he might have derived from the execution of work in full, provided that the contractor will be paid transport charges of any Bonafede materials actually brought at site and rendered surplus abandonment or curtailment and there taken back by the contractor, the quality and kind of such material rendered surplus is to be certified by the architect whose decision shall be final and binding.</p>
33	<p><b>Payment withheld:</b> The Bank's engineer may withheld the amount on account of a subsequent discovered evidence nullify the whole or part of any certificate to such extent as may be necessary in his opinion to protect the employer from loss on account of:</p> <ul style="list-style-type: none"><li>a). Defective work not remedied;</li><li>b). Failure of the contractor to make payment properly to sub-contractor for materials or labour or supplier,</li><li>c). A reasonable doubt that the contract can be completed for the balance then unpaid,</li><li>d). Damages to another contractor or sub-contractor, claims filed or reasonable evidence indicating probable fillings of claims. When grounds are removed, payment shall be made for amounts withheld because of them.</li></ul>
34	<p><b>Advance payments:</b> Advance payment will be made to the contractor against the materials as state in clause no. 35 of GCC.</p>
35	<p><b>Inspection of work</b> The proposed work covered under this tender during its progress can also be inspected by the Chief Technical Examiner/ Technical examiner or by an officer of the vigilance cell of authority on behalf of the Bank.</p>
36	<p><b>Failure by contractor to comply with Bank's/ Architect instructions:</b> If the contractor after receipt of written notice from the bank and / or the architect requiring compliance within 10 days fails to comply with such further drawings and/or Bank's /architects instructions, the Bank through the architect or other person, may employ other person to execute any such work whatsoever that may be necessary to give effect thereto and pay all cost incurred in connection therewith and same shall be recoverable from the contractor by the bank on the certificate of the architect as a debt or shall have right to deduct same from any moneys due to or to become due to contractor</p>
37	<p><b>Permits, licences and possession prior to completion:</b> Permits and licences that are required to execute this work which are under government control, will be arranged by the contractor. The Bank will render necessary assistance, sign any forms or applications that may be necessary. The Bank shall have right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be an acceptance of any work not completed in accordance with the contract agreement.</p>
38	<p><b>Guarantee for the specialized works:</b> Whether provision for submission of a guarantee has been advised, the same shall be submitted from the specialized agency along with counter guarantee by the main contractor engaged for the work. The guarantee shall be furnished on a non-judicial stamp paper of appropriate value. If the contractor is required to submit the guarantee for any item/items for a period of more than 12months, the guarantee in case of</p>

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	those items will be valid after expiry of the <b>Defect Liability Period of 12</b> months as stipulated in contract.
39	<b>Tests, results and site register:</b> The contractor is required to maintain the list of registers at site of work, as aforesaid and should produce the same for inspection of the Bank/architect whoever desired by them:
40	IT/CESS/Other tax, as applicable, shall be deducted from the bill of the contractor as per Govt rule.
41	<b>Agreement:</b> The contractor shall execute the agreement as per draft agreement within 15 days of issue of WO. He shall pay all stamp and legal expense incidental thereto. However, the written acceptance of the tender by the employer/ consultant on behalf of employer will constitute a binding contract between the employer and the person so tendering whether such formal agreement is or is not subsequently executed.
42	<b>No compensation for alteration in or restriction of work to be carried out:</b> If at any time after the commencement of work, it is felt by the Bank/architect for any reason whatsoever, not require the whole work thereof as specified in the tender to be carried out, the architect/bank shall give notice in writing of the fact to the contractor who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage with which he might have derived from the execution of work in full, but which he did not derive in consequences of the full amount of work not having been carried out: neither he shall have claim for compensation by reason of any alteration having been made in the original specification, drawing, design, and instructions which shall involve any curtailment of the work as originally contemplated.
43	<b>Declaration:</b>  I/we have inspected the site of works and have made me/us fully acquainted with the local conditions in and around the sites of works. I/we hereby declare that I/we have gone through the conditions laid down in the NIT. GCC, SCC and additional terms and conditions, drawings, and specifications and understood the said, and in the basis of the same I/we quoted rates in SOQ attached with the tender document. I/we shall also uniformly maintain such progress with the work as may be directed by the Bank/architects to ensure completion of same within the target date as mentioned in the tender document.
44	<b>Contractor to provide everything necessary:</b> The contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, schedule of quantities, and specifications are taken together whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred therefrom and if the contractor finds and discrepancies therein, he shall immediately and in writing refer the same to the architect and employer whose decision shall be final and binding. The contractor shall provide himself with ground and fresh water for carrying out the works at his own cost. Percentage rate quoted is applicable on each individual items will be inclusive of everything necessary to complete the said items of work within the contemplating of the contract and beyond the unit price to extra payment will be allowed for incidental or contingent work, labour, and or materials, inclusive of all taxes and duties whatsoever except for specific items if any stipulated in the tender document.
45	<b>Tenders:</b> The works will be paid for as “Measured work” on the basis of actual work done and not a lumpsum contract. The tender is strictly on percentage rate basis

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	<p>and it should be workable and self-supporting. Details analysis shall be submitted by the contractor if called upon by the architect/ employer. The employer/architects shall not be bound to recognize the contractors' analysis.</p> <p>All items of work described in the Schedule of Quantities/BOQ are to be deemed and paid as complete works in all respects and details including preparatory and finishing works involved, directly, related, to and reasonably detectable from drawings, specifications, and schedule of quantities and no further charges in the tender in respect of any item of works, the payment of such items of work will be made for the actual work done on the basis of lumpsum charges as will be assessed to be payable by the employer/architect.</p> <p>The employer has power to add or to omit from any work as shown in drawings or described in specifications or included in the schedule of quantities and intimate the same in writing but no addition, omission or variation shall be made by the contractor without authorization from the employer. No variation shall vitiate the contract.</p>
46	<p><b>Other persons engaged by the employer:</b> The employer reserves the right to execute any part of work included in the contract or any work which is not included in this contract by other agency or persons and the contractor shall allow all reasonable facilities and use of his scaffolding for the execution of such work. The main contractor shall extend all cooperation in this regard.</p>
47	<p><b>Tools, storage materials, protective works, and site office, if required:</b></p> <p>The contractor shall provide, fix up and maintain in an approved position proper office accommodation for the contractor's representative and staff to receive instructions notices or communications and clear away on completion of the works and make good all works disturbed. Temporary hut for the watchman and clear away when no longer required and to provide all necessary attendance lights etc required shall be provided. Temporary latrines for workers and field staff and keep the same in a clean and sanitary condition to the satisfaction of public health authorities.</p> <p>The contractor shall indemnify the employer against any possible damages to the building, roads or members of the public in course of execution of the work.</p> <p>The contractor shall provide and maintain proper sheds for the proper staging and adequate protection of the materials etc and other works that may be executed on the site including tools, and materials of sub-contractor removal of shade after completion of work.</p>
48	<p><b>Notice and patents of appropriate authority and banks:</b></p> <p>The contractor shall conform to the provision of acts of legislation relating to the work and to the regulation and bye-laws of any authority, and or any water, lighting, and other companies and/or authorities with whose systems the structures were proposed to have connection and shall before making any variations from the drawings or specifications that may be associated to so conform give employer/architects written notices specifying the variations proposed to be made and the reasons for making them and apply for instruction thereon. The employer/architect on receipt of such intimation shall give a decision within a reasonable time.</p> <p>The contractor shall arrange to give notices requires for by the said acts, regulations or bye-laws to be given to any authority and to pay such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipt with the employer.</p>
49	<p><b>The contractor immediately to remove all offensives matters:</b></p> <p>The contractor shall arrange for the disposal of the all waste material/scraps so accumulated to the satisfaction of the employer and local authority and no claims will be entertained afterwards if he does include in this rate for the purpose.</p>
50	<p><b>Access:</b> Any authorized representative of the employer shall at all reasonable times have free access to the works and/or to the workforce, factories, or other places</p>

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	where materials are being prepared or constructed for the works and also to any places where materials are being prepared or constructed for the work and also to any place where the materials are lying or from where they are being obtained for inspection, examination and test of the materials and workmanship.
51	<b>Materials, workmanship and samples, testing of materials/final measurement:</b> The contractor shall have to carry out tests on materials and workmanship in approved materials testing laboratories or as prescribed by the employer/architects in approved material testing laboratories or as prescribed by the employer/ architects at his own cost to prove that the materials, etc under test conform to the relevant IS standards as specified in the specifications.
52	<b>Contractor's employee:</b> the contractor shall employ technically qualified and competent supervisors for the work who shall be available (In turn) throughout the working hours to receive and comply with instructions of the employer/ architects. The contractor shall engage in the execution of the work. The contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job effectively. The contractor shall employ local labours on the work as far as possible. No labour below the age 18 years and who is not an Indian national shall be employed on the work. The contractor shall comply with the provision of the Payment of Wages act, Employees liability act, Workman compensation act, control labour (regulation and abolition) act-1970 and central rules-1971, and The Apprentice act-1961.
53	<b>Dismissal of workman:</b> The contractor shall on the request of the employer immediately dismiss from works any person employed thereon by him who may in the opinion of the employer be not suitable or incompetent or who may misconduct himself such discharge shall not be basis of any claim for compensation or damages against the employer or any of their offices or employer.
54	<b>Damage to person and property, insurance etc:</b> The contractor shall be responsible for all injury to the work or workmen to persons, animals or things and for all damages to the structural and/or decorative part of the property which may arise from the operations or neglect or himself of any sub-contractor or of any of his sub-contractor's employees, whether such injury or damages arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this contract. The clause shall be held to include inter-alia any damage to the building work forming the subject of this contract by rain, wind, earthquake, or other inclemency of the weather. The contractor shall indemnify the employer and hold harmless in respect of all and any expenses arising from any such injury or damages to persons or property as aforesaid and any expenses arising out from any injury or damages to the person or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of compensation or damage consequent upon the such claim. The employer shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or any from or in respect of any such claims or damages from any sums due to or to become due to the contractor.
55	<b>Payments:</b> All interim payments shall be regarded as advance payments, if released on ad-hoc basis without conducting any joint measurement due to time constraints of all stake holders i.e Contractor, Architect & Employer. However, any advance payment if paid shall be governed by clause 35 of GCC.



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56	<b>Final payment:</b> The final bill shall be accompanied by a certificate of completion from the Employer/Architect. The acceptance the final bill by the contractor would indicate that he will have no further claim in respect of the work executed.
57	<b>Variation/ deviation:</b> quantities may be increased or decreased depending on site conditions and employer requirements
58	<b>Substitution:</b> Should the contractor desire to substitute any materials and workmanship, he/they must obtain the approval of the employer/architects in writing for any such substitution well in advance. Material designed in this specification indefinitely by such term as equal or other approved etc specific approval of the employer/architects has been obtained in writing.
59	<b>Preparation of building works for occupation:</b> The whole of the work will be thoroughly inspected by the contractor and the deficiencies and defects put right. On completion of such inspection, the contractor shall inform the employer that he has completed the work and it is ready for inspection.
60	<b>Clearing of the site on completion:</b> On completion of work, the contractor shall clear away and remove from the site all constructional plants and equipment. 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 employer/architects.
61	<b>Concealed work:</b> The contractor shall give due notice to the employer/architect whenever any work is to be buried in the earth concrete or in the bodies of walls or otherwise becoming inaccessible later on, in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall at the opinion of the employer/architect be either opened up for measurement at the contractor” expenses or no payment may be made for such materials.
62	<b>Idle labour:</b> whatever the reasons may be, no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entered under any circumstances.
63	<b>Nomination subcontractor:</b> No subletting of the work is permitted.
64	<b>Notice of any claim:</b> The contractor shall submit within seven days, in case there is any instance for which the contractor considers himself entitled to or likes to prefer claim for additional payment, a statement giving particulars as full and detailed as possible to enable the architect/employer verification, admissibility and assessment failing which no claims will be entertained.
65	<b>Final claims:</b> Not later than 90 days the issue of the completion certificate the contractor shall submit to the architect/employer a statement of final account with supporting documents showing in detail the value of work done in accordance with the contract together with all considers due to him.
66	<b>Certificate of completion:</b> When the whole of the works have been substantially completed and satisfactorily passed any final test that may be prescribed in the contract, the contractor shall give written notice to that effect to the architect /employer with an undertaking to finish any outstanding work during the DLP for issue of a certificate of completion in respect of the works. The architect / employer within 30 days of receipt of such either issue notice to the contractor with a copy to the employer, a certificate e of completion stating the date of completion on which in his opinion the above work substantially completed in terms of the contractor. Or, give instructions to the contractor specifying all the work which require to be done by the contractor before issue of the certificate. The contractor shall receive the certificate after completion of defect rectification work within 30 days of completing work.
67	<b>Opportunities for other agencies:</b> Employer reserves the right to let other contractors in connection with his work under similar general conditions. The contractor shall

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	afford other contractors' reasonable opportunity for the introduction and storage of their materials and execution of their work and shall properly be connected coordinate his work with them.
68	<b>Claims extra:</b> When any instruction or decision given at site involves an extra or where the contractor may plan to claim extra, it shall be the responsibility of the contractor to inform the architect of the extra amount and get written authorization from the architect before proceeding with the work involved.
69	<b>Superintendence supervision:</b> The contractor shall give all personal superintendence during the execution of the work and this obligation and liability will continue until expiration of the maintenance period. The contractor shall also during the whole time of work when in progress employ a competent representative who shall be constantly in attendance at the site while his men are at work. Any directions explanations, instructions or notices given by the Bank or the architect to such representative shall be deemed to have been given and duly served on the contractor.
70	<b>Possession prior to completion:</b> the bank shall have the right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be an acceptance of any work not completed in accordance with the contract agreement.
71	<b>Action where no specification:</b> In case of any class of work for which there is no such specification in technical specifications, such work shall be carried out in accordance with the CPWD specifications and in the event of there being no CPWD specifications, then in such case, the work shall be carried out in all respects in accordance with the instructions and requirements of the Bank/ architect.
72	<b>Technical examination:</b> the project work covered under this tender during its progress is subject to inspection by the CTE / Technical examiner/CVC, Govt of India or by an officer of the Vigilance cell of the Authority, the contractor will be required to extend all assistance or facilities for such inspections.

Signature of tenderer

Date

Address:

**ANNEXURE - 3**

**FORM 1**

**PROFORMA OF APPLICATION FOR REGISTRATION OF ESTABLISHMENT EMPLOYING CONTRACT LABOUR**

1	Name and location of the Establishment.	
2	Postal address of the Establishment.	
3	Full name and address of the Principal Employer. (furnish father's name in the case of individuals)	
4	Full name and address of the Manager or the person responsible for the supervision and control of the Establishment.	
5	Nature of work carried on in the Establishment.	
6	Particulars of Contractors and Contract Labour:	
(a)	Names and address of the Contractors	
(b)	Nature of work in which contract labour is employed or is to be employed.	
(c)	Maximum number of contract labour to be employed any day through each Contractor.	
(d)	Estimated date of commencement of each contract work under each Contractor.	
(e)	Estimated date of termination of employment of contract labour under each Contractor.	
7	Particulars of Treasury Receipt enclosed.(Name of the Treasury, Amount and Date)	

I hereby declare that the particulars given above are true to the best of my knowledge and belief.

