



GWALIOR SMART CITY DEVELOPMENT CORPORATION LIMITED
BID DOCUMENT



‘Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium’

Gwalior, Madhya Pradesh, India

Tender Reference Number: [GSCDCL/0043/2018]

Date of Issue: [16 April 2018]

OFFICE OF THE EXECUTIVE DIRECTOR
GWALIOR SMART CITY DEVELOPMENT CORPORATION LIMITED
Nagar Nigam Mukhyalay, City Center, Gwalior, Madhya Pradesh

DISCLAIMER

Gwalior Smart City Proposal (**SCP**) has been selected to implement the Area Based Development (**ABD**) and pan-city proposals by Government of India (GoI) under Smart City Mission (**SCM**). Gwalior SCP proposes smart solutions in ABD area and across pan city with various smart features and infrastructure.

To implement smart city projects in Gwalior, Gwalior Municipal Corporation (**GMC**) and Madhya Pradesh Urban Development Corporation has formed a special purpose vehicle called Gwalior Smart City Development Corporation Limited (**GSCDCL**).

GSCDCL has prepared this Tender Document (TD) for the '**Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium**'. This TD is a detailed document with specific terms and conditions on which the Bidder is expected to work. GSCDCL has taken due care in preparation of information contained herein and believes it to be accurate. However, neither GSCDCL or any of its authorities or agencies nor any of their respective officers, employees, agents, or advisors give any warranty or make any representations, express or implied as to the completeness or accuracy of the information contained in this document or any information which may be provided in connection or arising out of it.

The information provided in this document is to assist the Bidder(s) preparing their proposals. However, this information is not intended to be exhaustive and interested parties are expected to make their own inquiries to supplement and verify information in this document. The information is provided on the basis that it is non-binding on GSCDCL or any of its authorities or agencies, or any of their respective officers, employees, agents, or advisors. Each Bidder is advised to consider the TD as per its understanding and capacity. The Bidders are also advised to do appropriate examination, enquiry and scrutiny of all aspects mentioned in the TD before bidding. The Bidders are encouraged to take professional help of experts on financial, legal, technical, taxation, and any other matters/ sectors appearing in the document or specified work. The Bidders should go through the TD in detail and bring to notice of GSCDCL any kind of error, misprint, inaccuracy or omission.

GSCDCL reserves the right not to proceed with the project, to alter the timeline reflected in this document, or to change the process or procedure to be applied. It also reserves the right to decline to discuss the project further with any party submitting a proposal. No reimbursement of cost of any type will be paid to persons, entities submitting a proposal under or pursuant to this TD.

[To be provided on a non-judicial stamp papers of appropriate amount, duly notarized]

{Location, Date}

To:

The Executive Director,
Gwalior Smart City Development Corporation Limited (GSCDCL)
Nagar Nigam Mukhyalay, City Center, Gwalior, Madhya Pradesh

Reference: GSCDCL NIT No. ("TD") dated.

Dear Sir/Madam,

Over and above all our earlier confirmations and submissions as per the requirements of the TD, I/ we hereby declare, confirm and undertake that:

- 1 I/ We have quoted item rate price considering all items as requested by GSCDCL in the TD and stand committed to deliver to the highest standards and quality as required by GSCDCL to meet the timelines of the project. My/ Our bid submission is in line with the requirements of GSCDCL as stated in the TD.
- 2 I/ We confirm that we have factored in all costs and expenses for meeting the complete scope and deliverables of the TD.
- 3 I/ We are completely aware of the service level requirements and timelines specified by GSCDCL and are committed to adhering to the same. I/ We have also clearly taken note of the service level requirements of GSCDCL and expectations from us and wish to confirm that we have taken care of every aspect to meet the same.
- 4 I/We have gone through the bid documents and its terms and conditions and fully understood it. All the terms and conditions are acceptable to me / us.
- 5 I/ We have clearly understood GSCDCL's requirements and wish to confirm that I/ we shall abide by the terms and conditions of the TD.
- 6 I/ We confirm and understand that all arithmetical totaling errors will be corrected for the purpose of evaluation only and the consideration of that error for payment would be completely according to GSCDCL's discretion. I/ We also confirm and understand that for all other errors which we have made in the bid, GSCDCL, for the purpose of evaluation will take the corrected amount based on the price quoted by me/ us in the price sheets but the payment of such amounts would be completely according to GSCDCL's discretion.
- 7 I/ We confirm that I/ we will provide the best of my/ our resources and the people proposed by me/ us will be dedicated to GSCDCL for the sake of resource continuity. Further, I/ We also confirm that GSCDCL may interview the key resources proposed by me/ us and confirm its acceptability. In any event if a resource is found unfit by GSCDCL I/ we agree to change the same and provide GSCDCL with a replacement within reasonable time so as not to affect the services/ project timelines.
- 8 I/ We confirm and understand that GSCDCL has an aggressive rollout schedule and I/ we will adhere to the rollout schedule at no additional cost/burden to GSCDCL.
- 9 I/ We confirm that all the proposed solution components are compatible and interoperable with each other and the solution will meet the functional and technical requirements of GSCDCL.
- 10 I/ We confirm that the prices and values quoted by me/ us encompass the complete scope of the project and I/ we will ensure that the quality of deliverables for the project is not affected due to any pricing pressures.

- 11 There has been no conviction by a Court of Law or indictment / adverse order by a regulatory authority for a grave offence against me/ us. It is further certified that there is no investigation pending against me/us or the CEO, Directors/ Manager/ key employees of my/ our concern.
- 12 That the decision of GSCDCL will be final and undisputable in accepting or rejection of my / our offer.
- 13 That the self-certified information given in the bid document is fully true and authentic.
- 14 That:
 - a) Earnest money, will be deposited ONLINE/RTGS/NEFT/IMPS.
 - b) Information regarding financial qualification and annual turn-over is correct.
 - c) Information regarding various physical qualifications is correct.
- 15 No close relative of the undersigned and firm/company is employed with GSCDCL or any of its affiliates, shareholders or such other agencies that may influence the outcomes of this tender.

Dated this.....by20

[Signature of the authorized signatory]

[Name of the authorized signatory]

[Designation]

Phone no, *[insert phone number]*

Address: *[insert postal address for correspondence]*

E-mail *[insert e-mail for correspondence]*

SECTION – 1

GWALIOR SMART CITY DEVELOPMENT CORPORATION LIMITED

NOTICE INVITING TENDER (NIT)

NIT No.: GSCDCL/043/2018

Date: 16-04-2018

Gwalior Smart City Development Corporation Limited (GSCDCL) invites online **item rate bids** for the following works (estimated on UADD SOR w.e.f. 10/05/2012) from eligible registered contractors and firms of repute fulfilling eligibility criteria (Bidders) through www.mpeproc.gov.in for “**Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium**”.

The details are as under:

Key Schedule		
	Event's Name	Information
1.	Probable Amount of Contract	Rs. 7,70,98,240.00 (Rupees Seven Crore Seventy Lakhs Ninety Eight Thousand and Two Hundred and Forty only)
2.	Tender document Fee	Rs.20,000.00 /- (Rupees Twenty Thousand only) to be paid only through Online e-Tendering Payment Gateway
3.	Earnest Money Deposit (EMD)	Rs. 7,70,982 /- (Rupees Seven Lakhs Seventy Thousand Nine Hundred and Eighty Two only)
4	Last date for sending pre-bid queries	24/04/2018 till 17:30 hours. at gscdcltender@gmail.com
5.	Date, Time & Place of Pre-bid Meeting	25/04/2018 at 15:00 hours. Venue: Gwalior Smart City Development Corporation Limited, Nagar Nigam Mukhyalay, City Center, Gwalior, Madhya Pradesh
6.	Last date for Online Purchase of Tender Document	14/05/2018 till 1730 hours.
7.	Last date of Online Submission of Bids	15/05/2018 till 1730 hours.
8.	Date & Time for Opening of Pre-Qualification	16/05/2018 at 1600 hours.
9.	Date & Time for Opening of Technical Proposal	16/05/2018 at 1610 hours.
10.	Date & Time for Opening of Financial Proposals	Will be intimated later to the technically qualified Bidders
11.	Project Award Criteria	Lowest Bidding

Note: The bidders shall have to submit their bids online and upload the relevant documents as per key schedule (key dates).

1. All details relating to the Bid Document(s) can be viewed and downloaded from the website mentioned in NIT.
2. Bid document can be purchased after making online payment of portal fees through

Credit/Debit/Cash Card/internet banking.

3. At the time of submission of the Bid the eligible bidder shall be required to:
 - (i) pay the cost of Bid Document(No exemption is applicable);
 - (ii) deposit the Earnest Money(No exemption is applicable);
 - (iii) Submit a check list; and
 - (iv) Submit an affidavit.Details can be seen in the Bid Data Sheet.
4. Eligibility for Bidders:
 - a) At the time of submission of the Bid the bidder should have valid registration with the Government of Madhya Pradesh, PWD in appropriate class. However, such bidders who are not registered with the Government of Madhya Pradesh and are eligible for registration can also submit their bids after having applied for registration with appropriate authority.
 - b) The bidder would be required to have valid registration with MPPWD in appropriate class at the time of signing of the Contract.
 - c) Failure to sign the contract by the selected bidder, for whatsoever reason, shall result in forfeiture of the earnest money deposit.
5. Pre-qualification – Prequalification conditions, as applicable, are given in the Bid Data Sheet.
6. Special Eligibility - Special Eligibility Conditions, if any, are given in the Bid Data Sheet.
7. Amendment to NIT, if any, would be published on website only, and not in Newspaper.

Executive Director
Gwalior Smart City Development Corporation Ltd.

TENDER DOCUMENT

TABLE OF CONTENTS

Section No.	Particulars	Details
Section 1	Notice Inviting Tender	
Section 2	Instructions to Bidders	
	Bid Data Sheet	
	Annexure – A	Key Dates
	Annexure – B	Affidavit
	Annexure – C	Prequalification Criteria
	Annexure – D	Special Eligibility Criteria
	Annexure – E	Specifications
	Annexure – F	Procedure for participating in E-tendering
	Annexure – G	Joint Venture
	Annexure – H	Organizational Details
	Annexure – I	Technical Proposal
	Annexure – J	Financial Bid
	Annexure – K	Materials to be issued by department
	Annexure – L	Letter of Acceptance (LOA)
Annexure – M	Performance Security	
Section 3	Table of Clauses	
	Part-I	General Conditions of Contract (GCC)
	Contract Data	
	Annexure – N	Drawings
	Annexure – O	Detail of Milestones
	Annexure – P	Compensation for Delay
	Annexure – Q	List of Equipment for Quality Control Lab
	Annexure – R	Price Adjustment
	Annexure – S1 Annexure – S2	Bank Guarantee Form for Earnest Money Deposit Mobilization & Machinery Advance
	Annexure – T	Bank Guarantee Form for Secured Advance
	Annexure – U	Physical Completion Certificate
	Annexure – V	Final Completion Certificate
	Annexure – W	Salient Features of Labour laws
	Part-II	Special Conditions of Contract (SCC)
Section 4	Bill of Quantities	
Section 5	Form of Agreement	

SECTION – 2

INSTRUCTIONS TO BIDDERS (ITB)

A. GENERAL

1. SCOPE OF BID

The detailed scope of work (hereinafter referred to as 'Work') for the project titled '**Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium**', prepared by the Project Development & Management Consultants on behalf of GSCDCL, is described below:

Background & Introduction to the Project

Gwalior Smart City Mission through the Smart City Proposal (SCP) delineated Maharaj Bada (admeasuring 50 Acres) as the core area within the old historic quarters of Gwalior for a comprehensive urban Historical Revitalization. For this purpose a multi-strand precinct level historic revitalization project was envisaged, for which the proposed component are: creation of brand Gwalior with special focus on outreach to tourists, visitors and local citizenry and promotion of local cultural identity to the national and international audiences; pedestrianization of the urban nuclei with special focus on enhancing the pedestrian experience and environment; decongestion and regulated vehicular traffic movement by provisioning for alternate routes/lay-byes, large scale parking facilities at important nodes around Maharaj Bada; conservation and adaptive reuse of 6 public heritage buildings; façade restoration and dynamic façade illumination of 5 public and 2 private heritage buildings at Maharaj Bada; development of heritage trail network (heritage walks) of total 4 Kms in and around Maharaj Bada including façade restoration of 60 odd private heritage buildings, trail development, signage etc.; improvement and redevelopment of 4 retail markets within the Maharaj Bada with intend to reorganize movement and activities, façade controls, provision of civic services, disaster responsiveness, etc.; reorganization and formalization of hawking/vending activities within the Maharaj Bada area; improvement and enhancement of tourist/visitor amenities, facilities and interpretation like tourist information centre, parking, toilets, tourist beats, drinking water facilities, entertainment & recreational elements, etc.; and integrated precinct planning and landscaping plan encompassing provisions for unified underground rehabilitation of obtrusive utility services, provisions for urban green areas, paved areas, other landscape features, etc.

As a part of the larger scheme for Maharaj Bada historic precinct, four action areas were delineated considering that the said urban space is an 'aspirational hinge' for the city of Gwalior which in a way represents the aspirational notions amongst its citizenry. The aspirational aspects namely include: need for better civic and public infrastructure; need for enhanced cultural identity; need for a harmonized and pedestrian friendly open space within the core city area with embedded recreational and leisure values; and need for a technology apt educational and knowledge infrastructure. Conservation and Adaptive Reuse of the existing Bharat Scout & Guide Building (Gorkhi Palace Complex) as Digital/Virtual Cultural Heritage Museum & Planetarium is amongst six projects for Conservation and Adaptive Reuse of Heritage Buildings at Maharaj Bada which also largely aims to increase awareness and improve the interpretation values about the regional cultural heritage aided by high end digital technology and ICT solutions.

The total site delineated for this purpose is 4130 Sq.m or 1.02 Acres of which the existing historic building ground coverage approximately 2216.1 Sq.m The total built-up area of the building is approximately 3182.67 Sq.m in two floors. The total carpet area of the historic building is 2476.27 Sq.m. The Gwalior Smart City mission through this project broadly intends to: Conserve and protect the historical character of the historic Bharat Scout and Guide (BSG) building which forms a significant part of the historic Gorkhi Palace Complex; Improve, retrofit and repair adaptively to the needs of the proposed museum; capture and encapsulate the cultural heritage values of Gird-Agra-Agimere-Malwa region via digital media; and Increase cultural and socio-technical interactivity and awareness amongst children and youth; and provide scientific education embedded recreational experience.

The entire project is subdivided into two packages: one which deals with the conservation, civil, retrofitting, services provision, interior refurbishment and other developmental works; and other which deals with procurement of Digital/electronic equipment(s), ICT integration and Virtual/Digital environment development including complete content design and development. The subprojects packages are as follows:

1. Package 1: Conservation, Retrofitting, MEP and Other Allied and Development Works for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium
2. Package 2: Digital/Virtual ICT procurement, System Integration and Content Development for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium are as follows:

Proposed Works

The nature of works proposed under Package 1: Conservation, Retrofitting, MEP and Other Allied and Development Works for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium are as follows:

- Conservation works involving dismantling and demolition activities
- Conservation works involving earthwork and strengthening of foundations
- Conservation works involving masonry works in brick and stone
- Conservation works involving surface cleaning stone embellishments
- Conservation works involving raking of existing masonry
- Conservation works involving strengthening and replacement of existing roof systems
- Conservation works involving pointing and consolidation of stone masonry
- Conservation works involving plastering in lime mortar
- Restoration works involving replacement of broken/missing chajja and ornate brackets
- Restoration works involving replacement of broken/missing railing and balustrades
- Conservation works involving lime concrete terracing on roofs
- Protection works involving laying of plinth protection
- Retrofitting and civil works involving provisioning for ceiling level services track frame
- Retrofitting and civil works involving provisioning for services conduits (electrical and A/V)
- Retrofitting and civil works involving provisioning for utility services piping (water supply, drainage & sewage)
- Civil works involving water proofing, pest control, earthwork and laying of flooring
- Civil works involving provision of wooden, glazed and UPVC doors, windows, ventilators and clearstory
- Civil works involving construction of new partition walls
- Civil works involving sanitary and plumbing installation
- Civil works involving finishing works like lime based painting of interior and exterior surfaces
- Electrical works involving supply, installation, testing and commissioning of HV, MV and LV cabling, wiring, main/submain, fixtures and fittings
- Electrical works involving supply, installation, testing and commissioning of fibre optic cabling
- Electrical and HVAC works involving supply, installation, testing and commissioning of HVAC ducting, outdoor units, piping, etc.
- Electro-mechanical works involving supply, installation, testing and commissioning of passenger lift
- Specialized works involving supply, installation, testing and commissioning of firefighting systems and equipment
- Civil and interior refurbishment works involving supplying, installation and construction of fixed furniture
- Civil and interior refurbishment works involving supplying, installation and positioning of movable furniture
- Civil and water works involving construction of waste water, sewer and rain water drainage network
- Civil and water works involving construction of rain water harvesting system

- Civil works involving construction of paved pedestrian pathways and walkways
- Horticulture works involving landscaping, development and plantation works
- Specialized works involving supply, installation, testing and commissioning of landscape lighting, etc.
- Civil works involving construction of ramps, staircase, etc.
- Specialized works involving supply and installation of street and garden furniture like tree guard, dustbins, bollards, signage, benches, fountain, art installations, etc.
- Civil and specialized works involving complete construction of planetarium including interior works

The nature of works proposed under Package 2: Digital/Virtual ICT procurement, System Integration and Content Development for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/Virtual Cultural Heritage Museum and Planetarium are as follows:

- Procurement/Supply, installation testing and commissioning of Hardware, Networking, Equipment, Smart Gadgets, Electronic Items, Machineries, Installations, etc. for Digital/Virtual/Automated Experiences related to museum and interalia.
- Procurement, customization and deployment of necessary Software for all installed media equipment and hardware as per requirements and approval from competent authority.
- Management and Maintenance of Hardware and Software and content development and updation for all digital installations/equipment.
- Provide help desk service support for all specified hardware/software installed in the museum.
- Design, development and e-procurement of display/broadcast contents vide Digital rights copywriting
- Content development including digital and physical content for all installations, media kiosk interaction and other information print media.
- Design of holistic museum and planetarium visitor's experience by maintaining the scientific and aesthetic integrity of exhibits and dioramas.
- Design and development of content for all digital screens/ kiosk for visitor interaction.
- Design and development of animated A/V or any other viewing format for all virtual/augmented reality medium in museum.
- Design and provision for aesthetic placement/ developing display systems for all museum objects, artefacts and artwork including start up curatorship and collection management
- Design and development of print/ digital advertising for museum events, signage and museum collection labels.
- Design and installation of museum collection information display boards
- Design, development and deployment of digital or printed content for planetarium over and above the pre-installed sky/planet show with the control panel.
- Design and fabrication of museum dioramas and all 3D exhibit components.
- Auxiliary Civil, Mechanical and specialized works required for museum displays
- Any other system and ICT integration/aggregation works proposed under this project

2. GENERAL QUALITY OF WORK

The work shall have to be executed in accordance with the drawings (prepared by Contractor and approved by the competent authority), technical specifications specified in the Bid Data Sheet/Contract Data, and shall have to meet high standards of workmanship, safety and security of workmen and works.

3. PROCEDURE FOR PARTICIPATION IN E-TENDERING

The procedure for participation in e-tendering is given in the Bid Data Sheet.

4. ONE BID PER BIDDER

- 4.1. The bidder can be an individual entity or a Consortium/joint venture (if permitted as per Bid Data sheet). In case Consortium/Joint Venture is permitted, the requirement of Consortium/Joint Venture shall be as per the Bid Data Sheet.

- 4.2. No bidder shall be entitled to submit more than one bid whether jointly or severally. If he does so, all bids wherein the bidder has participated shall stand disqualified.

5. COST OF BIDDING

The bidder shall bear all costs associated with the preparation and submission of his bid, and no claim whatsoever for the same shall lie on the GSCDCL.

6. SITE VISIT AND EXAMINATION OF WORKS

The bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the work. All costs shall have to be borne by the bidder.

B. BID DOCUMENTS

7. CONTENT OF BID DOCUMENTS

The Bid Document comprises of the following documents:

1. NIT with all amendments.
 2. Instructions to Bidders,
 3. Conditions of Contract:
 - i. Part I General Conditions of Contract and Contract Data; and
 - ii. Part II Special Conditions of Contract.
 4. Specifications
 5. Drawings,
 6. Priced Bill of Quantities
 7. Technical and Financial Bid
 8. Letter of Acceptance
 9. Agreement and
 10. Any other document(s), as specified.
8. The bidder is expected to examine carefully all instructions, conditions of contract, the contract data, forms, terms and specifications, bill of quantities, forms and drawings in the Bid Document. Bidder shall be solely responsible for his failure to do so.

9. PRE-BID MEETING

Wherever the Bid Data Sheet provides for pre-bid meeting:

- 9.1. Details of venue, date and time would be mentioned in the Bid Data Sheet. Any Change in the schedule of pre-bid meeting would be communicated on the website only, and intimation to bidders would not be given separately.
- 9.2. Any prospective bidder may raise his queries and/or seek clarifications in writing before or during the pre-bid meeting. The purpose of such meeting is to clarify issues and answer questions on any matter that may be raised at that stage. The
- 9.3. Employer may, at his option, give such clarifications as are felt necessary.
- 9.4. Minutes of the pre-bid meeting including the gist of the questions raised and the responses given together with any response prepared after the meeting will be hosted on the website.
- 9.5. Pursuant to the pre-bid meeting if the Employer deems it necessary to amend the Bid Document, it shall be done by issuing amendment to the online NIT.

10. AMENDMENT OF BID DOCUMENTS

- 10.1. Before the deadline for submission of bids, the Employer may amend or modify the Bid Documents by publication of the same on the website.
- 10.2. All amendments shall form part of the Bid Document.
- 10.3. The Employer may, at its discretion, extend the last date for submission of bids by publication of the same on the website.

C. PREPARATION OF BID

11. The bidders have to prepare their bids online, encrypt their Bid Data in the Bid Forms and submit Bid Seals (Hashes) of all the envelopes and documents related to the Bid required to be uploaded as per the time schedule mentioned in the key dates of the Notice Inviting e- Tenders after signing of the same by the Digital Signature of their authorized representative.

12. DOCUMENTS COMPRISING THE BID

The bid submitted online by the bidder shall be in the following parts:

Part 1 – This shall be known as Envelope A and would apply for all bids. Envelope A shall contain the following as per details given in the Bid Data Sheet:

- (i) Registration number or proof of application for registration and organizational details in format given in the Bid Data sheet
- (ii) Payment of the cost of Bid Document;
- (iii) Earnest Money; and
- (iv) EPF Registration
- (v) An affidavit duly notarized.

Part 2 – This shall be known as Envelope B and required to be submitted only in works where pre-qualification conditions and/or special eligibility conditions are stipulated in the Bid Data Sheet. Online Envelope B shall contain a self-certified sheet duly supported by documents to demonstrate fulfilment of pre-qualification conditions.

Part 3 – This shall be known as Online Envelope C and would apply to all bids. Envelope C shall contain financial offer in the format prescribed enclosed with the Bid Data Sheet. Financial offer shall be submitted online only.

13. LANGUAGE

The bid as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer shall be in English. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in English. In such case, for the purposes of interpretation of the bid, such translation shall govern.

14. TECHNICAL PROPOSAL

14.1. Only, in case of bids with pre-qualification conditions defined in the Bid data sheet, the Technical Proposal shall comprise of formats and requirements given in the Bid Data Sheet.

14.2. All the documents/ information enclosed with the technical proposals should be self-attested and

certified by the Bidder. The Bidder shall be liable for forfeiture of his earnest money deposit, if any document/ information are found false/fake/untrue before acceptance of Bid. If it is found after acceptance of the Bid, the sanctioning authority may at his discretion forfeit his performance security/guarantee, security deposit, enlistment deposit and take any other suitable action.

15. FINANCIAL BID

15.1. The Bidder shall have to quote rate for each items of Bill of Quantities (BOQ) as described in Annexure J-1.

15.2. The Bidder shall fill in rates and prices and line item total (both in figures and words) for all items described in the BOQ along with total bid price (both in figures and words). Items for which no rate or price is entered by the Bidder will not be paid for by GSCDCL when executed and shall be deemed covered by the other rates and prices in the BOQ.

15.3. All duties, taxes(excluding GST), and other levels payable by the Bidder under the contract, or for any other cause shall be included in the rates, prices and total Bid Price submitted by the Bidder.

15.4. The rates and prices quoted by the Bidder shall be fixed for the entire duration of the Contract.

16. PERIOD OF VALIDITY OF BIDS

The bids shall remain valid for a period specified in Bid Data Sheet after the date of “close for bidding” as prescribed by the Employer. The validity of the bid can be extended by mutual consent in writing.

17. EARNEST MONEY DEPOSIT (EMD)

The Bidder shall furnish, as part of the Bid, Earnest Money Deposit (EMD), of the amount specified in the Bid Data Sheet.

17.1. The amount of EMD to be deposited ONLINE/RTGS/NEFT/IMPS in favour of CEO, Gwalior Smart City Development Corporation Limited (GSCDCL).

17.2. Bid not accompanied by EMD shall be liable for rejection as non-responsive. No exemption is permitted.

17.3. EMD of bidders whose bids are not accepted will be returned within 10(ten) working days of the decision on the bid.

17.4. EMD of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the Bank Guarantee of required value for Performance Security.

17.5. Failure to sign the contract by the selected bidder, for whatsoever reason, shall result in forfeiture of its EMD.

D. SUBMISSION OF BID

18. The bidder is required to submit bid online only under the digital signature of authorized signatory.

E. OPENING AND EVALUATION OF BID

19. PROCEDURE

19.1. Cover ‘A’ shall be opened first online at the time and date notified and its contents shall be checked. In cases where Cover ‘A’ does not contain all requisite documents, such bid shall be treated as nonresponsive, and Cover “B” and/or “C” of such bid shall not be opened.

19.2. Wherever Cover 'B' (Technical Bid) is required to be submitted, the same shall be opened online at the time and date notified. The bidder shall have freedom to witness opening of the Cover 'B'. Cover 'C' (Financial Bid) of bidders who are not qualified in Technical Bid (Cover 'B') shall not be opened.

19.3. Cover 'C' (Financial Bid) of the qualified bidders shall be opened online at the time and date notified. The bidder shall have freedom to witness opening of the Cover 'C'.

19.4. After opening Cover 'C' all responsive bids shall be compared to determine the lowest evaluated bid.

19.5. The GSCDCL reserves the right to accept or reject any bid, and to annul the bidding process and reject all the bids at any time prior to contract award, without incurring any liability. In all such cases reasons shall be recorded.

19.6. The GSCDCL reserves the right of accepting the bid for the whole work or for a distinct part of it.

20. CONFIDENTIALITY

20.1. Information relating to examination, evaluation, comparison and recommendation of contract award shall not be disclosed to bidders or any other person not officially concerned with such process until final decision on the bid.

20.2. Any attempt by a bidder to influence the Employer in the evaluation of the bids or contract award decisions may result in the rejection of its bid.

F. AWARD OF CONTRACT

21. AWARD OF CONTRACT

The Employer shall notify the successful bidder by issuing a 'Letter of Acceptance' (LOA) that his bid has been accepted.

22. PERFORMANCE SECURITY

22.1. Prior to signing of the Contract the bidder to whom LoA has been issued shall have to furnish performance Security and Additional Performance Security (if applicable) of the amount, form and duration, etc. as specified in the Bid Data Sheet.

22.2. If the Bid, which results in the lowest evaluated Bid price, is seriously unbalanced or front loaded the opinion of GSCDCL, GSCDCL after evaluation, taking in to consideration the schedule of the estimated contract price may require Additional Performance Security from the Successful Bidder for such unbalanced Bid price.