Principal Employer  
Seal and Stamp

ANNEXURE – 4

FORM XII

PROFORMA OF REGISTER OF CONTRACTORS

1. Name and addresses of the Principal Employer \_\_\_\_\_
2. Name and address of the Establishment \_\_\_\_\_

Sr. No	Name address and of con- tractor the	Nature of work on contract	Location of contract work	Period of contract from to	Maximum number of workmen employed by the contractor

ANNEXURE – 5

PROFORMA OF SITE ORDER BOOK

Name of the work \_\_\_\_\_

Date of Commencement \_\_\_\_\_

<b>Sr. No</b>	<b>Remarks/ Instructions of the site Engineer/ Architect</b>	<b>Dated Initials of site Engineer/ Architect</b>	<b>Initials of the Contractor for having received the instructions</b>	<b>Action taken with date</b>	<b>Dated initials of the site Engineer</b>	<b>Remarks of the Architects PMC/ C.C. Officials</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

ANNEXURE - 6

**PROFORMA FOR APPLICATION BY CONTRACTOR FOR EXTENSION OF TIME**

1.	Name of the Contractor			
2.	Name of the work as given in the Agreement			
3.	Agreement WO			
4.	Tender amount			
5.	Date of commencement of work			
6.	Period allowed for completion as per agreement			
7.	Date of completion as per agreement			
8.	Period for which extension of time has been given			
		<u>Date</u>	<u>Month</u>	<u>Year</u>
	a)	1 <sup>st</sup> extension vide Bank's Letter No.		
	b)	2 <sup>nd</sup> extension vide Bank's Letter No.		
	c)	3 <sup>rd</sup> extension vide Bank's Letter No.		
9.	Reasons for which extensions have been previously given (copies of the previous applications should be attached)			
10.	Period for which extension is applied for and the reasons thereof including hindrances, time for extra work assigned, if any etc.			

Signature of Contractor

Recommendations of Architects

Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha.



**ANNEXURE – 8**

**CONTRACT EXECUTION**

**EXTENSION OF TIME PERIOD FOR THE WORK OF**

1.	Name of work & E.C. sanction	
2.	Name of Contractor	
3.	Contract Cost	
4.	Date & Reference of work order	
5.	Date of start of work(As per work order)	
6.	Time period as per tender	
7.	Scheduled Date of completion	
7.A	Interim schedule if any	
8.	No. of extensions	
9.	Date & Reference of last extension	
10.	Reasons for delay and period of delay for each reason including corrective action taken by Bank/Architect (quote & attach references wherever necessary) i) ii)etc	
11.	Total delay due to above	.....days
12.	Responsibility for each reason for delay (a) Bank (b) Architect (c) Contractor (d) unforeseen circumstance (e) force measures etc. and corrective action not been taken (Attach references of letters etc.)	
13.	Present status of work – Physical progress, % progress & cost of work remaining/ incomplete	
14.	Any interim schedule / milestone achieved	
15.	Any other hold/restraint envisaged in the completion of the remaining work. suggest corrective actions necessary	
16.	Recommendation for the no. of days of extension along with reasons	
17.	Financial loss to the Bank if any due to this extension and recommendations for liquidated damages if justifiable (State reasons)	



Engineer-in-charge

Recommendation approved

**ANNEXURE – 9**

**LETTER FOR GRANTING EXTENSION OF TIME**

To

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Dear Sirs,

**Bank's Office Building / Staff / Officer's Quarters under  
Construction at \_\_\_\_\_ work- Extension of Time**

Refer your letter No. \_\_\_\_\_ dated \_\_\_\_\_ in connection with the grant of extension of time for completion of the captioned work.

The date of completion of the above-mentioned work is \_\_\_\_\_ as stipulated in the contract. Extension of time for completion of the work upto \_\_\_\_\_ is, hereby granted by the Bank without prejudice to the right of the Bank to recover liquidated damages in accordance with the provisions of the contract.

Notwithstanding the extension hereby granted, time is and shall continue to be the essence of the said contract.

Yours Faithfully,

Architects

**ANNEXURE – 10**

**SPECIMEN OF LETTER GIVEN TO THE CONTRACTOR IN REGARD TO THE RECTIFICATION OF DEFECTIVE WORK AND REMOVAL OF SUBSTANDARD MATERIAL**

To

M/s. \_\_\_\_\_

\_\_\_\_\_

Sir,

**SUB: NATURE OF WORK**

I, whereas the above work has been awarded to you under the subject contract and the same is in progress/the same has been completed.

2. Whereas the items of works as detailed in schedule attached herewith have been executed with unsound, imperfect and unskillful workmanship/with materials of inferior description and that materials and/on articles provided for the execution of the work are unsound and of a quality inferior to the contracted for.

3. Whereas the materials and/or articles provided by you for execution of the work as detailed in the schedule hereto are unsound and of quality inferior to that contracted for.

4. Now you are hereby called upon to rectify or remove and reconstruct forthwith each item of work as detailed in the said schedule of work in whole or in part as the case may require with sound, perfect and skilful workmanship and/or with materials and articles of sound and proper quality as per the contract at your own cost and charge.

5. I, in exercise of the powers conferred on me by the aforesaid agreement, hereby give you notice to remove the cause set out above within..... days to my satisfaction falling which action will be taken against you under clause (8).....of the agreement. Yours faithfully,

Asstt. General Manager (Premises& Estate)

**FORMAT OF UNDERTAKING IN CONNECTION WITH PAYMENT OF ADVANCE  
ON MATERIALS BROUGHT BY THE CONTRACTOR TO THE SITE**

The Undertaking made this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_ between the State Bank of India, \_\_\_\_\_ and having its \_\_\_\_\_ office at \_\_\_\_\_ (hereinafter called the Bank ) of the one part and \_\_\_\_\_ (hereinafter called the contractors of the other part).

The Bank and the Contractors have entered into an Agreement dated \_\_\_\_\_ hereinafter called as the said agreement and in terms of Clause No. \_\_\_\_\_ of the conditions in the agreement, the Bank has agreed that the Contractors will be paid an advance of 75% of the cost of non-perishable building materials brought by the Contractor to the site for consumption in the works at the discretion of the Bank.

The Contractors have applied to the Bank that they be allowed advances on the security of materials absolutely belonging to them and brought by them to the site of work. The Bank has agreed to do so on the terms and conditions hereinafter set out.

Now this Letter of Undertaking witnesses that in consideration of the said agreement and in consideration of the amount paid / payable to the Contractors by the Bank and./ or any further advances as may be made to the Contractors as aforesaid, the Contractors hereby agree with the Bank and undertake as under :

- (i) The amount advanced by the Bank to the Contractors as aforesaid and all or any further sum or sums advanced as aforesaid shall be employed by the Contractors in or towards expediting the execution of the said works and for no other purpose whatsoever.
- (ii) That the materials which have been offered to and accepted by the Bank as security are absolutely the Contractor's own property and free from encumbrances of any kind and the Contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the Contractors indemnify the Bank against all claims to any materials in respect of which an advance has been made to them as aforesaid.
- (iii) That the materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractors solely in the execution of the said works in accordance with the directions of Assistant General Manager (Premises & Estate) of the Bank and in accordance with the terms of the said agreement.
- (iv) That the Contractors shall take at their own cost all the necessary and adequate arrangement for the proper watch, safe custody and protection against all risks of the said materials and that until used in construction as aforesaid, the said materials shall remain at the site of the said works in the Contractor's custody and on their own responsibility and shall at all times be open to inspection to the Bank 's Engineers or any Officer authorized by the Bank. In the event of the materials or any part thereof being

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stolen, destroyed or damaged, the Contractor will further replace the same with other materials of like quality or repair and make good the same as required by the Bank.

- (v) That the said materials shall not or on any account be removed from the site of the said works except with the written permission of the Assistant General Manager (Premises & Estate) the Bank.
- (vi) That the advances shall be repayable in full when or before the Contractors receive payment from the Bank of the price payable to them for the said works under the terms and the provisions of the said agreement provided that if any intermediate payments are made to the Contractors on account of work done, then on occasion of each such payment, the Bank will be at liberty to make a recovery from the Contractor's bill for such payment by deducting therefrom the value of the said materials then actually used in the construction and in respect of which recovery has not been made previously, the value for this purpose being determined in respect of each description of materials at the rates at which the amounts of the advances made under these presents were calculated.
- (vii) That if the Contractors shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents, the total amount of advance or advances that may still be owing to the Bank, shall immediately, on the happening of such default, be repayable by the Contractors to the Bank together with interest thereon at 12% per annum from the date or respective dates of such advance or advances to the date of repayment and with all costs, charges, damages and expenses incurred by the Bank in or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractors and the Contractors hereby covenant and agree with the Bank to repay and pay the same respectively to him accordingly.
- (viii) That the Contractors hereby charge all the said materials with the repayment to the Bank of the sum or sums advanced as aforesaid and all costs, charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the powers contained therein if any when-ever the covenant for payment and repayment hereinabove contained shall become enforceable and the money owing shall not be paid in accordance therewith, the Bank may at any time thereafter adopt all or any of the following courses as he may deem best :
  - (ix) (a) Seize and utilize the said materials or any part thereof in the completion of the said works on behalf of the Contractors in accordance with the provisions in that behalf contained in the said agreement debiting the Contractor with the actual cost of effecting such completion and the amount due in respect of advances under these presents and crediting the Contractors with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the Contractors, they are bound to pay the same to the Bank on demand.
  - (b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from the sale, retain all the sums aforesaid repayable or payable to the Bank under these presents and pay over the surplus (if any) to the Contractor.
  - (c) Deduct all or any part of the money owing out of the Security Deposits or any sum due to the Contractor under the said agreement.
  - (x) That except in the event of such default on the part of the Contractors as aforesaid, no interest shall be payable on the said advance.

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- (xi) That in the event on any conflict between the provisions of these presents and the said agreement, the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction of effect of these presents the settlement of which has not been herein before expressly provided for the same shall be referred to the Officer-inCharge, Premises Department, whose decision shall be final and no appeal shall lie against his decision before any court, arbitrator or authority.
- (xii) The provision of this Undertaking shall be deemed to be supplemental to the said agreement.

IN WITNESS WHEREOF the Contractors have set their hands to these presents the day and year first hereinabove written.

Signed, sealed and delivered by the said contractors in the presence of

Witness :Signature

Name  
Address

Witness :Signature

Name  
Address

**FORMAT OF CERTIFICATE OF ADVANCE PAYMENT BY ARCHITECT**

<b>Certificate No. Interim /</b>	<b>Dated</b>	
<b>Client:</b>	<b>Project No.</b>	<b>Building work / Interior work</b>
	<b>Particulars:</b>	
<b>Contractor:</b>	<b>Contract / Letter No.</b>	<b>Dated:</b>
	<b>Contractor's Bill No.</b>	<b>Dated:</b>

This is to certify that the amount given below (\*) is due to your Contractors for the work done by them and/or against materials delivered at site and/or for advance towards contract on the above referred project.

Advance against contract Rs \_\_\_\_\_  
 Less: Advance adjusted to-date Rs. \_\_\_\_\_  
 Balance Advance Rs. \_\_\_\_\_  
 Advance against material delivered at site Rs. \_\_\_\_\_  
 Amount of work done to-date Rs \_\_\_\_\_  
**Total Rs** \_\_\_\_\_  
 Less: Retention on work done Rs \_\_\_\_\_  
 Less: Previously certified upto Rs \_\_\_\_\_  
**PRESENT CERTIFICATE ( \* )Rs.** \_\_\_\_\_  
**RUPEES**.....

The cost of steel Pipe, GI Duct or any other material supplied by you or payments made by you directly, if any and not covered herein above, should be adjusted before making the payment of the certified amount (\*).

Necessary Deduction U/S194C of the income Tax 1961 and sales tax may be made before paying the above certified amount.

By a copy of this letter, we are intimating the Contractors to call on you for the necessary payment.

**Remarks if any :**  
 The details of Insurance policy are given in the next page.

**Signature of Architects**  
 Enclosures: Bill

**BANK GUARANTEE IN LIEU OF SD/ASD**

Place: .....

Date:.....

(On non-judicial stamp paper of Rs.-----/-)

**BANK GUARANTEE IN LIEU OF SECURITY DEPOSIT**

B.G.No. \_\_\_\_\_ Value Rs. \_\_\_\_\_

State Bank of India,

(Address)

**Sub: Bank Guarantee of Rs.....towards Security Deposit for the work offer  
State Bank of India.**

**(Name of Branch/Office)**

Dear Sir,

WHEREAS (Name and address of contractor/ vendor) (hereinafter called the Contractor) have entered into contract for (Name of Work) with State Bank of India (SBI) as mentioned in the letter of SBI's Consultants (Name & address of consultants) vide their letter No..... dated .....and the correspondence and tender relating thereto which is hereinafter referred to as "the said contract" the Contractor has now agreed to produce a Bank Guarantee amounting to 2% of the contract value less earnest money deposit of Rs.....(Rupees only), to State Bank of India for performing their part of the contract obligations.

AND WHEREAS in terms of said contract, the contractor is required to furnish to State Bank of India a Guarantee of a Scheduled Bank for a value of Rs..... to be valid upto (date).

AND WHEREAS (Name of Bank and its branch) having their office at (address) the Guarantor, at the request of the contractor hereby furnishes a PBG in favour of State Bank of India and Guarantees in the manner hereinafter appearing.

In consideration of the premise, we (name of Bank and its branch) having our office at (address) here after called the "Guarantor" (which expression shall include its successors and assigns) here by expressly, irrevocably & unreservedly undertake and guarantee under that if the Contractor fails to execute the work according to his obligations under the said contract, then notwithstanding any dispute between State Bank of India and the contractor the Guarantor shall, on demand without demur and without reference to the contractor pay to State Bank of India immediately any sum claimed by State Bank of India under the said contract up to a maximum amount of Rs. \_\_\_\_\_ (Rupees only).

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In case the amount demanded by State Bank of India is not paid within 48 hours of receipt of demand, the Guarantor agrees to pay the aforesaid amount of Rs. \_\_\_\_\_/- (Rupees \_\_\_\_\_ only).

- (i) Such payment shall be notwithstanding any right the contractor may have directly against State Bank of India or any disputes raised by the Contractor with State Bank of India or any suits or proceedings pending in any competent court or before any arbitrator. State Bank of India's written demand shall be conclusive evidence to the Guarantor that such payment is payable under the terms of the Contract and shall be binding in all respect on the guarantor.
- (ii) The Guarantor shall not be discharged or released from the the undertaking and Guarantee, by any arrangement, variations made between SBI and the Contractor and or indulgence shown to the contractor by SBI, with or without the consent and knowledge of the guarantor or by alterations in the obligations of the contractor by any forbearance, whether as to payment, time performance or otherwise.
- (iii) This guarantee shall remain valid until or as may be caused to be extended by the contractor or until discharged by SBI in writing whichever is earlier.
- (iv) This guarantee shall be a continuing guarantee and shall not be revocable during its currency except with the previous written consent of SBI.
- (v) This guarantee shall not be affected by any change in the constitution of the contractor, by absorption with any other body or corporation or dissolution or otherwise and this guarantee will be available to or enforceable against such body or corporation.
- (vi) In order to give effect to this guarantee SBI will be entitled to act as if the Guarantor were the Principal debtor and the Guarantor hereby waives all and any of its rights or surety ship.
- (vii) This guarantee shall continue to be in force notwithstanding the discharge of the contractor by operation of law and shall cease only on payment of the full amount by the Guarantor to SBI of the amount hereby secured.
- (viii) This guarantee shall be in addition to and not in substitution for any other guarantee or security for the contractor given or to be given to SBI in respect of the said contract.
- (ix) Any notice by way of request and demand or otherwise here under may be sent by post or any other mode or communication to the guarantor addressed as aforesaid and if sent by post it shall be deemed to have been given at the time when it would be delivered in due course of post and in providing such notice when given by post it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of SBI that the envelope was so posted shall be conclusive.
- (x) These presents shall be governed by and constructed in accordance with Indian Law.