22.3. If the lowest evaluated Bid price is lower by 15% or more of the SOR amount, such Bid will be deemed as unbalanced Bid price and classified as unworkable rate. For such unbalanced bids which classify as unworkable rate, the bidder to whom LOA has been issued, shall furnish, in addition to the performance security, an Additional Performance Security of an amount, which will be equal to the difference between the unworkable rate calculated with reference to the SOR amount and agreement amount. By way of illustration, if the lowest evaluated Bid price is lower by 22% of the SOR amount, the Additional Performance Security for the unworkable rate that shall be required from the successful bidder shall be calculated as 7% of the SOR amount, being the difference between 22% of the SOR amount and 15% as the benchmark for classification as unworkable rate.

23. SIGNING OF CONTRACT AGREEMENT

- 23.1. The successful bidder shall have to furnish Performance security and additional performance security, if any, and sign the contract agreement within 15 days of issue of LOA.
- 23.2. The signing of contract agreement shall be reckoned as intimation to commencement of work. No separate work order shall be issued by the Employer to the contractor for commencement of work.
- 23.3. In the event of failure of the successful bidder to submit Performance Security and additional performance security if any or sign the Contract Agreement, its EMD shall stand forfeited without prejudice to the right of the employer for taking action against the bidder.
- 23.4. An indicative terms and conditions of the GCC, SCC and/or the draft contract that shall be executed by and between GSDCL and the successful bidder is attached. GSDCL reserves the right to modify/ amend the said terms and conditions of the GCC, SCC and/or draft contract after consultation with the successful bidder. Such terms and conditions as may be considered necessary by the GSDCL at the time of finalization of the Agreement, successful bidder would be required to execute the Agreement with such conditions.

24. CORRUPT PRACTICES

The Employer requires that bidders observe the highest standard of ethics during the procurement and execution of contracts. In pursuance of this policy, the Employer:

- i. may reject the bid for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract; and
- ii. may debar the bidder declaring ineligible, either indefinitely or for a stated period of time, to participate in bids, if it at any time determines that the bidder has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, a contract.
- iii. may debar the bidder if he is being blacklisted by any Department of State Government or Government of India for non-performance/ sub- standard execution or any other reason whatsoever in similar type of works.

For the purposes of this provision, the terms set forth above are defined as follows:

- a) "Corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
- b) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- c) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- d) "Collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.

BID DATA SHEET

GENERAL

S.N.	Particulars	Data
1	Office inviting Tender	Gwalior Smart City Development Corporation Limited
2	NIT No.	GSCDCL/043/2018
3	Date of NIT	16/04/2018
4	Bid document download Available from date & time	17/05/2018 at 1030 hours.
5	Website link	http://www.mpeproc.gov.in

SECTION 1– NIT

Clause Reference	Particulars	Data
2	Portal fees	Rs. _____(shall be reflected on the portal)
3	Cost of bid document	Rs.20,000/- (Twenty thousand only)
	Cost of bid document payable at	Bidders shall be directed to the payment gateway through the portal
	Cost of bid document in favour of	Executive Director, Gwalior Smart City Development Corporation Limited
4	Affidavit format	Annexure B
5	Pre-qualifications required	Yes
	If Yes, details	As per Annexure C
6	Special Eligibility	Yes
	If Yes, details	As per Annexure D
7	Key Dates	Annexure A

SECTION 2–ITB

Clause Reference	Particulars	Data
1	Name of work	<p>‘Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium’</p> <ul style="list-style-type: none"> • <u>Package 1:</u> Conservation, Retrofitting, MEP and Other Allied and Development Works for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium • <u>Package 2:</u> Digital/Virtual ICT procurement, System Integration and Content Development for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium
2	Specifications	Annexure E
3	Procedure for participation in e-tendering	Annexure F

Clause Reference	Particulars	Data
4	Whether Consortium/Joint-venture is allowed	Yes maximum Three (3) including Lead Member
	If yes, requirement for Consortium/JV	Consortium /Joint Venture agreement (Joint Venture shall be Incorporated JV)
9	Pre-bid meeting to held	Yes
	If Yes, Date, Time & Place	Date: 25/04/2018 Time: 15:00 Hrs Place: Gwalior Smart City Development Corporation Limited, Nagar Nigam Mukhyalaya, City Centre, Gwalior
12	Envelope-A should reach in physical form to	Deleted
14	Envelope-B Technical Proposal	Annexure – I (Formats I-1 to I-5)
	Envelope-C Financial Bid	Annexure – J
15	Material to be issued by the department	Nil
16	Period of Validity of Bid	180 Days
	Earnest Money Deposit	Rs. 7,70,982 /- (Rupees Seven Lakhs Seventy Thousand Nine Hundred and Eighty Two only)
17	Forms of Earnest Money Deposit	Amount of EMD to be deposited only ONLINE/RTGS/NEFT/IMPS (Make payments before 48 Hours)
	EMD valid for a period of ONLINE/RTGS/NEFT/IMPS	Not less than 180 days from the last ONLINE/RTGS/NEFT/IMPS Chief Executive Officer, Gwalior Smart
21	Letter of Acceptance (LoA)	Annexure L
22	Amount of Performance Security	5% of contract amount
	Additional Performance Security, if any (as per clauses 22.2, 23.1, 23.3)	Yes, applicable.
	Performance security in the format	Annexure M
	Performance security in favour of	Executive Director, Gwalior Smart City Development Corporation Limited,
	Performance security valid up to	Till 3 (three) months from the date of expiry of the Defect Liability Period

KEY DATES & EVENTS

S. No.	Department Stage	Bidder's Stage	Start		Expiry		Envelopes
			Date	Time	Date	Time	
1.		Purchase of Tender – Online	17/04/2018	1030 Hours	14/05/2018	1730 Hours	
2.	Pre-Bid Meeting		25/04/2018	1500 Hours			
3.		Bid Submission – Online			15/05/2018	1730 Hours	
4.	Mandatory Submission Opening		16/05/2018	1600 Hours			Envelope A
5.	Technical Proposal Opening		16/05/2018	1610 Hours			Envelope B
6.	Financial Bid Opening		TBA				Envelope C

Note: Original Affidavit shall have to be submitted by the Successful Bidder before agreement. Scan copy of affidavit and all other declaration shall be submitted by the bidder online at the time of Bid submission.

AFFIDAVIT

(To be contained in Envelope A)
(On Non-Judicial Stamp of Rs.100)

I/we _____ who is/are _____ (status in the firm/company) and competent for submission of the affidavit on behalf of M/S _____ (name of the bidder) do solemnly affirm an oath and state that:

I/we are fully satisfied for the correctness of the certificates/records submitted in support of the following information in bid documents which are being submitted in response to notice inviting e- tender No. _____ for _____ (name of work) dated _____ issued by the _____ (name of the Authority)

I/we are fully responsible for the correctness of following self-certified information/ documents and certificates:

1. That the self-certified information given in the bid document is fully true and authentic.
2. That:
 - a) Term deposit / Bank Guarantee submitted as Earnest Money Deposit, and other relevant documents provided by the Bank are authentic.
 - b) Information regarding financial qualification and annual turn-over is correct.
 - c) Information regarding various physical qualifications is correct.
3. No close relative of the undersigned and our firm/company is working in the department.

OR

Following close relatives are working in the department:

Name: _____ Designation: _____ Present Posting

Signature with Seal of the Deponent (bidder)

I/ We, _____ above deponent hereby certify that the facts mentioned in above para(s) 1 to 3 are correct to the best of my knowledge and belief.

Verified today _____ (dated) at _____ (place)

Signature with Seal of the Deponent (bidder)

PRE-QUALIFICATION CRITERIA

This work ‘**Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium**’ has two different packages according to their respective nature of work:

1. Package 1- Conservation, Retrofitting, MEP and Other Allied and Development Works for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium; and
2. Package 2- Digital/Virtual ICT procurement, System Integration and Content Development for Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium

The packages mentioned above are only for understanding purposes and the Bidders are expected to bid for the project as a whole. The two areas of specialization required for execution of this work are Conservation/Civil/Retrofitting and ICT/Automation for which the Bidders are encouraged to bid as incorporated Joint Ventures or Consortium. However bidders possessing both experiences and meeting the prequalification criteria can bid as single entity.

A. Mandatory Qualifications

	Criteria	Compliance Requirements			
		Single Entity	Incorporated Joint Venture/Consortium		
	Requirement		All Partners Combined	Each Partner	One Partner
i) Valid Registration	Registration No. issued by centralized registration system of Govt. of MP or proof of application for registration	Must meet requirement	Not Applicable	Not Applicable	Lead Partner Must meet requirement
ii) Accreditation/ Certification	The Bidder having Quality Certification Appropriate ISO 9001:2008 Or latest.	Must meet requirement	Not Applicable	Not Applicable	One Partner must meet requirement
iii) Bidder Class/Category	Valid registration of Bidder in appropriate category (B or C) with the Public Works Department, Government of Madhya Pradesh, Central Public Works Department, Government of India or any other State PWD	Must meet requirement	Not Applicable	Not Applicable	Lead Partner Must meet requirement
iv) PAN No.	Must have pan no. in name of the company/firm/organisation incorporated under Indian Law	Must meet requirement	Incorporated JV must meet requirement. Not Applicable for Consortium	Must meet requirement	Must meet requirement
v) GSTIN No.	Must have GSTIN Certificate in name of the company/firm/organisation incorporated under Indian Law	Must meet requirement	Incorporated JV must meet requirement. Not Applicable for Consortium	Must meet requirement	Must meet requirement
vi) TAN No.	Must have TAN No. in name of the company/firm/organisation incorporated under Indian Law	Must meet requirement	Incorporated JV must meet requirement. Not Applicable for Consortium	Must meet requirement	Must meet requirement
vii) EPF No.	Must have valid EPF registration in name of the company/firm/organisation incorporated under Indian Law	Must meet requirement	Incorporated JV must meet requirement. Not Applicable for Consortium	Not Applicable	Lead Partner Must meet requirement

Note: Incorporated JV/Consortium shall comprise of not more than three firms/companies. The minimum equity under JV/Consortium of Lead firm must be 51%.

B. Financial Qualifications

	Criteria	Compliance Requirements			
	Requirement	Single Entity	Incorporated Joint Venture/Consortium		
			All Partners Combined	Each Partner	One Partner
i) Net Worth	Net Worth for the Financial Year 2016-17 should be positive. (Certificate of Chartered Accountant showing calculation of Net Worth must be enclosed).	Must meet requirement	Not Applicable	Must meet requirement	Not Applicable
ii) Average Annual Financial Turnover	The bidder should have an Average Annual financial turnover during the last 3 consecutive financial years, ending 31st March 2018, should be at least 30% of the estimated cost of the project i.e. INR 231.29 Lakhs . (Audited Balance Sheets of all the three financial years must be submitted in support, without which the bid may not be considered. The calculation sheet for annual average construction turnover shall be certified by a Chartered Accountant)	Must meet requirement	Must meet requirement	Not Applicable	Lead member must meet 51% of the requirement i.e. INR 117.96 Lakhs

C. Experience

	Criteria	Compliance Requirements			
	Requirement	Single Entity	Incorporated Joint Venture/Consortium		
			All Partners Combined	Each Partner	One Partner
1. Similar Sector Experience					
a) Similar Sector Experience in Conservation, Retrofitting, MEP and Other Allied and Development Works	Experience of having successfully executed (Successfully executed would mean successful completion and commissioning of the project) the following: i) three similar works each costing not less than the amount equal to INR 154.20 Lakhs (20% of the probable amount of contract) during the last 7 financial years OR ii) two similar works each costing not less than the amount equal to INR 231.29 Lakhs (30% of the probable amount of contract) during the last 7 financial years OR iii) one similar work of aggregate cost not less than the amount equal to INR	Must meet requirement	Must meet minimum 70% of the requirement i.e. INR 107.94 Lakhs for three similar works OR must meet minimum 70% of the requirement i.e. INR 161.91 Lakhs for two similar works OR must meet minimum 70% of the requirement i.e. INR 269.84	Not Applicable	Not Applicable

	385.49 Lakhs (50% of the probable amount of contract) during the last 7 financial years		Lakhs for one similar work		
b) Similar Sector Experience in Digital/Virtual ICT procurement, System Integration, Content Development and Virtual Platform Development			must meet minimum 30% of the requirement i.e. INR 46.26 Lakhs for three similar works OR must meet minimum 30% of the requirement i.e. INR 69.39 Lakhs for two similar works OR must meet minimum 30% of the requirement i.e. INR 115.65 Lakhs for one similar work	Not Applicable	Not Applicable

Note: The value of executed works shall be brought to current costing level by enhancing the actual Value of work at simple rate of 7% per annum; calculated from the date of completion to last date of receipt bid.

Bidders are required to submit the corresponding Work Order copies & Execution/Completion Certificates issued by the respective clients. The Certificates should be issued by respective authority (not below Executive Engineer) of client. GSCDCL may call for original certificates for verification.

1. Similar works for Conservation, Retrofitting, MEP and Other Allied and Development Works means the single entity bidder or incorporated JV/Consortium Partner must have successfully executed any 3 of the following characteristics of works:
 - i) Conservation works involving restoration/ preservation/ reconstruction/ repair/ retrofitting/ adaptive reuse of heritage buildings which have certain historical or cultural significance duly recognized by statutory or non-statutory competent authorities or custodian agencies such as: any state archaeology & museum department/ state department of culture/ Archaeological Survey of India/ INTACH/ AKDN/ or equivalent organizations.
 - ii) Civil/ retrofitting/ other site development works in revitalization/ redevelopment/ rejuvenation/ regeneration projects at historical sites/ urban historical precincts or areas/ historical monuments/ museums/ historical public buildings for which the custodian and/or funding agency is municipal bodies/ tourism departments/ development authorities/ state PWD/ CPWD/ or equivalent departments.
 - iii) Civil/ repair/ retrofitting works in buildings /monuments/ sites majorly involving (above 51% of the total value of item of works of a contract) works in traditional materials like lime mortar, stone masonry in lime mortar, lime concrete, lime plaster, arash work, ashlar stone works, traditionally carved stone works, etc.
 - iv) Civil/ building services (mechanical, electrical, plumbing, HVAC)/ site development / infrastructural/ landscaping works in historic/ cultural/ tourism sites for which the custodian or implementation agency is any government or quasi-government organisation or PSU
 - v) Comprehensive building construction and site development works involving civil works, MEP, and other specialized works in public buildings or large private buildings site area not less than 1 Acre with built-up area not less than 1500 Sq.m

2. Similar works for Digital/Virtual ICT procurement, System Integration and Content Development means the single entity bidder or incorporated JV/Consortium Partner must have successfully executed any 2 of the following characteristics of works:

- i) Procurement works involving supply/purchase from OEM, installation, testing and commissioning of IT/ICT related goods/hardware and software for installation of likes of Interactive Media Kiosks/ Digital Wall/ PCs/ Laptops/ Tablets/ Tele-communication Infrastructure/ Virtual or Augmented Reality Infrastructure/ Multi Media Infrastructure/ or equivalent IT/ICT infrastructure for government or private projects in India and abroad.
- ii) Procurement and On-site Operation and Management (O&M) or Annual Maintenance Contract (AMC) services for IT & ICT systems/ Tele-communication Infrastructure/ Virtual or Augmented Reality Infrastructure/ Multi Media Infrastructure/ or equivalent IT/ICT infrastructure for government or private projects in India and abroad.
- iii) Comprehensive Content Development and Post Production Services for Digital Media Platforms including collection, collation and digitization of existing information/ design and development of software and interactive digital platforms/ content copy writing/ production of interactive digital short films or documentaries or editorials/ storyboarding and developing instructional interactivity/ deployment of content platforms with tracking and reporting abilities/ etc. interalia services for IT & ICT systems/ Tele-communication Infrastructure/ Virtual or Augmented Reality Infrastructure/ Multi Media Infrastructure/ or equivalent IT/ICT infrastructure for government or private institutions/museums/art galleries/science centers/etc. and corporations in India and abroad.

SPECIAL ELIGIBILITY CRITERIA

Not Applicable

Annexure – E

(See clause 2 of Section 2-ITB & Clause 10 of GCC)

SPECIFICATIONS

Specifications of proposed works in order of their preference are compliant to the latest versions of MPUADD (part 1 to 4), MPPWD, CPWD (volume I & II), and MORTH specifications and standards. Non Scheduled works have detailed specifications supported by detailed design drawings. Specifications for conservation works are compliant to the: Directorate of Archaeology, Archives & Museums (DAAM); Archaeological Survey of India (ASI); relevant International Charters on Heritage Conservation; and Indian National Trust for Art and Cultural Heritage (INTACH) standards. Non-scheduled conservation specifications are supported with detailed process and instructions. The minimum FRS (Functional Requirement Specification) and SRS (System Requirement Specification) for all hardware and software under the ICT/IT components are detailed in the Bill of Quantities, notwithstanding which the client is liable to make changes in specifications during the execution of the project.

The works in General shall be carried out as per latest MP-UADD Specifications, (updated with corrections slips issued upto last date of submission of tender) unless otherwise specified in the nomenclature of the individual item or in the particular specifications of concerned items of works.

For items not covered under MP-UADD specifications with correction slips or those specifications are not given in the technical specifications appended or not incorporated in the nomenclature of the individual item, the work shall be done as per latest relevant BIS Codes of Practice or as per approval of Engineer-in-charge.

All the works shall be executed as per the approved drawings / designs. The patterns shown in the tender drawings can be modified as per the site requirements by the Engineer- in-charge and nothing extra whatsoever shall be payable over and above the quoted rates.

Material should be of the best approved quality obtainable and they shall comply with the respective Indian Standard Specifications. Samples of all materials shall be got approved before placing order and the approved sample shall be deposited with the Client/Engineer In-Charge.

1.1.1. GENERAL

SPECIAL STRUCTURES

- a) For structures like retaining walls, wing walls, chimneys, over head reservoirs/ tanks and other elevated structures, where elevations/ heights above a defined datum level have not been specified and identification of floors cannot be done as in case of building. Level, at 1.2 m above the ground level shall be the floor 1 level as well as plinth level. Level at a height of 3.5 m above floor 1 level will be reckoned as floor 2 level and level at a height of 3.5 m above the floor 2 level will be floor 3 level and so on, where the total height above floor 1 level is not a whole number multiple of 3.5 metre. Top most floor level shall be the next in sequence to the floor level below even if the difference in height between the two upper most floor levels is less than 3.5 metres

FOUNDATION AND PLINTH

- a) The work in foundation and plinth shall include: (a) For buildings: All works upto 1.2 metre above ground level or upto floor 1 level whichever is lower: (b) For abutments, piers and well steining: all works upto 1.2 m above the bed level: (c) For retaining wall, wing walls, compound walls, chimneys, over head reservoirs/ tanks and other elevated structures: All works upto 1.2 metre above the ground level: (d) For reservoirs/ tanks (other than overhead reservoirs/ tanks): All works upto 1.2 metre above the ground level: (e) For basements: All works upto 1.2 m above ground level or upto floor 1 level whichever is lower. Note: Specific provision shall be made in the estimate for such situations where the foundation level is more than 3 (three) metre depth from the plinth for all types of structures mentioned above.

MEASUREMENTS

- a) In booking dimensions, the order shall be consistent and in the sequence of length, width and height or depth or thickness.
- b) Rounding off: Rounding off where required shall be done in accordance with IS: 2-1960. The number of significant places rounded in the rounded off value should be as specified.

MATERIALS

- a) Samples of all materials to be used on the work shall be got approved by the contractor from the Engineer-in-Charge well in time. The approved samples duly authenticated and sealed shall be kept in the custody of the Engineer-in-Charge till the completion of the work. All materials to be provided by the contractor shall be brand new and as per the samples approved by the Engineer-in-Charge.
- b) Materials obtained by the contractor from the sources approved by the Department shall be subjected to the Mandatory tests. Where such materials do not conform to the relevant specifications, the matter shall be taken up by the Engineer-in-Charge for appropriate action against the defaulters. In all such cases, necessary documents in original and proof of payment relating to the procurement of materials shall be made available by the contractor to the Engineer-in-Charge.
- c) Samples, whether submitted for approval to govern bulk supplies or required for testing before use and also the sample of materials bearing 'Standard mark,' if required for testing, shall be provided free of cost by the contractor. All other incidental expenditure to be incurred for testing of samples e.g. packaging, sealing transportation, loading, unloading etc. except testing charges shall be borne by the contractor.
- d) The materials, supplied by the Department shall be deemed to be complying with the specifications.
- e) Materials stored at site, depending upon the individual characteristics, shall be protected from atmospheric effects due to rain, sun, wind and moisture to avoid deterioration.
- f) Materials like timber, paints etc. shall be stored in such a way that there may not be any possibility of fire hazards. Inflammable materials and explosives shall be stored in accordance with the relevant rules and regulations or as approved by Engineer-in-Charge in writing so as to ensure desired safety during storage.
- g) The unit weight of materials unless otherwise specified shall be reckoned as given in IS: 1911-1967.

SAFETY IN CONSTRUCTION

- a) The contractor shall employ only such methods of construction, tools and plant as are appropriate for the type of work or as approved by Engineer-in-Charge in writing.

- b) The contractor shall take all precautions and measures to ensure safety of works and workman and shall be fully responsible for the same. Safety pertaining to construction works such as excavation, centering and shuttering, trenching, blasting, demolition, electric connections, scaffolds, ladders, working platforms, gangway, mixing of bituminous materials, electric and gas welding, use of hoisting and construction machinery shall be governed by CPWD safety code, relevant safety codes and the direction of Engineer-in-Charge

1.1.2. DISMANTLING AND DEMOLISHING

- c) All materials obtained from dismantling or demolition shall be the property of the Government unless otherwise specified and shall be kept in safe custody until they are handed over to the Engineer in-Charge/ authorized representative.
- d) The demolition shall always be well planned before hand and shall generally be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Engineer-in-Charge before starting the work.
- e) Due care shall be taken to maintain the safety measures prescribed in IS 4130.
- f) Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property. Wherever specified, temporary enclosures or partitions and necessary scaffolding with suitable double scaffolding and proper cloth covering shall also be provided, as directed by the Engineer-in-Charge.
- g) Necessary precautions shall be taken to keep noise and dust nuisance to the minimum. All work needs to be done under the direction of Engineer-in-Charge. Helmets, goggle, safety belts etc. should be used whenever required and as directed by the Engineer-in-Charge.
- h) The demolition work shall be proceeded with in such a way that it causes the least damage and nuisance to the adjoining building and the public.
- i) Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully removed first. Chisels and cutters may be used carefully as directed. The dismantled articles shall be removed manually or otherwise, lowered to the ground (and not thrown) and then properly stacked as directed by the Engineer-in-Charge.
- j) Where existing fixing is done by nails, screws, bolts, rivets, etc., dismantling shall be done by taking out the fixing with proper tools and not by tearing or ripping off.
- k) Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Engineer-in-Charge within a lead of 50 metres. All unserviceable materials, rubbish etc. shall be disposed off as directed by the Engineer-in-Charge.
- l) The contractor shall maintain/disconnect existing services, whether temporary or permanent, where required by the Engineer-in-Charge.
- m) No demolition work should be carried out at night especially when the building or structure to be demolished is in an inhabited area.
- n) Screens shall be placed where necessary to prevent injuries due to falling pieces.
- o) Water may be used to reduce dust while tearing down plaster from brick work.
- p) Safety belts shall be used by labourers while working at higher level to prevent falling from the structure.
- q) First-aid equipment shall be got available at all demolition works of any magnitude.

ROOF TRUSSES

- r) If a building has a pitched roof, the roof structure should be removed to wall plate level by hand method. Sufficient purlins and bracing should be retained to ensure stability of the remaining roof trusses while each individual truss is removed progressively.

- s) Temporary bracing should be added, where necessary, to maintain stability. The end frame opposite to the end where dismantling is commenced, or a convenient intermediate frame should be independently and securely guyed in both directions before work starts.
- t) On no account should the bottom tie of roof trusses be cut until the principal rafters are prevented from making outward movement

1.1.3. CONSERVATION WORKS

MATERIALS AND WORKMANSHIP

- a) The term “Materials” shall mean all materials, goods and articles of every kind whether raw, processed or manufactured and equipment and plant of every kind to be supplied by the implementing agency for incorporation in the works.
- b) All materials shall be of the specified quality and should match the original in colour, texture and composition. New material should be of acceptable conservation grade.
- c) Materials shall be transported, handled (stacked where necessary) and stored in such a manner as to prevent deterioration, damage or contamination failing which such damaged materials will be rejected and shall not be used on any part of the works under this contract.
- d) Work shall be performed only by mason skilled and competent in the particular class of work. Wherever possible skilled craftsman must be engaged and traditional methods employed in reconstruction processes. All work should match the standard and quality of the original workmanship of the building.
- e) The building conservation works should be carried out in a manner complying with the principles of conservation and good conservation practices as accepted nationally and internationally.
- f) H-frame scaffolding and other special scaffolding should be provided for accessing and working on certain parts of the building without causing any harm to the structures. Special care must be taken while working so that flooring is not damaged. Scaffolding may be propped against the face of the building with suitably padded buffer.
- g) Recycling of the historic material: The historic material should be reused as far as possible. This essentially includes the historic timber members, stone and bricks. The partially decayed timber members should also be reused after consultation with the client and the principal consultant.
- h) The scaffolding should be metal cup lock system and not take support by burrowing into the historic masonry.
- i) All vehicular movement within the forecourt for movement of material or man power should move at a minimum distance of 2 meters from the buildings and should follow the demarcated pathway.

SAMPLING AND TESTING OF MATERIALS

- a) The implementing agency shall submit samples of such materials (before going for bulk supply, bulk supply shall be taken up after obtaining written approval of the said samples by the authority concerned) as may be required by the Project Manager for Quality Assurance and shall carry out the specified tests directed by the Project Manager at the site or at the supplier’s premises or at a laboratory approved by the Project Manager.
- b) Samples shall be submitted and tests carried out sufficiently early to enable further samples to be submitted and tested if required by the Project Manager for Quality Assurance.
- c) Final specifications of the building materials, to be used for conservation work, should be based on laboratory tests to ensure that they comply with the original materials. Scientific investigations of the art work materials should be carried out to better inform proposed conservation interventions.
- d) The implementing agency shall give the Project Manager seven days’ notice in writing of the date on which any of the materials will be ready for testing or inspection. The Project Manager shall attend the test at the appointed place within seven days of the said date on which the materials are expected to be ready for testing or inspection according to the implementing agency, failing which the test may proceed in his absence unless instructed by the Project Manager to carry out such a test on a mutually agreed upon date.
- e) The implementing agency shall in any case submit to the Project Manager within seven days of every test such number of certified copies (not exceeding six) of the test readings as the Project Manager may require.

- f) The provisions of this clause shall also apply to materials supplied under any nominated sub-contract.

STANDARDS

- a) The latest specifications, as prepared and published by Public Works Department, Govt. of Uttar Pradesh, shall be construed to be a part of the tender. These shall be followed in respect of all materials, workmanship and various tests to be performed and the acceptance criteria.
- b) In respect of items, where Public Works Department, specifications are either not available or do not serve the intent of design, the Central Public Works Department, Govt. of India, Specifications shall govern.
- c) Where Specifications are still not found, the latest provisions of National Building Code of India / Indian Standards (IS) / IRC / MORTH / CPHEEO shall hold good.
- d) The requirement of these specifications shall be fulfilled by the implementing agency within the tendered rates. The items quoted shall be deemed to have taken these specifications into account.
- e) At the request of client, the implementing agency has to provide a certificate stating that the materials supplied comply in all respects with the standard; the implementing agency shall obtain the certificate and forward it to the Project Engineer.
- f) If no standard is indicated, the relevant Indian Standard, if any, shall apply. Indian Standards are published by:

Indian Standards Institution,
Manak Bhavan,
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New Delhi – 110 002

- g) In case of discrepancy between the Technical Specification and the Standards referred to herein, the Technical Specification shall govern.

SITE CLEARANCE

- a) **De-vegetation:** The growth of vegetation in the joints of historic brick buildings is the principle factor in causing their ruin. Therefore the plants and trees growing on and close to the structure need to be removed as specified by conservation architect.

In removing weeds, trees or shrubs, etc. from walls, it is essential that the roots should be completely destroyed, and during the process of raking out, any tendrils found in the joints should be followed up and removed. The stumps can be injected with chemical called Round up or tree killer, arsenic or hot lime slurry shall be poured around the roots.

Joints which have to be raked out in order to destroy the vegetation should, after the earth etc. has been removed, be immediately re-pointed.

The removal of trees from historic masonry is an operation that demands special care. As a rule large trees should be removed in sections in order to prevent injury being done to the masonry.

Refilling shall be done by using earth in layers of 200mm. thickness with compaction in pits.

DISMANTLING AND DEMOLISHING WITHIN HISTORIC BUILDINGS/SITES

- a) **Dismantling:** The term 'Dismantling' implies carefully separating the parts without damage and removing. This may consist of dismantling one or more parts of the building as specified or shown on the drawings.
- b) **Precautions:** All materials obtained from dismantling or demolition shall be the property of the Government unless otherwise specified and shall be kept in safe custody until they are handed over to the Project Manager/ authorized representative.

- c) **Findings on site:** The findings should be brought in to notice of the conservation architect. The constructions details will be reviewed on the basis of the new findings. The implementing agency should photo document the various findings on site during the course of conservation works. It is important that the implementing agency adheres to the time plan keeps the conservation architect informed about the various explorations in the building so that the documentation of the findings and relevant changes in the details can be carried.
- d) **Marking and keeping material:** All materials removed in accordance with the items of work shall be marked as they are removed, so as to clearly show where they have been removed from, and shall be kept on the site and protected from damage until they are inspected by the Conservation Architect. Marking of the historic material is essentially important.
- e) The dismantling shall always be well planned before hand and shall generally be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Project Manager before starting the work.
- f) Due care shall be taken to maintain the safety measures prescribed in IS 4130.
- g) **Care in removal:** All demolition shall be undertaken in a careful manner with minimum disturbance to prevent any damage to other parts or to the rest of the building.
- h) While removing the incompatible later additions (lime washes, cement plaster, etc.) the implementing agency shall take all precautions to protect the existing original details (art work, original plaster and original elements). All work on decorative surfaces shall be carried out by Art Conservators only or under their direct supervision. Precautions to safeguard the decorative surfaces/art works shall be carried out prior to commencement of civil dismantling or demolition works on the building. Suitable measures for their protection shall be adopted by the civil works implementing agency and firm carrying out the art conservation work in consultation with each other.
- i) **Protection of historic features and materials:** Utmost care must be taken to ensure that the historic fabric of the building is not damaged in the course of demolition works as well as during conservation works. Special care must be taken to protect floor surfaces (brick floors, marble floors, stone etc.), decorative features (doors, wall paintings etc.).
- j) Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property. Wherever specified, temporary enclosures/partitions or necessary scaffolding (suitable double scaffolding and proper cloth covering), shall also be provided, as directed by the Project Engineer.
- k) Necessary precautions shall be taken to keep noise and dust nuisance to the minimum.
- l) All work needs to be done under the direction of Project Manager. Helmets, goggle, safety belts etc. should be used whenever required and as directed by the Project Manager.
- m) The demolition work shall be proceeded with in such a way that it causes the least damage and nuisance to the adjoining building and the public.
- n) Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully removed first.
- o) Chisels and cutters may be used carefully as directed. The dismantled articles shall be removed manually or otherwise, lowered to the ground (and not thrown) and then properly stacked as directed by the Project Manager.
- p) Where existing fixing is done by nails, screws, bolts, rivets, etc., dismantling shall be done by taking out the fixing with proper tools and not by tearing or ripping off.
- q) Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Project Manager within a lead of 50 meters. All unserviceable materials, rubbish etc. shall be disposed of as directed by the Project Manager.
- r) The implementing agency shall maintain/disconnect existing services, whether temporary or permanent, where required by the Project Engineer.
- s) No demolition work should be carried out at night especially when the building or structure to be demolished is in an inhabited area.

- t) Screens shall be placed where necessary to prevent injuries due to falling pieces as it a tourist site. Care must be taken for the safety of tourist during implementation. Water may be used to reduce dust while tearing down plaster from brick/stone work.

MASONRY WORK

- a) **Materials:** Materials shall comply with the specifications and standards as specified.
- b) **Lime:** This specification lays down the general characteristics of lime to be used for the conservation work. No readymade or factory made lime is to be used for any of the work.

The classification of lime to be used for various purposes is as follows:

Lime for concrete terracing: Class A lime: Hydraulic Lime

Lime for making lime mortar: Class B lime: Feebly hydraulic lime

Lime for making lime plaster: Class C lime: Fat lime

Supply and Storage: The lime to be used for concreting of terrace or Class A lime is to be supplied as hydraulic lime only. The class B and class C shall be supplied as quick lime. Lime supplied as quick lime or lump lime at the site should be in a sealed condition and subsequently stacked in a store or any other place which is dry and under cover well protected from rain. This is necessary because quick lime deteriorates quickly as it attracts moisture and carbon dioxide from atmosphere. For storing it should be piled up and covered with a blanket of lime dust to exclude moist air. Therefore it should be slaked as soon as possible in a pit called a '*Haudi*' specially constructed for this. It should be slaked for at least 10 days prior to its use for making lime mortar and plaster.

Rejection of Lime: The lump or quick lime having stone pieces, impurities and powdery shall be rejected. The Implementing agency at his own expense shall remove lime, which has been rejected by the Engineer, from the site of work within 3 days.

Lime slaking in tank: A tank or the '*Haudi*' lined with stone or brick and finished with cement large enough to permit, stirring and hoeing shall be prepared (generally tanks suitable for 5 quintals or 10 quintals of quick lime are used in practice). The tank shall be filled to half its depth with water.

Quick lime shall be gradually added till it fills the entire bottom to about half the depth of water. **(Never add water to lime)**. While quick lime is being added it shall be constantly stirred and hoed so as to break up the lumps. No part of the lime shall be allowed to expose above water level. As the lime slakes with evolution of heat temperature begins to rise and more lime or water may be added till the required temperature is reached and that temperature should be maintained by the addition of more lime or water till all the lime apparently has slaked, the stirring and hoeing shall be continued during the above process and for some period even after the slaking is apparently over. This whole act has to done with utmost precaution to the body by covering the eyes with glass goggles and wearing rubber boots.

Maturing: After the lime has cooled, more water shall be added if required and it shall be left undisturbed for not more than 7 days. The putty shall be allowed to mature but not allowed to dry out till it is used. Therefore the tank will need to be filled with water to allow the slaked lime to be constantly in submerged in water.

- c) **Surkhi:** Surkhi is the powdered burnt bricks, brickbats and is used as an admixture to lime both for making lime mortar and lime plaster. Surkhi shall always be obtained from fully burnt or slightly under burnt, but never from over burnt bricks. Surkhi obtained from burnt loam shall not contain any un-burnt soil. Surkhi shall be perfectly clean, free from an admixture or any foreign element. Surkhi shall not contain soluble sulphate more than 0.5% for exposed work and work in damp situations and not more than 1.0% when used for works in dry and internal situations.

Stacking: Surkhi shall be stacked on masonry or wooden platform in regular stacks as of size 2.0M x 2.0M x 0.6M at the places as directed by the Engineer and shall be protected from dust, rains and dampness and shall be kept under adequate coverings provided by the implementing agency.

- d) **Sand:** Sand used in the making of mortar should be coarse grained, perfectly clean and sharp and preferably of a yellow and variegated colour. It should, if possible, be obtained from local pits.

It is absolutely essential that it should possess the above mentioned qualities in order that a successful result may be obtained for the lime mortar. Fine grained, dusty or dirty sand must not be allowed, and each fresh consignment should be carefully inspected in order to see that it corresponds with the sample approved in the first case. Many sands which would otherwise be of good quality contain lumps of foreign matter, or a quantity of dusty particles. Such sand may with the Engineers consent, be used after it has been thoroughly washed and sifted.

e) **Mortar mixes** -Lime surkhi mortar and Lime surkhi plaster

Materials used: Lime: Lime A, B and C class shall be used in the preparation of mortar and shall, conform to lime specification 2.1.1

Surkhi Aggregates: It shall conform to Surkhi specification

Sand aggregate in lime mortar: shall confirm to sand specification

Water: For all mortars water used shall be free from mud, clay, and acidic, basic or organic impurities and shall be drinkable.

Proportion: The lime surkhi mortar shall be in conformance to the DSR-2016 specification for lime in 1:1:1 (1 lime putty: 1 surkhi: 1 fine sand).

The proportion of mix for mortar shall also depend upon the percentage purity of lime with regard to its CaO content. In case the CaO content of lime is lower, the proportion of lime shall be suitably increased to compensate, for the lower CaO content of the lime used. The lime plaster will be as per archaeological specification 3.1 (a) in 1:2 (1 lime: 2 surkhi).

Preparation of mortar: Mortar mill (Lime *Chakki* or Mill) mixing: Slaked lime in the required quantity and fine aggregates in proportions (For lime mortar, 1:1:1 (1 lime putty: 1 surkhi: 1 fine sand) and 1:2 (1 lime: 2 Surkhi) shall be put along with limewater/water in the *chakki* spreading uniformly all along its circumference and ground with a stone *chakki* till a mortar of uniform colour and desired consistency is obtained. As grinding is done the mixture shall be continuously raked and turned over and over especially from corners and sides. Mortar is to be ground to the required consistency depending on the mode of grinding i.e. bullock or tractor for 3 hrs and 1and half hour (at least) respectively. The prepared masala has to be then removed to a rectangular pit that would be used for storing of the masala with enough space to allow the masala to be mixed well for a short duration using feet before delivering it for application.

Addition of surkhi or other pozzolonas in the making of mortars gives the mortars the properties of hydraulic mortars i.e. quick setting properties and should be treated like Class A and Class B lime mortars, depending upon the hydraulicity.

Strengthening of the mortar: The prepared lime mortar should be added with the admixture of *Lapti ka paani* + *methi+ gulgul ka paani*, which should be added only after being filtered properly. The filtered admixture will be thoroughly mixed with the lime mortar and then added with *rumimastagi ka paani* for extra strengthening of the mortar.

Storage of Mortar: Lime mortars prepared shall be used up as soon as possible after mixing 2 days for Class B limes from the time of making Putty or first grinding. Mortars from Class C limes can be used for periods longer than 3 days after the making of mortar provided they are protected from drying out. The mortar left over at the end of the working hour should be properly covered with moistened jute bags. When the mortar is used after a gap of two days it should be sprinkled with limewater and mixed well using feet covered with gumboot.

Rejection of Mortar: Mortar not found in accordance with the specifications above and unsuitable according to field and laboratory tests of lime mortar shall be rejected. The implementing agency at its own cost shall remove rejected mortar from the site of work within 3 days.

f) **Filling of cracks:** Cracks can be categorized into minute hairline crack and wide crack especially in plaster. Not much action is needed to put a stop or to treat micro-cracks. On the other hand, the wide cracks are filled with putty of lime and the materials originally used for the preparation of plaster at various places. Filling is done with a painted spatula and sometimes with a dropper.

Where the cracks are structural the cracks need to further investigate and the underlying masonry condition assessed to find the cause of the cracks. Often the joints in the stone masonry deteriorated as a result of deteriorating mortar which gives rise to major cracks.

Cracks in the masonry will need to be stitched and the masonry grouted with hydraulic lime grouting 1:1 (1 lime putty: 1 fine sieved sand) using pressure grouting to strengthen the masonry.

The gauged brick masonry work shall be of superior quality and be smoothed by physical /abrasive technique so as to achieve hair line joints.

- g) **Cutting and Cleaning cement/ lime pointing from masonry joints:** When modern lime or cement pointing has to be cut out from old joints and stone faces from the historic building in the complex, great care is to be taken such that the edges and surfaces of the brick/stone are not touched with chisel. When the cement pointing is hard and compact, a very small chisel is to be used and the centre of the cement joint is cut out, after which the sides of the joints where the cement adheres, are to be picked off with a steel tool, but without the use of a hammer.

SAND STONE WORK

- a) **Sand stone slab flooring/ pathway:** The stone flooring with chisel dressed stones will be as per Archaeological specification clause no 5.10. Wherever old paving stones exist; the old stone slab will be re-laid in the same area with missing stones replaced. Where the new paving stones have to be laid care should be taken to see that the stones slab match as much as possible to the old paving stone slab.
- b) **Repair of Chhajjas:** To replace chajja either large part of it should be damaged or completely missing. At places where large pieces have fallen off, the remaining pieces should also be carefully removed out and completely new chhajja carved out in the same pattern should be placed in grooves, if possible reusing the old chhajja slabs. In order to maintain the authenticity of the material of the new chhajjas to the old chhajjas, it will have to be made out in the same stone, which is broken off and can be replaced. The newly carved piece should be made in same pattern, matching in colour, texture and size as the existing stone slab chhajja and it should fixed in the same manner.

WOOD WORK

- a) **Fixing of new Doors:** The doors should be of best teak or other superior quality wood, free from knots, etc. It should match in size, colour, texture and design as per the existing doors in the west gateway. The door specifications and drawings given by the conservation architect should be referred in all respects.

FINISHING WORK

- a) **Treatment of bulging plaster and damaged plaster:** The problem associated with deteriorating plaster is in the form of bulging, flaking and loss of plaster in small or big patches from the ceiling and wall surfaces. In case of severe conditions related to the above the deteriorated plaster can be carefully removed without harming the surface of the underlying masonry and re-plastering it. All this should be done under the strict supervision of art conservator and only for areas specified in the conservation drawings.

In many a place, the plaster separates from the walls and a gap is formed between them. There are two types of separation of plaster from the support, one in which the gap between the support and plaster is considerable with minor cracks formed on surface and another in which plaster is detached, the gap is too much. Here again it is advisable to repair the lime plaster, similar in composition to the original plaster for filling up the lost areas.

- b) **Lime Surkhi Plaster Work:**

Sequence of work: Surface Preparation: Surfaces to be plastered shall be thoroughly cleaned of all dust, grease, oil and loose mortar. The entire surface shall then be thoroughly washed with brush and clean water.

Joints shall be racked out to depth of 20mm minimum with a hooked tool specially made for the purpose. Care should be taken not to damage masonry edges while racking. All surfaces of concrete, old plaster and stone shall be roughened sufficiently for bond with the plaster. Soft or crumbling stonework and other surfaces shall be dismantled and repaired if required. All surfaces to be plastered shall be thoroughly wetted for 24 hours before commencing plaster and shall be kept damp during the progress of work. At the same time the wall should not be too wet, as plaster is then likely to fall out and will also not be appropriate. It is essential

to maintain uniform suction of water by receiving surfaces, which shall be ensured by damping evenly all dry patches before applying plaster. The Engineer will inspect and approve all preparatory work before the commencement of plastering work.

Application & Curing: The first coat shall be done as per specified in archaeological specification 3.1 (a) and should be in ratio 1:2 (lime: surkhi). The first coat shall be applied to the wall with trowel in thickness 5 to 8mm. This surface shall be raked out, immediately after applying when it wet, by trowel at distances 30mm to 45mm. in jig jag pattern. This shall be done for complete room and should be left for 2-3 days.

Now the surface shall be thoroughly wetted for 24 hours before applying the next coat of surkhi plaster. The thickness for the surkhi plaster 25mm. in ratio 1:2 (lime: surkhi). The surkhi plaster for wall shall be done from the top to bottom and if possible each wall should be done on the same day if to avoid defects or unevenness at the joints. To ensure even thickness and a true surface, about 150mm. x 150mm. of surkhi plaster shall first be applied horizontally and vertically at 2m centers, approximately over the entire surfaces, to serve as gauges.

The surkhi mortar shall be filled between these to gauge with a straight edge wooden piece (plainer or *butkada*). The plastered surface shall be firmly pressed to uniform plumb and plane. The surface shall be left for 24hours. The surface shall develop cracks after 24 hours. All plastered surface shall be thoroughly wetted for 24 hours before commencing plaster and shall be kept damp during the progress of work. At the same time the wall should not be too wet, as plaster is then likely to fall out and will not be satisfactory. It is essential to maintain uniform suction of water by receiving surfaces, which shall be ensured by damping evenly all dry patches before applying plaster. The Engineer will inspect all preparatory work and process shall not be commenced, until Engineer approves all preparatory works.

The surface shall be hammered at the cracks with the help of wet wooden sticks (*jaal / baint* wood) made for the purpose. The cracks should seems be mixed. The surface shall be left for 7 days and shall cure during the process.

All corners, angles, junctions, etc. shall be truly vertical, horizontal or carved as the case may be and shall be carefully finished. Rounding or chamfering of corners or junctions wherever required shall be done without any extra payment. No portion shall be left out initially to be patched up later on. Before applying *surkhi, loi* the entire surface of the *surkhi* plaster should be rechecked with a true straight edge (wooden or aluminum plainer 2.5m long), plumb, string, level, etc.

If any crack appears on surfaces or if any portion found soft or if sound defective due to less lime, improper curing or any other reason, the relevant portion shall be removed and redone as per the instruction of the Engineer.

The surface is thoroughly wetted before applying *loi* (final coat). Now the *surkhi loi* shall be apply in thickness 2mm. (ratio 1:2) is applied with the plainer. The surface shall be smoothened by rubbing and pressing.

c) Surface finish: Removal of lime wash

While removal of lime washes/white wash from an old surface care should be taken to prevent injury to the underlying surface in particular any inscription, painting or relief beneath. Lime wash can be removed by light brushing with soft brush and water or light sponging in case of painted or delicate surface. In certain cases scraping using surgical blade and knife may be resorted to by skilled worker under close supervision and instruction of the engineer in consultation with the conservation architect.

The task of cleaning stucco work or removal of lime wash and dirt from the surface is a specialized and difficult job to be undertaken only under the directions supervision of art conservation expert in consultation with the conservation architect.

1.1.4. EARTHWORK

SITE CLEARANCE

- a) Before the earth work is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth up to 30cm measured at a height of one meter

above ground level and rubbish removed up to a distance of 50 meters outside the periphery of the area under clearance. The roots of trees and saplings shall be removed to a depth of 60cm below ground level or 30 cm below formation level or 15 cm below sub grade level, whichever is lower, and the holes or hollows filled up with the earth, rammed and leveled.

- b) The trees of girth above 30 cm measured at a height of one meter above ground shall be cut only after permission of the Engineer-in-Charge is obtained in writing. The roots of trees shall also be removed as specified
- c) Existing structures and services such as old buildings, culverts, fencing, water supply pipe lines, sewers, power cables, communication cables, drainage pipes etc. within or adjacent to the area if required to be diverted/removed, shall be diverted/dismantled as per directions of the Engineer-in Charge and payment for such diversion/dismantling works shall be made separately.
- d) In case of archaeological monuments within or adjacent to the area, the contractor shall provide necessary fencing around such monuments as per the directions of the Engineer-in-Charge and protect the same properly during execution of works. Payment for providing fencing shall be made separately.
- e) Lead of 50 m mentioned in the 'Schedule Of Quantities' is the average lead for the disposal of excavated earth within the site of work. The actual lead for the disposal of earth may be more or less than the 50 m for which no cost adjustment shall be made in the rates.
- f) Disposal of Earth shall be disposed off at the specified location or as decided by the Engineer-in Charge. The contractor has to take written permission about place of disposal of earth before the earth is disposed off, from Engineer-in-Charge.

EXCAVATION IN ALL KINDS OF SOILS

- g) All excavation operations manually or by mechanical means shall include excavation and 'getting out' the excavated materials. In case of excavation for trenches, basements, water tanks etc. 'getting out' shall include throwing the excavated materials at a distance of at least one metre or half the depth of excavation, whichever is more, clear off the edge of excavation. In all other cases 'getting out' shall include depositing the excavated materials as specified. The subsequent disposal of the excavated material shall be either stated as a separate item or included with the items of excavation stating lead.
- h) During the excavation the natural drainage of the area shall be maintained. Excavation shall be done from top to bottom. Undermining or undercutting shall not be done.
- i) In firm soils, the sides of the trenches shall be kept vertical upto a depth of 2 meters from the bottom. For greater depths, the excavation profiles shall be widened by allowing steps of 50 cms on either side after every 2 meters from the bottom. Alternatively, the excavation can be done so as to give slope of 1:4 (1 horizontal: 4 vertical). Where the soil is soft, loose or slushy, the width of steps shall be suitably increased or sides sloped or the soil shored up as directed by the Engineer-in Charge. It shall be the responsibility of the contractor to take complete instructions in writing from the Engineer-in-Charge regarding the stepping, sloping or shoring to be done for excavation deeper than 2 meters.
- j) The excavation shall be done true to levels, slope, shape and pattern indicated by the Engineer-in Charge. Only the excavation shown on the drawings with additional allowances for centering and shuttering or as required by the Engineer-in-Charge shall be measured and recorded for payment.
- k) In case of excavation for foundation in trenches or over areas, the bed of excavation shall be to the correct level or slope and consolidated by watering and ramming. If the excavation for foundation is done to a depth greater than that shown in the drawings or as required by the Engineer-in-Charge, the excess depth shall be made good by the contractor at his own cost with the concrete of the mix used for levelling/ bed concrete for foundations. Soft/defective spots at the bed of the foundations shall be dug out and filled with concrete (to be paid separately) as directed
- l) While carrying out the excavation for drain work care shall be taken to cut the side and bottom to the required shape, slope and gradient. The surface shall then be properly dressed. If the excavation is done to a depth greater than that shown on the drawing or as required by the Engineer-in-Charge, the excess depth shall be made good by the contractor at his own cost with stiff clay puddle at places where the drains are required to be pitched and with ordinary earth, properly watered and rammed, where the drains are not required to be pitched. In case the drain is required to be pitched, the back filling with clay puddle, if required, shall be done simultaneously as the pitching work proceeds. The brick pitched storm water drains should be avoided as far as possible in filled-up areas and loose soils.

- m) In all other cases where the excavation is taken deeper by the contractor, it shall be brought to the required level by the contractor at his own cost by filling in with earth duly watered, consolidated and rammed.
- n) In case the excavation is done wider than that shown on the drawings or as required by the Engineer-in-Charge, additional filling wherever required on the account shall be done by the contractor at his own cost.
- o) The excavation shall be done manually or by mechanical means as directed by Engineer-in-charge considering feasibility, urgency of work, availability of labour /mechanical equipment and other factors involved. Contractor shall ensure every safety measures for the workers. Neither any deduction will be made nor will any extra payment be made on this account.

EARTH WORK BY MECHANICAL MEANS

- a) Earth work by mechanical means involves careful planning keeping in view site conditions i.e. type of soil, nature of excavation, distances through which excavated soil is to be transported and working space available for employing these machines. The earth moving equipment should be accordingly selected.
- b) The earth moving equipment consists of excavating and transporting equipment. Excavating equipment may be further classified as excavators and tractor based equipment.

FILLING

- a) The earth used for filling shall be free from all roots, grass, shrubs, rank vegetation, brushwood, tress, sapling and rubbish.
- b) Filling with excavated earth shall be done in regular horizontal layers each not exceeding 20 cm in depth. All lumps and clods exceeding 8 cm in any direction shall be broken. Each layer shall be watered and consolidated with steel rammer or ½ tonne roller. Where specified, every third and top must layer shall also be consolidated with power roller of minimum 8 tonnes. Wherever depth of filling exceeds 1.5 metre vibratory power roller shall be used to consolidate the filing unless otherwise directed by Engineer-in-charge. The top and sides of filling shall be neatly dressed. The contractor shall make good all subsidence and shrinkage in earth fillings, embankments, traverses etc. during execution and till the completion of work unless otherwise specified.

SURFACE EXCAVATION

- a) Excavations exceeding 1.5 m in width and 10 sqm. on plan but not exceeding 30 cm. in depth in all types of soils and rocks shall be described as surface excavation and shall be done as specified in 2.7 and 2.8.

EXCAVATION IN TRENCHES FOR PIPES, CABLES ETC. AND REFILLING

- a) This shall comprise excavation not exceeding 1.5 mts in width or 10 sqm in plan and to any depth trenches for pipes. Cables etc. and returning the excavated material to fill the trenches after pipes, cables etc. are laid and their joints tested and passed and disposal of surplus excavated material upto 50 m lead

FILLING IN TRENCHES, PLINTH, UNDER FLOOR ETC.

- a) Earth Normally excavated earth from same area shall be used for filling. Earth used for filling shall be free from shrubs, rank, vegetation, grass, brushwood, stone shingle and boulders (larger than 75mm in any direction), organic or any other foreign matter. Earth containing deleterious materials, salt peter earth etc. shall not be used for filling. All clods and lumps of earth exceeding 8 cm in any direction shall be broken or removed before the earth is used for filling.

SURFACE DRESSING

- a) Surface dressing shall include cutting and filling upto a depth of 15 cm and clearing of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth upto 30 cm measured at a height of one metre above the ground level and removal of rubbish and other excavated material upto a distance of 50 metres outside the periphery of the area under surface dressing. High portions of the ground shall be cut down and hollows depression filled upto the required level with the excavated earth so as to give an even, neat and tidy look

FELLING TREES

- a) While clearing jungle, growth trees above 30 cm girth (measured at a height of one metre above ground level) to be cut, shall be approved by the Engineer-in-Charge and then marked at site. Felling trees shall

include taking out roots upto 60 cm below ground level or 30 cm below formation level or 15 cm below sub-grade level, whichever is lower.

- b) All excavation below general ground level arising out of the removal of trees, stumps etc. shall be filled with suitable material in 20 cm layers and compacted thoroughly so that the surfaces at these points conform to the surrounding area. The trunks and branches of trees shall be cleared of limbs and tops and cut into suitable pieces as directed by the Engineer-in-Charge.

ANTI-TERMITE TREATMENT

- a) Sub-terranean termites are responsible for most of the termite damage in buildings. Typically, they form nests or colonies underground. In the soil near ground level in a stump or other suitable piece of timber in a conical or dome shaped mound. The termites find access to the super-structure of the building either through the timber buried in the ground or by means of mud shelter tubes constructed over unprotected foundations.
- b) Termite control in existing as well as new building structures is very important as the damage likely to be caused by the termites to wooden members of building and other household article like furniture, clothing, stationery etc. is considerable. Anti-termite treatment can be either during the time of construction i.e. pre-constructional chemical treatment or after the building has been constructed i.e. treatment for existing building.
- c) Prevention of the termite from reaching the super-structure of the building and its contents can be achieved by creating a chemical barrier between the ground, from where the termites come and other contents of the building which may form food for the termites. This is achieved by treating the soil beneath the building and around the foundation with a suitable insecticide.

1.1.5. CEMENT MORTAR

WATER

- a) Water used for mixing and curing shall be clean and free from injurious quantities of alkalies, acids, oils, salts, sugar, organic materials, vegetable growth or other substance that may be deleterious to bricks, stone, concrete or steel. potable water is generally considered satisfactory for mixing. The Ph value of water shall be not less than 6. The following concentrations represent the maximum permissible values: (of deleterious materials in water).