Notwithstanding anything contained hereinbefore the liability of the guarantor under this guarantee is restricted to a sum of Rs.\_\_\_\_\_.

This guarantee will remain valid upto \_\_\_\_\_ unless a demand or claim under this guarantee is made in writing on or before \_\_\_\_\_ the guarantor shall be discharged from all liability under the guarantee thereafter.

Dated the .....

For (Name of Bank)

(Signature/s with designation/s of signatory/ies)

Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha.



(Name and Stamp of Bank)

ANNEXURE – 14

**FORMAT OF MEASUREMENT BOOK**

**1<sup>ST</sup> Page:**

STATE BANK OF INDIA

.....office,

Measurement Book No.

(Pages 1 to.....)

This book is issued to Shri.....

**Signature of A.G.M. (Premises& Estate) / D.G.M. (Premises)**

Certified that this book contains..... pages

**Signature of the official** (to whom the book is issued)

**MEASUREMENT BOOK PAGES NOS. 1 TO.....**

Item No.	Description	Measurement No.LB D/H	Quantity	Remarks

Site Engineer Architect Contractor

Checking/Test checking Engineer Date of checking/Test checking

NOTE :

Checking and test checking pertains to items wherever initialed.

**FORMAT FOR RUNNING BILL**

**I. Running A/C Bill**

- (i) Name of Contractor / Agency:
- (ii) Name of work:
- (iii) Sr, No. of this Bill:
- (iv) No. and date of previous bill:
- (v) Reference to Agreement No.:
- (vi) Date of written order to commence:
- (vii) Date of completion as per agreement:

Sr. No.	Item Description	Estimated Quantity	Unit	Rate (Rs.)	Tendered Amount (Rs.)	
1.	2.		3.	4.	5.	
<b>Up to previous R/A Bill</b>		<b>Up to date (Gross)</b>		<b>Present Bill (7-6)</b>		<b>Remark</b>
<b>Qty.</b>	<b>Amount (Rs.)</b>	<b>Qty.</b>	<b>Amount (Rs.)</b>	<b>Qty.</b>	<b>Amount (Rs.)</b>	
6.		7.		8.		9.

**Note :**

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- (i) If part rate is allowed for any item, it should be \_\_\_\_\_ indicated with reasons for allowing such a rate 'Net value since'
- (ii) If adhoc payment is made, it should be mentioned previous bill specifically.

**II. ACCOUNT OF SECURED ADVANCE, IF ADMISSIBLE ON MATERIALS HELD AT SITE BY THE CONTRACTOR**

No.	Item	Quantity	Unit	Amount	Remarks
1.	2.	3.	4.	5.	6.

Total value of materials at site.

Secured Advance @ \_\_\_\_\_ % of above value B

CERTIFIED (i) that the materials mentioned above have actually been brought by the contractor to the site of the work and no advance on any quantity of any of this item is outstanding on their security (ii) that the materials are of imperishable nature and are all required by the contractor for use in the work in connection with the items for which rates of finished work have been agreed upon.

Dated signature of Site Engineer preparing the bill

Designation \_\_\_\_\_

Dated signature of Bank's Architects

(Name of the Architects)

\_\_\_\_\_

Dated signature of Contractor

**CERTIFICATE**

The measurements on the basis of which the above entries for the Running Bill No. \_\_\_\_\_ were made have been taken jointly on \_\_\_\_\_ and are recorded at pages \_\_\_\_\_ to \_\_\_\_\_ of measurement book No. \_\_\_\_\_.

\_\_\_\_\_  
Signature and Signature and date of Signature and date of

Date of contractor Architect's representative the Site

Engineer (seal)

The work recorded in the above mentioned measurements has been done at the site satisfactorily as per tender drawings, conditions and specifications.

Architect Site Engineer Bank's Engineer

## **TECHNICAL SPECIFICATIONS FOR HVAC & ALLIED WORKS**

### **1. GENERAL**

#### **1.1. Design Philosophy**

This specification is intended to cover design, residual, engineering, manufacture, test and inspection at works, delivery to site properly packed for transportation, erection, testing, commissioning, performance demonstration at site and handing over to the Bank as indicated in the schedule of requirement as per the codes/standards and scope of work.

#### **1.2. Codes and Standards**

The Design shall be done on the guide lines of the applicable local & International codes and standards, illustratively listed below as per the project requirements and site conditions.

The installation shall also be in conformity with the bylaws and requirements of the local authority in so far as these become applicable to the installation. Wherever this specification calls for, a higher standard of materials and /or workmanship than those required by any of the above regulations and standards, then this specification shall take precedence over the said regulations and standards.

Wherever drawings and specifications require something that may conflict with the regulations, the regulations shall govern. This shall be referred to the Superintendent for arbitration.

<b>Sr. No</b>	<b>Codes &amp; Standards</b>	<b>Code &amp; Standards Description</b>
1	NBC 2016	National Building Code of India
2	ECBC 2007(Revised 2008)	Energy Conservation Building Code
3	ASHRAE Hand Books.	HVAC Systems and Equipment 2008
		HVAC Applications 2007
		Fundamentals 2005
4	ASHRAE 62.1-2007	Ventilation for acceptable Indoor Air Quality
5	ASHRAE 90.1 - 2007	For Lighting & equipment heat dissipation
6	ASHRAE 170 - 2008	Ventilation of healthcare facilities
7	ASHRAE 52.1-1992 and 52.2-2007	Air filters
8	SMACNA standards	Duct construction standards
9	UL Standards	Rating of Fire Damper
10	BIS Codes	Motors, cabling, wiring and accessories
11	NFC 2000	National Fire Codes
12	NEC	National Electric Codes
13	FM / NFPA	Guide Lines for various materials used in the project.
14	IS	IS Standards Where Ever Applicable.

#### **1.2.1. Building Information**

This report communicates the proposed HVAC engineering designs system requirements to be built for the proposed building at Bhubaneswar.

**1.3. Scope of Work**

The scope of work under for this Tender shall include design, supply, installation, testing, commissioning, training & handing over of HVAC system.

The work under this system shall consist of design, supply, installation, testing, training & handing over of all materials, equipment, hardware, software appliances and necessary labour to commission said system, complete with all the required components strictly as per the specifications, design details. The scope also include the supply, installation & commissioning of any material or equipment including civil works that are not specifically mentioned in the specifications and design details but are required for successful commissioning of the project.

The general character and the scope of work to be carried out under this contract are illustrated in Drawings, Specifications and Schedule of Quantities. The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Bank/Architect site representative. The contractor shall furnish all labor, materials and equipment (except those to be supplied by the Bank) as listed under Schedule of Quantities and specified otherwise, transportation and incidental necessary for supply, installation, testing and commissioning of the complete HVAC system as described in the Specifications and as shown on the drawings. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the Drawings/Documents as being furnished or installed, but which are necessary and customary to be performed under this contract. The HVAC System shall comprise of following:

- a) Other related miscellaneous items as per the tender drawing & Bill of quantities.
- b) Dismantling and shifting of Existing ducts (2<sup>nd</sup> to 5<sup>th</sup> floor) as per the Bank/Architect schedule.
- c) Dismantling and shifting of Existing ducts & associated motor, panel etc. of basement ventilation system as per the Bank/Architect schedule.
- d) Dismantling and shifting of Existing AHU's, starter panel etc. as per the Bank/Architect schedule.
- e) Dismantling of condenser water piping and replacement of new piping with proper work plan and schedule with in as per Bank/Architect permitted Shut down of chiller.
- f) Dismantling of Chilled water piping and replacement of new piping with proper work plan and schedule with in as per Bank/Architect permitted Shut down of chiller. The old pipeline to be shifted to site as per instruction of the Bank/Architect.
- g) Dismantling of Cooling tower Base structural Platform and replacement of new structural platform with proper work plan and schedule with in as per Bank/Architect permitted Shut down of chiller. This work will plan phase to phase manner since already working office will NOT allow continue shutdown (only in Bank Holiday's)
- h) Arrangement of all required material and tools & tackles, manpower with work plan, method statement and get the approval from Bank/Architect for Above mentioned dismantling and replacement work
- i) Co-ordination with all other service contractor for completion and commissioning of the HVAC system.
- j) All Starter panel for HVAC Equipment under HVAC Contractor scope.

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- k) Supply, laying and Termination of Incoming cable in starter panel / pump etc. from centralized HVAC control desk to each floor starter panel is under HVAC contractor scope.
- l) Starter panel to equipment power cable & Control cable supply, laying and termination under HVAC contractor's scope.
- m) Co-ordination with False ceiling contractor for grill cutout and fixing (marking of grills cutout as per drawing under HVAC contractor scope and cut out will done false ceiling contractor scope)
- n) Dismantled Existing material shifting to Bank/Architect guided area under HVAC contractor scope.
- o) After dismantling, supply, installation, testing and commissioning of new AHUs with starter panel, Condensor pipe, Chiller pipe, valves, new AC ducting, ventilation system, starter panel etc. as per schedule of quantity has to be executed by HVAC vendor.
- p) Cutting holes, chases & like through all types of wall/floors and finishing for all services, crossings, including sealing, frame work, cover plates, making good to the damage and finish to the approved standard under HVAC vendor scope.
- q) Supply and installation of Civil Foundation / Structural plat form / MS for all HVAC Equipments (AHU/Ventilation Fans/DX units/Ducting / pipes). Based on the project / site condition under HVAC vendor scope and cost of the same to be considered while quoting the rate for the respective equipment & materials.
- r) Lift well, basement lift lobby, staircase pressurization etc. Ventilation of basements, plant room, HVAC electrical panel room, battery room & wash rooms etc.
- s) Air-Balancing, testing & commissioning of the HVAC services.
- t) Test reports, as-installed drawings, operation and maintenance manual for the new equipment.
- u) Training to existing HVAC AMC staff after completion of the Job.

Work under this section shall be executed without any additional cost. The rates quoted in this tender shall be inclusive of the works given in this section.

Contractor shall provide all tools, equipment, metering and testing devices required for the purpose.

On award of work, Contractor shall submit a detailed proposal giving time line and make of the material list to be supplied and installed under this contract.

All tests shall be made in the presence of the Architect or his representative or any inspecting authority. At least five working days, notice in writing shall be given to the inspecting parties before performing any test.

Water flow rates of all equipment and in pipe lines through valves shall be adjusted to design conditions. Complete results of adjustments shall be recorded and submitted.

Contractor shall ensure proper balancing of the system and for the Pipes / valves /Wiring/Cable installed in his scope of work. The balancing shall be to the satisfaction of Bank /Architect.

Three copies of all test results shall be submitted to the Engineer in A4 size sheet paper within two weeks after completion of the tests.

**1.3.1. Inspection and Approval**

The contractor shall obtain approval to the installation from the Local Authority if required. Successful Bidder shall be responsible for preparation of documents / applications / drawings / Necessary calculations and follow up action at all stages, (Drawing / completion) arranging inspections, revisions / modifications for obtaining approval from the Architect/Bank within the overall completion period stipulated in the Tender. The Contractor shall also make payment of all statutory payments. The quoted rates shall take care of any contingencies.

The contractor shall guarantee both the material and workmanship of first class quality corresponding to standard engineering practice. Any defective materials/ Poor workmanship shall be rejected, the contractor has to rectify/ replace at his own cost. Guarantee/ Warranty certificate of the materials supplied shall be handed over to the Bank/ Architect.

**1.3.2. Quality Assurance**

Comply with the current applicable codes as specified in the Tender documents and local statutory rules, regulations and requirements.

Drawings, specifications, codes and standards minimum requirements. Where requirements differ, the more stringent shall apply.

Execution of work in strict accordance with the best practices of the trades in a thorough substantial, workman like manner by competent workmen.

All equipment, materials and installation method shall comply with the General Specification and the current standards and regulations as described in the Tender Documents.

The Architect/ Bank Site representative reserves the right to inspect and reject any part of the works not complying the tender specification and approved make. The Contractor shall replace such rejected works without cost variation and delay to the Contract.

Approval or acceptance by the Bank / Architect Site representative shall not relieve the Contractor of his responsibilities under the Contract for the quality of materials and the standard of workmanship in the Works.

No work shall be covered up or put out of view without the agreement of the Bank/ Architect representative. The Contractor shall provide/allow the Bank/ Architect Site representative full opportunity for the examination and measurement of any work which is about to be covered or put out of view. Upon request by the Bank/ Architect Site representative, the Contractor shall expose their Works and allow/provide access to the Bank/ Architect Site representative to inspect any part of the Works during the course of the manufacturing or site installation/erection.

When requested by the Bank/ Architect Site representative, the Contractor shall submit evidence including written certificates and full testing reports from approved/recognized testing organization certifying that his proposed equipment or material have been tested and conform with the specified standard.

Each item of equipment/material proposed shall be a standard catalogue product of an established manufacturer strictly from the manufacturers listed in respective sections and quoted by the Contractor in technical data part of respective sections

**1.3.3. Bye-Laws and Regulations**

The installation shall be in conformity with the Bye-laws, Regulations and Standards of the local authorities concerned, in so far as these become applicable to the installation. But if these Specifications and Drawings call for a higher standard of materials and / or workmanship than those required by any of the above regulations and standards, then these Specifications and



Drawings shall take precedence over the said regulations and standards. However, if the Drawings and specifications require something which violets the Bye-laws and regulations then Bye-laws and regulations shall govern the requirement of this installation.

#### **1.3.4 Drawing & Shop drawing**

The contractor shall prepare all shop drawings. Minimum Three (03) sets of drawings shall be submitted after final approval along with Pen drive.

When the Architect/Consultant makes any amendments in the above drawings, the contractor shall supply two fresh sets of drawings with the amendments duly incorporated along with check prints, for approval. The contractor shall submit further six sets of shop drawings to the Architect/ Banker site representative for the exclusive use by the Architect/ Banker site representative and all other agencies. No material or equipment may be delivered or installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/equipment/installation.

Shop drawings shall be submitted for approval two weeks in advance of planned delivery and installation of any material to allow Architect/Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.

Manufacturer's drawings, catalogues, pamphlets and other documents submitted for approval shall be in four sets. Each item in each set shall be properly labeled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data of general nature shall not be accepted.

Samples of all materials shall be submitted to the Architect/ Banker site representative prior to procurement. These will be submitted in two sets for approval and retention by Architect/ Banker site representative and shall be kept in their site office for reference and verification till the completion of the Project. Wherever directed a mockup or sample installation shall be carried out for approval before proceeding for further installation.

Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimensions. Where drawings are approved, said approval does not mean that the drawings supersede the contract requirements, nor does it in any way relieve the contractor of the responsibility or requirement to furnish material and perform work as required by the contract.

Where the contractor proposes to use an item of equipment, other than that specified or detailed on the drawings, which requires any redesign of the structure, partitions, foundation, piping, wiring or any other part of the mechanical, electrical or architectural layouts; all such re-design, and all new drawings and detailing required therefore, shall be prepared by the contractor at his own expense and getting approval from the Architect/ Consultant/ Bank site representative. Any delay on such account shall be at the cost of and consequence of the Contractor.

The contractor shall provide as built drawings, as approved by the Bank's/Architect's Site representative AutoCAD DWG format in CD/DVD, as per the Project Documentation requirement. The drawings shall be submitted as directed by the Bank's/Architect's site representative, or putting into operation, whichever is earlier.