CEMENT

- a) The cement used shall be any of the following grade and the type selected should be appropriate for the intended use.
 - i. 33 grade ordinary Portland cement conforming to IS 269.
 - ii. 43 grade ordinary Portland cement conforming to IS 8112.
 - iii. 53 grade ordinary Portland cement conforming to IS 12269.
 - iv. Rapid hardening Portland cement conforming to IS 8041.
 - v. Portland slag cement conforming to IS 455.
 - vi. Portland Pozzolana cement (flyash based) conforming to IS 1489 (Part 1).
 - vii. Portland Pozzolona cement (calcined clay based) conforming to IS 1489 (part 2).
 - viii. Hydrophobic cement conforming to IS 8043
 - ix. Low heat Portland cement conforming to IS 12600.
 - x. Sulphate resisting Portland cement conforming to IS 12330
 - xi. White cement conforming to IS 8042

FINE AGGREGATE

- a) Aggregate most of which passes through 4.75 mm IS sieve is known as fine aggregate. Fine aggregate shall consist of natural sand, crushed stone sand, crushed gravel sand stone dust or marble dust, fly ash and broken brick (Burnt clay). It shall be hard, durable, chemically inert, clean and free from adherent coatings, organic matter etc. and shall not contain any appreciable amount of clay balls or pellets and harmful impurities e.g. iron pyrites, alkalies, salts, coal, mica, shale or similar laminated materials in such form or in such quantities as to cause corrosion of metal or affect adversely the hardening, the strength, the durability or the appearance of mortar, plaster or concrete. The sum of the percentages of all deleterious material shall not exceed 5%. Fine aggregate must be checked for organic impurities such as decayed vegetation humps, coal dust etc. in accordance with the procedure prescribed.

1.1.6. BRICK WORK

COMMON BURNT CLAY BRICKS

- a) Shall conform to IS:1077 and shall be hand moulded or machine moulded. They shall be free from nodules of free lime, visible cracks, flaws warpage and organic matter, have a frog 100 mm in length 40 mm in width and 10 mm to 20 mm deep on one of its flat sides. Bricks made by extrusion process and brick tiles may not be provided with frogs. Each brick shall be marked (in the frog where provided) with the manufacturer's identification mark or initials.

TILE BRICK

- a) The bricks of 4 cm height shall be moulded without frogs. Where modular tiles are not freely available in the market, the tile bricks of F.P.S. thickness 44 mm (1-3/4") shall be used unless otherwise specified.

1.1.7. STONE WORK

COURSED RUBBLE MASONRY - FIRST SORT

- a) Face stones shall be hammer dressed on all beds, and joints so as to give them approximately rectangular block shape. These shall be squared on all joints and beds. The bed joint shall be rough chisel dressed for at least 80 mm back from the face, and side joints for at least 40 mm such that no portion of the dressed surface is more than 6 mm from a straight edge placed on it. The remaining unexposed portion of the stone shall not project beyond the surface of bed and side joint. The bushing on the face shall not project more than 40 mm as an exposed face and 10 mm on a face to be plastered. The hammer dressed stone shall also have a rough tooling for minimum width of 25 mm along the four edges of the face of the stone, when stone work is exposed.
- b) The mortar for jointing shall be as specified.
- c) All stones shall be wetted before use. The walls shall be carried up truly plumb or to specified batter. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. The height of each course shall not be less than 15 cm nor more than 30 cm.
- d) Face stones shall be laid alternate headers and stretchers. No pinning shall be allowed on the face. No face stone shall be less in breadth than its height and at least one third of the stones shall tail into the work for length not less than twice their height.
- e) The hearting or the interior filling of the wall shall consist of stones carefully laid on their proper beds in mortar; chips and spalls of stone being used where necessary to avoid thick beds of joints of mortar and at the same time ensuring that no hollow spaces are left anywhere in the masonry. The chips shall not be used below the hearting stone to bring these upto the level of face stones. The use of chips shall be restricted to the filling of interstices between the adjacent stones in hearting and these shall not exceed 10% of the quantity of stone masonry.
- f) The masonry in a structure shall be carried up uniformly but where breaks are unavoidable, the joints shall be raked back at angle not steeper than 45°. Tothing shall not be allowed.
- g) All bed joints shall be horizontal and all side joints vertical. All joints shall be fully packed with mortar, face joints shall not be more than one cm thick.
- h) When plastering or pointing is not required to be done, the joints shall be struck flush and finished at the time of laying. Otherwise, joints shall be raked to a minimum depth of 20 mm by raking tool during the progress of work, when the mortar is still green.

STONE CHAJJA

- a) Stone slabs shall be hard, sound and durable. These shall be chisel dressed on all faces which are exposed to view and rough dressed at other surface. Angles shall be true and edge lines straight. The finished thickness shall be as stipulated with permissible tolerance of ± 2 mm. The length of stone slabs in chajja shall not be less than 60 cm unless otherwise specified.
- b) In case of sloping chajja the stone shall be sloped as specified. It shall have minimum bearing of 20 cm measured horizontally on the wall and the bearing shall also be similarly sloped. Each slab shall have a hole in the centre of the bearing area through which the anchoring M.S. holding down bolt shall pass. The holding down bolts shall be 12 mm diameter and shall be bent at right angles at its lowest end and buried horizontally for at least 7 cm in a joint 30 cm below the bearing surface. Each holding down bolt shall be secured at top by suitable washer and nut.

- c) In case of horizontal chajja, the stone shall be fixed horizontally with a slight outer slope of about 1 cm. It shall have minimum bearing of 15 cm on the wall. Holding down bolts shall be provided, only where so specified.

1.1.8. WOOD WORK AND PVC WORK

TIMBER

- a) The timber shall be free from decay, fungal growth, boxed heart, pitch pockets or streaks on the exposed edges, splits and cracks. The timber shall be graded as first grade and second grade on the basis of the permissible defects in the timber. For both the grades, knots should be avoided over a specified limit.
- b) Control on moisture content of timber is necessary to ensure its proper utility in various climatic conditions. For specifying the permissible limit of moisture content in the timber the country has been divided into four climatic zones as per Appendix B of Chapter 9. In each of the zones, maximum permissible limit of moisture content of timber for different uses, when determined in accordance with the procedure laid down
- c) The process of drying timber under controlled conditions is called seasoning of timber. Timber shall be either air seasoned or kiln seasoned and in both cases moisture content of the seasoned timber shall be as specified in Table 9. 2 of Chapter 9 unless otherwise specified, air seasoned timber shall be used. Kiln seasoning of timber, where specified, shall be done as per IS 1141 in a plant approved by Engineer in-Charge.

PANELLING MATERIAL

- a) Timber panels shall be preferably made of timber of larger width. The minimum width and thickness of a panel shall be 150 mm and 15 mm respectively. When made from more than one piece, the pieces shall be joined with a continuous tongue and groove joint, glued together and reinforced with metal dowels. The grains of timber panels shall run along the longer dimensions of the panels. The panels shall be designed such that no single panel exceeds 0.5 square metre in area.
- b) Plywood boards are formed by gluing and pressing three or more layers of veneers with the grains of adjacent veneers running at right angles to each other. The veneers shall be either rotary cut or sliced and shall be sufficiently smooth to permit an even spread of glue. Face veneers may be either decorative on both sides or one side commercial and the other decorative. Plywood shall be of BWP grade or BWR grade as per IS 303.
- c) Particle boards shall be of medium density and manufactured from particles of agro waste, wood or lignocellulose i.e. material blended with adhesive and formed into solid panels under the influence of heat, moisture, pressure etc. The particle boards shall be flat pressed three layered or graded and of Grade-I as per Table 1 of IS 3087. Both surfaces of the boards shall be sanded to obtain a smooth finish and shall conform to IS 3087.
- d) Fibre boards shall be of medium density cement board reinforced with wood fibre, produced by fiberizing steamed wood under pressure, blended with adhesive and wax and formed into solid panels under controlled conditions of heat and pressure as per IS 14862.
- e) For panel exceeding 0.5 sqm in area, the nominal thickness of the glass to be used shall be as specified.
- f) Particle Board Prelaminated particle board Grade-1 (FPT-I or graded wood particle board FPT-I) bonded with BWP type synthetic resin and prelaminated conforming to IS 12823 Grade-I, type II or I shall be used.
- g) Fire retardant plywood shall generally conform to IS 5509. The plywood to be given fire retardant treatment shall conform to BWR grade of IS 303 to be able to stand pressure impregnation. Plywood for treatment shall be clean, free from oil or dirt patches on the surface and at a moisture content not exceeding 15 percent. In case of veneered decorative plywood care shall be taken that colour of the solution does not spoil to decorative surface.

DOOR, WINDOW AND VENTILATOR FRAMES

- a) Timber for door, window and ventilators frames shall be as specified. Timber shall be sawn in the direction of the grains. All members of a frame shall be of the same species of timber and shall be straight without any warp or bow. Frames shall have smooth, well-planed (wrought) surfaces except the surfaces touching the walls, lintels, sill etc., which may be left clean sawn. Rebates, rounding or moulding shall be done before the members are jointed into frames. The depth of the rebate for housing the shutters shall be 15 mm, and the

width of the rebates shall be equal to the thickness of the shutters. A tolerance of ± 2 mm shall be permitted in the specified finished dimensions of timber sections in frames.

- b) The Jamb posts shall be through tenoned in to the mortise of the transoms to the full thickness of the transoms and the thickness of the tenon shall be not less than 2.5 cm. The tenons shall closely fit into the mortise without any wedging or filling. The contact surface of tenon and mortise before putting together shall be glued with polyvinyl acetate dispersion based adhesive conforming to IS 4835 or adhesive conforming IS 851 and pinned with 10 mm dia hard wood dowels, or bamboo pins or star shaped metal pins. The joints shall be at right angles when checked from the inside surfaces of the respective members. The joints shall be pressed in position. Each assembled door frame shall be fitted with a temporary stretcher and a temporary diagonal brace on the rebated faces.
- c) The frames shall be got approved by the Engineer-in-Charge before being painted, oiled or otherwise treated and before fixing in position. The surface of the frames abutting masonry or concrete and the portions of the frames embedded in floors shall be given a coating of coal tar. Frames shall be fixed to the abutting masonry or concrete with holdfasts or metallic fasteners as specified. After fixing, the jamb posts of the frames shall be plugged suitably and finished neat. Vertical members of the door frames shall be embedded in the floor for the full thickness of the floor finish and shall be suitably strutted and wedged in order to prevent warping during construction. A minimum of three hold fasts shall be fixed on each side of door and window frames one at centre point and other two at 30 cm from the top and bottom of the frames. In case of window and ventilator frames of less than 1 m in height two hold fasts shall be fixed on each side at quarter point of the frames. Hold fasts and metallic fasteners shall be measured and paid for separately.

PANELLED GLAZED OR PANELLED AND GLAZED SHUTTERS

- a) Panelled or glazed shutters for doors, windows, ventilators and cupboards shall be constructed in the form of timber frame work of stiles and rails with panel inserts of timber, plywood, block board, veneered particle board, fibre board wire gauze or float glass. The shutters may be single or multipanelled, as shown in the drawings or as directed by the Engineer-in-Charge. Timber for frame work, material for panel inserts and thickness of shutters shall be as specified. All members of the shutters shall be straight without any warp or bow and shall have smooth well planed face at right angles to each other.
- b) Any warp or bow shall not exceed 1.5 mm for door shutter and 1 mm for window and ventilator shutters The right angle for the shutter shall be checked by measuring the diagonals and the difference between the two diagonals should not be more than 3 mm. Generally panelled glazed or panelled and glazed shutter shall conform to IS 1003 (Pt. 1 & 2).
- c) Timber for stiles and rails shall be of the same species and shall be sawn in the directions of grains. Sawing shall be truly straight and square. The timber shall be planed smooth and accurate to the required dimensions. The stiles and rails shall be joined to each other by plain or haunched mortise and tenon joints and the rails shall be inserted 25 mm short of the width of the stiles. The bottom rails shall have double tenon joints and for other rails single tenon joints shall be provided. The lock rails of door shutter shall have its centre line at a height of 800 mm from the bottom of the shutters unless otherwise specified. The thickness of each tenon shall be approximately one-third the finished thickness of the members and the width of each tenon shall not exceed three times its thickness.
- d) Glass panelling (Glazing) shall be done as specified in 9.2.6. Glazing in the shutters of doors, windows and ventilators of bath, WC and Lavatories shall be provided with frosted glass the weight of which shall be not less than 10 kg/sqm. Frosted glass panes shall be fixed with frosted face on the inside. Glass panels shall be fixed by providing a thin layer of putty conforming to IS 419 applied between glass pane and all along the length of the rebate and also between glass panes and wooden beading.
- e) These shall be made from mild steel flat 40 × 5 mm size conforming to IS 7196 without any burns or dents. 5 cm length of M.S. flat at one end shall be bent at right angle and one hole 11 mm dia shall be made in it for fixing to wooden frame with 10 mm dia nut bolt. The bolt head shall be sunk into the wooden frame, 10 mm deep and plugged with wooden plug. At the other end 10 cm length of the hold fast flat shall be forked and bent of length as specified at right angle in opposite direction and embedded in cement concrete block of size 30 x 10 x 15 cm of mix 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate, 20 mm nominal size) or as specified
- f) Fitting shall be of mild steel, brass, aluminium or as specified. Some mild steel fittings may have components of cast iron. These shall be well made, reasonably smooth, and free from sharp edges and corners, flaws and other defects. Screw holes shall be counter sunk to suit the head of specified wood screws.

UPVC- DOOR FRAMES

- a) UPVC door frame shall be made of PVC material conforming to IS 10151. The door frame shall be made from extruded UPVC section having overall dimensions of 48 x 40 mm or 42 x 50 mm having wall thickness of 2.0 mm + 0.2 mm. Corners of the door frame to be jointed by M.S. galvanized brackets. Joints mitred and plastic welded. The hinge side vertical outer frames shall be reinforced by galvanized M.S. Tube of size 19 x 19 mm of wall thickness 1 mm + 0.1 mm and a tie rod shall be provided at the bottom of the frame. The frame shall be fabricated in factory as per nomenclature of the item and directions of Engineer-in-Charge.
- b) The frames are to be fixed in prepared openings in the walls. All civil work and tiling should be completed before the fixing of the frames. The frames are to be fixed directly on the plastered wall. In case tiling is to be done in the place the frames are to be fitted, a 50 mm strip should be left untilted at the location where the frames are to be fitted. The frames are erected in the prepared opening such that the vertical members of the door frame are embedded 50 mm in the floor. The frame shall be fitted truly in plumb. A minimum of three anchor bolts or screws of size 65/100 shall be used to fix each vertical member. One bolt shall be fixed at 200 mm from the top member and one bolt shall be fixed at 200 mm from the floor. The third anchor bolt shall be fixed in the center. The top horizontal member shall be fixed using two 65/100 size anchor bolts or screws at a distance of 200 mm from both the corners.

1.1.9. STEEL WORK

STEEL WORK IN BUILT UP SECTION (WELDED)

- a) Straightening, shaping to form, cutting and assembling, shall be as far as applicable, except that the words "riveted or bolted" shall be read as "welded" and holes shall only be used for the bolts used for temporary fastening as shown in drawings.
- b) Welding shall generally be done by electric arc process as per IS 816 and IS 823. The electric arc method is usually adopted and is economical. Where electricity for public is not available generators shall be arranged by the contractor at his own cost unless otherwise specified. Gas welding shall only be resorted to using oxyacetylene flame with specific approval of the Engineer-in-charge. Gas welding shall not be permitted for structural steel work Gas welding required heating of the members to be welded along with the welding rod and is likely to create temperature stresses in the welded members. Precautions shall therefore be taken to avoid distortion of the members due to these temperature stresses.
- c) The work shall be done as shown in the shop drawings which should clearly indicate various details of the joint to be welded, type of welds, shop and site welds as well as the types of electrodes to be used. Symbol for welding on plans and shops drawings shall be according to IS 813.
- d) As far as possible every efforts shall be made to limit the welding that must be done after the structure is erected so as to avoid the improper welding that is likely to be done due to heights and difficult positions on scaffolding etc. apart from the aspect of economy. The maximum dia of electrodes for welding work shall be as per IS 814. Joint surfaces which are to be welded together shall be free from loose mill scale, rust, paint, grease or other foreign matter, which adversely affect the quality of weld and workmanship.
- e) Before welding is commenced, the members to be welded shall first be brought together and firmly clamped or tack welded to be held in position. This temporary connection has to be strong enough to hold the parts accurately in place without any disturbance. Tack welds located in places where final welds will be made later shall conform to the final weld in quality and shall be cleaned off slag before final weld is made.
- f) The specification shall be as described except that while erecting a welded structure adequate means shall be employed for temporary fastening the members together and bracing the frame work until the joints are welded. Such means shall consists of applying of erection bolts, tack welding or other positive devices imparting sufficient strength and stiffness to resist all temporary loads and lateral forces including wind. Owing to the small number of bolts ordinarily employed for joints which are to be welded, the temporary support of heavy girders carrying columns shall be specially attended. Different members which shall be fillet welded, shall be brought into as close contact as possible. The gap due to faulty workmanship or incorrect fit if any shall not exceed. 1.5 mm if gap exceeds 1.5 mm or more occurs locally the size of fillet weld shall be increased at such position by an amount equal to the width of the gap.
- g) Before the member of the steel structures are placed in position or taken out of the workshop these shall be painted

TUBULAR / HOLLOW SECTION TRUSSES

- a) Conforming to the requirement of IS 1161. The steel tubes when analysed in accordance with the method specified in IS 228 shall show not more than 0.06 percent sulphur, and not more than 0.06 per cent phosphorous.

- b) Tubes shall be designated by their nominal bore. These shall be light, medium or heavy as specified depending upon the wall thickness. The standard size and weights of tubes are listed in Appendix C. Hollow sections shall be as per IS 4923.
- c) Tubes shall be clean finished and reasonably free from scale. They shall be free from cracks, surface flaws, laminations and other defects. The ends shall be cut clean and square with axis of tube, unless otherwise specified.
- d) Wall thickness of tubes used for construction exposed to weather shall be not less than 4 mm and for construction not exposed to weather it shall be not less than 3.2 mm where structures are not readily accessible for maintenance, the minimum thickness shall be 5 mm.
- e) The component parts of the structure shall be assembled in such a manner that they are neither twisted nor otherwise damaged and be so prepared that the specified cambers, if any, are, maintained. The tubular steel work shall be painted with one coat of approved steel primer after fabrication. All fabrication and welding is to be done in an approved workshop. The joint details shall be generally as per S.P-38 of B.I.S publication.
- f) All material before being assembled shall be straightened, if necessary, unless required to be of curvilinear form and shall be free from twist.
- g) Where welding is adopted, it shall be as per IS 816.
- h) The ends of all the tubes, for columns transmitting loads through the ends, should be true and square to the axis of the tubes and should be provided with a cap or base accurately fitted to the end of the tube and screwed, welded or shrunk on. The cap or base plate should be true and square to the axis of the column.
- i) When the end of a tube is not automatically sealed by virtue of its connection by welding to another member the end shall be properly and completely sealed. Before sealing, the inside of the tubes should be dry and free from loose scale.
- j) In tubular construction the ends of tubes may be flattened or otherwise formed to provide for welded. Riveted or bolted connections provide that the methods adopted for such flattening do not injure the material. The change of sections shall be gradual.
- k) Tubular trusses shall be hoisted and erected in position carefully, without damage to themselves, other structure, equipment and injury to workman.
- l) The method of hoisting and erection proposed to be adopted shall be got approved from the Engineer-in-charge. The contractor shall however be fully responsible, for the work being carried out in a safe and proper manner without unduly stressing the various members. Proper equipment such as derricks, lifting tackles, winches, ropes etc. shall be used.

STEEL WORK WELDED IN BUILT-UP SECTIONS FOR HAND RAIL USING M.S. TUBULAR/ERW TUBULAR PIPES AND G.I. PIPES

- a) Hot finished welded (HFW) Hot finished seamless (HFS) and electric resistance welded tube shall conform to IS 1161
- b) G.I. pipes used for Hand rail to be conforming to IS 1239-Part I for medium grade. GI pipes to be screwed and socketed type and of required nominal bore.
- c) All screwed tubes and socket of GI pipes shall have pipe threads conforming to the requirements of IS 554.

1.1.10. FLOORING

RED OR WHITE FINE DRESSED SAND STONE FLOORING

- a) The slabs shall be red or white as specified in the description of the item. The stone slabs shall be hard, sound, durable and tough, free from cracks, decay and weathering. In case of red sand stone, white patches or streaks shall not be allowed. However, scattered spots upto 10 mm diameter will be permitted. Before starting the work the contractor shall get samples of slabs approved by the Engineer in-Charge.
- b) The slabs shall be hand or machine cut to the requisite thickness along planes parallel to the natural bed of stone and should be of uniform size if required.

- c) Every slab shall be cut to the required size and shape and chisel dressed on all sides to a minimum depth of 20 mm. The top and the joints shall be fine tooled so that straight edge laid along the face is fully in contact with it. In case machine cut stones are used, chisel dressing and fine tooling of machine cut surface need not be done provided a straight edge laid anywhere along the machine cut surface is in contact with every point on it.
- d) The thickness of the slabs after dressing shall be 40 mm or as specified in the description of item with a permissible tolerance of ± 2 mm.
- e) Base concrete on which the slabs are to be laid shall be cleaned, wetted and mopped. The bedding for the slabs shall be with cement mortar 1:5 (1 cement : 5 coarse sand) or as given in the description of the item.
- f) The average thickness of the bedding mortar under the slabs shall be 20 mm and the thickness at any place under the slabs shall not be less than 12 mm.
- g) Mortar of specified mix shall be spreaded under each slab. The slab shall be washed clean before laying. It shall then be laid on top, pressed and lapped, so that all hollows underneath get filled and surplus mortar works up through the joints. The top shall be tapped with a wooden mallet and brought to level and close to the adjoining slabs, with thickness of joint not exceeding 5 mm. Subsequent slabs shall be laid in the same manner. After laying each slab surplus mortar on the surface of slabs shall be cleaned off and joints finished flush.
- h) In case pointing with other mortar mix is specified, the joint shall be left raked out uniformly and to a depth of not less than 12 mm when the mortar is still green. The pointing shall be cured for a minimum period of 7 days. The surface of the flooring as laid shall be true to levels and slopes as instructed by the Engineer-in-Charge.
- i) Slabs which are fixed in the floor adjoining the wall shall enter not less than 12 mm under the plaster, skirting or dado. The junction between wall plaster skirting and floor shall be finished neatly and without waviness.
- j) The finished floor shall not sound hollow when tapped with wooden mallet.
- k) In case of chisel dressed stone flooring slight unevenness, if any existing between the edges of slabs at joints shall then be removed by chiselling in a slant.

RED OR WHITE FINE DRESSED AND RUBBED SAND STONE FLOORING

- a) The specifications for dressing the top surface and the sides shall be as described. In addition the dressed top and sides shall be table rubbed with coarse grade carborundum stone before paving, to obtain a perfectly true and smooth surface free from chisel marks.
- b) The thickness of the slabs after dressing shall be as specified with a permissible tolerance of ± 2 mm.
- c) The slabs shall be laid with 3 mm thick or 5 mm thick joints as specified in the description of the item.
- d) Where the joints are to be limited to 3 mm thickness, the slabs shall be laid as specified in 11.19.3 except that the bedding mortar shall be as specified in 11.23.3 and sides of the slabs to be jointed shall be buttered with cement mortar 1:2 (1 cement: 2 stone dust) admixed with pigment to match the shade of the slab.
- e) Where the slabs are to be laid with 5 mm thick joints, the specifications for laying shall be as described.
- f) Finishing shall be as specified except that chisel marks and unevenness shall be removed by rubbing with coarse grade carborundum stone.

1.1.11. ROOFING

CORRUGATED GALVANISED STEEL SHEET ROOFING

- a) These shall be of the thickness specified in the description of the item and shall conform to IS 277. The sheets shall be of 275 grade of coating (See Appendix-A) unless otherwise specified in the description of item.
- b) The sheets shall be free from cracks, split edges, twists, surface flaws etc. They shall be clean, bright and smooth. The galvanising shall be non-injured and in perfect condition. The sheets shall not show signs of rust or white powdery deposits on the surface. The corrugations shall be uniform in depth and pitch and parallel with the side.

- c) The top surfaces of the purlins shall be uniform and plane. They shall be painted before fixing on top. Embedded portions of wooden purlins shall be coal tarred with two coats.
- d) Roof shall not be pitched at a flatter slope than 1 vertical to 5 horizontal. The normal pitch adopted shall usually be 1 vertical to 3 horizontal.
- e) The sheets shall be laid and fixed in the manner described below, unless otherwise shown in the working drawings or directed by the Engineer-in-Charge.
- f) The sheets shall be laid on the purlins to a true plane, with the lines of corrugations parallel or normal to the sides of the area to be covered unless otherwise required as in special shaped roofs.
- g) The sheets shall be laid with a minimum lap of 15 cm at the ends and 2 ridges of corrugations at each side. The above minimum end lap of 15 cm shall apply to slopes of 1 vertical to 2 horizontal and steeper slopes. For flatter slopes the minimum permissible end lap shall be 20 cm. The minimum lap of sheets with ridge, hip and valley shall be 20 cm measured at right angles to the line of the ridge, hip and valley respectively. These sheets shall be cut to suit the dimensions or shapes of the roof, either along their length or their width or in a slant across their lines of corrugations at hips and valleys. They shall be cut carefully with a straight edge chisel to give a smooth and straight finish.
- h) Lapping in C.G.S. sheets shall be painted with a coat of approved steel primer and two coats of painting with approved paint suitable for G.S. sheet, before the sheets are fixed in place.
- i) Sheets shall not generally be fixed into gables and parapets. They shall be bent up along their side edges close to the wall and the junction shall be protected by suitable flashing or by a projecting drip course, the later to cover the junction by at least 7.5 cm.
- j) The laying operation shall include all scaffolding work involved.
- k) Sheets shall be fixed to the purlins or other roof members such as hip or valley rafters etc. with galvanised J or L hook bolts and nuts, 8 mm diameter, with bitumen and G.I. limpet washers or with a limpet washer filled with white lead as directed by the Engineer-in-Charge. While J hooks are used for fixing sheets on angle iron purlins, and L hooks are used for fixing the sheet to R.S. joists, timber or precast concrete purlins. The length of the hook bolt shall be varied to suit the particular requirements.
- l) The bolts shall be sufficiently long so that after fixing they project above the top of the nuts by not less than 10 mm. The grip of J or L hook bolt on the side of the purlin shall not be less than 25 mm. There shall be a minimum of three hook bolts placed at the ridges of corrugations in each sheet on every purlin and their spacing shall not exceed 30 cm. Coach screws shall not be used for fixing sheets to purlins.
- m) The galvanised coating on J or L hooks, and bolts shall be continuous and free from defects such as blisters, flux stains, drops, excessive projections or other imperfections which would impair serviceability.
- n) Where slopes of roofs are less than 21.5 degrees (1 vertical to 2.5 horizontal) sheets shall be joined together at the side laps by galvanised iron bolts and nuts 25 × 6 mm size, each bolt provided with a bitumen and a G.I. limpet washer or a G.I. limpet washer filled with white lead. As the overlap at the sides extends to two corrugations, these bolts shall be placed zig-zag over the two overlapping corrugations, so that the ends of the overlapping sheets shall be drawn tightly to each other. The spacing of these seam bolts shall not exceed 60 cm along each of the staggered rows. Holes for all bolts shall be drilled and not punched in the ridges of the corrugations from the underside, while the sheets are on the ground.
- o) Wind ties shall be of 40 x 6 mm flat iron section or of other size as specified. These shall be fixed at the eaves of the sheets. The fixing shall be done with the same hook bolts which secure the sheets to the purlins. The ties shall be paid for separately unless described in the item of roofing.
- p) The roof when completed shall be true to lines, and slopes and shall be leak proof.