#### **1.3.5 Samples**

The terms 'sample' includes natural materials, fabricated items, equipment, devices, appliances, or parts thereof as specified and other samples as may be required to determine whether kind, Quality, Construction, workmanship, finish, color and other characteristic of materials confirm to requirement of the tender documents.

Samples shall establish kind, quality and other required characteristics of various parts of the work. Indicate details of construction, dimensions, capacities, weights and electrical performance characteristic of equipment or material.

Samples and sample board shall be prepared and identified by the manufacturer and stamped/engraved with make, type, Cat No. and size marking shall be indelible and legible.

### **1.3.6. Quality of Materials**

The Contractor shall arrange/ provide for all standard guarantees for products furnished under this Tender. However, such guarantees shall be in addition to and not in lieu of all other liabilities which manufacturers and the Contractor may have by law or by other provisions of the Tender Documents.

All materials, items of equipment and workmanship furnished under this Tender shall carry standard warranty against all defects in materials and workmanship. Any faults due to defective or improper material, equipment, workmanship which develop shall be made good, forthwith, by and at the expense of the Contractor, including all other damage done to areas, materials and other systems resulting from this failure.

Guarantee that all elements of the systems are of sufficient capacity to meet the specified performance requirements as set forth herein or as indicated.

Upon receipt of notice from the Bank/Architect Site representative, of failure of any part of system or equipment during the defect liability period the affected parts shall be replaced.

### **1.3.7. Equipment and Materials Approval**

Approval of materials and equipment shall be based on latest manufacturer's published data. Complete and detailed information of all materials and equipment to be incorporated in the work shall be submitted. Submit detailed description and specifications, catalogues cuts, installation data, diagrams, dimensions, controls and any other data required to demonstrate compliance with the Tender Documents. Each item submitted shall be referenced to the applicable paragraph in the Specification.

At the request of the Bank's/Architect's Site representative, submit a sample of any equipment or material for further study before approval. Where samples are required by the Bank's/Architect's Site representative, the period required to obtain the sample will be taken into account when scheduling approvals.

Only approved materials shall be employed at the site. All materials installed which are not approved shall be removed and reinstall by approved ones.

Time periods for equipment and materials approvals shall be as submitted for the approval of the Bank/ Architect Site representative.

All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place. Fasteners and supports shall be adequate to support the required load.

All equipment and accessories shall operate without objectionable noise or vibration. Should operation of any of the equipment or systems produce noise or vibration which is, in the opinion of the Bank's/Architect's Site representative objectionable, make change in equipment and do all work necessary to eliminate the objectionable noise or vibration at no additional cost to the Bank.

All equipment and components shall be new, and the manufacturer's current model shall be ensured. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protective signaling system, meeting the relevant Codes.

### **1.3.8 Workmanship**

The entire work provided in this specification shall be constructed and finished in every respect in a workmanlike and substantial manner. The Contractor shall provide the system in accordance with the best trade practice and to the satisfaction of the Bank's/Architect's Site representative.

Keep others fully informed as to the shape, size and position of all openings required for apparatus and give full information sufficiently in advance of the work so that all openings may be built in advance. Provide and install all sleeves, supports, etc., hereinafter specified or required.

Obtain detailed information from the manufacturers of apparatus as to the proper method of installing and connecting the same. Obtain all information from others which may be necessary to facilitate work and the completion of the whole Project.

Provide the services of an experienced foreman, who shall be continuously in charge of the erection of the electrical work, together with all necessary skilled workmen, helpers and labourers, required to properly unload, transfer, erect and connect up, adjust, start, operate and test the system.

Before installing any work, verify that it does not interfere with clearance required for other work. Notice of adverse conditions shall be forwarded in writing to the Bank's/Architect's Site representative before any work in question is installed. If notification is not made, and work installed causes interference with the contemplated design, make such changes in his work as directed by the Bank's/Architect's Site representative to permit the installation of all work of the Project, at no additional cost to the Bank.

#### **1.3.9 Method of Measurement**

The works shall be measured in accordance with relevant IS codes. Notwithstanding any general or local custom, except where otherwise specifically described or prescribed in the contract or BOQ.

#### **1.3.10 Balancing, Testing and Commissioning**

Balancing of HVAC systems and all tests as called for the Specifications shall be carried out by the contractor through a specialist group, in accordance with the Specifications and Indian Standards. Performance test shall consist of three days of 8 hour each operation of system for each season.

The installation shall be tested again after removal of defects and shall be commissioned only after approval by the Bank/ Architect site representative. All tests shall be carried out in the presence of the representatives of the Architect/Consultant and Bank site representative.

#### **1.3.11 On Site Training**

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labor and helpers for operating the entire installation for a period of seven (7) working days of eight (8) hours each, to enable the Bank Maintenance staff to get acquainted with the operation of the system. During this period, the contractor shall train the Bank Maintenance personnel in the operation, adjustment and maintenance of all equipment installed.

#### **1.3.12 Completion Certificate**

On completion of the HVAC system, a certificate shall be furnished by the contractor, counter signed by the Architect, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local authority.

## **2.0 Special Conditions**

### **2.1 General**

These special conditions are intended to amplify the General Conditions of Contract, and shall be read in conjunction with the same. For any discrepancies between the General Conditions and these Special Conditions, the more stringent shall apply.

### **2.2 Existing Services**

The contractor is deemed to have visited and inspected the site to familiarize himself with the existing site conditions and services at tender stage.

Co-ordination between shop drawings, work on site and existing services shall be carried out by the Contractor.

The Contractor shall be fully responsible for any damages to the existing services including repairs, and penalties imposed by the concerned parties etc and for removing any site obstacles such as underground cables, pipes, civil works etc. which is obstructing his work on site.

### **2.3 Builders Work**

Obtain Bank's/Architect's Site representative approval before commencing builder's work in connection with if any installation. Related co-coordinated shop-drawings shall be submitted for approval. Materials approval shall be obtained as per procedure of the Bank's/Architect's Site representatives. The contractor shall make it certain that drawings properly co-coordinated with other works are submitted immediately after signing of the contract and approval of drawings and the materials are obtained at least one month prior to the commencement date of the construction.

Check with other trades to ensure equipment and material can be installed in space provided. Provide other trades with information necessary for them to execute their work.

Details on drawings which are specific regarding dimensions and locations, are for information purposes. Co-ordinate with other trades to ensure work can be installed as indicated.

### **2.4 Quiet Operation and Vibration Isolation**

All equipment shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the Bank/Architect site representative. In case of rotating machinery sound or vibration noticeable outside the room in which it is installed, or annoyingly noticeable inside its own room, shall be considered objectionable. Such conditions shall be corrected by the Contractor at his own expense. The contractor shall guarantee that the equipment installed shall maintain the desired NC levels.

### **2.5 Accessibility**

The HVAC Contractor shall verify the sufficiency of the size of the shaft openings, clearances in cavity walls and suspended ceilings for proper installation of his piping/cabling/ducting/ other ancillaries. His failure to communicate insufficiency of any of the above shall constitute his acceptance of sufficiency of the same. The Contractor shall locate all equipment which must be serviced, operated or maintained in fully accessible positions. The exact location and size of all access panels, required for each concealed, valve or other devices requiring attendance, shall be finalized and communicated in sufficient time, to be provided in the normal course of work. Failing this, the Contractor shall make all the necessary repairs and changes at his own expense. Access panel shall be standardized for each piece of equipment / device / accessory and shall be clearly nomenclature / marked.

### **2.6 Manufacturer's Instructions**

Where manufacturer has furnished specific instructions, relating to the material and equipment used in this project, covering points not specifically mentioned in these documents, such instructions shall be followed in all cases.

### **2.7 Electrical Installation**

Work related to the electrical services, shall be carried out in full knowledge of, and with the complete coordination of Composite work contractor. The electrical installation shall be in total conformity with the control wiring drawings prepared by the contractor and approved by the Architect/Consultant. All equipment shall be connected and tested in the presence of an authorized representative of the contractor.

### **2.8 Maintenance of HVAC System**

HVAC contractor has to carry out the maintenance of the HVAC system executed under this contract, for a period of one year which includes replacement of all spare/accessories etc. with no additional cost (costing for this will be included in the quoted amount) up to the defects liability period.

#### **2.8.1 Maintenance Contract.**

Routine Preventive Maintenance Schedule to be submitted

- a) Schedule to cover manufacturer's recommendation and/or common engineering practice (for all plant and machinery under contract).
- b) Plant and machinery history card giving full details of equipment and frequency of checks and overhaul.
- c) Monthly status report.
- d) There shall be no reimbursement for the extended period.
- e) Break-downs shall be attended to within ten hours of reporting.
- f) Spare are to be made available within seven calendar days in case of total break-down/burnout.

#### **2.8.2 Shut Downs**

- a) Routine shut downs shall be permitted only as allowed by the Bank P&E department.
- b) Contractor shall be at liberty to carry out routine maintenance as and when required but with prior permission of the Bank.

#### **2.8.3 Complaints**

The Contractor shall receive calls for any and all problems experienced during defect liability period of the system under this contract, attend to these within 10 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

#### **2.11.4 Repairs**

All equipment that requires repairing shall be immediately serviced and repaired. Since the period of Mechanical Maintenance runs concurrently with the defects liability period, all replacement parts and labor shall be supplied promptly free-of-charge to the Owner.

**2.11.5 Operating Instruction & Maintenance Manual**

Upon completion and commissioning of part HVAC system the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer’s operating and maintenance manuals. Upon approval of the draft, the contractor shall submit three (3) complete bound sets of typewritten operating instructions and maintenance manuals; one each for retention by Architect’s site representative and two for Banks Operating Personnel. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4 year period of maintenance of each equipment.

**2.12 Tools and Tackles**

The Contractor shall provide and install all necessary hoists, ladders, hydra, Crane, scaffolding, tools, tackles, all transport for labour and materials and plant necessary for the proper execution and completion of the work to the satisfaction of the Bank’s/Architect’s site representative.

**3. TECHNICAL SPECIFICATION AND INSTALLATION**

**3.1 INDOOR DESIGN CONDITION**

Dry Bulb Temperature : 23 ± 1 ° C  
 Relative Humidity : Not Exceeding 60%

The air conditioning system for conditioned areas shall be designed to cater for the Comfort Cooling application only (However there will be no Humidity control in Office areas). The approximate 2<sup>nd</sup> floor CFM calculation & basement ventilation system data sheet mention hereunder for reference. However, the contractor should note, they have to calculate the actual CFM requirement of each floor as per the site conditions based on other parameter such as floor layout, comfort level etc. Accordingly, it’s the responsibility of the HVAC vendor to obtain approvals of the details drawing and CFM data sheet from the architect/Bank prior to execution of the work.

**3.2 SYSTEM DESCRIPTION & HVAC DESIGN REQUIREMENTS**

<b>ROOM DATA SHEET FOR AIRCONDITIONING SYSTEM ( 2<sup>ND</sup> FLOOR)</b>							
<b>S.no</b>	<b>Room Name</b>	<b>Area (Sq.ft)</b>	<b>Occupancy</b>	<b>Appliance load</b>	<b>Calculated TR</b>	<b>Calculated CFM</b>	<b>Proposed System</b>
<b>Typical Floor Left wing</b>							
1	DGM Cabin	350	4	1 PC	2.12	907	<b>37 TR &amp; 17000 CFM AHU</b>
2	DGM & COD	335	4	1 PC	2.24	1050	
3	DGM Secretary	142	3	1 PC	1.03	428	
4	CDO Secretary	142	3	1 PC	1.03	428	
5	CM Confidential	200	4	1 PC	1.24	561	

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6	HR Cabin	90	3	1 PC	0.68	264	
7	L&D	90	3	1 PC	0.68	264	
8	HR MS	90	3	1 PC	0.68	264	
9	Cabin	90	3	1 PC	0.68	264	
10	PPG Cabin	90	3	1 PC	0.68	264	
11	BCDM Cabin	90	3	1 PC	0.68	264	
12	Investigation	90	3	1 PC	0.68	264	
14	Marketing	90	3	1 PC	0.68	264	
15	HUB Room	102	Nil	1 KW	0.81	414	
16	HR Com- pactor 1	174	Nil	Nil	1.16	481	
17	HR Com- pactor 2	174	Nil	Nil	1.16	481	
18	Meeting room 1	149	4	1 PC	1.02	415	
19	PPG 1	60	2	1 PC	0.41	213	
20	PPG 2	60	2	1 PC	0.41	213	
21	BCDM 1	60	2	1 PC	0.41	213	
22	BCDM 2	60	2	1 PC	0.41	213	
23	HR 1	60	2	1 PC	0.41	213	
24	HR 2	60	2	1 PC	0.41	213	
25	Work Station & Corridor	2845	77	42 & 4 KW	18.19	8094	
<b>TOTAL FOR LEFT WING</b>		<b>5695</b>			<b>37.9</b>	<b>16649</b>	
<b>Typical Floor Right wing</b>							
1	DGM Cabin 4	398	4	1 PC	2.26	1018	<b>37 TR &amp; 17000 CFM AHU</b>
2	DGM F1	334	4	1 PC	2.24	1050	
3	DGM Secre- tary 1	142	3	1 PC	1.03	428	
4	DGM Secre- tary 2	142	3	1 PC	1.03	428	
5	CM SLBC	200	4	1 PC	1.24	561	
6	Cabin	90	3	1 PC	0.68	264	
7	SLBC/ RSETI	90	3	1 PC	0.68	264	
8	PROD/MICRO	90	3	1 PC	0.68	264	
9	BC/CSP	90	3	1 PC	0.68	264	
10	Cabin	90	3	1 PC	0.68	264	
11	P&E	90	3	1 PC	0.68	264	
12	OAD	90	3	1 PC	0.68	264	
13	OL	90	3	1 PC	0.68	264	
14	Compactor 1	127	Nil	Nil	0.87	318	

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15	Compactor 2	237	Nil	Nil	1.64	687
16	VC Room	305	6	2 PC	2.14	891
17	Meeting room 2	149	4	1 PC	1.02	415
18	BCDM 1	60	2	1 PC	0.41	213
19	BCDM 2	60	2	1 PC	0.41	213
20	OL 1	60	2	1 PC	0.41	213
21	OL 2	60	2	1 PC	0.41	213
22	Work Station & Corridor	2699	75	44 & 4 KW	15.57	6814
<b>TOTAL FOR RIGHT WING</b>		<b>5694</b>			<b>36.1</b>	<b>15574</b>

**3.3 Ventilation System**

Plant Room & Pump Room Ventilation							
S.no	Room Name	Area (Sq.ft)	Height (Ft)	Volume (Cu.ft)	ACH	Calculated CFM	Proposed System
1	Fire Pump room	1313	10	13132	15	3283	3300 CFM Supply and Exhaust fan
2	Plant Room	3000	10	30000	15	7500	7500 CFM Supply and Exhaust fan
3	Ground floor Battery room	245	12	2940	20	980	1000 CFM Exhaust & 800 CFM Supply air fans
Typical floor Toilet Ventilation							
S.no	Room Name	Area (Sq.ft)	Height (Ft)	Volume (Cu.ft)	ACH	Calculated CFM	Proposed System
1	Male Toilet	318	12	3810	15	953	1000 CFM Exhaust Fan & fresh air through door grill
2	Female Toilet	139	12	1666	15	417	500 CFM Exhaust Fan & fresh air through door grill

BASEMENT CARPARK VENTILATION CALCULATION											
S.no	Room Name	Area (Sq.ft)	Height (Ft)	Volume (Cu.ft)	ACH Normal Mode	ACH Fire Mode	Calculated Normal Mode CFM	Calculated Fire mode CFM	Proposed Jet Fans	Proposed Exhaust Axial Fans	Remarks



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1	Lower Basement	15000	10	150000	6	12	15000	30000	4 Nos of 3750/7500CFM capacity Dual speed Jet fans	2 Nos of 15000 CFM Axial Fans 1 Working in Normal mode 2 working in Fire mode	Fresh air for the Basement Through the ramp
2	Upper Basement	6000	10	60000	6	12	6000	12000	No Need since upper basement elevated in ground level	2 Nos of 6000 CFM Axial Fans 1 Working in Normal mode 2 working in Fire mode	Fresh air for the Basement Through the ramp

**3.4 INTRODUCTION**

The HVAC Service System for the project shall be designed & conceptualized based on the Architectural Planning & Design Standards to produce a concept which is an integrated whole. This design basis report has been worked out on the preliminary set of data confirmed & architectural drawings shared and shall be fine-tuned during the detailed design stage, based on final architectural/interior layouts and confirmation of user requirements.