RIDGES AND HIPS OF PLAIN GALVANISED STEEL SHEETS

- a) Ridges and hips of C.G.S. roof shall be covered with ridge and hip sections of plain G.S. sheet with a minimum lap of 20 cm on either side over the C.G.S. sheets. The end laps of the ridges and hips and between ridges and hips shall also be not less than 20 cm. The ridges and hips shall be of 60 cm overall width plain G.S. sheet, 0.6 mm or 0.8 mm thick as given in the description of the item and shall be properly bent in shape.
- b) Ridges shall be fixed to the purlins below with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to the purlins.

- c) Similarly, hips shall be fixed to the roof members below such as purlins, hip and valley rafters with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to those roof members. At least one of the fixing bolts shall pass through the end laps of ridges and hips, on either side. If this is not possible extra hook bolts shall be provided.
- d) The end laps of ridges and hips shall be joined together with C.G.S sheet by galvanised iron seam bolts 25 x 6 mm size each with a bitumen and G.I. washer or white lead as directed by the Engineer-in-Charge. There shall be at least two such bolts in each end lap.
- e) Surface of C.G.I. sheets of ridge and hip sections and the roofing sheets which overlap each other shall be painted with a coat of approved primer and two coats of approved paint suitable for painting G.S. Sheets before they are fixed in place.
- f) The edges of the ridges and hips shall be straight from end to end and their surfaces should be plane and parallel to the general plane of the roof. The ridges and hips shall fit in squarely on the sheets.

VALLEY AND FLASHING OF PLAIN GALVANISED STEEL SHEETS

- a) Valley shall be 90 cm wide overall plain G.S. sheet 1.6 mm thick or other size as specified in the item bent to shape and fixed. They shall lap with the C.G.S. sheets not less than 25 cm width on other side. The end laps of valley shall also be not less than 25 cm.
- b) Valley sheets shall be laid over 25 mm thick wooden boarding if so required.
- c) Flashing shall be of plain G.S. sheet of 40 cm overall width 1.25 mm thick or 1.00 mm thick as specified in the item bend to shape and fixed. They shall lap not less than 15 cm over the roofing sheets. The end laps between flashing pieces shall not be less than 25 cm.
- d) Flashing and valley sheets shall be fixed to the roof members below, such as purlins and valley rafters with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to those roof members.
- e) At least one of the fixing bolts shall pass through the end laps of the valley pieces on other side. If this is not possible extra hook bolts shall be provided. The free end of flashing shall be fixed at least 5 cm inside masonry with the mortar of mix 1: 3 (1 cement: 3 coarse sand). Refer Fig. 12.3.
- f) Surface of G.S. sheets under overlaps shall be painted with a coat of approved primer and two coats of approved paint suitable for painting G.S. sheets.
- g) The edges of valley and flashing should be straight from end to end. The surfaces should be true and without bulges and depressions.

GUTTERS MADE OF PLAIN GALVANISED STEEL SHEETS

- a) Gutter shall be fabricated from plain G.S. Sheets of thickness as specified in the item.
- b) Eaves gutters shall be of the shape and section specified in the description of the item. The overall width of the sheet referred to therein shall mean the peripheral width of the gutter including the rounded edges. The longitudinal edges shall be turned back to the extent of 12 mm and beaten to form a rounded edge. The ends of the sheets at junctions of pieces shall be hooked into each other and beaten flush to avoid leakage.
- c) Gutter shall be laid with a minimum slope of 1 in 120.
- d) Gutter shall be supported on and fixed to M.S. flat iron brackets bent to shape and fixed to the requisite slope. The maximum spacing of brackets shall be 1.20 metres.
- e)
- f) Where these brackets are to be fixed to the sides of rafters, they shall be of 40 × 3 mm section bend to shape and fixed rigidly to the sides of rafters with 3 Nos. 10 mm dia bolts, nuts and washers. The brackets shall overlap the rafter not less than 30 cm and the connecting bolts shall be at 12 cm centres.
- g) Where the brackets are to be fixed to the purlins, the brackets shall consist of 50 × 3 mm M.S. flat iron bent to shape with one end turned at right angle and fixed to the purlin face with 2 Nos. of 10 mm dia bolts nuts and washers. The bracket will be stiffened by provision of 50 × 3 mm. M.S. flat whose over hung portion bent to right angle shape with its longer leg connected to the bracket with 2 Nos. 6 mm dia M.S. bolts, nuts and

washers and its shorter leg fixed to face of purlin with 1 No. 10 mm dia, bolt, nut and washer. The over hang of the vertical portion of the bracket from the face of the purlin shall not exceed 22.5 cm with this arrangement. The spacing of the brackets shall not exceed 1.20

- h) The gutter shall be fixed to the brackets with 2 Nos. G.I. bolts and nuts 6 mm dia, each fitted with a pair of G.I. and bitumen washers. The connecting bolts shall be above the water line of the gutters.
- i) For connection to down take pipes, a proper drop end or funnel shaped connecting piece shall be made out of G.S. sheet of the same thickness as the gutter and riveted to the gutter, the other end tailing into the socket of the rain-water pipe. Wherever necessary stop ends, angles etc., should be provided.
- j) The gutters when fixed shall be true to line and slope and shall be leakproof.

RED OR WHITE SAND STONE ROOFING

- a) The stone slabs shall be hard, even, sound and durable and shall conform to standards as detailed in subhead 7.0 of stone work. Slabs shall have been sawn or chiselled in a plane parallel to the natural bed of the stone. The slabs shall be rough chisel dressed on the top so that the dressed surface shall not be more than 6 mm from a straight edge placed on it. The edges of the depressions or projections shall be chisel dressed in a slant, so that surface does not have sharp unevenness. The sides shall also be chisel dressed to a minimum depth of 20 mm so that the dressed edges shall at no place be more than 3 mm from a straight edge butted against it. The thickness of the slab shall be uniform and as specified in the item with a permissible tolerance of 2 mm. The slabs shall be uniform in length, the length being 5 to 8 mm less than the centre to centre spacing of the supporting wooden Joists (Karries) or RCC battens. Unless the design require some other shape the slabs shall be rectangular.
- b) The width of the slabs may vary unless otherwise stipulated. It shall not be less than 40 cm.
- c) The bearing of slabs over the supporting rafts karries shall not be less than 30 mm. Where a raft carry supports a slab from one side only, the bearing of such slab shall be for full width of the rafts. For bearing over the wall, the stone slabs shall be bedded over a layer of cement mortar 1 : 4 (1 cement : 4 fine sand) of thickness not less than 12 mm.
- d) The slabs shall be washed clean and wetted before being laid. The stone slabs shall be jointed in cement mortar 1:4 (1 cement : 4 coarse sand). The width of joints shall not be more than 8 mm not less than 5 mm. The top joints shall be finished flush and ceiling joints pointed with the cement mortar 1:3 (1 cement : 3 fine sand).
- e) The finished surface shall be truly levelled or slopped as shown in the plan or as directed by the Engineer-in-Charge. It shall be cleaned off all mortar droppings and cement markings both on top and on the under side.

CAST IRON RAIN WATER PIPES

- a) Pipes shall conform to IS 1230 and shall be perfectly, smooth and cylindrical, their inner and outer surfaces being as nearly as practicable concentric. These shall be sound and of uniform castings, free from laps, pin holes or other imperfections and shall be neatly finished and carefully fitted both inside and outside. The ends of pipes shall be reasonably square to their axes.
- b) C.I. rain water pipes shall be of the dia specified in the description of the item and shall be in full length of 1.8 metre including socket ends of the pipes, unless shorter lengths are required at junctions with fittings. The pipe lengths shall be in each case be with socket. The pipes shall be supplied without ears unless otherwise specifically mentioned.
- c) The pipes supplied shall be factory painted (with a tar base composition) both inside and outside which shall be smooth and tenacious.
- d) Every pipe shall ring clearly when struck all over with a light hand hammer. When shorter pipes are cut from full lengths they shall be cut with a hacksaw. The sizes, weights, sockets and tolerances of pipes shall be as shown
- e) Pipes shall be either fixed on face of wall or embedded in masonry, as required in the description of the item.
- f) Plain pipes (without ears) shall be secured to the walls at all joints with M.S. holder bat clamps. The clamps shall be made from 1.6 mm thick galvanised M.S. sheet of 30 mm width, bent to the required shape and size

so as to fit tightly on the socket of the pipe, when tightened with screw bolts. It shall be formed out of two semi-circular pieces, hinged with 6 mm dia M.S. bolt on one side and provided with flanged ends on the other side with hole to fit by the screw bolt and nut, 40 mm long. The clamp shall be provided with a hook made out of 27.5 cm long 10 mm diameter M.S. bar, rivetted to the ring at the centre of one semi circular piece. The details of the clamps are shown in Fig 12.8. The clamps shall be fixed to the wall by embedding their hooks in cement concrete block 10 x 10 x 10 cm in 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) for which necessary holes shall be made in the wall at proper places. The clamps shall be kept about 25 mm clear off finished face of wall, so as to facilitate cleaning and painting of pipes.

- g) The pipes shall be fixed perfectly vertical or to the lines as directed. The spigot of the upper pipe shall be properly fitted in the socket of the lower pipe such that there is a uniform annular space for filling with the jointing material. The annular space between the socket and the spigot shall be filled with a few turns of spun yarn soaked in neat cement slurry. These shall be pressed home by means of caulking tool. More skins of yarn shall be wrapped if necessary and shall be rammed home. The joint shall then be filled with stiff cement mortar 1:2 (1 cement : 2 fine sand) well pressed with caulking tool and finished smooth at top at an angle of 45 degree sloping up. The joints shall be kept wet for not less than 7 days by tying a piece of gunny bag, four fold, to the pipe and keeping it moist constantly.
- h) Where pipes are to be embedded in masonry, these shall be fixed in masonry work as it proceeds. In such cases care shall be taken to keep the pipes absolutely vertical or to the line as directed by the Engineer-in-Charge. The pipe shall have a surrounding of 12 mm minimum thickness of mortar at every portion of the external surface. The mortar shall be of the same mix as is used in the masonry. The joint shall be caulked with lead as soon as the next length of pipe is placed in position.
- i) The open end (socket end) of the pipe shall be kept closed till the next length is fitted and jointed, to prevent any brick bats or concrete or pieces of wood falling in and choking the pipe.
- j) The depth of lead from the lip of socket shall be 25 mm minimum. In case of 100 mm dia. 75 mm and 50 mm pipes, the quantity of lead required per joint shall be 1.00 kg, 0.66 kg and 0.50 kg respectively for purpose of reckoning theoretical Consumption.
- k) In order to ensure that required quantity of lead is poured into the joint and to control wastage of lead, at the beginning, three or four samples shall be made and the quantum of lead per joint approved by the Engineer-in-Charge.
- l) The actual consumption of lead should be within $\pm 5\%$ of the approved sample job subject to the provision that a variation of $\pm 20\%$ shall be allowed over the theoretical quantity of lead due to dimensional tolerances allowed as per Indian Standards. This variation includes allowances of wastage also.
- m) The spigot end shall butt the shoulder of the socket and leave no gap in between. The annular space between the socket and the spigot will be first well packed in with spun yarn leaving 25 mm from the lip of the socket for the lead. The joint shall then be lead caulked as described in detail under jointing of S.C.I soil, waste and vent pipes.

CAST IRON ACCESSORIES FOR RAIN WATER PIPES

- a) C.I. accessories such as bends of various degrees, heads, offsets of different projections, branches and shoes shall conform to IS 1230.
- b) Bends shall be of the nearest standard degree as actually required at site. Heads shall be of the flat or corner type as required. Offsets shall be of the projection as stipulated in the description of the item. Branches shall be single or double as described in the item and shall be of the nearest standard degree as actually required. Standard shoes shall be of overall vertical length, 180 mm for 75 mm dia., 205 mm for 100 mm dia and 275 mm for 150 dia sized pipe from top of socket to lowest tip of shoe. Shoes of longer lengths if used shall be in lengths 300 mm, 375 mm, 450 mm, or 600 mm from top of socket to lowest tip of shoe of as actually required at site.
- c) The fittings shall be of the diameter specified in the description of the item. The thickness of the fittings and details of spigots and sockets shall be same as those of the corresponding size of straight pipes. The fittings shall be supplied without ears unless otherwise specifically mentioned in the item. The fittings shall be factory painted with a tar basis composition both inside and outside which shall be smooth and tenacious. Every fittings shall ring clearly when struck all over with a light hard hammer. The fittings shall be of standard size and their individual weights shall conform to the weights

1.1.12. FINISHING

PAINTING

- a) Materials Paints, oils, varnishes etc. of approved brand and manufacture shall be used. Only ready mixed Paint (Exterior grade) as received from the manufacturer without any admixture shall be used.
- b) If for any reason, thinning is necessary in case of ready mixed Paint, the brand of thinner recommended by the manufacturer or as instructed by the Engineer-in-Charge shall be used.
- c) Approved Paints, oil or varnishes shall be brought to the site of work by the contractor in their original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empties shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from the Engineer-in-Charge.
- d) Painting shall not be started until the Engineer-in-Charge has inspected the items of work to be painted, satisfied himself about their proper quality and given his approval to commence the painting work. Painting of external surface should not be done in adverse weather condition like hail storm and dust storm.
- e) Painting, except the priming coat, shall generally be taken in hand after practically finishing all other building work.
- f) The rooms should be thoroughly swept out and the entire building cleaned up, at least one day in advance of the Paint work being started.
- g) The surface shall be thoroughly cleaned and dusted off. All rust, dirt, scales, smoke splashes, mortar droppings and grease shall be thoroughly removed before painting is started. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection, before painting is commenced.
- h) Before pouring into smaller containers for use, the Paint shall be stirred thoroughly in its containers, when applying also, the Paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform.
- i) The painting shall be laid on evenly and smoothly by means of crossing and laying off, the latter in the direction of the grains of wood. The crossing and laying off consists of covering the area over with Paint, brushing the surface hard for the first time over and then brushing alternately in opposite direction, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat.
- j) Where so stipulated, the painting shall be done by spraying. Spray machine used may be (a) high pressure (small air aperture) type, or (b) a low pressure (large air gap) type, depending on the nature and location of work to be carried out. Skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding a suitable thinner.
- k) Spraying should be done only when dry condition prevails. Each coat shall be allowed to dry out thoroughly and rubbed smooth before the next coat is applied. This should be facilitated by thorough ventilation. Each coat except the last coat, shall be lightly rubbed down with sand paper or fine pumice stone and cleaned off dust before the next coat is laid.
- l) No left over Paint shall be put back into the stock tins. When not in use, the containers shall be kept properly closed.
- m) No hair marks from the brush or clogging of Paint puddles in the corners of panels, angles of mouldings etc. shall be left on the work.
- n) In painting doors and windows, the putty round the glass panes must also be painted but care must be taken to see that no Paint stains etc. are left on the glass. Tops of shutters and surfaces in similar hidden locations shall not be left out in painting. However, bottom edge of the shutters where the painting is not practically possible, need not be done nor any deduction on this account will be done but two coats of primer of approved make shall be done on the bottom edge before fixing the shutters.
- o) On painting steel work, special care shall be taken while painting over bolts, nuts, rivets overlaps etc.
- p) The additional specifications for primer and other coats of Paints shall be as according to the detailed specifications under the respective headings.

PAINTING PRIMING COAT ON WOOD, IRON OR PLASTERED SURFACES

- a) The primer for wood work, iron work or plastered surface shall be as specified in the description of item
- b) The primer shall be ready mixed primer of approved brand and manufacture.
- c) Where primer for wood work is specified to be mixed at site, it shall be prepared from a mixture of red lead, white lead and double boiled linseed oil in the ratio of 0.7 kg : 0.7 kg : 1 litre.
- d) Where primer for steel work is specified to be mixed at site, it shall be prepared from a mixture of red lead, raw linseed oil and turpentine in the ratio of 2.8 kg : 1 litre : 1 litre.
- e) The wood work to be painted shall be dry and free from moisture. The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well dusted. Knots, if any shall be covered with preparation of red lead made by grinding red lead in water and mixing with strong glue sized and used hot. Appropriate filler material conforming to IS 345 with same shade as Paint shall be used where specified. The surface treated for knotting shall be dry before Paint is applied. After obtaining approval of Engineer-in-Charge for wood work, the priming coat shall be applied before the wood work is fixed in position. After the priming coat is applied, the holes and indentation on the surface shall be stopped with glazier's putty or wood putty. Stopping shall not be done before the priming coat is applied as the wood will absorb the oil in stopping and the latter is therefore liable to crack.
- f) All rust and scales shall be removed by scrapping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought iron during rolling which becomes loose by rusting, shall be removed.

PAINTING SYNTHETIC ENAMEL PAINT OVER G.S. SHEETS

- a) Paint, suitable for painting over G.S. sheets, of approved brand and manufacture and of the required shade shall be used. New or weathered G.S. sheets shall be painted with a priming coat of one coat of redoxide zinc chromate Paint. Primer shall be applied before fixing sheets in place.
- b) The painting of new G.S. sheets shall not usually be done till the sheets have weathered for about a year. When new sheets are to be painted before they have weathered they shall be treated with a mordant solution prepared by mixing 38 gm of copper acetate in a litre of soft water or 13 gm hydrochloric acid in a solution of 13 gm each of copper chloride, copper nitrate and ammonium chloride dissolved in a litre of soft water. This quantity of solution is sufficient for about 235 sqm. to 280 sqm of area and is applied for ensuring proper adhesion of Paint. The painting with the mordant solution will be paid for separately.
- c) Before painting on new or weathered G.S. sheets, rust patches shall be completely cleaned with coarse emery paper and brush. All grease marks shall also be removed and the surface washed and dried and rusted surface shall be touched with synthetic enamel paint of approved brand, manufacturer and shade.
- d) If the old Paint is firm and sound, it shall be cleaned of grease, smoke etc. The surface shall then be rubbed down with sand paper and dusted. Rusty patches shall be cleaned up and touched with synthetic enamel paint.
- e) If the old Paint is blistered and flaked, it shall be completely removed as described in 13.41. Such removal shall be paid for separately and painting shall be treated as on new work.
- f) The number of coats to be applied shall be as in the description of item. In the case of C.G.S. sheets, the crowns of the corrugations shall be painted first and when these get dried the general coat shall be given to ensure uniform finish over the entire surface without the crowns showing signs of thinning.
- g) The second or additional coats shall be applied when the previous coat has dried.

PAINTING CAST IRON RAIN WATER, SOIL, WASTE AND VENT PIPES AND FITTINGS

- a) The primer shall be prepared on site or shall be of approved brand and manufacture as specified in the item.
- b) Paint shall be anti-corrosive bitumastic Paint, aluminium Paint or other type of Paint as specified in the description of the item.
- c) The number of coat of painting over the priming coat shall be as stipulated in the description of the item. The application of Paint over priming coat shall be carried out as specified

1.1.13. SANITARY INSTALLATION

PLASTIC OVERHEAD STORAGE TANK

- a) Plastic overhead storage tanks shall be of polyethylene (PE) of external black colour and internal PE lining in white. The tank material shall be non toxic suitable for potable water. The materials must be as per Bureau of Indian Standards. The capacities of the tanks shall be as specified in the BOQ.

INDIAN TYPE W.C.PAN

- a) Indian Type W.C.Pan (IWC) : The WC pan shall be of 1st quality white vitreous china of specified size and pattern. It shall be of back flush inlet type. The pan shall be of approved best quality and shall bear the mark of the manufacturer. The pan shall be provided with a 100 mm 'P' or 'S' trap as specified in the item with a min. 50 mm seal.
- b) Fixing : The WC pan shall be sunk or raised from the general floor as shown in drawing, but its surrounding floor shall be sloped towards the pan. Care shall be taken so that the pan is not damaged in the process of fixing; if damaged in any way, it shall be replaced immediately. It shall be fixed in a proper cement concrete base of 1:3:6 proportion (with a wire netting where required) taking care that the cushion is uniform and even without having any hollows between the concrete base and pan.
- c) The joint between the pan and the trap shall be made with epoxy putty (M-seal or equivalent) and shall be leak proof.

EUROPEAN TYPE W.C.

- a) European type W.C. Pan (EWC) : Shall be of wash down type, shall bear the mark of an approved firm and shall be of best quality. The closet shall be of 1st quality vitreous china ware having integrated trap 'P' or 'S' type with or without vent outlet,
- b) Seat : The seat with lid shall be of PVC/Thermoplastic (black) and shall be fixed in position by using aluminium or plastic hinges supplied by manufacturer.

URINAL

- a) Lipped Front Urinal : The urinal shall be of flat back lipped front basin of required dimensions in first quality white vitreous china ware of an approved make. It shall be fixed in position by using rawl plugs embedded in the wall with S.S. screws 75 mm long. Each urinal shall be connected to a 40 dia flexible PVC waste pipe which shall discharge into a 100 mm half round white porcelain channel & CI floor trap.
- b) Wall Type Urinal This shall be a standing urinal with 300 x 300 wall glazed tiles set on the vertical wall at an inclination of 1:30 (aprox.). Height of tiles shall be 1200 mm and inside width of urinal shall be 700 mm. Division plates shall be 25 mm thick gray kota stone or black stone 470 mm wide x 750 mm high. The stone shall be embedded in wall by 25-35 mm. The balance will protrude from the vertical wall edge. A half-round white porcelain channel will be embedded at the bottom of the wall tiles in a PCC (1:3:6) platform 125 mm thick. The platform will protrude 600 mm from the wall. The platform flooring will be with 300 x 300 mm non-skid ceramic tiles set in cement/sand mortar (1:4) – 12 mm thick. The bed will slope towards the channel. All details are shown in drawings.

LAVATORY WASH BASIN (WHB)

- a) Lavatory Basin : The basins shall be 1st class of white vitreous china of approved pattern. The size of the basin shall be as shown in drawing and BOQ. The basins shall be of approved quality and make.
- b) Fittings: Each WHB shall be provided with a PTMT pillar tap (15 mm) and fitted with 32 mm dia PTMT waste complete in all respect of approved quality.
- c) Fixing: The basin shall be supported on a pair of C.I., painted concealed type brackets embedded in wall with PCC (1:3:6) blocks. These brackets shall be painted to the required shade as specified.
- d) 32 mm dia flexible PVC waste pipe with brass coupling nut shall discharge into the floor trap inlet below the WHB.

TOILET REQUISITES

- a) Water connection: Water connection to flushing cistern, lavatory basins shall be by means of white PVC 15 mm dia connector with PTMT coupling nuts. The length of connector shall be 375 mm.
- b) Shelf : This shall be of PTMT approx. 500 mm. Long. Shelf shall be fixed to wall with SS screw and PVC hold fasts.

BRASS/C.P. ON BRASS WATER FITTINGS

- a) All fittings shall be of standard manufacture and shall in all respect comply with the Indian Standard Specifications. The brass fittings shall be fixed in pipe line in a workman like manner. Care must be taken to see that joints between fittings are made leak proof. The fittings and joints shall be tested to a pressure of 7 Kg per sq.cm. unless otherwise specified. The defective fittings and the joints shall be repaired, redone or replaced at the contractors expense. PTMT (Polytetra Methylene Terephthalate) with hardness 75 on Rockwell scale, dimensionally stable upto 1200C. These fittings should conform to BIS recommendation or equivalent IS code if any

BIB COCK

- a) The bib cock shall be of brass CP/PTMT specified quality with flat seat opening of screw down pattern of the size as specified.

STOP COCK

- a) The stop cock shall be of brass CT/PTMT specified quality with flat seat opening of screw down pattern of the size as specified.

SHOWER ROSE

- a) The shower rose (fixed mounted or telephone) shall be of brass CT/PTMT specified quality 100 mm ϕ with uniform perforation. The inlet size shall be 20 mm or 15 mm as specified.

HOT & COLD WATER MIXER

- a) Shall be brass CP 15 mm inlet with or without integrated spout wall mounted of specified quality as approved.

H.C.I., SOIL, WASTE, AND VENT (ANTISYPHONAGE) PIPES AND FITTINGS:

- a) H.C.I. Pipes and fittings: The heavy cast iron pipes and fittings shall be I.S.I marked pipes & fittings conforming to I.S. 3989/1970 & IS 1729/1979 of approved quality. The pipes shall be free from cracks and other flaws. The interior of pipes and fittings shall be clean and smooth and painted inside with approved anticorrosive paint. The painting will be factory furnished. Tolerance : In thickness & masses shall be as per IS of latest edition.
- b) Fixing: The pipes and fittings shall be fixed to walls /ceilings by using proper clamps or ears integrated with the pipes. The pipes shall be fixed perfectly vertical or in a line as directed and shown in drawing. If eared pipes are used fixing will be done with galvanised nail 125-150 long embedded in pcc (1:2:4) with non- shrink grout.
- c) Where pipes are laid along walls, the cast iron pipes are to be fixed 25 mm away from the wall surface. Cast iron bobbins etc. are to be used for this purpose.
- d) The access door fittings shall be of proper design so as not to form any cavities in which filth may accumulate. Doors shall be provided with SS bolts and synthetic rubber gaskets. The doors shall be secured to make it leak proof.
- e) Connections between main pipe and the branch pipes shall be made by using required types of fittings with/without access doors for cleaning.
- f) Jointing : The annular space between the sockets and spigots will be first well packed in with spun yarn for half the depth of the socket. The remaining space in the socket will be filled with molten lead by using jointing collars or clay. After pouring lead the joint will be cooled and caulked with caulking tools to drive home the lead 3 mm behind socket edge.

- g) Lead for Joints : It shall be bluish grey in colour very soft and malleable, free from mixture of zinc or tin conforming to IS 782.
- h) Spun Yarn for Joints : This shall be of best quality dense rope. It shall be free from dust etc. It shall be caulked inside the socket in dry condition.
- i) Procedure of Jointing : The spigot shall be carefully centred in the socket by laps of spun yarn. Twisted ropes of uniform thickness will be caulked into the annular space between spigot and socket, leaving the requisite depth for lead. Molten lead shall be poured and caulked as mentioned above. Alternatively joints may be caulked with a stiff mixture of cement/sand (1:1) with requisite quantity of waterproofing compound as described in BOQ.
- j) Joints may also be with rubber gaskets as described in BOQ.
- k) Testing : All H.C.I. pipes and fittings including joints will be tested by smoke test and left in working order after completion. The smoke test shall be carried out as stated below:
 - l) Smoke shall be pumped into the piping system at the lowest end from a smoke generator. The materials usually burnt are greasy cotton waste which form clear pungent smoke, which is usually detectable by sight as well as by smell, if leaks occur at any point of the pipes. The contractor will have to rectify all defects traced in such tests at their own expense to the complete satisfaction of the Engineer-in-Charge. The traps and soil fittings should be of heavy cast iron and should have water seal at least 50 mm., deep. While testing operation is done all traps should be filled with water. The pressure for smoke test shall be 38 mm WC.
- m) Paintings: All the exposed H.C.I. pipes and fittings shall be painted with two coats of black bituminastic paint over a coat of primer.
- n) The surface of the pipes and fittings to be painted shall be cleaned thoroughly before application of paint and primer.