**3.5 Air Handling units:**

- a) The air-handling units will be located in multiples in each floor. The air-handling unit will be double skin in construction with (PU) 48 mm sandwich panel with Thermal break profile. The air-handling units will have high efficiency filters to have cleanliness of 20 microns. The panel of AHU will be powder coated/ pre plasticized sheets.
- b) The fan section will have DIDW centrifugal forward/backward curved blower mounted on vibration isolation mountings with its bearings fixed on the scroll. The fan will be complete with belt drive package. The impeller and shaft of the fan will be both statically and dynamically balanced. The fan and motor assembly will be mounted on a common framework entirely isolated from the unit by rubber-in-shear or spring vibration mountings. The fan discharge will be isolated from the casing by a flexible canvas connection.
- c) The Coils shall be of fin and tube type having copper tubes and aluminum fins. The tubes shall have a minimum diameter of 12 mm. The number of fins shall be 5 per cm. The tubes shall be mechanically expanded by means of a mandrel for optimum tube to fin bonding. The fins shall be plate or spiral and tubes shall be staggered. Headers shall be of MS. The air face velocity across the coil shall not exceed 2.5 m/sec. The coils shall have capped vent and drain connections provided on the headers. Cooling coils of water duty shall be tested for 7 KSC working pressure. The filter section shall

be provided with the same casing construction as that of the unit. The face velocity shall not exceed 1.75 mps for 50mm thick filters and 35 mps for 150mm thick filters. The Pre filters shall be of panel type with synthetic non-woven washable type media with GI framework. The filters shall be easily removed for cleaning. The vibration of the air handling unit fans on the bearing shall not exceed a peak-to-peak displacement of 75 microns.

- d) The VFD motor will be of TEFC squirrel cage type having class F insulation and IP 55 protection. The motor will be of energy efficient type with high and flat efficiency curve for 50 to 100% load. The noise level of unit will not exceed 65 dB (A) at 1m from the filter side.
- e) The housing/casing of the air handling unit shall be sectionalized / unitary of double skin construction. The housing shall be so made that it can be delivered at site in total/semi knocked down conditions depending upon the locations. The Frame work shall be of Extruded Aluminum hollow sections filled with preformed insulation section duly powder coat painted/anodized. Frame shall be assembled using mechanical joints to make a sturdy & strong frame work for various sections.
- f) Galvanized sheet steel fresh air louvers with bird screen will be provided in the clear openings in masonry walls of the Air Handling Unit rooms having at least one external wall. Each Air Handling Unit will be provided with manual air vent at high point in the chiller water circuit cooling coil and drain plug in the bottom of the coil. Cooling thermostats will be located in return air stream, to ramp up / ramp down on AHU Fan Motor and PIBCV. All AHU's will be fitted with insulated Butterfly valves, balancing valves, condensate drain piping- up to sump or floor drain in AHU room, thermometers & pressure gauges. All AHUs and starter panel will be integrated with Fire alarm panel and will automatically switch-off in case of fire.
- g) **PERFORMANCE DATA**  
Air handling units shall be selected for the lowest operating noise level of the equipment. Fan performance rating and power consumption data with operating points clearly indicating shall be submitted and verified at the time of commissioning of the equipment.
- h) **TEST REPORTS:**  
The contractor /manufacturer shall describe the tests that will be conducted on the Air Handling Units. They shall furnish relevant test certificate / certificates arranged from the OEM to the effect, that such tests have been duly performed on the AHUs.

### **3.6 Ventilation Fans**

Scope of this section comprises of supplying, erection, testing and commissioning of following type of fans.

- a) Centrifugal Fans SISW/DIDW
- b) Inline fans (Vane axial/Tube axial)
- c) Propeller fans
- d) Jet fans.

The above fans shall be as indicated on drawings and mentioned in schedule of quantities.

**2.6.1 Centrifugal Fans:**

**2.6.1.1 Casing:**

Casing shall be welded construction fabricated with 2mm M.S. sheet with spray galvanization. Minimum zinc deposition shall conform to class III of IS: 277.

The minimum thickness of casing shall not be less than 2 mm. The fan scroll shall be attached to the side plate by means of continuous lock seam.

18 gauge galvanized wire mesh inlet screens of 25 mm sieves shall be provided on both inlets if fan is without enclosure. Housing shall be provided with standard cleanout, safety screen, and door with quick locking tension handles and neoprene gasket. Rotation arrow shall be clearly marked on the housing.

**2.6.1.2 Impeller:**

The impeller shall have die-formed, forward/backward curved blades, welded to the rim and back plates to have a non-over loading characteristic of the fan. Rim shall be spun to have a smooth contour. If required, intermediate stiffening rings shall be provided. Shaft sleeves shall be furnished wherever required. The impeller, pulley and housing shall be statically and dynamically balanced. Fan velocity shall not exceed 1800 FPM at a maximum fan speed of 1000 RPM. However higher velocities shall be acceptable for applications of higher static pressures.

**2.6.1.3 Shaft:**

Shaft shall be constructed of SAE 1040 steel turned ground and polished. Shaft shall not pass through first critical speed through the full range or specified fan speeds.

**2.6.1.4 Bearings:**

The bearing shall be self-aligning, heavy duty ball, roller or sleeve bearings. Bearing shall be selected for quiet operation and shall be grease pack, pillow block type.

**2.6.1.5 Inlet guard:**

Inlet guard shall be spun to have a smooth contour. Inlet screen if provided shall be of galvanized wire mesh of 25 mm square.

**2.6.1.6 Base Plate:**

Base plate shall be provided for each fan. Base for both fans and motor shall be built as an integral part and shall be mounted on a concrete foundation through metallistik vibration isolators. The concrete foundation shall be at least 150 mm above the finished floor level and shall be further isolated from structural floor through 25 mm thick layers of sand all around & sandwiched ribbed rubber pads.

**2.6.1.7 Motor:**

Fan motor shall be of squirrel cage type totally enclosed fan cooled motor, suitable for 415/220± 10% volts, 50 Hz, 3 phase. Horse power indicated on the name plate of motor shall be more than brake horse power by at least 10%. Motor R.P.M. shall not exceed 1500 RPM. The fan motor combination selected for the particular requirement shall be of the most efficient type (i.e smallest horse power) so that power consumption and noise level may be minimized. Wherever to be used with VFD the motor should be suitable for the VFD and temperature should not rise at low speed if required to suite the VFD. The Contractor to supply inverter grade motor.

**2.6.1.8 Drive:**

The fan shall be provided with oil resistant type V-belts. All belts shall be selected for 150% rated HP. V-belts shall be supplied with removable belt guards that do not impede the air flow to the fan inlet. There shall be a minimum of two belts per drive.

**2.6.2 Axial Flow Fans:**

Axial flow fan shall be of vane axial type and shall be suitable for mounting in duct or wall/floor/slab as required and Suitable for site condition

**2.6.2.1 Impellers:**

Single piece cast aluminum or steel impeller shall be with blades of aerofoil design to give maximum efficiency and shall vary in twist and width from hub to tip to effect equal air distribution along the blade length. Single piece fan and hub shall be statically and dynamically balanced. Maximum clearance between blade tip and the fan housing at the specified speed shall be 5 mm. Impeller blades shall be whirl tested to a speed 25% above the design operating speed. Extended grease leads for external lubrication shall be provided. The fan blade shall be adjustable type so that actual air flow can be achieved at site as per indicated in drawings & BOQ.

**2.6.2.2 Casing:**

Casing shall be constructed of 14 gauge sheet steel, properly reinforced for rigidity. Fan casing, motor mount and straightening vanes shall be of welded steel construction. Motor mounting plate shall be minimum 20 mm thick and machined to receive motor flanges. Casing shall be provided with two nos., wide, hinged doors which open easily. Inspection doors with handle and neoprene gasket shall be provided. Casing shall have flanged connection on both ends for ducted applications. Support brackets for ceiling suspensions shall be welded to casing for connection to hanger bolts. Straightening vanes shall be aerodynamically designed for maximum efficiency by converting velocity pressure to static pressure potential and minimizing turbulence. Casing shall be bondorized, primed and finish coated with enamel paint. Housing shall be mounted on adequate quantity of metallistik vibration isolators.

**2.6.2.3 Motor:**

Motor shall be squirrel cage, totally enclosed, fan cooled, constant speed, suitable for  $415 \pm 10\%$  volts, 50 Hz, 3 phase power supply, Motor nameplate horsepower shall be more than brake horse power by a minimum of 10%. Motor speed shall not exceed 1450 RPM. The fan and motor combination selected for particular requirement shall be of the most efficient type so that sound level and energy consumption is minimum. Motor conduit box shall be mounted on exterior of the casing. Wires from the motor to the conduit box shall be protected from the air stream by enclosing in a flexible metal conduit. In case of corrosive/inflammable air, the motor shall be isolated from air passage. For exhaust of Smoke/Inflammable air, fans shall be of 2 hrs fire rating. Motor shall be of high temperature resistance Class 'H'.

**2.6.2.4 Rotor:**

Hub and blades shall be cast aluminum construction. Blades shall be die formed Aerofoil section for maximum efficiency and shall vary in twist and width from hub to tip to effect equal air distribution along the blade length. Fan blades mounting on the hub shall be statically and dynamically balanced. Maximum clearance between blade tip and fan housing at the specified duty blade setting shall be 5 mm. Rotor blades shall be whirl tested to speed of 25% above the design operating speed and certification of the test shall be provided by the manufacturer. Extended grease leads for external lubrication shall be provided. Rotor shall be statically and dynamically balanced. The fan pitch control shall be manually readjusted at site upon installation for obtaining actual air flow values as specified and quoted. The impeller blade shall be of adjustable type blade.

**2.6.2.5 Vibration Isolation:**

The assembly of fan and motor shall be suspended from the ceiling by spring type vibration isolators.

**2.6.2.6 Accessories;**

The following accessories shall be provided with all fans:

- i. Outlet cone for static pressure regain.
- ii. Inlet cone.
- iii. Fan silencers if required.

Fan shall be factory assembled and shipped with all accessories factory-mounted.

**2.6.3 Propeller fans**

Propeller fans shall be approved make direct-drive, three or four blade type mounted on a steel mounting plate with orifice ring.

**2.6.3.1 Mounting Plate:**

Shall be steel construction, square with streamlined venturi inlet (reversed for supply applications) coated with baked enamel finish, the mounting plates shall be of standard size, constructed of 12 to 16 gauge sheet steel depending upon the fan size. Orifice ring shall be correctly formed by spinning or stamping to provide easy passage of air without turbulence and to direct the air stream.

**2.6.3.2 Fan Blades:**

Shall be constructed of cast aluminum or steel. Fan hub shall be of heavy welded steel construction with blades bolted to the hub. Fan blades shall be quiet in operation and shall be statically and dynamically balanced at the factory.

**2.6.3.3 Shaft;**

Shall be of steel, accurately ground and shall be of ample size for the load transmitted, and shall not pass through first critical speed through the full range of specified fan speeds.

**2.6.3.4 Motor:**

Shall be standard (easily replaceable) permanent split capacitor or shaded pole for small sizes, totally enclosed with pre-lubricated sleeve or ball bearings, designed for quiet operation with a maximum speed of 900 RPM for fans of 380 mm. dia or larger and 1450 RPM for fans 300 mm dia or smaller. Motors for fans 600 mm dia and larger shall be suitable for 415/220 +/- 10% volts, 50 cycles, 3/1 phase supply, and for fans less than 60 cms. dia shall be suitable for 230 +/- 6% volts, 50 cycles, single phase power supply, and shall be suitable for either horizontal or vertical service, as indicated on drawings and in schedule of quantities.

**2.6.3.5 Accessories;**

The following accessories may be required and provided with propeller fans as indicated in BOQ. :

- i. Wire guard on inlet side, and bird-screen at the outlet.
- ii. Oscillating louvered anodized aluminium cover with bird screen.
- iii. Regulators for controlling fan speed for single phase fan motors.

**2.6.4 Performance Data**

All fans shall be selected for the lowest operating noise level. Capacity rating, power consumption with operating points clearly indicated, shall be submitted, and verified at the time of testing and commissioning of the installation.

**2.6.5 Testing**

Capacity of all fans shall be measured by Velometer. Measured air flow capacities shall conform to the specified capacities and quoted ratings. Power consumption shall be computed from measurements of incoming voltage and input current.

**3 DUCT WORK**

All longitudinal seams shall be Pittsburgh lock seam or grooved seam.

All transverse joints shall be made with the flanged angle frame connections. Either angle iron or slide-on flange. All transverse joints may also be made with 'C' cleats-up to 400mm maximum duct size only.

All ducts over 400mm either direction shall be cross-broken except those to which rigid board insulation is attached or to which diffusers or branch ducts are connected.

All elbows shall be "Standard radius" or "square throat - double vane", unless the approval of the Contractor is obtained for a satisfactory alternative.

Steel not required to be galvanized shall be wire brushed after fabrication and coated with 2 layers of primer.

Angles shall not be fixed over cross breaks.

Round spigots for flexible ductwork connection to rigid sheet metal ductwork or plenums shall have a minimum length equal to one diameter of the flexible duct. Each spigot shall be completed with a circular volume control damper for flow control.

All supply air plenum boxes at supply air fittings shall be constructed to the same standard as low pressure ductwork and shall have butterfly type volume control dampers for the air flow rate control.

Supply and install crossovers, transitions, offsets and changes in duct shapes to avoid interference with beams, pipes, electrical conduits, lighting fixtures and other obstructions to maintain equal air flow resistance of all ducts. Pieced or patched sheet metal work is not acceptable. Where patented ducting systems have been approved, installation shall be in accordance with the manufacturer's recommendations.

Inspect all ductwork internally prior to erection and remove all dirt, dust and other foreign matter. Cover all open ends of ducts during construction with polythene sheeting taped in position. No pipes shall pass through ducts, unless deemed necessary by the Contractor where pipes are shown to pass through ducts, provide teardrop sheet metal fairings, carefully shaped around pipes, seal ducts at junction.

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All joints shall be lapped, creased and secured for airtight connection. Lap all slip-joints in direction of air flow.

All flanged transverse joints shall be sealed with neoprene gasket around the entire perimeter. Joints in air chambers and plenums shall be caulked airtight. Bottoms of all such air chambers resting on masonry floor shall be gasketed or caulked to prevent air leakage.

Connect the ducts, casings, plenums, rain baffles, bird screens and sheet metal work to all fresh air intakes as specified.

Where ductwork in Plant Rooms is specified or shown to be insulated, mount such ducts not less than 150 mm away from floors and walls, so that insulation may be installed.

Where floor slabs are of weatherproof construction do not pierce waterproofing with retaining bolts or inserts. Check with Contractor for approved method of securing plenums, chambers and casings to a waterproof slab.

Supply and install hangers, brackets and supports for all sheet metal and ductwork suitable for the building construction.

Pop rivets shall be of the self sealing type.

For square elbows use long tail pattern turning vanes, 37 on mm centres. The tangent portion of the tail of each vane shall be half as long again as the arc.

All turning vanes at every elbow in acoustically lined duct shall be acoustically lined.

Adequately protect all ductwork delivered to site. Any ductwork damaged in transit or storage shall be replaced at the direction of the Contractor.

### 3.1 Rectangular Duct

a. For Low Pressure System (upto Fan external static pressure of 50mm WC).

LARGER SIDE OF DUCT mm	THICKNESS OF SHEET mm/G	TYPE OF TRANSVERSE JOINT	TYPE OF REINFORCEMENT
	GSS / SS		
Upto 750	0.63 / 24	Rolamate / TDF	As per SMACNA
751 to 1500	0.80 / 22		

b. Longitudinal seams shall be Pittsburgh lock type at corners as shown on sheet. Longitudinal joints shall not be provided for rectangular ducting at locations other than corners, except where larger side of duct exceeds 2500mm. Longitudinal joints of ducting having side larger than 2500mm other than corner shall be grooved or standing seam as shown.

If specified, sealing of the longitudinal seams shall be accomplished-using Dow corning RTV 732 Silastic or equivalent.

c. All circumferential joints shall be MS angle flanged joints.

d. Flanges used for transverse joints shall be joined with each other with Galvanized Steel (GS) bolts, washers and nuts. The bolts shall be of minimum M8 size and the spacing between bolts shall be maximum 150 mm for low-pressure system and 100 mm for high-pressure system.

e. For transverse angle flanged joints, **neoprene gasket (3mm uncompressed thickness and width equal to flange face)** adhered to the flange face shall be used. The

bolt holes in gasket shall be the same as bolt diameter and shall be punched prior to insertion of gaskets

- f. All flanges shall be applied with two coats of zinc-chromate, silver or zinc paint. (Red oxide is prohibited)
- g. Angles shall have welded corners and shall be riveted to the ducts at 300mm centers. (Maximum).
- h. For SS ducts all related appurtenances such as transverse joint angles, reinforcement angles, fasteners, turning vanes, access doors, etc. shall be of the same material as of duct.

### **3.1.1 Duct Supports and Hangers**

- a. Rectangular Ducts shall rest on supporting 14 G GI Slotted channel and this supporting slotted channel shall be supported by full threaded GI rod from ceiling. Supporting details for low-pressure system shall be as given below.

<b>LARGER SIDE OF DUCT mm</b>	<b>SUPPORTING ANGLE mm</b>	<b>VERTICAL ROD DIAMETER mm</b>	<b>MAXIMUM SPACING BETWEEN SUPPORTS mm</b>
Upto 900	40x40x6	10	2400
901 to 1500	40x40x6	10	2400
1501 to 2400	40x40x6	10	2400
2401 and above	65x65x6	12	2400

The GI slotted channel thickness shall be 14 G.

Supporting details for high-pressure system shall be as given below:

- b. Zinc coated anchor fasteners or embedded plates shall be provided for upper attachments to the building. Anchor fasteners shall be provided by Contractor. Embedded plates shall be provided by Contractor. Contractor shall provide duct supports from angle cleats welded to the embedded plates. Anchor fasteners shall be loaded to maximum 20% of the maximum rated capacity specified by the manufacturer. Architect representative shall approve all anchor fasteners used for supporting duct.
- c. In case of insulated duct, anchor fasteners shall be selected based on actual total load.
- d. Duct supports shall be qualified and sized for seismic forces.

### **3.1.2 Flexible Connections (Metal Duct connections to Supply / Exhaust Fan)**

Where sheet metal duct connects to the intake or discharge of fan units, a flexible of fire retarding double layer heavy duty canvas of at least 150mm width shall be provided. The material shall be attached to angle frames by means of steel and over the end of the flexible connection.



The material shall be secured between the band and the angle frame by bolting. Sleeve shall be made smooth and the connecting ductwork rigidly held by independent supports on both ends. The flexible connection shall be suitable for fan intake and outlet pressures. This shall be part of the equipment supplier.

### **3.1.3 Transformation**

Duct transformation shall be used to change the shape of duct and shall be made for easy and noiseless flow of air. Maximum slope of transformation shall be 1:4

### **3.1.4 Bends, Offsets and Branch Connections**

Factory fabricated bends, offsets and branch connections shall be supplied and installed. All bends, offsets and branch connections shall be made for smooth and noise less flow of air and minimum pressure drop. In case of full radius elbow optimum ratio of centre line radius of elbow to duct dimension of 1.25 shall be considered. However, due to space constraint shorter radius constraint shorter radius elbow or square elbow with guide vanes may be provided. Contractor shall furnish the details of guide vanes i.e. number of vanes, location etc. in the drawing. The flow of air to the branch duct shall be regulated by a splitter damper or volume control damper.

### **3.1.5 Duct Joint Sealants**

All sealants, adhesives, tapes, etc., used for jointing and sealing of ductwork systems shall comply with the requirements.

Jointing for flanged cross joints shall be formed from a gasket. Gaskets may be soft neoprene, armaflex tapes or other material to approval and gaskets shall have adhesive backing on both sides.

Note: All adhesives and sealants must comply with South Coast Air Quality Management District (SCAQMD) Rule #1168 for VOC limits to achieve LEED credit IEQc4.1

### **3.1.6 General Installation Guide lines**

Lay out all work at the building site. Take all necessary measurements and construct the work to meet actual building conditions.

Inspect all ductwork internally prior to erection and remove all dirt, dust and other foreign matter. Cover all open ends of ducts during construction with polythene sheeting taped in position. No pipes shall pass through ducts, unless deemed necessary by the Contractor where pipes are shown to pass through ducts, provide teardrop sheet metal fairings, carefully shaped around pipes, seal ducts at junction.

All joints shall be lapped, creased and secured for airtight connection. Lap all slip-joints in direction of air flow.

All flanged transverse joints shall be sealed with neoprene gasket around the entire perimeter. Joints in air chambers and plenums shall be caulked airtight. Bottoms of all such air chambers resting on masonry floor shall be gasketed or caulked to prevent air leakage.

Connect the ducts, casings, plenums, rain baffles, bird screens and sheet metal work to all fresh air intakes as specified.

Where ductwork in Plant Rooms is specified or shown to be insulated, mount such ducts not less than 150 mm away from floors, walls, so that insulation may be installed.

Where floor slabs are of weather-proof construction do not pierce waterproofing with retaining bolts or inserts. Check with Contractor for approved method of securing plenums, chambers and casings to a waterproof slab.

Supply and install hangers, brackets and supports for all sheet metal and ductwork suitable for the building construction.

Pop rivets shall be of the self-sealing type.

For square elbows use long tail pattern turning vanes, 37 on mm centres. The tangent portion of the tail of each vane shall be half as long again as the arc.

All turning vanes at every elbow in acoustically lined duct shall be acoustically lined.

Adequately protect all ductwork delivered to site. Any ductwork damaged in transit or storage shall be replaced at the direction of the Contractor.

### **3.2 Flexible Ductwork**

All flexible supply air ducts shall have 25mm thick glass-fibre insulation with a 0.075mm thick glass fibre reinforced aluminium foil bonded to the internal face by means of a solvent-based SBR adhesive. The internal face shall be supported with 1.3mm thick spring-steel wires bonded at 20mm centres by means of a solvent-based SBR adhesive. Ensure that flexible ducts comply with F.S.D. regulations. Flexible duct shall not be longer than 1.5 m and round GI ducts shall be used in connection with the flexible ducts whenever necessary to comply this requirement in case that the duct is longer than 1.5 m. The airflow velocity through the flexible duct shall not be more than 3.0 m/s.

The flexible duct shall be made of triple lamination of aluminium foil, polyester and Metalized Polyester film permanently bonded to a coated spring steel wire helix. The exterior shall be wrapped with 1.25 inch thick 14 kg / m<sup>3</sup> fibreglass insulation. The outer insulation jacket / vapour barrier shall be made of fibreglass reinforced Metalised Polyester film laminate. The fire rating of the flexible duct shall conform to BS 476 Parts 5, 6 and 7. Duct shall be in tear and puncture resistant construction.

#### **3.2.1 Method of Installation:**

- The maximum length is 1.5m if the length exceeds more than 1.5m round duct connectors made of GI sheets shall be used.
- The maximum allowable sag between any two adjacent suspension points should not exceed 50 mm per meter
- Flexible ducts mounted above the suspended ceiling should always be independently supported.
- Hanging straps should be used for supporting the flexible ducts, minimum width of the material used for the hanging straps should be at least 25mm
- Extra care should be taken when making flexible connection to fixed conventional ducts and ensure that they don't get stressed. An additional support is to be provided to obviate this potential problem.
- Connections to the ceiling supply air plenum boxes should be served in most direct manner.
- All bends should be made as large as possible and should have a radius of not less than the diameter of the duct in use.
- Double bends to be avoided however if unavoidable ensure that each radius is not less than  $R=2XD$
- Flexible duct must not be in direct physical contact with un insulated heating or hot process pipes.
- Every branch duct shall have test plugs.

- Every duct tap-off from supply and return air duct shall be complete with opposed blade volume control damper.

The duct leakage rate shall not exceed 1% of full flow and 25% of the ducts shall be tested at site for duct leakage

### **3.3 Fire Dampers**

All supply and return air ducts at plant room crossings, UPS room crossings and at all floor crossings shall be provided with smoke & fire dampers of at least 120 minute fire rating. These shall be multi leaf dampers.

All springs and catches shall be of non-ferrous and corrosion-resistant materials.

Fire damper shall be provided with "extended sleeves". Access doors shall be provided within the duct in accordance with the manufacturer's recommendation.

Fire dampers blades and outer frames shall be of 16G GSS construction. The damper blades shall be provided on both ends using chrome plated spindles in self-lubricated bronze bushes. Stop shall be provided on top and bottom of damper housing made of 16G GSS. For preventing smoke leakage, side metallic compression seals shall be provided.

All fire dampers shall be of very low leakage; non-heat degradable; single membrane non-airfoil drag; design with friction free metal-to-metal seals, and dead air space seal formed at blade joints incorporated into the blade and frame shapes.

All smoke & fire dampers shall be approved by the relevant Authorities. Inspection door shall be provided for fire dampers. Smoke & Fire dampers shall be latest UL 555 rated and certified by UL. All smoke & fire dampers shall be complete with factory fabricated and fitted duct sleeve. The joints at the sleeve end shall be slip on type.

In particulars, fire dampers shall be installed in ducts where they pass through compartmentation walls, firewalls and concrete floors except in the case where the duct itself is in a fire isolated shaft.

Solenoid operated smoke & fire dampers shall be provided at all the locations. These dampers shall also be provided for the smoke free lobby, and lift well pressurisation system at each floor level. These shall consist of damper blades held in open position against spring pressure by a solenoid valve operating at 230 V. The dampers shall close on receiving fire or smoke signal as described elsewhere in this specification. These dampers shall close automatically on failure of power supply. Each of these dampers shall be provided with indication cum control panel for voltage step down, status indication, remote testing, reset facility as well as transmission of signal to BMS. These local panels shall be mounted within the AHU rooms.

### **3.4 Volume Control Dampers**

An adjustable deflector or damper with approved locking device shall be installed at each branch take off in supply and return systems and at each exhaust hood neck in exhaust systems. Dampers shall be not less than two metal gauges heavier than the duct, they shall have extended shafts and lugs mounted on the quadrant so that damper control can be located external to the insulation. Sheet metal stools shall be supplied as necessary. Dampers shall be adjusted and locked during the testing period.

VCD shall be fabricated of minimum 18G GSS and shall be of robust construction. VCD shall be single blade type for round duct and opposed blade type for rectangular duct. VCD shall have a locking device mounted outside the duct to hold the VCD in a fixed position without vibration. Fully open and fully closed position shall be marked for easier operation of VCD.

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Motor operated VCD shall be provided as per the drawing. Actuator for dampers shall develop sufficient torque for easy operation of VCD.

VCD shall be provided with Teflon or brass bushing for blade shaft as specified in Data Sheet – A. Motor operated VCD shall be provided with Teflon bushing or sealed ball bearing for blade shaft as specified in Data Sheet – A.

For SS duct, all splitter dampers and VCDs shall be fabricated from SS 304 sheet.

Volume dampers shall be used as detailed below, except where specified otherwise.

Opposed Blade - manually adjustable zone balancing dampers branches and at registers, grilles for air conditioning supply and return.

Splitter Dampers - manually adjustable at main duct separation.

Stream Splitter Dampers - on direct duct mounted registers.

Rotating Butterfly - at all minor branch ducts including flexible duct spigot connections.

Multi-leaf dampers shall be used where single leaf blades would be over 225 mm wide. Blades shall lock against each other and be provided with approved edge trim of neoprene to ensure an air tight seal or other approved material.

### **3.5 Air Fittings (Diffusers)**

All supply fittings diffusers shall be complete with opposed blade volume control dampers. The vanes shall be spring-loaded or otherwise arranged so that they remain permanently in their set position without vibration or noise. Where shown on the drawings, return and exhaust air fittings shall also have opposed blade volume dampers.

All grilles, registers and diffusers shall be capable of being removed easily from the ductwork for access to dampers, etc., and constructed in accordance with the best practice and free from sharp edges.

Except where otherwise shown on the drawings, all air fittings shall have concealed fixing systems. Exposed screw fixings will not be accepted. All corners shall have mitred joints with no discernible gaps and all surfaces shall be completely smooth suitable for a painted finish.

Painting - All diffusers and registers shall be prime-coated with best quality rust-preventive primer and then painted flat-grey enamel. Final colour enamel coat to be approved by the Project Manager.

Return air grilles for fan coil units shall generally be arranged such that the central core of the grilles is hinged and demountable for access to the filter for cleaning. Mounting frames for these grilles shall include provisions for fixing the filters in position.

Air fittings requirement that they comply with tender as closely as possible with the quality and performance standards of imported products such as Anemostat, Barber Colman, Tempmaster etc. In preparing the tender, the Contractor shall ensure that such a standard are locally obtainable. The Bank/ Architect representative specific approval for all air fittings will be required.

Samples of every type of grille, diffuser, etc., shall be submitted to the Bank/ Architect for approval before orders are placed.

Air fittings mounted to the air duct or the plenum should be rigidly fixed to the air duct or plenum without leakage of air to the above of the false ceiling.

### **4.0 Pipes and Pipe Fittings:**

#### **4.1 CHILLED WATER PIPING**

Pipes threads shall be to IS 554 and flanged to IS 1536.

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All chilled water piping shall be black steel unless otherwise stated. Pipes shall be given one primary coat of anti-corrosive red paint before being installed and one coat after installation and welding. Pipes shall be sloping towards drain points. Fittings shall be brand new, of pressure ratings suitable for the piping system. Fitting used on welded piping shall be of the welded type. Flanges shall be new and from standard manufacturers. Supply of flanges shall include bolts, washers etc. as required. Mitered or Mitred or fabricated fittings shall not be permitted. Flanges shall be as per ISI.