1.1.14. WATER SUPPLY

GALVANISED IRON PIPES & FITTINGS

- a) The pipes shall be of galvanised (as per IS 4736), screwed and socketed and shall conform to I.S. 1239 (Part- I) with ISI mark. The fittings shall be of malleable cast iron (galvanised) (IS: 1879) with ISI mark.
- b) Laying & Fixing: Where pipes have to be cut or re-threaded, ends shall be carefully reamed and filed so that no obstruction to bore is visible.
- c) Jointing shall be done by applying a layer of white zinc paste and fine jute threads on the threaded part (external & internal) and the socket or fitting is to be screwed tight to a torque of approximately 4 kg-m During pressure testing the joint shall show no sign of leakage.
- d) All cutting holes, chases, trenches etc. at any place necessary in connection with the work as per items of this tender and subsequent mending damages are to be included in the rates.
- e) Internal works: Internal G.I. pipes and fittings inside the duct walls shall be fixed exposed by means of M.S. galvanised holder bat clamps keeping the pipe 25 mm clear off the wall every where or concealed as directed. It shall be by chasing floors and walls as directed. The holder bat clamps shall be fixed at distances mentioned in the drawings and BOQ.
- f) All pipes and fittings shall be fixed truly vertical or horizontal or as directed by the Engineer-in-Charge.
- g) For internal works in toilets etc. pipes may be concealed within wall chases. The depth of chase shall be at least the outer dia of pipes and fittings. The pipes shall be anchored by means of galvanised hooks.
- h) External Works: For external work G.I. pipes and fittings shall be laid in trenches. The width of the trench shall be as shown in drawing. The pipes laid underground shall be at approx. 900 mm below ground level. The work of excavation and refilling shall be done in accordance with the general specification for earthwork. All buried pipes shall be painted with 2 coats of coal tar epoxy paint to a DFT of maximum 100 microns.
- i) Painting: All internal G.I. pipes and fittings shall be painted with 2 coats of enamel paint of approved quality over a coat of epoxy primer. The cost of such painting shall be included in the contractor's rate. All pipes and fittings in external work shall be painted with 2 coats of enamel paint over a coat of epoxy primer.

- j) Testing : All G.I. pipes and fittings shall be tested by hydraulic pressure machine to a pressure of 7 kg per sq.cm. All leaky joints must be made leak proof by tightening or re-doing at contractor's expense. Water for testing shall be at contractors own cost.

PROCEDURE FOR PARTICIPATION IN E-TENDERING

1. Registration of Bidders on e-Tendering System

All the PWD registered bidders from Madhya Pradesh or any other State of India with relevant experience are already registered on the new e-procurement portal <https://www.mpeproc.gov.in>. The user id will be the Contractor ID provided to them by MP Online. The password for the new portal has been sent to the Bidders on registered email ID. For more details may contact M/s Tata consultancy Services Corporate Block, 5th floor, DB city Bhopal-462011, email id: eprochelpdesk@mpsdc.gov.in Helpdesk phone numbers are available on website.

2. Digital Certificate:

The bids submitted online should be signed electronically with a class III Digital Certificate to establish the identity of the Bidder submitting the bid online. The Bidders may obtain class III digital certificate issued by an approved certifying authority authorized by the Controller of Certifying Authorities, Government of India. A class III digital certificate is issued upon receipt of the required proofs along with an application. Only upon the receipt of the required documents, a digital certificate can be issued. For details, please visit <http://cca.gov.in>.

Note:

- i) It may take up to 7 (seven) working days for issuance of class III digital certificate; hence the Bidders are advised to obtain the certificate at the earliest. Those Bidders who already have valid class III digital certificate need not obtain another digital certificate for the same. The Bidders may obtain more information and the APPLICATION FORM REQUIRED TO BE SUBMITTED FOR THE ISSUANCE OF DIGITAL CERTIFICATE FROM <http://cca.gov.in>.
- ii) Bids can be submitted till bid submission end date. Bidder will require digital signature for the bid submission. The digital certificate issued to the authorized user of a partnership firm/ private limited company/ public limited company and user for online bidding will be considered as equivalent to a no-objection certificate/ power of attorney to that user.
In case of partnership firm, majority of the partners have to authorize a specific individual through authority letter signed by majority of partners of the firm.
In case of private limited company, public limited company, the Managing Director may authorize a specific individual through an Authority Letter. Alternatively, a Board resolution may be passed authorizing such individual. Unless the authority letter or Board resolution is revoked, it will be assumed to represent adequate authority of the specific individual to bid on behalf of the organization for online bids as per The Information Technology Act, 2008. Information Technology Act 2008. This Authorized Representative/ User will be required to obtain a digital certificate. The Digital Signature executed through the use of the responsibility of Management/Partners of the concerned firm to inform the Certifying Authority, if the authorized user changes, and apply for a fresh Digital Certificate for the new Authorized user.

3. Set Up of Bidder's Computer System:

In order for a Bidder to operate on the e-tendering System, the computer system of the Bidder is required to be set up for Operating System, Internet Connectivity, Utilities, Fonts, etc. The details are available at <https://www.mpeproc.gov.in>

4. Key Dates:

The Bidders are strictly advised to follow the Key Dates as mentioned in Annexure - A.

5. Preparation and Submission of Bids:

The Bidders have to prepare the proposal online, encrypt their bid data in the Bid forms and submit Bid of all the envelopes and documents related to the Bid required to be uploaded as per the key schedule in adherence to the key dates of the NIT under the digital signature of the authorized representative.

6. Purchase of Bid Document:

For purchasing of the bid document, Bidders have to pay applicable bid amount only through online mode as per Bid Data Sheet. The cost of Bid document is separately mentioned in the detailed NIT. The Bid Document shall be available for purchase to concerned eligible Bidders immediately after online release of the bids and up to scheduled time and date as set in the key dates. The payment for the cost of bid document shall be made online through Credit/ Debit/ Cash Card or via internet banking.

7. Withdrawal, Substitution and Modification of Bids

Bidder can withdraw and modify the bid before submission end date.

Note:

- Bidders are requested to visit our e-tendering website regularly for any clarifications and/or due date extension or corrigendum.
- Bidder must positively complete online e-tendering procedure at www.mpeproc.gov.in.
- GSCDCL shall not be responsible in any way for delay/ difficulties/ inaccessibility of the downloading facility from the website for any reason whatsoever.
- In case, due date for opening of bids happens to be a holiday, the due date shall be shifted to the next working day for which no prior intimation will be given.
- GSCDCL reserves the right for extension of due date of opening of technical and or financial bid.

ANNEXURE-G

(See clause 4 of Section 2-ITB)

CONSORTIUM AGREEMENT

This Consortium Agreement (Agreement) entered into this day of [Date] [Month] 2018__ at [Place] between _____ (hereinafter referred to as "_____") and having office at [Address], India, as Party of the First Part and _____ (hereinafter referred to as "_____") and having office at [Address], as Party of the Second Part and _____ (hereinafter referred to as "_____").

_____ and _____ are individually referred to as a 'Party' and collectively as the 'Parties'.

WHEREAS Gwalior Smart City Development Corporation Limited (GSCDCL), has issued a NIT No. ___ dated _____ ("Tender/Bid Document") for 'Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium' (hereinafter referred to as the "Project")

AND WHEREAS the Parties have had discussions for formation of a Consortium for submitting the Bid for the Project and have reached an understanding on the following points with respect to each of the Parties' rights and obligations towards each other and their working relationship.

NOW THEREFORE, in consideration of the mutual promises, conditions and covenants set out herein, the Parties hereby agree as below:

The purpose of this Agreement is to define the principles of collaboration among the Parties to:

- a. jointly Bid for the "Project" as a Consortium.
- b. sign Agreement with GSCDCL in case of award ("Contract").
- c. provide and perform the supplies and services which would be ordered by GSCDCL pursuant to the Contract.

This Agreement shall not be construed as establishing or giving effect to any legal entity. It shall relate solely towards GSCDCL for the "Project" to be performed and shall not extend to any other activities.

iii. The Parties shall be jointly and severally responsible and bound towards GSCDCL for the Project in accordance with the terms and conditions of the RFP and the Contract.

iv. ----- (Name of Party) shall act as Lead Bidder of the Consortium. As such, it shall act as the coordinator of the combined activities of the Consortium and shall carry out the following functions:

- a. to ensure the technical, commercial and administrative co-ordination of the Project;
- b. to lead the Contract negotiations with GSCDCL;
- c. to receive instructions and incur liabilities for and on behalf of all Parties; and
- d. in case of an award, act as channel of communication between GSCDCL and the Parties for execution of the Contract.

v. That the Parties shall carry out all responsibilities in terms of the Project "_____"

vi. That the broad roles and the responsibilities of each Party as per each member's field of expertise at each stage of the bidding shall be as below:

Party A: _____

Party B: _____

Party C: _____

vii. That the proposed administrative arrangements (organization chart) for the management and execution of the Project shall be as follows:

viii. That the profit and loss sharing ratio shall be _____.

ix. That the Parties agree that all the members of the Consortium shall be jointly and severally liable for all obligations in relation to the Contract until the completion of the Project in accordance with the Contract.

x. The Parties affirm that they shall implement the Project in good faith and shall take all necessary steps to see the Project through expeditiously.

xi. That this Agreement shall be governed by and construed in accordance with the laws of India and courts in _____ shall have exclusive jurisdiction to adjudicate disputes arising from the terms herein.

IN WITNESS WHEREOF the Parties affirm that the information provided is accurate and true and have caused the Agreement duly executed on the date and year above mentioned.

(Party of the First part)

(Party of the Second part)

(Party of the Third part)

Witness:

1. _____

2. _____

DRAFT JOINT VENTURE AGREEMENT

(To Be Made On Stamp Paper of Requisite Value and Notarized)

This Joint Venture Agreement (“AGREEMENT”) made at _____ on this __ day of _____, 2012

BY AND AMONGST

M/s _____ {Lead Member (JV Member 1)}, a _____ incorporated under _____ (name of the relevant act/law of under which registered in the Country of Registration) and having its registered office / a company incorporated under the Laws of _____ (hereinafter referred to as “_____”, which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successors in interest, subsidiaries and assigns) of the **ONE PART**;

AND

M/s _____ (JV Member 2), a _____ incorporated under the _____ and having its registered office / a company incorporated under the Laws of _____ (hereinafter referred to as “_____”, which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successors in interest, subsidiaries and assigns) of the **SECOND PART**;

M/s _____ (JV Member 3), a _____ incorporated under the _____ and having its registered office / a company incorporated under the Laws of _____ (hereinafter referred to as “_____”, which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successors in interest, subsidiaries and assigns) of the **THIRD PART**;

(_____, _____ and _____ shall be individually referred to as a “Party” and jointly referred to as the “Parties” or “JV Members”).

WHEREAS:

- B. A. Gwalior Smart City Development Corporation Limited (GSCDCL), has issued a RFP No. ____ dated _____ (“**Tender/Bid Document**”) for ‘**Conservation and Adaptive Reuse of Bharat Scout and Guide (Gorkhi Palace Complex) as Digital/ Virtual Cultural Heritage Museum and Planetarium**’ (hereinafter referred to as the “**Project**”)
- C. M/s _____, M/s _____ and M/s. _____ have agreed to consolidate their resources and experience, and apply jointly as a Joint Venture (hereinafter referred to as the “Joint Venture”), vide this Joint Venture Agreement, for the purpose of implementing and completing the Project, within time frame stipulated in the Request for Proposal Document (hereinafter referred to as the “RFP document”).
- D. M/s _____, M/s _____ and M/s. _____ have therefore agreed to enter into this Joint Venture Agreement in respect of the submission of the Bid/ Proposal for the Project on the terms set out below.

NOW THEREFORE IN CONSIDERATION OF THE PREMISES AND THE MUTUAL, CONDITIONS AND CONVENANTS HEREIN CONTAINED THE PARTIES HEREBY AGREE AS BELOW:

1. The recital herein contained shall constitute an integral and operative part of this Agreement.
2. The Parties hereto agree to consolidate their resources and hereby form a Joint Venture to jointly prepare, submit and Bid for the Project, which has financing benefits, as detailed in the RFP document issued by GSCDCL for the implementation and completion of the Project.

3. The Parties hereto agree that _____ shall be the Lead Member and _____ and _____ shall be the JV Members 2 respectively of the Joint Venture.
4. The Parties shall mutually and jointly take all the decisions in respect of the Project on behalf of the Joint Venture. _____ (*Lead Member*) shall be authorized to act on behalf of the Joint Venture as their representative for implementation and completion of the Project.
5. _____ undertakes that it has the necessary qualification to fulfill technical and financial capability criteria for the implementation and completion of the Project as detailed in the RFP Document {including the draft Concession Agreement (Section-II of the RFP document)}.
6. Special Purpose Company (SPC)

For the purpose of execution of the Project, in the event of award of the Project to the Joint Venture, the Parties will set up a Special Purpose Company (“SPC”), formed under the Companies Act, 1956. The common equity shareholding pattern of the SPC shall consist of _____% shares to be held by _____, _____% shares to be held by _____.
 _____ (*Lead Member*) shall individually and compulsorily hold at least 51% equity stake in the SPC till the end of the Contract Period. On successful award of the Project, the SPC shall enter into Contract Agreement (“Agreement”) with GSCDCL (as per the Tender Document), which shall specify the terms and conditions of the completion of the Project and shall carry out all the responsibilities in the terms of the Tender/Bid Document.
 The registered office of the Joint Venture/SPC shall be located at _____.

7. Operation & Maintenance (O & M)

_____, _____ and _____ shall be jointly and severally liable for the implementation, operation, maintenance and management of the Project in accordance with the terms of the Tender/Bid Document. It is further unanimously agreed by the Parties that the Lead Member, along-with other JV Member 2 in the SPC shall:-

- a) coordinate the day to day activities of the Joint Venture/SPC;
- b) undertake to be jointly and severally liable/responsible for all the obligations and liabilities relating to the Project, in accordance with the terms of the Tender/Bid Document and the Agreement with GSCDCL, till the end of the Contract Period;
- c) complete all works assigned under the Tender/Bid Document (including Concession Agreement) within the time period stipulated in the Tender/Bid document; and
- d) execute individual/independent Deed of Guarantee by all JV Members, towards the SPC, in favour of GSCDCL for the pledging / providing technical, financial and such other supports as may be necessary for the performance of works assigned under the Tender/Bid Document (including draft Agreement) within the time period stipulated in the Tender/Bid document.

8. Role and Responsibility

The role and the responsibility of each Party for the implementation, operation & maintenance and execution of the Project shall be as follows:

Name of Member	Type of Member	Role & Responsibility
_____	JV Member 1 (Lead Member)	_____
_____	JV Member 2	_____
_____	JV Member 3	_____

9. _____ All the basic/fundamental terms and conditions of this Agreement shall be incorporated in the Article of Association of the SPC (to be incorporated by the Parties). Any other terms and conditions to the extent not agreed upon by the Parties in this Agreement

(and which are not contradictory to the basic/fundamental provisions of this Agreement) shall be mutually agreed upon by the Parties and incorporated in the Article of Association of the SPC.

10. Confidentiality

All information, document, etc. exchanged between the Parties related to this agreement or the preparation of any Bid or the performance of the Project shall remain confidential and shall not be revealed to third parties for a certain time period to be agreed upon. Unless otherwise required by law, the Parties undertake not to disclose to any third party or any else and / or use any Information, without prior consent of the other Party.

11. Term and Duration

This Agreement shall come into effect on the date of submission of the Bid/Proposal for the development, implementation/execution and completion of the Project. This Agreement shall terminate upon the successful completion of the Project and may be extended further for such period as may be required by the GSCDCL. This Agreement can be terminated only upon Joint Venture's /SPC's Bid for the Project is conclusively rejected by the GSCDCL.

12. Costs/Expenses

All out-of-pocket expenses/costs of and incidental to this Agreement including stamp duty and registration fees, if any shall be borne and paid by the Parties in proportion to their shareholding in the SPC. Each Party shall pay and bear their own advocated/solicitors fees in the preparation of this Agreement.

13. Indemnity

The Second and the Third Part of this Agreement undertakes to indemnify the lead member from and against all direct and indirect damages, losses, liabilities, obligations, claims or proceedings of any kind, interest, penalties, cost, fee, or expenses (including, without limitation, reasonable attorneys' fees and expenses), suffered, incurred or paid, directly, as a result of, in connection with or arising from any breach of its covenants, obligations and responsibilities hereunder, including any act or omission or negligence, or of any Applicable Law, attributable to Second and the Third Party's negligence or wilful default in performance or non-performance under this Agreement.

14. Governing Law

This Agreement shall in all respect be governed, construed and interpreted in accordance with laws of Republic of India.

15. Settlement of Disputes

(a) Any disputes arising out of this Agreement shall be amicably settled by the authorised representatives of the Parties, failing any such disputes shall be resolved by Arbitration in accordance with the Arbitration and Conciliation Act, 1996, as amended by one or more arbitrators appointed in accordance with the said Act. This Clause shall survive the termination of this Agreement..[Language of Arbitration shall be English]. The venue of the Arbitration proceedings shall be in _____, India. The Parties jointly and severally undertake that the implementation and completion of the Project shall not be affected during the dispute(s) or the settlement of dispute(s) period. The Award rendered by the Arbitral Tribunal shall be final and binding upon the Parties.

(b) In the event of a dispute between the Parties over the subject of this Agreement, the prevailing party shall be entitled to reasonable advocates/solicitors' fees and costs incurred in the resolution of such dispute.

16. Amendments

This Agreement can be amended or suppressed by further Agreement made in writing at the request of any of the Parties after unanimous approval by the Parties and by obtaining prior consent and written approval from GSCDCL.

17. Notices

Any notices, requests, demands or any communications from any party to the other party under this Agreement shall be by Regd./Speed mail or facsimile transmission sent to the addresses as indicated in this Agreement. Any party may change its address but shall promptly inform GSCDCL and the other Parties/JV Members of any such change.

18. Language

The official language of this Agreement and all future Agreements shall be English.

19. Assignment

None of the Parties to this Agreement shall have the right to assign its benefits or liabilities under this Agreement to any other company, firm or person without obtaining prior consent and written approval of GSCDCL.

20. Entire Agreement

This Agreement constitutes the entire Agreement between the Parties and supersedes all prior writings, Agreements or understandings; written or oral relating to the subject matter thereof.

IN WITNESS WHEREOF the Parties hereto have caused this Agreement to be executed by their duly authorized representatives the day and year first above written.

SIGNED AND DELIVERED BY _____

By: _____
Title: _____
Date: _____

SIGNED AND DELIVERED BY _____

By: _____
Title: _____
Date: _____

SIGNED AND DELIVERED BY _____

By: _____
Title: _____
Date: _____

Witness:

1. _____
2. _____

ANNEXURE-H

(See clause 12 of Section 2 ITB& clause 4 of GCC)

ORGANIZATIONAL DETAILS

(To be enclosed with technical proposal)

S.N.	Particulars	Details
1.	Registration No. issued by centralized registration system of Govt. of MP or proof of application for registration	(If applicable, scanned copy of proof of application for registration to be uploaded)
2.	Valid registration of Bidder in appropriate class through centralized registration of Govt. of MP Registration no..... date.....	(Scanned copy of Registration to be uploaded)
3.	Name of Organization/ Individual	
4.	Entity of Organization Individual/Proprietary Firm/Partnership Firm (Registered under Partnership Act)/ Limited Company (Registered under the Companies Act– 1956)/ Corporation	(Scanned copy of Certificate to be uploaded)
5.	ISO Certification	(If applicable, scanned copy of Certificate to be uploaded)
6.	Address of Communication	
7.	Telephone Number with STD Code	
8.	Fax Number with STD Code	
9.	Mobile Number	
10.	E-mail Address for all communications	
11.	GST No	(If applicable, scanned copy of Certificate to be uploaded)
12.	Pan No	(If applicable, scanned copy to be uploaded)
13.	TAN No.	(If applicable, scanned copy to be uploaded)
14.	EPF Registration	(If applicable, scanned copy to be uploaded)
15.	Details of Authorized Representative	
	Name	
	Designation	
	Postal Address	
	Telephone Number with STD Code	
	Fax Number with STD Code	
	Mobile Number	
	E-mail Address	

Annexure – I

(See clause 14 of Section 2 of ITB)

ENVELOPE – B, TECHNICAL PROPOSAL

Technical Proposal shall comprise the following documents:

S.N.	Particulars to be submitted	Format
1.	Financial and Physical Experience	(Format: I - 1)
2.	Annual Turnover	(Format: I - 2)
3.	List of technical personnel for the key positions	(Format: I - 3)
4.	List of Key equipment/ machine/s in quality control labs	(Format: I - 4)
5.	List of Key equipment/ Machines for Construction Work	(Format: I - 5)

Note:

1. Technical Proposal should be duly page numbered and indexed.
2. Technical Proposal should be uploaded on website www.mpeproc.gov.in, otherwise will not be considered.

FINANCIAL & PHYSICAL EXPERIENCE DETAILS

(Bidders has to furnish details along with certificates as required for the qualification purposes).

Annexure – I (Format: I - 2)
(See clause 14 of Section 2 of ITB)

ANNUAL TURN OVER

Requirements:

Average annual construction turnover for the construction works to be provided in the following format for the last 3 consecutive financial years ending 31 March 2018.

Financial Information			
Financial Year	2014-15	2015-16	2016-17
Annual Turnover (in INR Crore) for Lead Member			
Annual Turnover (in INR Crore) for JV/Consortium Member 1			
Annual Turnover (in INR Crore) for JV/Consortium Member 2			
TOTAL AVERAGE TURNOVER			
Note:			
i. Annual turnover of works should be certified by chartered accountant.			
ii. Mandatory Supporting Documents:			
a. Audited balance sheet including all related notes and income statements for the above financial years to be enclosed.			
iii. Should have positive net- worth.			

Annexure – I (Format: I - 3)
(See clause 14 of Section 2 of ITB)

LIST OF TECHNICAL PERSONNEL FOR THE KEY POSITIONS

The Contractor will have to appoint the following key personnel during the execution and entire contract period, apart from other key personnel and support staff as necessary.

S. No.	Details	Required nos.
1	Project Manager with Master's degree in Civil Engineering having minimum relevant post qualification experience of 15 years	One
2	Heritage Expert with Master's degree in Conservation having minimum relevant post qualification experience of 10 years with specific experience in setting up of Museum/ Interpretation Centre/ Similar nature of works	One
3	IT/ICT Expert with Bachelor's degree in Technology/Electronic Engineering having minimum relevant post qualification experience of 7 years	One
4	Site Engineer with Degree/Diploma in Civil Engineering having minimum 5 (for Degree holders) / 7 (for Diploma holders) years' experience	Two
5	Quality Control /Quality Assurance Engineer with Degree in Civil Engineering having minimum 5 years of relevant experience	One

Penalty for Non-deployment of above staff are as follows:

S. No.	Details	Penalty to be computed on Per Day basis
1	Project Manager with Master's degree in Civil Engineering having minimum relevant post qualification experience of 15 years	Rs. 75,000/- p.m.
2	Heritage Expert with Master's degree in Conservation having minimum relevant post qualification experience of 10 years	Rs. 60,000/- p.m.
3	IT/ICT Expert with Bachelor's degree in Technology/Electronic Engineering having minimum relevant post qualification experience of 7 years	Rs. 40,000/- p.m.
4	Site Engineer with Degree/Diploma in Civil Engineering having minimum 5 (for Degree holders) / 7 (for Diploma holders) years experience	Rs. 30,000/- p.m.
5	Quality Control /Quality Assurance Engineer with Degree in Civil Engineering having minimum 5 years of relevant experience	Rs. 25,000/- p.m.

List of Key Equipment / Machines for Quality Control Labs

Indicative Laboratory Equipment List			Available with the bidder		
S. No.	Name of Equipment/ Machinery	Quantity	S. No.	Name of Equipment/ Machinery	Quantity
1	Machinery and Equipment Required for Conducting Tests as per UADD/CPWD Specifications (latest Revision)				
2					
3					
4					
5					
6					
...					
...					
...					
...					

- The Contractor shall arrange to provide fully furnished and adequately equipped field laboratory with adequate qualified technical staff. Preferably located adjacent to the Project Office and provided amenities like water supply, electric supply etc.
- The laboratory equipment shall confirm I.S. specifications. The Contractor shall carry out the calibration of the instruments as directed by the Engineer-in-charge on expiry date of calibration. On completion of work in all respect, the equipment will be the sole property of the Contractor.
- It shall be considered as incidental to the work, and no extra payment will be made what so ever will not be made for the same.

Annexure – I (Format: I - 5)
(See clause 14 of Section 2 of ITB)

LIST OF EQUIPMENTS / MACHINES FOR CONSTRUCTION WORK

Bidders to furnish details of minimum requirement in the format given below for the Work:

S. No.	Name of Equipment/ Machinery	Min Quantity Required	Details of Equipment/ Machinery Available with the bidder	Quantity Available
1	Sand Blasting Machine	1		
2	Vibratory Roller	1		
3	Tractor	1		
4	Lime Mill (chakki) with slaking tank	1		
5	Loader with Back Hoe	1		
6	Tipper Truck	1		

After Inspection, Engineer In charge may accept the request as it is or instruct for some changes if required in the machinery which shall be carried out by the Contractor at this own cost. Only after its approval by the Engineer In Charge, the Contractor shall carry out work from the approved machinery.

FINANCIAL BID

TENDER FOR ITEM RATE CONTRACT:

NAME OF WORK: (NAME OF THE WORK AS APPEARING IN THE BID FOR THE WORK)

We do hereby bid for the execution of the above work within the time specified on **item rate** at a total price (in figures) (in words)..... excluding GST based on the rates of each item quoted in Annexure J-1 bill of quantities. The item wise rates given therein in all respects are in accordance with the specifications, designs, drawings and instructions in writing in all respects in accordance with such conditions so far as applicable.

We have visited the site of work and are fully aware of all the difficulties and conditions likely to affect carrying out the work. We have fully acquainted ourselves about the conditions in regard to accessibility of site and quarries/ kilns, nature and the extent of ground, working conditions including stacking of materials, installation of tools and plant conditions effecting accommodation and movement of labour etc. required for the satisfactory execution of contract.

Should this bid be accepted, we hereby agree to abide by and fulfil all the terms and provisions of the said conditions of contract annexed hereto so far as applicable, or in default thereof to forfeit and pay to the EXECUTIVE DIRECTOR, GWALIOR SMART CITY DEVELOPMENT CORPORATION LIMITED, GWALIOR; Madhya Pradesh or his/her successors in office the sums of money mentioned in the said conditions.

Note:

Only one rate above or below or at par against quantity of each item given in the Bill of Quantities shall be quoted.

Rate shall be quoted in figures as well as in words. If any difference in figures and words is found, lower of the two shall be taken as valid and correct rate. If the Bidder is not ready to accept such valid and correct rate and declines to furnish performance security and/or fails to sign the contract its earnest money deposit shall be forfeited.

In case the rate "above" or "below" is not given by a Bidder for any item of the Bill of Quantity, its bid shall be treated as non-responsive. Items for which no rate or price is entered by the Bidder will not be paid for by GSCDCL when executed and shall be deemed covered by the other rates and prices in the BoQ.

All duties, taxes, (excluding GST) and other levies payable by the Bidder shall be included in the rate quoted by the Bidder.