Tee-off connections shall be through equal or reducing tees, as required. Ferrules welded to the main pipe shall be used for tee connections, which are 2 sizes smaller than the main pipe. Drilling and tapping of the walls of the main pipe shall not be permitted to. Standard tees shall be used in case the tapping is the same as pipe size or one size smaller.

All tapping to main header from equipment shall be shoe type joint in the direction of flow.

Pipe size	Material	Joints & Fittings	Sealing Materials
Up to 50 mm	MS ERW Class "C" Heavy class IS 1239/1958	1. Screwed Fittings 2. Unions 3. Screwed flanged	1. Non Hardening 2. Lubricant 3. 3 mm 3 ply rubber insertion
65 mm to 150 mm	MS ERW Class "C" Heavy class IS 1239/1958	1. Welded 2. Slip-on flanges 3. Screwed flanges	1. --- 2. 3 mm 3 ply rubber insertion 3. 3 mm 3 ply rubber insertion
200 mm to 300 mm	Welded pipe B.S 534/1934 6 mm wall thickness	1. Welded 2. Slip-on flanges	1. --- 2. 3 mm 3 ply rubber insertion
350 mm and over	Welded pipe B.S 534/1934 6 mm wall thickness	1. Welded 2. Slip-on flanges	1. --- 2. 3 mm 3 ply rubber insertion

Quality of all equipment and valve connections, or connections to any other mating pipe shall be through unions, threaded fittings, for easy removal up to 50mm dia and flanges welded or screwed flanges for MS for larger dia or as required for mating connections. All welded piping is subject to the approval of the project architect/Bank and sufficient number of flanges and unions shall be provided as required. The same shall be included as a part of the pipe cost.

#### **4.1.1 PIPING INSTALLATION:**

The drawings indicate schematically the size and location of pipes. Pipe runs and sizes cannot be changed. However where there are problems, the pipe run may change after prior approval of the Bank/ Architect representative is received to meet the site conditions. Contractor must check all Consultant's drawings and inform, if any, change is required. They must keep in view the specific openings in buildings and other structures through which the pipes are designed to pass. In case of any change required in the drawings, the Contractor shall prepare detailed drawing along with cross section and longitudinal section details wherever a change in drawing is required. All the working drawings shall be approved by the Bank/ Architect Site representative before starting of the installation.

Piping shall be properly supported on or suspended from stands, clamps, hangers, etc. as specified and required. The contractor shall adequately design all the brackets saddles, clamps handles etc and be responsible for their structural integrity. All such samples should have the approval of the Engineer-in-charge.

Pipes supports shall be of mild steel, adjustable for height and prime-coated with rust preventive paint and finish coated black. Where pipe and clamp are of dissimilar material, a gasket

shall be provided in between. Contractor shall ensure that all pipes with insulation are not in direct contact with the hangers (pipe supports).

Di-electric couplings or unions shall be provided between connections of dissimilar metals- pipes, to cooling coils, flanges and FCU's. All such pipes should also be insulated and should be air tight.

**4.1.2 Hanger angles shall be the following diameters:**

Pipe size (mm)	Angle supports
20 to 50	40 X40 X 3 MM
65 TO 80	40 X40 X 6 MM
100 TO 125	50 X50 X 6 MM
150 TO 200	50 X50 X 6 MM
250 and above	75 X 75 X 6 mm

**4.1.3 Spacing for the pipe supports shall be as follows:**

Pipe size (mm)	Spacing (Mtrs)
12 to 40	2.0
50 TO 80	3.0
100 and above	3.0

Pipe hangers shall be fixed on walls and ceiling by means of approved shear load fasteners of required sizes. The anchor fasteners shall be approved by Bank / Architect site representative before installation. There shall be minimum 2 anchor fasteners per leg of the supports. Distance between two anchor fasteners should be minimum 3". The cleats used for anchoring shall be made of 50 x 50-x 6mm cross-section. Where pipes are supported from steel structure provide beam clamps as approved by Bank / Architect site representative.

All piping connected to coils and apparatus requiring tube cleaning or removal shall run clear of such area except for removable connections.

All piping shall be independently supported at equipment so that the equipment shall not carry the weight of piping.

Piping shall not be located over electrical equipment without adequate protection against condensation dripping and leakage. All such pipes require prior approval of the Bank / Architect site representative.

Piping passing expansion joints shall provided with expansion loops, if required, as shown in the drawings.

Vertical risers shall be parallel to walls and column lines and shall be straight and plump. Risers passing from floor shall be supported by clamps or collars attached to pipe and with a 12mm thick rubber pad or any resilient material, where pipes pass through the terrace floor, suitable flashing shall be provided to prevent water leakage. Risers shall also have a suitable elbow or concrete pipe support at the lowest point.

Insulated piping shall be supported in such a manner as not to put undue pressure on the insulation. 1.80mm metal sheet shall be provided between insulation and the clamp saddle or

roller extending at least 150mm on both sides of the clamp, saddle or roller. At pipe supports provide wooden battens shaped to suit the pipe diameter between pipe and hanger so as to prevent metal-to-metal contact and sweating of support. The wooden gutty shall be at least 100mm in height.

Piping work shall be carried out with minimum disturbance to the other work on the site. A program of work shall be chalked out in consultation with the Bank/Architect site representative.

Contractor shall make sure that the clamps anchor sets are adequate for the pipes supported. Piping layout shall take due care of expansion and contraction in pipes.

All pipes using screwed fittings shall be accurately cut to the required sizes and threaded in accordance with IS 554 and burrs removed before laying. Open ends of the piping shall be blocked as the pipe is installed to avoid entrance of foreign matter. Wherever reducers are to be made in horizontal runs, eccentric reducers shall be used if the piping is to drain freely, in other locations, concentric reducers may be used.

All chilled water piping will be black steel unless otherwise stated. Pipes will be given one primary coat of anti corrosive red paint before being installed and one coat after installation and welding. Pipes will be sloping towards drain points.

Fittings will be brand new, of pressure ratings suitable for the piping system. Fitting used on welded piping will be of the welded type. Flanges will be new and from standard manufacturers. Supply of flanges will include bolts, washers etc. as required.

Tee-off connections will be through equal or reducing tees, as required. Ferrules welded to the main pipe will be used for tee connections, which are 2 sizes smaller than the main pipe. Drilling and tapping of the walls of the main pipe will not be permitted to. Standard tees will be used in case the tapping is the same as pipe size or one size smaller.

#### **4.2 PIPE TESTING:**

All pipes lines must be flushed with water at least 2/3 times before connection to the AHUs/FCUs. All piping shall be tested to hydrostatic test pressure of at least one and half times the maximum operating pressure, but not less than 10 Kg/Sq.cm or 1.5 times operating pressure whichever is higher for a period of not less than 24 hours. All leaks and defects in joints revealed during the testing shall be rectified to the satisfaction of the Bank/Architect site representative.

Piping repaired subsequent to the above pressure test shall be re-tested in the same manner. System may be tested in sections and such sections shall be securely capped.

The Bank/Architect Site representative shall be notified well in advance well in advanced by the Contractor of his intention to test a section or sections of piping and he or his authorized representative shall witness all testing.

The Contractor shall make sure that proper noiseless circulation of fluid is achieved through all coils and other heat exchange equipment in the system concerned. If proper circulation is not achieved, the Contractor shall rectify the defective connections. He shall bear all the expenses for carrying out the above rectifications, including the tearing up and re-finishing of floors, walls etc as required.

No insulation shall be applied to chilled water piping until after the completion of the pressure testing to the satisfaction of the Bank/Architect Site representative

The Contractor shall provide free of any additional cost, all materials, tools, equipments, instruments, services and labour required to perform the test to remove water resulting from cleaning and/ after testing.

Flushing of all pipes should be done atleast 2/3 times before connecting the pipe line to the AHUs/Chiller/Pumps only after all air pressure test have been done and certified by the Bank/Architect Site representative

### **5.0 DRAIN PIPING**

All pipes to be used for condensate drain and fittings shall be Blue HDPE Pipe unless specified otherwise.

For proper drainage of units Condensate, 'U' trap shall be provided in the drain piping.

All condensate drain piping shall be insulated and painted as per the section "Insulation" as indicated in Schedule of Quantities.

### **6.0 INSULATION Material**

Thermal insulation material for Duct & Pipe insulation shall be closed cell Elastomeric EPDM Rubber unless specified otherwise. The Thermal conductivity of the insulation material shall not exceed 0.038 W/moK at an average temperature of 32oC. Density of the EPDM rubber shall be 40-60 Kg/m<sup>3</sup>. The product shall have temperature range of – 57 oC to 125oC.

The insulation material shall be fire rated for Class V 0 as per UL 94. The flammability and smoke density shall be 25/50 as per ASTM E 84, Non flammable as per JIS K 6911, Australian standard 1530 and class 5.3 as per EMPA. Water vapour diffusion resistance factor( $\mu$ ) \_ 7000. The water absorption (weight%) shall not exceed 5 as per ASTM D 1056. The insulation material should be free from Nitrosamine contents as per US FDA norms. It should be CFC free. It should not be corrosive to copper and stainless when tested as per DIN 1988. The material should not develop crack when tested for ozone resistance as per ASTM 1149. The % shrinkage (Heat Stability) should not exceed 6 when tested as per ASTM C 534( 93oC, 7 days).

No cracks should develop when exposed to UV (accelerated weathering resistance test cycle UVB-313 at 60 oC/8h, CON at 50 oC/4h) as per ASTM G 154-04. The resistance to microbiological growth should be in accordance to UL 181 – and meet the acceptance criteria of resistance to fungal contamination as per ASTM G21. It should meet the acceptance criteria of resistance to bacterial contamination as per ASTM 2180.

Thickness of the insulation shall be as specified for the individual application.

Each lot of insulation material delivered at site shall be accompanied with manufacturer's test certificate for thermal conductivity values, density, water vapor resistance factor, Nitrosamine content, Heat stability and fire properties.

Samples of insulation material from each lot delivered at site may be selected by Bank's/Architect's site representative and gotten tested for thermal conductivity and density at Contractor's cost.

Adhesive used for sealing the insulation shall be modified neoprene contact adhesive with minimum bond strength of 1.25 kg/m<sup>2</sup>. It should have high water vapour resistance, good weathering properties and self-extinguishing once dried strictly as per manufacturer's recommendations.

### **7.0 PRESSURE GAUGES:**

Pressure gauges shall not be less than 100 mm dia. And of approximate range and be complete with shut off gauge cocks etc. duly calibrated before insulation. Shut off gauge cocks shall be gate valves of ½" dia.

Care shall be taken to protect pressure gauges during pressure testing.

### **8.0 THERMOMETERS:**

Thermometers shall be 100 mm dia. Dial industrial type of approximate range duly calibrated before installation.

Thermometers shall be installed in separate brass well with oil.



## **9.0 Testing and Balancing**

### **9.1 General**

Testing and balancing shall be made in the presence of the Bank/Architect site representative or his testing and balancing shall be made in the presence of the Consulting Engineer or his all air conditioning & ventilation equipment. The duly filled the checklist has to be submitted to the Bank/Architect site representative before starting the testing & balancing.

Supply all necessary skilled labour, helpers, equipment and materials for tests, operating the system.

Protect valves and equipment from damage during tests. Include connection to previously tested sections, if the systems are tested in sections.

Prior to the balancing procedure operate all systems for at least 16 consecutive hours, or longer if required, to prove satisfactory automatic operation. If systems shutdown is experienced for any reason, repeat and test until 16 consecutive hours are achieved. Operate equipment as recommended by the equipment manufacturers and in such a manner as to avoid damage to the work of other trades.

Submit to the Consulting Engineers for review a log of all tests made which shall include time, temperature, pressure and other readings necessary to indicate that the systems have been operated and tested as required by the Specification.

Upon completion of testing and balancing submit six (6) copies of the recorded test data for the Consulting Engineers evaluation and approval.

Flow quantities for Air side, Chilled and Condenser Water Systems shall be verified by the Bank/Architect representatives before the report is submitted.

### **9.2 Testing of Medium & Low Pressure Ducts**

The Medium and Low Pressure ducts shall be tested for air leaks as per SMACNA with test rigs complete with Fan and measuring devices.

### **9.3 Testing of Piping**

Test all piping as noted below with no leaks or no loss of pressure. Repair or replace defective piping until tests are accomplished successfully.

### **9.4 Testing of Electrical Work**

Supply necessary meters, instruments, temporary wiring and labour to perform all required tests and adjustment of equipment and wiring installed and connected under this Sub Contract, including the electrical equipment supplied by others to determine proper polarity, phasing, freedom from earth faults and shorts and the proper operation of equipment, meters relays etc.

All materials and manner of installation shall be in strict accordance with the applicable requirements of the local Authorities. The installation must pass all inspections, and will be subject to the approval of such authorities and the Engineer.

Wherever any codes, laws, etc., require any work to be tested or approved the contractor shall provide proper facilities for access and for inspection, all at his own expense.

Tests shall be made for continuity and identification of each conductor. Both ends of a given conductor shall be identified alike. Before circuit terminal connections are made, continuity and identification shall be checked by means of a D.C. test device using a bell or buzzer or battery powered phone to ring out the wires.

All earth tests shall be made with 100 volt merger test-type instrument.

Test each circuit for grounds and shorts by means of a merger insulation-testing instrument, which shall impress a voltage of not less than 100 volts D.C. upon the circuit under test. Any circuit showing an insulation resistance less than the minimum values given in the Wiring Rules shall be investigated and weak points corrected. All circuits under merger insulation test shall be connected to the respective final terminals and switches or breaker, in the 'OFF' position.

Correct or replace any nominal current carrying circuit which is defective or earthed. Also correct all trouble encountered by test and set breakers and relays as directed so that equipment will be in proper operating condition, before being placed in service.

Following establishing procedure, equipment will be energized after certification by the Architect that the installation is satisfactory. Final operational tests shall determine that the wiring connections are correct.

### **9.5 Pre Balance Checks and Start Up**

The Air and Water Systems will be checked out at specified below, and started up prior to balancing.

- Complete "water pressure and duct pressure testing for leakage.
- Complete all 'Punch List' check items.
- Install all dampers and other balancing devices as called for in the construction documents and verify the same are properly installed, indexed and in good working order.
- Check all motor starters and verify that the heater sizing is correct, taking length of electrical feeders into consideration. Record amp readings on all motors.
- Check out and align all equipment drives.
- Set all fan sheaves to provide the indicated capacities at specified static pressures (RPM as specified).
- Set all manual balancing dampers, valves and balancing valves at 100% open position. Verify that all fire dampers are open.
- All adjustable pitch pulleys shall be removed from the motor shaft. The shaft and pulley threads shall be cleaned, lightly oiled, and pulley remounted, aligned and properly adjusted.
- Clean interior of all plenums, casings and ducts and install all filters before starting systems.
- Make sure all controls systems are calibrated and functioning properly.
- Place all systems in automatic operation.
- Operate systems for 16 consecutive hours without shutdown with all equipment in perfect working order. Manufacturer's representative must be present at initial start-up all equipment.
- Check fan and pump bearings for grease.
- Install clean prefilters and install high efficiency filters in all systems prior to starting air balance.
- Provide availability of personnel from all the related mechanical and controls contractors during balancing.

### **Test Reporting Forms**

25 Test forms used for testing and balancing shall be set up to include the following information. Each sheet shall have job name and address, name of air conditioning sub-contractor, architect and engineer instruments used to perform tests, and name of test technician or test engineer. All forms shall be submitted in typewritten form. A minimum of 6 copies shall be submitted. Test sheets shall be similar to those shown in the relevant section.