Signature of Bidder

Name of Bidder

BILL OF QUANTITIES

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
1.1.1	Dismantling doors, windows and clerestory windows of area 3 sqm or below (steel or wood), including shutters, chowkhats, architrave, holdfasts, etc. complete and stacking within 50 metres lead	Each	217.00			
1.1.2	Dismantling doors, windows and clerestory windows of area beyond 3 sqmts (steel or wood), including shutters, chowkhats, architrave, holdfasts, etc. complete and stacking within 50 metres lead	Each	3.00			
1.1.3	Dismantling aluminium/gypsum partitions, doors, windows, fixed glazing and false ceiling including disposal of unserviceable material within 50 metres lead as directed by Engineer -in- charge	Sqm	9.50			
1.1.4	Dismantling C.I., asbestos rain water pipe with fittings and clamps including stacking the material within 50 metres lead	metre	39.58			
1.1.5	Demolishing brick work in cement mortar manually including stacking of serviceable and disposal of unserviceable material within 50 metres lead as per direction of Engineer - in charge	Cum	394.92			
1.1.6	Dismantling dressed stone work in lime mortar/ ashlar face stone work manually/ by mechanical means including stacking of serviceable and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge	Cum	239.87			
1.1.7	Dismantling tile work of thickness 10mm to 25mm in floors and walls laid in cement mortar including stacking material within 50 metres lead.	Sqm	138.10			
1.1.8	Dismantling stone slab flooring laid in lime/cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 metres lead.	Sqm	2,760.87			
1.1.9	Careful dismantling of old decayed Lime/ cement plaster and cleaning the surface for replastering including disposal of unserviceable material at all levels including all lifts and leads as per the direction of Engineer-in-charge/ Conservation Architect. Utmost care must be taken to ensure that the brick masonry or any other part of the building is not damaged in the course of dismantling.	Sqm	9,139.48			
1.1.10	Careful dismantling of lime concrete over terrace, roof and floors including disposal of material including all lifts and leads. The work to be done under the supervision of Engineer-in-charge/ Conservation Architect and strictly with light tools. Hammering to be restricted.	Cum	515.39			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
1.1.11	Careful dismantling of cement concrete, of nominal mix 1:3:6 or richer, manually and disposal of material within 50 mts lead as per direction of Engineer - in - charge /Conservation Architect.	Cum	197.02			
1.1.12	Careful dismantling & stacking of armoured/unarmoured or single core wire of main, submains, circuits in any system of wiring including recoiling as per direction of Engineer-in-Charge /Conservation Architect.	metre	1,600.00			
1.1.13	Careful dismantling & stacking of D.F. Board, D.P. Switch, TP, TPN switch or DB of any size complete with board or angle/ flat iron frame and making site clear including refilling of holes as per direction of Engineer-in-Charge /Conservation Architect.	Each	560.00			
1.1.14	Demolishing R.B. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in- charge.	Cum	7.92			
1.1.15	Extra for cutting reinforcement bars manually/ by mechanical means in R.C.C. or R.B. work (Payment shall be made on the cross sectional area of R.C.C. or R.B. work) as per direction of Engineer- in-charge.	Sqm	39.59			
1.1.16	Careful dismantling and disposal of multiple layers of bitumen felt and concrete from above the lime concrete terrace and along the parapet wall as per directions of Engineer-in-charge	Sqm	432.81			
1.1.17	Dismantling stone Beam (average size 3600mm x 300 mm x 200mm) roofing laid on stone beams, karries(dismantling the stone beam & karries to be paid separately) including stacking of serviceable material & disposal of unserviceable material within 50 meter lead complete as per direction of the Engineer-in-charge /Conservation Architect	Cum	23.45			
1.1.18	Cutting of trees girth from 2700mm to 3600mm including cutting of trunks, branches and removal of stumps stacking of serviceable materials with all lifts earth filling in the depressions/ pit, complete as per specifications.	Nos.	6.00			
1.1.19	Cutting of trees girth from 300mm to 600mm including cutting of trunks, branches and removal of stumps stacking of serviceable materials with all lifts earth filling in the depressions/ pit, complete as per specifications.	Nos.	26.00			
1.1.20	De-vegetation from the monument by removal of bushes, trees including complete uprooting from the wall and roofs/ structures carefully including suitable chemical treatment to roots to avoid further growth. Disposal of rubbish at all leads as per the Engineer-in-charge/ Conservation Architect	Nos.	8.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
1.1.21	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees & saplings of girth upto 30cm measured at a height of 1meter above ground level & removal of the rubbish up to a distance of 50 m out side the periphery of the area cleared.	Sqm	113.59			
1.1.22	Providing and fixing double scaffolding system (cup lock type) on the exterior side/ interior side of building/structure, upto 20 metre height, above ground level, including additional rows of scaffolding in stepped manner as per requirement of site, made with 40mm dia M.S. tube, placed 1.5 metre centre to centre, horizontal & vertical tubes joint with cup & lock system with M.S. Tubes, M.S. tube challis, M.S. clamps and staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for execution of work of cleaning and/ or pointing and/ or applying chemical and removing it thereafter. The scaffolding system shall be stiffened with bracings, runners, connecting with the building etc., wherever required, if feasible, for inspection of work at required locations with essential safety features for the workmen etc., complete as per directions and approval of Conservation Architect/ Engineer-in-charge.	Sqm	714.90			
1.1.23	Disposal of building rubbish / malba / similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge, beyond 50 m initial lead, for all leads including all lifts involved.	Cum	5,479.41			
1.1.24	Dismantling steel work in single section of RS joists, channels angles and tees and stacking within 50metres	kg	857.25			
1.1.25	Dismantling 15 to 40 mm dia G.I. pipe including stacking of dismantled pipes within 50 metres lead as per the direction of Engineer-in-Charge- internal work- exposed on wall	metre	111.60			
1.2.1	Earth work in excavation by manual means over areas including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.	Cum	52.76			
1.3.1	Half brick masonry of class designation 40 in super structure above plinth level up to floor 2 level including the cost of scaffolding in cement mortar 1:3 (1 cement : 3 coarse sand)	Sqm	11.54			
1.3.2	Extra for providing and placing in position 2 Nos. 6mm dia. M.S. bars at every third course of half brick masonry (with of class designation 40)	Sqm	8.54			
1.3.3	Coursed rubble masonry (first sort) with hard stone in super structure with at all	Cum	196.97			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	levels in lime mortar 1:1 (1 lime putty : 1 sand: 1 surkhi)					
1.3.4	Tile brick masonry with common burnt clay F.P.S (non modular) tile bricks/ lakhori bricks in superstructure above plinth and upto floor five level in lime mortar 1:1:1 (1 lime: 1 surkhi: 1 sand)	Cum	11.96			
1.3.5	Tile brick masonry with common burnt clay F.P.S (non modular) tile bricks/ Lakhori bricks of in gauged arch / cornices/ other ornamental works in superstructure above plinth and upto floor five level in lime mortar 1:1:1 (1 lime: 1 surkhi: 1 sand) including centering and shuttering complete	Cum	25.42			
1.4.1	Cleaning by Sandblasting of multiple layers of limewash, algae, other accretions from plain stone surfaces of stone beams, chajjas, stone brackets etc. using high pressure micro-aero-abrasive cleaning systems with necessary equipment, complete in all aspects. Extreme precaution to be undertaken to clean only the external deposits and not damage the stone's natural composition.	Sqm	3,635.08			
1.4.2	Cleaning by sandblasting / manually of multiple layers of lime-wash, from decorative stone surfaces of stone columns, arches etc. using low pressure micro-aero-abrasive cleaning systems with necessary equipment, complete in all aspects as per the directions of art conservator/ conservation architect. Extreme precaution to be undertaken to clean only the external deposits and not damage the stone's natural composition and decorative details.	Sqm	787.89			
1.4.3	Careful raking of joints in stone masonry of lime or cement mortar and preparing the surface for replastering or pointing including disposal of rubbish at level including all lift and lead as per the direction of Engineer-in-Charge /Conservation Architect. When raking is undertaken in joints of original masonry, great care is to be taken such that the edges and surfaces of the stone are not damaged with the chisel.	Sqm	9,139.48			
1.4.4	Pointing of coursed stone masonry / brick masonry (before plastering) and gaps between masonry surfaces ,on a raked surface including cleaning of the surface and applying/ inserting traditional lime mortar 1:3 (1 Lime : 1 Coarse Sand: 1 Khakha: 1 Surkhi aggregate), up to desired thickness, properly filled and compacted with appropriate tool to fill and cover the opened joints and applying a single coat of rough lime mortar to make the surface fit for plastering as per the direction of Engineer-in-Charge /Conservation Architect, including extra for pointing on walls on the outside at height more than 10 m from ground	Sqm	9,139.48			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	level for every additional height of 3 m or part there of					
1.4.5	Plastering with Lime Surkhi plaster in proportion 1:1:1 (1lime: 1 surkhi:1 coarse sand) as per conditions and mixing with gugal (gum)/belgiri/ seera etc. as per traditional practice, matching with existing thickness or as specified by engineer-in-charge including preparation of mortar by traditional methods (by pressure mixing in chakki) in two courses of base course and finished course including tamping, beating, curing till the shrinkage cracks disappear. The work is to be done with all leads and lifts, each coat to be done after 3 days of previous coat. Surfaces to be plastered shall be thoroughly cleaned of all dust, grease, oil and loose mortar. Curing to be done for 21 days with help of water spray pump. In proportion 1:1:1 (1 lime: 1 surkhi: 1 sand) to be based on the site conditions and specifications of Engineer-in-Charge /Conservation Architect.	Sqm	7,567.28			
1.4.6	Provision of lime plaster on flat surfaces with simple mouldings/ ribs/ grooves etc. as per existing design in lime mortar 1:1:1 (1 lime:1 surkhi: 1 coarse sand) mixed with gugal (gum)/ belgiri including finishing and matching with original upto all lifts and leads and as directed by Engineer-in-charge / Conservation Architect	Sqm	206.62			
1.4.7	Lime concrete terracing on roofs and upper floors laid to slope in ratio of 1:1 [1 lime mortar {1 lime:1 surkhi:1 coarse sand} : 1 coarse brick aggregate 25 mm nominal size] mixed with gur/seera and belgiri. Ramming to be undertaken with wooden tools including thapis, chapkis and rammers and beating with wooden thapis/ split bamboo. The finished surface shall be covered with jute bags kept moist, or the surface may be sprinkled with water several times so as to keep it constantly wet for 21 days. All work to be done as per direction of Engineer-in-Charge /Conservation Architect.	Cum	450.15			
1.4.8	Providing and fixing fine dressed sandstone beam of section 200x460 upto 5600mm length matching with traditional design type in lime including pointing matching the stone shade as per the direction of Engineer-in-charge/Conservation Architect.	Cum	25.83			
1.4.9	Providing and fixing stone slab(patties) of approved matching type, about size (1500mm X 400mm X 80mm) on roof and floor including removing broken patties (slabs) carefully and replacement of slab of approved size, type and as per existing detail and direction of Engineer-in-charge/ Conservation Architect	Sqm	16.12			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
1.4.10	Providing gola 75 x75mm in lime concrete 1:2:4 (1 lime : 2 coarse sand : 4 graded stone ballast 10mm nominal size) including finishing with lime mortar 1:2 (1 lime : 2 coarse sand) as per the direction of Engineer-in-Charge /Conservation Architect.	Rm	272.07			
1.4.11	Providing 300 x 300mm size lime concrete khurra laid to slope. Khurra to be prepared as per approved design on three side all complete as per the direction of Engineer-in-Charge /Conservation Architect.	Nos	4.00			
1.4.12	Providing and fixing stone spout on roof giving proper slope (of approximate size 1380mmx175mmx150mm) in white sand stone to be made and fixed manually including removal and refixing of masonry complete as per the direction of Engineer-in-Charge /Conservation Architect.	Nos	4.00			
1.4.13	Providing & fixing terracotta balustrade filled with lime concrete as per existing design, complete as per directions of engineer in charge/ Conservation architect.	Nos	764.00			
1.4.14	Providing and fixing missing stone brackets of average size 1500mm x.125mmx 500mm under chajjas & balconies as per existing design & material of thickness upto 100mm, matching with existing historic stone in size, pattern, colour and texture, including pointing in lime mortar 1:2 (1lime putty : 1 surkhi :1 sand at all levels including all lift and leads as per the direction of Engineer-in-Charge /Conservation Architect.	Nos	7.00			
1.4.15	Providing and fixing white sand stone fined dressed table rubbed & polished work as in Mutakka (vertical stone post) (.075x.075x0.570)mt. Size of existing deign to receive stone plain on side having 2cm. deep grooving of size 7.5 cm. Inside and 25 cm. Long, circular moulded and flowered design on Top including supply of all material labour T&P etc. required for proper completion of work .	Nos	58.00			
1.4.16	Providing and fixing white sand stone fined dressed table rubbed & polished work as in Plain Dilla (stone railing) of exiting design to receive railing plain on side having 2cm. deep grooving of size 43cm. Inside and 25 cm. Long, circular moulded and moulding design on Top including supply of all material labour T&P etc. required for proper completion of work .	Sqm	13.07			
1.4.17	Providing and fixing fine dressed stone Jaali matching existing type, size, pattern in lime mortar 1:1:1 (1 lime: 1 surkhi :1 sand) including pointing matching the stone colour all complete as per the direction of Engineer-in-Charge /Conservation Architect	Nos	13.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
1.4.18	Centering and shuttering including strutting, propping etc. and removal of all forms: Columns, Pillars, Piers, abutments, Posts and Struts.	Sqm	33.89			
1.4.19	Providing and fixing stone parnala (surface rainwater drain) in white sand stone (size 1500mm x 250x150mm to be made and fixed manually including removal and refixing of masonry complete as per the direction of Engineer-in-Charge /Conservation Architect.	Rm	4.45			
1.5.1	Laying 40-50mm stone slabs in plinth protection over a bed 20mm thick lime mortar 1:4 over 150mm thick layer of brick aggregates of 25-30mm properly rammed and well compacted earth cut to slope including pointing and finishing the top surface smooth and providing adequate slope as per direction of Engineer-in-Charge /Conservation Architect.	Sqm	263.78			
1.5.2	Providing, filling and ramming dry brick ballast 20-40mm nominal size under plinth protection including ramming, consolidation and dressing complete as per direction of Engineer-in-Charge /Conservation Architect.	Cum	52.76			
2.1.1	Steel work in built up tubular in rectangular hollow tubes etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete in Electric resistance or induction butt welded tubes	Kg	4,726.05			
2.1.2	Providing, fixing and welding of Stainless Steel D fan hooks screwed to the top side of the steel tubular channel complete with screw and washer. Bolting plate size 15mm x 75mm, nominal thickness 12mm, corrosion resistant D hook shall be of high tensile steel conforming to IS-2759 or of mild steel conforming to IS-2758 of	Each	226.00			
2.1.3	Providing and hoisting of 5mm dia tensile Stainless Steel wire attached to D hooks on tubular framed structure and existing ceiling hooks complete including SS thimble eye rope fitting and SS end sleeve. Weight 0.1551 kg/m, The type of rope to be used shall be a six stranded fibre or steel core or eight stranded steel core, ordinary lay, rope grade 1770 as specified in IS 2266.	Tonne	0.08			
2.1.4	Providing and fixing in position of 5mm dia Aluminium Ferrules to the wire assembly complete with crimping conforming to IS 10942:2000	Each	904.00			
2.1.5	Providing and fixing in position of 5mm dia SS Thimble Eye to the wire assembly, Size: 60mm; Solid type, Galvanised; IS 2315:1978 Specification for thimbles for wire ropes (first revision). Eyes of sling legs shall be	Each	452.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	formed by using hand splicing or mechanical splicing using ferrules conforming to IS 10942. Such eyes shall be soft eyes or reinforced with thimbles as per the requirement. The length of the soft eye shall be minimum twelve times the rope diameter unless otherwise specified. The width of the eye shall be approximately half of its length. In order to protect the bearing surface of the soft eye, a stirrup may be fitted. The bearing point over which the soft eye used shall be more than twice the rope diameter for single part sling and four times the rope diameter in case of endless type sling.					
2.1.6	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete On steel work	Sq.m	169.04			
2.2.1	Supplying and fixing of rigid steel conduit ISI marked along with the accessories on surface including painting etc. as required in HG Conduit 20mm, Wall thickness 1.6mm (on walls and ceiling channel)	meter	1,843.67			
2.2.2	Add extra for supply of 20mm Junction Box, one way (metal)	100 Nos	4.00			
2.2.3	Add extra for supply of 20mm Junction Box, two way (metal)	100 Nos	2.00			
2.2.4	Supplying and fixing of rigid steel conduit ISI marked along with the accessories in concealed system including painting etc. as required in HG Conduit 20mm, Wall thickness 1.6mm (for concealed in floors)	meter	599.48			
2.3.1	Providing and fixing G.I. Pipes complete with G.I. fittings and clamps, i/c making good the walls etc. concealed pipe, including painting with anti corrosive bitumastic paint, cutting chases and making good the wall in 15 mm dia nominal bore (for concealed internal water supply)	meter	67.50			
2.3.2	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. in 20 mm dia nominal bore (for inlet from OHT to service area)	meter	142.50			
2.3.3	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc. in 32 mm dia nominal bore (from municipal source to UGT)	meter	13.00			
2.3.4	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete in 32 mm dia nominal bore (from municipal source to UGT)	Each	13.00			
2.3.5	Fixing water meter and stop cock in G.I. pipe line including cutting and threading the pipe and making long screws etc. complete (cost of water meter and stop	Each	1.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	cock to be paid separately) (from municipal source to UGT)					
2.3.6	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. in 40 mm dia nominal bore (from UGT to OHT)	meter	81.07			
2.3.7	KSRB 13-11.1 : Providing and placing on terrace, polyethylene water storage tanks with manhole lid and suitable locking arrangements, making holes of suitable diameter for inlet, outlet and over flow pipes, including cost of all materials, labour, transport charges, HOM of equipment and testing complete as per specifications.(For 1000 litre capacity) Specification No.KBS 13.22	Each	5.00			
2.3.8	Providing and placing on at all floor levels high design HDPE (polyethylene) water storage tank ISI : 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	Litre	10,000.00			
2.3.9	Cutting holes up to 15x15 cm in floors and roofs for passing pipe etc. and repairing the hole after insertion of pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete so as to make it leak proof.	Each	15.00			
2.4.1.1	Providing, laying and jointing of LA Class socket and spigot cast iron (spun) pipes including testing of joints, cost of pipes and jointing materials, etc. complete of 100mm dia (on vertical surface)	meter	62.20			
2.4.1.2	Providing, laying and jointing of LA Class socket and spigot cast iron (spun) pipes including testing of joints, cost of pipes and jointing materials, etc. complete of 150mm dia (on vertical surface)	meter	56.40			
2.4.1.3	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design: Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of	Each	4.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg): With Sewer bricks conforming to IS : 4885					
2.4.2.1	Providing, laying and jointing of LA Class socket and spigot cast iron (spun) pipes including testing of joints, cost of pipes and jointing materials, etc. complete of 80mm dia (chamber to chamber)	meter	94.40			
2.4.2.2	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design: Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) : With Sewer bricks conforming to IS : 4885	Each	4.00			
2.4.3.1	Providing, laying and jointing of LA Class socket and spigot cast iron (spun) pipes including testing of joints, cost of pipes and jointing materials, etc. complete of 80mm dia (chamber to chamber)	meter	135.30			
2.4.3.2	Providing, laying and jointing of LA Class socket and spigot cast iron (spun) pipes including testing of joints, cost of pipes and jointing materials, etc. complete of 150mm dia (chamber to chamber)	meter	95.60			
2.4.3.3	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with 40 class designation bricks in cement mortar 1:4:(1 cement : 4 sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) RCC top slab with cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate), 15 cm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 sand) finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design. Chamber inside	Each	11.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	dimensions 455x610 mm and 45 cm deep for single pipe line					
2.4.3.4	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with 40 class designation bricks in cement mortar 1:4:(1 cement : 4 sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) RCC top slab with cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate), 15 cm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 sand) finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design. Chamber inside dimensions 600 x 850 mm and 45 cm deep for pipe line with three or more inlets :	Each	4.00			
2.5.1	Providing general disinfection services, spraying of insecticide and pesticide inside and outside the building (flies, bedbugs, lizards, cockroaches, spiders caterpillars etc., including cost of materials labour lead lift, hire charges of equipment etc., complete. (for all areas on top surface of existing lime concrete)	Sq.m	4,678.50			
2.5.2	Providing and laying water proofing treatment in sunken portion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying: (a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/ sqm. This layer will be allowed to air cure for 4 hours. (b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry. (for toilets)	Sq.m	149.72			
2.5.3	Providing and laying of Brick Bats	Cu.m	31.47			
2.5.4	Providing and laying of Cement mortar 1:6 (1 cement : 6 fine sand).	Cu.m	10.49			
2.5.5	Providing and laying of Cement mortar 1:6 (1 cement : 6 coarse sand).	Cu.m	10.49			
2.5.6	Providing and laying of high compression hand made cement based tiles of heritage revival type 200x200mm size and 20-25mm thk in specified colours and patterns to be laid in spaces/rooms as specified by the architect in cement mortar 1.5 to 3.5 cm sand cement bed mortar of 36 grade	Sqm	1,471.70			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	cement of ratio not leaner than 7:1 with neat cement slurry on top of approved thickness. Joints should be fine as possible and filled with matching cement mortar as directed by the architect. Joints to be filled by a grouting mixture provided by manufacturer. Rates to be inclusive of tile, storage, handling, delivery on site, laying as well as cutting required for introduction of square tile inserts, wastage, and subsequent cutting, curing, polishing as specified by manufacturer etc. complete. Poishing recommended by manufacturer is with Italian polish machine using no 1 polish stones.					
2.5.7	Providing and laying of high compression hand made cement based tile border of heritage revival type 200x100mm size and 20-25mm thk in specified colours and patterns to be laid in spaces/rooms as specified by the architect in cement mortar 1.5 to 3.5 cm sand cement bed mortar of 36 grade cement of ratio not leaner than 7:1 with neat cement slurry on top of approved thickness. Joints should be fine as possible and filled with matching cement mortar as directed by the architect. Joints to be filled by a grouting mixture provided by manufacturer. Rates to be inclusive of tile, storage, handling, delivery on site, laying as well as cutting required for introduction of square tile inserts, wastage, and subsequent cutting, curing, polishing as specified by manufacturer etc. complete. Poishing recommended by manufacturer is with Italian polish machine using no 1 polish stones.	Rm	600.00			
2.5.8	Providing and laying of high compression hand made cement based hexagonal Terrazzo Tiles of heritage revival type 200x200mm outside dimension size and 20-25mm thk in specified colours and patterns to be laid in spaces/rooms as specified by the architect in cement mortar 1.5 to 3.5 cm sand cement bed mortar of 36 grade cement of ratio not leaner than 7:1 with neat cement slurry on top of approved thickness. Joints should be fine as possible and filled with matching cement mortar as directed by the architect. Joints to be filled by a grouting mixture provided by manufacturer. Rates to be inclusive of tile, storage, handling, delivery on site, laying as well as cutting required for introduction of square tile inserts, wastage, and subsequent cutting, curing, polishing as specified by manufacturer etc. complete. Poishing recommended by manufacturer is with Italian polish machine using no 1 polish stones. (in toilets)	Sqm	83.20			
2.5.9	Kota/cuddapah stone slab 30 mm thick flooring over 20 mm (average) thick	Sqm	373.44			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar (1 cement : 4 course sand) 1 : 4 (minimum size of kota stone 0.25 sqm)					
2.6.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately). in Second class teak wood	Cu.m	8.73			
2.6.2	Extra for additional labour for circular works, such as in frames of fan light in Second class teak wood	Cu.m	1.20			
2.6.3	Providing and fixing panelled or panelled and glazed shutters for doors, windows and clerestory windows, including ISI marked M.S. pressed butt hinges bright finished of required size with necessary screws, excluding panelling which will be paid for separately, all complete as per direction of Engineer-in-charge in Second class teak wood of 35 mm thick shutters	Cu.m	2.37			
2.6.4	Providing and fixing panelling or panelling and glazing in panelled or panelled and glazed shutters for doors, windows and clerestory windows (Area of opening for panel inserts excluding portion inside grooves or rebates to be measured). Panelling for panelled or panelled and glazed shutters 25 mm to 40 mm thick. Second class teak wood	Sqm	12.20			
2.6.5	Providing and fixing panelling or panelling and glazing in panelled or panelled and glazed shutters for doors, windows and clerestory windows (Area of opening for panel inserts excluding portion inside grooves or rebates to be measured). Panelling for panelled or panelled and glazed shutters 25 mm to 40 mm thick. Toughened glass 12 mm thickness	Sqm	125.40			
2.6.6	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters in 35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	Sqm	102.34			
2.6.7	Extra for providing lipping with 2nd class teak wood battens 25 mm minimum depth on all edges of flush door shutters (over all area of door shutter to be measured).	Sqm	102.34			
2.6.8	Extra for cutting rebate in flush door shutters (Total area of the shutter to be measured).	Sqm	102.34			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
2.6.9	Providing 50x50x50 mm 2nd class teak wood plugs including cutting brick work and fixing in lime mortar 1:3 (1 lime : 3 fine sand) and making good the walls etc.	Each	792.00			
2.6.10	Providing and fixing expandable fasteners of specified size with necessary plastic sleeves and galvanised M.S. screws including drilling holes in masonry work /CC/ R.C.C./Stone Walls and making good etc. complete. 40mm long	Each	792.00			
2.6.11	Providing and fixing 2nd class teak wood plain lining tongued and grooved, including wooden plugs complete with necessary screws and priming coat on unexposed surface of 25mm thick	Sqm	10.29			
2.6.12	Providing and fixing wooden moulded beading to door and window frames with iron screws, plugs and priming coat on unexposed surface etc. complete in second class teak wood of 50x12 mm	meter	809.94			
2.6.13	Providing and fixing ISI marked oxidised M.S. single acting spring hinges with necessary screws etc. complete (COPPER OXIDISED AS PER IS: 1378) of 150 mm	Each	384.00			
2.6.14	Providing and fixing bright finished brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete.	Each	49.00			
2.6.15	Providing and fixing bright finished brass casement stays (straight peg type) with necessary screws etc. complete :	Each	15.00			
2.6.16	Providing and fixing bright finished brass handles with screws etc. complete of 125 mm	Each	30.00			
2.6.17	Providing and fixing bright finished brass hasp and staple (safety type) with necessary screws etc. complete of 150 mm	Each	10.00			
2.6.18	Providing and fixing bright finished brass tower bolts (barrel type) with necessary screws etc. complete of 200x10 mm	Each	30.00			
2.6.19	Providing and fixing fire resistant door frame of section 143 x 57 mm having built in rebate made out of 16 SWG G.I. sheet (zinc coating not less than 120 gm/sqm) duly filled with vermiculite based concrete mix, suitable for mounting 60 minutes fire rated door shutters. The frame is fitted with intumescent fire seal strip of size 10x4 mm (minimum) around the frame and fixing with dash fastener of approved size and make, including applying a coat of approved brand fire resistant primer etc. complete as per direction of Engineer-in-charge (Dash fastener to be paid for separately).	meter	75.08			
2.6.20	Providing and fixing 50 mm thick glazed fire resistant door shutters of 60 minutes	Sqm	14.56			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	fire rating conforming to IS:3614 (Part-II), tested and certified as per laboratory approved by Engineer-in-charge, with suitable mounting on door frame, consisting of vertical styles, lock rail, top rail 100 mm wide, bottom rail 200 mm wide, made out of 16 SWG G.I.sheet (zinc coating not less than 120 gm/m ²) duly filled FR insulation material and fixing with necessary stainless steel ball bearing hinges of approved make, including applying a coat of approved fire resistant primer etc. all complete as per direction of Engineer-in-charge (panelling to be paid for separately).					
2.6.21	Providing and fixing glazing in fire resistant door shutters, fixed panels, ventilators and partitions etc., with G.I. beading of appropriate size, made out of 20 SWG G.I.sheet (zinc coating not less than 120 gm/m ²), fire resistant sealant, including applying a coat of approved fire resistant primer on G.I. beading etc., complete all as per direction of Engineer-in charge. With clear fire resistant glass panes 6mm thick of approved brand, having minimum 60 minutes fire resistance	Sqm	40.85			
2.6.22	Providing and fixing panic bar / latch (Double point) fitted with a single body, Trim Latch & Lock on back side of the Panic Latch of reputed brand and manufacture to be approved by the Engineer- in- charge, all complete.	Each	26.00			
2.6.23	Providing and fixing factory made uPVC white colour casement/ Casement cum fixed glazed door comprising of uPVC multi-chambered frame, sash and mullion (where ever required) extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, EPDM gasket, zinc alloy (white powder coated) 3D hinges and one handle on each side of panels along with zinc plated mild steel multi point locking having transmission gear, cylinder with keeps and one side key, G.I fasteners 100 x 8 mm size for fixing frame to finished wall and necessary stainless steel screws, etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes and silicon sealant shall be	Sq.m	127.12			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	paid separately). Note: For uPVC frame, sash and mullion extruded profiles minus 5% tolerance in dimension i.e. in depth & width of profile shall be acceptable. Casement door with top hung ventilator with 3D and S.S. friction hinges (400 x 19 x 1.9 mm) made of (big series) frame 67 x 64 mm, sash 67 x 110 mm & mullion 67 x 80 mm all having wall thickness of 2.3 ± 0.2 mm and single glazing bead / double glazing bead of appropriate dimension.(Area of door upto 2.50 sqm					
2.6.24	Providing and fixing factory made uPVC white colour sliding glazed door comprising of uPVC multi-chambered frame with in-built roller track and sash extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), appropriate dimension uPVC extruded glazing beads, uPVC extruded interlock and uPVC extruded Inline sash adaptor (if required), EPDM gasket, wool pile, zinc alloy (white powder coated) handle with key on one side of extreme panels along with zinc plated mild steel multi point locking having transmission gear with keeps, zinc alloy (white powder coated) crescent lock (if required), stainless steel (SS 304 grade) body with adjustable double nylon rollers (weight bearing capacity to be 120 kg), G.I fasteners 100 x 8 mm size for fixing frame to finished wall and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes, wire mesh and silicon sealant shall be paid separately). Note: For uPVC frame and sash extruded profiles minus 5% tolerance in dimension i.e. in depth & width of profile shall be acceptable. Two track four panels sliding door made of (big series) frame 67 x 50 mm & sash 46 x 82 mm both having wall thickness of 2.3 ± 0.2 mm and single glazing bead / double glazing bead of appropriate dimension. (Area of door above 8.00 sqm upto 10.00 sqm).	Sq.m	21.83			
2.6.25	Supply and fixing of chromium plated MS turn latch/baby latch to be fixed on partitions of bathroom	Each	15.00			
2.6.26	Providing and fixing 12 mm thick frameless toughened glass door shutter	Sq.m	159.34			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).					
2.6.27	Fabricating, providing and erecting in position of Hot dip galvanised M.S.Ornamental security Grill Gate using 75 x 12mm M S Flat for around frame work with verticals at the centre and horizontal centre support M S Square of 20 x20 mm of different heights as shown in the drawing are to be fixed at 16 cms C/C for square bars of full height and at 8cms C / C for bottom rods providing ornamental C I Designers at the bottom and C I arrows in the middle and top. The entire frame work is to be fixed by means of expansion bolts to the brick pillars with necessary drilling holes. the work includes providing two coats of enamel painting over one coat of red lead ready mix primer coat etc. complete cost of all labour, painting, erection charges using hoist pulley cranes etc. as per specification and drawings.	kg	525.89			
2.7.1	Steel work in 50mm x 50mm (for normal partitions) built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete in Electric resistance or induction butt welded tubes grouted and bolted to the floor	Kg	3,821.25			
2.7.2	Non -asbestos multipurpose cement board reinforced with cellulose fibre manufactured through autoclaving process (high pressure steam cured) as per IS 14862 with suitable fibre cement screw. 8 mm thick	Sqm	329.93			
2.8.1	Providing and fixing European type wall hung white water closet of Paryware / Hindware with push valve concealed type with cover plate 32mm size of JAQUAR MAKE SERIES FLV1095 including soil pipe ,vent pipe up to outside face of wall ,100mm dia. G.I. plug bend inlet pipe all fittings, cutting& making good walls, floors etc. complete. As directed by Engineer In charge	Each	16.00			
2.8.2	Providing and fixing CP brass toilet paper holder	Each	16.00			
2.8.3	Providing and fixing 15 mm diameter PVC Aqua kraft type Supreme make or equivalent make super jet spray with flange 2 in 1 faucet 1.50 metre long including all accessories etc. complete As Directed By Engineer In charge	Each	16.00			
2.8.4	Providing and fixing trap of self cleansing design with screwed down or	Each	24.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors : Sand cast iron S&S as per IS: 3989.					
2.8.5	Providing and fixing 15 mm diameter PVC Aqua kraft type Supreme make or equivalent make super right angle stop tap with flange including all accessories etc. complete As Directed By Engineer In charge	Each	1.00			
2.8.6	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require : White Vitreous China Wash basin size 550x400 mm with a pair of 15 mm C.P. brass pillar taps.	Each	14.00			
2.8.7	Providing and fixing PTMT Bottle Trap for Wash basin and sink. Bottle trap 38mm single piece moulded with height of 270mm, effective length of tail pipe 260mm from the centre of the waste coupling 77mm breadth with 25mm minimum water seal, weighing not less than 263gms.	Each	14.00			
2.8.8	Providing and fixing PTMT liquid soap container 109mm wide, 125mm high and 112mm distance from wall of standard shape with bracket of the same materials with snap fittings of approved quality and colour. weighing not less than 105 gms.	Each	14.00			
2.8.9	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing : Rectangular shape 1500x450 mm	Each	7.00			
2.8.10	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS 13983 with C.I. brackets and stainless steel plug 40 mm including painting of fittings and brackets, cutting and making good the walls wherever required : Kitchen sink with drain board; 510x1040 mm bowl depth 250mm.	Each	2.00			
2.8.11	Providing and fixing 15 mm diameter PVC Aqua kraft type Supreme make or equivalent make super wall sink type tap with flange including all accessories etc. complete As Directed By Engineer In charge	Each	2.00			
2.8.12	Providing and fixing PTMT stop cock of approved quality and colour. 20mm nominal bore, 89mm long. Weighing not less than 88 gms.	Each	8.00			
2.8.13	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (6 to 7mm thick) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge	Sq.m	313.74			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	in skirting, risers of steps and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with pigment of matching shade complete.					
2.8.14	Providing and fixing 16mm thick gang saw cut mirror polished pre moulded and prepolished) machine cut for kitchen platforms, vanity counters, window sills , facia and similar locations of required size of approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) with joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edge to give high gloss finish etc. complete at all levels Area of slab over 0.50 sqm.	Sq.m	15.67			
2.8.15	Extra for providing full edge moulding to 16mm thick marble stone counters, Vanities etc. including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer in-Charge.	meter	41.19			
2.8.16	Extra for fixing marble /granite stone over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based adhesive including cleaning etc. complete.	meter	4.12			
2.8.17	Extra for providing opening of required size & shape for wash basins/ kitchen sink in kitchen platform, vanity counters and similar location in marble/Granite/stone work including necessary holes for pillar taps etc. including rubbing and polishing of cut edges etc. complete.	Each	2.00			
2.8.18	Providing and fixing cramps of required size & shape in RCC/ CC backing with cement mortar 1:2 (1 cement :2 coarse sand) including drilling necessary hole in stones and embedding the cramp in the hole (fastener to be paid separately). Stainless steel cramps.	kg	9.30			
2.8.19	Providing and fixing expansion hold fasteners on C.C. /R.C.C. surface backing including drilling necessary holes and the cost of bolt etc. complete. Fastener with threaded dia 12 mm.	Each	4.00			
2.8.20	Providing and fixing white vitreous china flat back half stall urinal of size 580x380x350mm with white PVC automatic flushing cistern, with fittings, standard size C.P. brass flush pipe, spreaders with unions and clamps (all in C.P. brass) with waste fitting as per IS : 2556, C.I. trap with outlet grating and other couplings in C.P. brass including painting of fittings and cutting and making good the walls and floors wherever required : Single half stall	Each	6.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	urinal with 5 litre P.V.C. automatic flushing cistern.					
2.8.21	Providing and fixing of SS Urinal divider panel 12 to 18 mm 0.5mx0.8m wall mounted; complete with bracket and supports	Each	9.00			
2.8.22	Providing and fixing PTMT urinal cock of approved quality and colour. 15 mm nominal bore, 80mm long. 42 mm high and 30mm wide with BSP female threads weighing not less than 48 gms.	Each	6.00			
2.8.23	Providing and fixing PTMT 15 mm Urinal spreader size 95x69x100 mm with 1/2" BSP thread and shapes. Weighing not less than 60 gms.	Each	6.00			
2.8.24	Providing and fixing cold rolled pre-painted steel partitions of IS standards, made out of 0.6mm of deep drawing quality galvanised on both sides 120gms/Sq.m. Primer coated upto 5 microns with thermosetting epoxy resin and finish painted with a polyester based paint 20 microns thick. The size of profiles is 46X52mm for external frame, section for mullion or transom is of size 46x70mm and section for fixing glass/board is of 18x31mm. The section should be cut to length joint mitred and assembling by means of corner brackets made out of cold rolled cold annealed strips of 1.2mm thick duly galvanised and fixed with nickel plated self tapping screws. 5mm thick glass should be fixed with EPDM gaskets. 10mm thick pre-laminated particle board shall be fixed with the help of the clipping bead. The above frames are fixed to the concrete / masonry walls and floors by means of self expanding screws.	Sq.m	69.99			
2.9.1	Khamira Colour Washing for Interior Walls as per old traditional practice to prepare the Khamira the lime should be slaked at least for 7-10 days and regularly it should be stirred by adding cured, Gugal, for no synthetic colour adding gum (babool gum) as per specification. Then applying prepared solution on walls three to four thin coats as desired finishing.	Sq.m	5,017.28			
2.9.2	Providing and applying of Eco Friendly Water Based Exterior Texture Paint, formulated with siloxanic resin and quartz powder with a maximum grain size of 0.3mm, having UV resistant, Anti-fungal, Antimould, Anti-algal, water repellent and vapor permeability properties, suitable for green building application applied one or two coat of siloxanic base texture paint on one coat of appropriate exterior primer of approved color and shade to achieve desired finish on smooth putty surface but approved color and shade to achieve desired finish on smooth putty surface but excluding the cost of surface	Sq.m	2,552.00			