#### **9.6 Diffusers, Grilles and Registers - Test Sheets**

- 25 Fan Systems and/or zone number.
- Room number or area designation.
- Outlet code number, which shall correspond to code number of outlet on air balance code drawing
- Size of Outlet.
- Type of Outlet.
- Manufacturer of Outlet.
- Manufacturer's effective area for each size.
- Required FPM and required CFM of each outlet.
- Available FPM and CFM of each outlet

#### **9.7 Test ,Code Drawing**

Each Report shall contain a single line drawing of air distribution system with fan system and zone number indicated. Each and every outlet, supply, and return shall be indicated on this drawing by a number corresponding to the number on the outlet test sheet, enabling the Engineer to locate each outlet for this drawing.

Drawing shall be clear and neat and shall list name of job and location of same.

#### **9.8 Air side Testing and Balancing**

The Air System shall be tested and balanced as under

- Test and adjust fan RPM to design requirements
- Test and record motor full load amperes.
- Make Pitot tube traverse of main supply ducts and obtain design CFM at fans.
- Test and record system static pressures, suction discharge and total.
- Test and adjust system for design recirculated air.
- Test and adjust system for design outside air.
- Test and record entering air temperatures DB/WB.
- Test and record leaving air temperature DB/WB
- Adjust all main supply and return air ducts to proper design CFM.
- Adjust all zones to proper design CFM (supply and return).

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- Test and adjust each diffuser, grille and register to within 10% of design requirements:
- Each grille, diffuser, register shall be identified as to location and area.
- Size, type and manufacturer of diffusers, grilles, registers, and all tested equipment shall be identified and listed. Manufacturer's ratings on all equipment shall be used to make required calculations.
- Readings and tests of diffusers, grilles, and registers shall include required velocity and test resultant velocity. Required CFM and test resultant CFM after adjustments.

### **10.0 Bill of Material**

#### **10.1 Preamble**

- All items of work mentioned in the Schedule of Quantities shall be read and executed strictly in accordance with the description of the item in the Schedule of Quantities & read in conjunction with the appropriate IS and conditions of Contract.
- The rate for each item of work included in the bill of quantities shall unless expressly stated otherwise included cost of: -
  - a. All materials, fixing materials, accessories, hardware, operations, tools, equipment, consumables, civil works wherever involved and incidentals required in preparation for in the full and entire execution and completion of the work called for in the item as per specification and drawings completely.
  - b. Wastage on materials and labour.
  - c. All taxes transit insurance, packing and forwarding charges, loading, transportation, unloading, handling, hoisting, to all levels, setting and fixing in position, disposal of debris and all other labour necessary in accordance with contract documents, good practice and recognized principles excluding GST.
  - d. Liabilities, obligations and risks arising out of conditions of contract.
- Supply of materials shall mean supply of materials at site. The rate for supply shall include all taxes, Octroi, insurance, packing and forwarding charges, transportation, unloading at site excluding GST.
- The successful contractors shall submit the Schematic diagrams, fabrication drawings with details of all equipments wirings diagrams etc., to Bank/ Architect for approval prior to supply/commencement of such works. The approval of these drawings will be general and will not absolve to contractor of the responsibility of the correctness of these drawings. At least six copies of the approved drawings shall be supplied to Architects for their distribution to various agencies at site at no cost of Bank.
- The tenderers must see the site conditions such as type of soil, locations etc., and take all factors into consideration while quoting the rates as no extra cost will be allowed on any ground arising out of or relating to the site conditions.

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- Any error in description or in quantity or omission of items from the contract shall not vitiate this contract but shall be corrected and deemed to be a variation required by the Architect/ Bank.
- The tenderer shall take into account the expenses of pre-commissioning tests to be conducted as per specification of the complete installation by licensed agencies.

### 11. Bill of quantity

Refer the separate sheet of bill of quantity.

### 12. APPROVED MAKES OF MATERIALS

Contractor shall use the material of approved make as indicated below unless specified otherwise in BOQ or as approved by the Bank/Architect representative.

The Contractor shall ensure the correct selection of the approved make meeting the specifications and application duties. Before placing order for procurement, the sample of approved make shall be got verified for its suitability to the specification and application duty. However, Bank/ Architect representative reserves the right to opt for best preferred listed make.

The Contractor shall quote the rate for material and equipment as per the list of approved makes. In the event of the Contractor wants to use alternate makes other than those stipulated for any reason, the Contractor can send a proposal after ensuring that what he proposes at the least meets both the quality, and safety standard of the stipulated makes, and the financial benefit that will accrue to the Employer. He shall also stand full guarantee to his alternate proposal. The alternate makes can be used only after an approval accorded by the employer, whose decision will be final in the matter.

#### 12.1 LIST OF APPROVED MAKES

SL.No	EQUIPMENTS / MATERIALS	APPROVED MAKE
1	Motors	Crompton/Siemens/Abb
2	VFD	Danfoss/ABB/Honewll/ L&T/Siemens/Allenbradley
3	MS C class pipe	Tata / Jindal (Hissar)/Sail/Prakash/Zenith
4	Butterfly valve	Audco / Advance/ CR/Intervale/Arrow/Alpha laval
5	Dual plate check valve	Advance / Emerald / Leader
6	POT / Y Strainer	Advance / Emerald / Sant/ Leader/Kirloskar/ CV&R
7	Balancing valve	Advance / T&A / Danfoss/ Bell & Gossett/C&R/ Anergy
8	Ball vave	Audco/Emerald/Rapidcoo/ TBS
9	Ball vave with strainer	Audco/Emerald/Rapidcoo/ TBS
10	2 Way modulating valve	Honeywell / Jhonson control / Belimo / Siemens
11	PIPCV valve	Savcon / Danfoss / Belimo
12	Pressure gauge / Temperature gauge/CO,CO2 Sensor/Actuator	H-Guru / Forb marshal / Dwyer/ Wika/Audco/Honeywell/Simens/Jhonson control /kele/Fiebig/TREND
13	Flexible Bellow	Cori / Resistoflex

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14	Automatic airvent	Anergy/ Rapid cool/Honey well/Jhonson control/ Emerald
15	Flow switch	Honeywell / Jhonson control / Siemens / Danfoss/L&T/H-Guru
16	Difrential pressure switch	Honeywell / Jhonson control / Siemens / Danfoss/L&T/H-Guru
17	Air Handling Units/cooling coils/FCU/cabinet Type Exhaust air Fans ( Note: All equipment shall be Eurovent certified, AHRI Certified coils and AMCA certified Fans.)	Zeco Aircon / Edgetech / VTS Ventus / Citizen / Flakt wood/ Systemair
18	HV / MV XLPE INSULATED CABLE	KEI / POLYCAB / RR CABLE / HAVELLS/FI-NOLEX/NICCO/UNIVERSAL/
19	Chilled water FCU	Kubic / Butoria / zeco / edgetech
20	DX Units	Carrier/Voltas/Blue Star /Daikin/ Mitsubishi/O-General
21	PVC/HDPE Pipes	Finolex / Astral/ Supreme/ Astral/ Aashirwad
22	Ducting GI Sheets	Jindal /Sail/Tata
23	Factory Fabricated Ducts /Rectangular Ducts	Rolastar / Zeco /Ductofab/Voltas/ Alpha duct
24	Duct Supports/Anchor Fasteners	Gripple/Hilti/Rawl Plug/Hi Tech
25	Fire Dampers	Ruskintitus/ Caryaire / Systemair/ Airmaster/ Air-flow/ Tri star
26	Diffusers/Grills/Slot Diffusers/Exhaust/Disc Valves/Vcd/Butterfly Dampers/Louvers/Floor Grills	Ruskintitus/ Caryaire / Systemair/ Airmaster/ Air-flow/ Tri star
27	Flexible Ducts	Supaflex/Karthila/Caryaire / Atco
28	Nitrile rubber Insulation	Armaflex / K-flex / A-flex
29	Fibre Glass Insulation	Up Twiga/Owens Corning/Kimmco/ Lloyd Insulation/Paramount
30	Puf Insulation	Up Twiga/Owens Corning/Kimmco/ Lloyd Insulation/Paramount
31	Copper Pipes	Totaline /Rajco/Mehta Tubes / Mandev tubes/ Nipon
32	Filters	AAF / Fudenberg / Comfill/ thermodyn/An-ergy/Thermodyne
33	Ventilation fans/Pressurization fans( AMCA Certified)	Flaktwoods/Kruger/Nicotra /Greenheck
34	All others items not Covered Above	As per approval of the project Architect & Bank

**13.0 Final Acceptance Tests**

Following commissioning and inspection of the entire installation, and prior to issue of the Completion Certificate, the Contractor shall carry out final acceptance tests in accordance with a programme to be agreed with the Architect/Bank.

Should the results of the acceptance tests show that plant, systems and/or equipment fail to perform to the efficiencies or other performance figures as given in this Specification, the Contractor shall adjust, modify and if necessary replace the equipment without further payment in order that the required performance is obtained.

Where acceptance tests are required by the relevant Authorities having jurisdiction, these tests shall be carried out by the Contractor prior to the issue of Completion Certificate to the acceptance of the Authorities.

#### **14.0 Rejection of Installation / Plant**

Any item of plant or system or component which fails to comply with the requirements of this Specification in any respect whatsoever at any stage of manufacture, test, erection or on completion at site may be rejected by the Architect either in whole or in part as he considers necessary/appropriate. Adjustment and/or modification work as required by the Architect so as to comply with the Authority's requirements and the intent of the Specification shall be carried out by the Contractor at his own expense and to the satisfaction of the Authority/Architect/Consultant.

After works have been accepted, the Contractor may be required to carry out assist in carrying out additional performance tests as reasonably required by the Bank/Architect.

#### **15.0 Warranty and Handover**

The Contractor shall warrant that all Plant materials and equipment supplied and all workmanship performed by him to be free from defects of whatsoever nature before handover to the Bank.

#### **16.0 Handing over of Document**

All testing and Commissioning shall be done by the Contractor to the entire satisfaction of the Bank's/Architect's site representative and all testing and commissioning documents shall be handed over to the Bank's/Architect's site representative.

The Contractor shall also hand over all maintenance and operation manuals, all certificates and all other documentation as per the terms of the contract to the Bank's/Architect's site representative.

#### **17.0 Guarantee**

The contractor shall guarantee both the material and workmanship of first class quality corresponding to standard engineering practice.

For a period of One Year from the date of acceptance of the total installation, contractor has to repair or replace to the satisfaction of the Bank, any or all such work that may prove defective in workmanship, equipment or materials within that period, ordinary wear and tear and unusual abuse or neglect excluded, together with any other work, which may be damaged or displaced in so doing. Any defective materials / workmanship shall be rejected, the contractor has to rectify / replace at his own cost.

Also contractor has to test the entire installation upon completion and ensure that all units are functioning satisfactorily. Guarantee certificate of the materials supplied shall be handed over to the Bank.

### **SCHEDULE OF RATES**

1. The schedule of rates should be read in connection with all the other sections of the tender.

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2. The quantities shown against the items of work are only approximate and may vary to any extent. No extra whatsoever shall be entertained.
3. The rates inserted in the bills of quantities are to be for the full inclusive value of the work described under the several items, including all cost and expenses which may be required in and for the construction and full protection of the work described, together with all risks, liabilities, and obligations set forth or implied in the documents on which the tender is based. The quoted rates shall be for all heights, lifts, and lead unless otherwise mentioned specifically in the description of the item.
4. General direction and description of work and materials given elsewhere in the contractor documents are not necessarily repeated in the Bill(s) of quantities. Reference to be made to the other documents for the full information/details.
5. The contractor shall be deemed to have visited the site before quoting for the tender and to have examined for himself the conditions under which the work will be carried out including local conditions affecting labor and to have studied the items of the bills of quantities, the drawing and specification, relating to them and to have satisfied himself that the rates quoted by him provide for all minor accessories and contingent works or service as necessary for the works described even though there are not specifically defined.
6. Tenderer is advised to read items of works carefully and quoted the rates accordingly. However, if he quotes different rates for the same item(s) of work under different schedules of items, the lowest rates quoted shall be made applicable to all the Bill of Quantities and the contract sum shall be corrected accordingly.
7. Where an item of work not mentioned in a particular bill of quantities, is required to be executed and where the rate for such an item of work is quoted under a different bill of quantities forming a part of this contract, then the contractor being called upon shall execute the work and shall be paid at the rate so quoted. Nothing extra over shall be payable on this account.
8. The drawing(s) attached with this tender document are for the purpose of tender, giving the tenderer a general idea of the nature and the extent of works to be executed.
9. The rates quoted by the tenderer shall be deemed to be for the execution of the works in accordance with the "Construction Drawings" (to be supplied to the contractor at the "Design Aspect" of these drawings).
10. The rates quoted by the tenderer shall include all labor, tools and plants, materials inclusive of all, transport, loading, unloading charges, all levies, all taxes, excise duties, etc. at the time of quoting their rates. The quoted rates shall remain firm throughout the contract period. No escalation on prices of labor and materials shall be entertained.



**LETTER OF UNDERTAKING**

To,  
The Assistant General Manager  
Premises & Estate Dept.,  
2nd Floor, J. N Marg, Kharvel nagar,  
Bhubaneswar

Dear Sir,

**REVAMPING/ REMODELING OF HVAC PLANT OF LHO BUILDING AT BHUBANESWAR, ODISHA**

Having examined the terms & conditions, drawings, specifications, design relating to the works specified in the memorandum hereinafter set out and having visited and examined the site of the works specified in the said memorandum and having acquired the requisite information relating thereto and affecting the quotation, I/We hereby offer to execute the works specified in the said memorandum within the time specified in the said memorandum on the percentage rate basis mentioned in the attached schedule and in accordance in all respect with the specifications, design, drawings and instructions in writing referred to in conditions of Tender, conditions of contract and with such conditions so far as they may be applicable.

**MEMORANDUM**

(a)	Description of work	Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha
(b)	Earnest Money	<b>Rs.1,98,500.00 (Rupees One Lakhs Ninety Eight Thousand Five Hundred Only)</b> by means of Demand Draft / Pay Order from any scheduled Nationalized Bank drawn in favor of "SBI" and payable in "Bhubaneswar".
(c)	Time allowed for completion of work from the date of issue of work order.	8 calendar <b>months</b> from the date of commencement as per tender.

Should this tender be accepted, I/we hereby agree to abide by and fulfill the terms and provisions of the said conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to SBI, the amount mentioned in the said conditions.

I/we have deposited Demand Draft / Banker's Cheque / FDR for a sum of **Rs.1,98,500.00** as Earnest money deposit with the SBI. Should I/we do fail to execute the contract when called upon to do so, I/we hereby agree that this sum shall be forfeited by me/us to SBI.

We understand that as per terms of this tender, the SBI may consider accepting our tender in part or whole or may entrust the work of **Revamping/ Remodeling of HVAC plant of LHO Building at Bhubaneswar, Odisha**. We, therefore, undertake that we shall not raise any claim / compensation in the eventuality of Bank deciding to drop any/part of the BOQ from the scope of work of this tender at any stage during the contract period. Further, we also undertake to execute the work entrusted to us in phases on our approved rates and within the stipulated time limit without any extra claim for price escalation.

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As when ask by the SBI, I/we shall submit the supporting technical data sheet, specification and make of the items as per the BOQ.

We, hereby, also undertake that, we will not raise any claim for any escalation in the prices of any of the material during the currency of contract/execution/completion period.

Yours faithfully,

Signature of contractor With Seal