Sl. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	preparation with putty and scaffolding apply by brush, roller, trowel and spray gun, as per manufacturer specification with the direction of Engineer-in-Charge.					
2.9.3	Two or more coats of French spirit polishing on new works including a coat of wood filler	Sq.m	349.20			
2.9.4	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work on steel and metal works	Sq.m	21.20			
3.1.1	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for Light Point/Fan Points: Short point	Each	100.00			
3.1.2	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for Light Point/Fan Points: Medium point	Each	250.00			
3.1.3	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for Light Point/Fan Points: Long point	Each	718.00			
3.1.4	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for 3 Pin 6 Amp socket outlet on Separate Board; Medium point	Each	40.00			
3.1.5	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm.	Each	80.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for 3 Pin 6 Amp socket outlet on Separate Board; Long point					
3.1.6	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for Call Bell / Buzzer Points; Long point	Each	4.00			
3.1.7	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for Twin Control light points; Medium point	Each	10.00			
3.1.8	Point wiring including metallic switch box, sheet, switches, socket, lamp holders/ceiling roses etc. with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI Marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting, etc. as required as per specification for Twin Control light points; Long point	Each	10.00			
3.1.9	Point wiring including metallic switch box, sheet, switches, socket for 3 pin 6 Amp. Socket outlet point with 1.5 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel conduit ISI marked of suitable size and 1.5 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit with required materials as per specification on same board	Each	11.00			
3.1.10	Point wiring including metallic switch box, sheet for 3 Pin 16 Amp. Socket Outlet Point With 4 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in Surface rigid Steel Conduit ISI Marked of suitable size including painting etc. with 16 Amp. Switch & Socket / S.S. Combined 16 Amp. of ISI Marked and 4 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit as per specification On Separate Board for Long Point	Each	2.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
3.1.11	Point wiring including metallic switch box, sheet for 3 Pin 16 Amp. Socket Outlet Point With 4 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in Surface rigid Steel Conduit ISI Marked of suitable size including painting etc. with 16 Amp. Switch & Socket / S.S. Combined 16 Amp. of ISI Marked and 4 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit as per specification On Separate Board for Extra Long -I	Each	7.00			
3.1.12	Point wiring including metallic switch box, sheet for 3 Pin 16 Amp. Socket Outlet Point With 4 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in Surface rigid Steel Conduit ISI Marked of suitable size including painting etc. with 16 Amp. Switch & Socket / S.S. Combined 16 Amp. of ISI Marked and 4 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit as per specification On Separate Board for Extra Long -II	Each	30.00			
3.1.13	Point wiring including metallic switch box, sheet for 3 Pin 16 Amp. Socket Outlet Point With 4 Sq. mm. PVC insulated cable FR with copper multi strand conductor ISI marked in Surface rigid Steel Conduit ISI Marked of suitable size including painting etc. with 16 Amp. Switch & Socket / S.S. Combined 16 Amp. of ISI Marked and 4 Sq. mm. PVC insulated copper earth continuity conductor of green colour inside conduit as per specification On Separate Board for Extra Long -III	Each	9.00			
3.1.14	Suppling and drawing following pair,0.5 Sq. mm PVC Insulated copper conductor unarmoured telephone cable in existing surface / concealed ,steel / PVC Conduit as required. 4 Pair (from source Telephone points)	meter	1,080.00			
3.1.15	Suppling and drawing Co-axial T.V. Cable RG-6 Grade , 0.7 mm Solid Copper conductor PE Insulated , Shielded with fine tined copper braid and protected with PVC Sheath in the existing surface / concealed ,steel / PVC. Conduit as required. (from source to TV points)	meter	420.00			
3.1.16	Wiring for sub-mains with PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel ISI marked conduit of suitable size(conduit included) including connection painting etc. ,as required as per specification 3 WIRE SUB MAIN: 2.5 sq. mm cable in 20 mm conduit (from SPNDB to Switch Boards)	meter	2,415.00			
3.1.17	Wiring for sub-mains with PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel ISI marked conduit of suitable	meter	105.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	size(conduit included) including connection painting etc. ,as required as per specification 3 WIRE SUB MAIN: 4.0 sq. mm cable in 20 mm conduit (from VTPNDB to SPNDB)					
3.1.18	Wiring for sub-mains with PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid steel ISI marked conduit of suitable size(conduit included) including connection painting etc. ,as required as per specification 3 WIRE SUB MAIN: 6.0 sq. mm cable in 25 mm conduit (from VTPNDB to SPNDB)	meter	80.00			
3.1.19	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required: Telephone socket outlet	Each	18.00			
3.1.20	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required: TV antenna socket outlet	Each	7.00			
3.1.21	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required: 5A USB socket outlet	Each	4.00			
3.1.22	Providing and Fixing floor socket box in brushed steel finish with pop up push and slide locking mechanism; Two 6A power socket and 2 LAN socket provision in each; Flushed mounted in concrete screed floor. Make: Legrand or equivalent	Each	17.00			
3.1.23	Suppling and fixing of approved make step type Modular electronic, Fan regulator single/double module including connection etc. as required on existing board upto 120 watt	Each	41.00			
3.1.24	Installation, testing and commissioning of wall bracket /ceiling fittings of all sizes and shapes containing upto two GLS/CFL/ LED lamps per fitting, complete with all accessories including connections etc. as required.	Each	451.00			
3.1.25	Supplying and fixing as per specification Call bell / buzzer of approved make with necessary materials complete. Remote/cordless bell	Each	4.00			
3.1.26	Supplying and fixing as per specification Call bell indicator 230 Volt A.C. of approved make with necessary materials complete. with 8 way Indicator	Each	2.00			
3.1.27	Supplying and fixing of multi core round HRFR / FR PVC insulated copper (flexible) conductor & PVC sheathed cables 1100 Volts as per IS:694-1990 of approved make; (23/.0076) Three core	meter	150.00			
3.1.28	Supplying and fixing as per specification Caution / Danger Board as required of approved make & design with necessary material complete. Small Size	Each	6.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
3.1.29	Installation, testing and commissioning of pre-wired, fluorescent fitting / compact fluorescent fitting of all types, complete with all accessories and tube/lamp etc. directly on ceiling/ wall, including connections with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and earthing etc. as required.	Each	21.00			
3.1.30	Supplying, erection and testing of approved make electric Ceiling fan of double ball bearing complete with standard down rod, canopy, hanging shackle, Aluminium blades, without regulator, A.C. 230-250 volts including connections with all necessary material complete as required confirming to IS :374/1979 with upto date amendments. Ceiling Fan (Energy Saver 50 W)-1200 mm Sweep	Each	41.00			
3.1.31	Supplying and fixing of Delux fresh air fan with louvers (ventilating fan) with self closing louvers of decorative PVC blades mounting square frame of approved make complete with all necessary material as required. Dia: 250 mm	Each	8.00			
3.1.32	Extra for fixing the louvers/ shutters complete with frame for a exhaust fan of all sizes.	Each	8.00			
3.1.33	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required. 3 run of cable	meter	314.00			
3.1.34	Supply of approved make powder coated sheet steel encloser SPN MCB DB inclusive of Busbar, Neutral bar, Earth bar & two earth terminals etc. complete as per IS:13032(exclusive of MCB & isolator)- 12 way double door (for SPNDB)	Each	4.00			
3.1.35	Labour charges for fixing sheet steel enclosures, MCB DB surface mounting type, as per accepted practice on 25x25x 5 mm angle iron clamp, including supplying and fixing of clamps duly embedded in wall, cable connection etc. complete :-	Each	4.00			
3.1.36	Supplying of ISI Marked and accepted standard of Miniature Circuit Breaker (MCB) of 'C' series suitable for 240/415 Volts, 50 Cycle , 10 kA Value AC supply confirming to IS : 8828 : 1996, IEC : 60898 :2002 but without enclosures SINGLE POLE & NEUTRAL(SPN); 6 Amp to 32 Amp Rating (inside SPNDB)	Each	96.00			
3.1.37	Fixing of MCB / Isolator SP/DP in sheet steel enclosure as required as per accepted practice, including mounting on busbar and cable connection etc. complete (Labour only)	Each	96.00			
3.1.38	Supplying of MCB Isolators suitable for 240/415 Volts, 50 Hz AC supply with KA value rating 10 kA of approved make confirming to IS :13947-Part III : 1993 &	Each	4.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	IEC :60947- 3:2001 (without enclosures) DOUBLE POLE 63 Amps. :- (inside SPNDB)					
3.1.39	Supplying of approved make Vertical TPN MCB DB Metal Double Door with provision for FP CB/Isolator/RCCB/RCBO as incomer and SP/TP MCBs as outgoing inclusive of Busbar, Neutral bar, Earth bar & two earth terminals etc. complete as per IS:13032(exclusive of MCB & isolator) 4 way (8+12) (for VTPNDB)	Each	4.00			
3.1.40	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required. (inside VTPNDB): 100 A, 16 kA, TPMCCB	Each	5.00			
3.1.41	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required. (inside VTPNDB): 125 A, 16 kA, TPMCCB	Each	4.00			
3.1.42	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required. (inside VTPNDB): 250 A, 25 kA, TPMCCB	Each	3.00			
3.1.43	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size in the existing RCC/ HUME/ METAL pipe as required of 240 sq.mm (from Main Busbar to VTPNDB)	meter	238.00			
3.1.44	Supplying HDPE pipes conforming to IS 4984:1995 with latest amendments and conveying to work site including loading and unloading at both destination and rolling, lowering into trenches, laying true to line and jointing of pipes and specials (excluding cost of specials) of 90mm dia of PN16 grade (from Main Busbar to VTPNDB)	meter	238.00			
3.1.45	Supplying, installation, testing & commissioning of following capacity Plug In/ tap off box on the existing Air Insulated Compact Type bus trunking/ rising mains for use on 3 phase 4 wire 415 V, 50Hz A.C. supply made with 1.6mm thick sheet steel enclosure (IP54) duly powder coated with provision of MCCB (but without MCCB) complete etc. as required 630 A, Isc = 50 kA for 1 second (Main Busbar Panel)	Each	1.00			
3.1.46	Supplying of ISI Marked and approved make of Moulded Case Circuit Breaker	Each	1.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	(MCCB) suitable for 3 phase,3 pole, 50 Hz, 415 Volts, AC supply with respective interrupting capacity (KA) at 415 Volts cited against their range standard conforming to IS - 8828 (Main Busbar Panel) MCCB with Breaking Capacity 35 KA at 415 V; Current Rating -250 Amps & Adjustable: 70% - 100% thermal & 5-10 times magnetic setting					
3.1.47	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required (Main Busbar Panel); 250 A, 35 kA, TPMCCB	Each	1.00			
3.1.48	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required (Main Busbar Panel); 150 A, 16 kA, TPMCCB	Each	1.00			
3.1.49	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required (Main Busbar Panel); 125 A, 16 kA, TPMCCB	Each	1.00			
3.1.50	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required (Main Busbar Panel); 100 A, 16 kA, TPMCCB	Each	2.00			
3.1.51	Supply, installation, testing and commissioning of 630A, 415V 4 Pole Onload Automatic Changeover Switch of approved brand and quality	Each	1.00			
3.1.52	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required. Incoming 800 A, 50 kA, TPMCCB (between Transformer and Busbar)	Each	1.00			
3.1.53	Supply of XLPE Insulated power cable (conforming IS-7098) 1100 Volt grade/Heavy duty power cable conforming to IS 1554-1100 Volts grade , 2 core /3½ core/4 core ISI MARKED with Alu. Stranded /solid conductor; ARMOURED 3½ CORE; 120 Sq.mm.(XLPE) (from Pole to Transformer)	meter	20.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
3.1.54	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 kV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required. Of 3 core 120 sq.mm (from Pole to Transformer)	meter	20.00			
3.1.55	Supply of XLPE Insulated power cable (conforming IS-7098) 1100 Volt grade/Heavy duty power cable conforming to IS 1554-1100 Volts grade , 2 core /3½ core/4 MARKED with Alu. Stranded /solid conductor; ARMoured 3½ CORE; 400 Sq.mm.(XLPE) (from Transformer to Busbar)	meter	25.00			
3.1.56	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 kV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required. Of 3.5 core 400 sq.mm (from Transformer to Busbar)	meter	25.00			
3.1.57	Supplying and fixing heavy duty cable gland for P.V.C. insulated armoured cable with brass washer, Rubber ring complete erected with cable and lead connection etc. as per specification complete. 3½ X 240 sq. mm (62mm) Gland Size 70mm 3 x 240 Sq.mm (from Main Busbar to VTPNDB)	Each	8.00			
3.1.58	Providing and erecting epoxy resin end termination/joint for low tension P.V.C./XPLE insulated cable of 1100 Volt grade complete with cable jointing compound, Harner, Plastic mould adhesive cum solvent epoxy putty, spacer, tapes etc. as per I.S. specification 8438. 1977 for cable duty erected on existing pole/support/switch gears and connection to supply for all core cable as under. id/od epoxy resin end termination 150-300 sqmm2 / 3 / 3½ / 4core (from Main Busbar to VTPNDB)	Each	8.00			
3.1.59	Supplying and fixing ferrules. (Aluminium in Line connector) As per IS - specification suitable for following size of cable with Aluminium stranded/solid conductor evenly cramped with high pressure tool including connection as required complete. 240.00 Sq.mm (from Main Busbar to VTPNDB)	Each	8.00			
3.1.60	Supply and making Heat shr. jointing . kit 1.1 kV XLPE/HD cable straight through jointing. Kit complete with all accessories including lugs etc. (I.D../O.D.) 120-240 sqmm 2 / 3 / 3½ / 4core (from Main Busbar to VTPNDB)	Each	8.00			
3.1.61	Supply and making cable end termination with all necessary materials including lugs etc. Heat shr. jointing . kit 1.1 kV XLPE/HD cable I.D. termination 350-500 sqmm 2 / 3 / 3½ / 4core (from Main Busbar to Transformer)	Each	2.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
3.1.62	Supply and making cable end termination with all necessary materials including lugs etc. Heat shr. jointing . kit 1.1 kV XLPE/HD cable O.D. termination 350-500 sqmm 2 / 3 / 3½ / 4core (from Main Busbar to Transformer)	Each	2.00			
3.1.63	Straight through cable jointing kit including compound, hardener, plastic mould with other accessories for the following aluminium conductor PVC insulated and PVC sheathed cable//XLPE of 1.1 kV grade:(I.D./O.D.) 400-500 sqmm 2 / 3 / 3½ / 4core (from Main Busbar to Transformer)	Each	2.00			
3.1.64	Supply and making Heat shr. jointing . kit 1.1 kV XLPE/HD cable straight through jointing. Kit complete with all accessories including lugs etc. (I.D../O.D.) 400-500 sqmm 2 / 3 / 3½ / 4core (from Main Busbar to Transformer)	Each	2.00			
3.1.65	Providing Task Lighting 70mm wide suspended with die cast aluminium end caps. Luminaire to be LED 48W along with set of 2 single steel wire suspensions with ceiling fixtures. Make: Philips, Osram, Havells or equivalent	Each	54.00			
3.1.66	Providing IP 20 grade Aluminium Die cast 580mm dia Suspended Down Lighter with reflector Luminaire to be LED 25W along with set of suspension system with ceiling fixtures. Make: Philips, Osram, Havells or equivalent	Each	21.00			
3.1.67	Providing Motion Sensor Lights surface mounted with detection distance of 16 mts with LED 7W. Make: Philips, Osram, Havells or equivalent	Each	18.00			
3.1.68	Supplying of LED PVC Square Batten with high quality diffuser with Life of 25000 burning hours and 70% lumen maintenance with CRI>80. Power Input: 220-240V @ 50Hz and Power factor>0.9 along with CE approved drivers, 5 years warranty against manufacturing defect working under standard electrical condition; LED light 4 feet-28 watts	Each	21.00			
3.1.69	Providing Wall Mounted IP 44 Grade up/down Light with built-in 3W LED. Make: Philips, Osram, Havells or equivalent	Each	121.00			
3.1.70	Providing IP 67 Grade waterproof 3 to 5 W floor recessed Light upto depth of 10mm with LED Driver. Make: Philips, Osram, Havells or equivalent	Each	135.00			
3.1.71	Providing 9W round track light with inbuilt driver; Size 70x130 ; CRI: More than 85; Beam Angle: 60 deg; Lumens: 1300; Make: Philips, Osram, Havells or equivalent	Each	49.00			
3.1.72	Providing ceiling mounted track line powder coated in black finish; cross section 32x38mm with groove for electrical wiring and mounting light. Length 3m	Each	36.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
3.1.73	Providing 12W wall mounted LED focus light with adjustable head; Heavy duty aluminium body with in-built driver.	Each	123.00			
3.1.74	Providing floor base mounted 30W LED focus light with adjustable head. Heavy duty aluminium body with in-built driver.	Each	36.00			
3.1.75	Providing 125mm high, metal accent up-light to be mounted in ceiling cove; capable of twisting on one axis. Make: Philips, Osram, Havells or equivalent	Each	22.00			
3.2.1	Supplying, fixing, testing and commissioning of 12 core Fibre Optic Cable with PE outer sheath, corrugated steel tape, water blocking tape/yarn, loose tube fibre, rip cord. Cable OD of 12.5mm, Operation temperature range - 60 deg C to + 70 deg C, Max. tensile load Short term: 2700N, long term: 800N, Crush resistance 2200 N/10cm and Minimal installation bending radius 15 OD	meter	89.20			
3.2.2	OFC 4 CORE UNARMoured SINGLE MODE Single Mode Fibre Optic cable	meter	2,500.00			
3.3.1	Design, Engineering, Procurement, manufacturing, testing, supply to Site, installation & commissioning of the VRV HVAC systems as per tender Specifications for Air Conditioning. The capacity of the system shall be 2x12 HP comprising of outdoor units, ducting, heat exchanger, indoor units, refrigerant piping circuit, safety devices, thermostats, centralized type remote controller, etc. complete including all mechanical, civil works and electrical works. Rates to include all the items required for satisfactory commissioning as per specification enclosed and any other item specifically not mentioned here but required for completion of the job in all respects. The job would also include dismantling of brick masonry, stone masonry at places where ever required for the entry of the branch ducts from the main duct. Rectifying the same after laying of the duct to the satisfaction of the engineer in charge. Job to include removal/cutting of the stone, dismantling the brick work/concrete rectifying the same after taking the duct inside. Rates to include all the modifications in the wall required for the completion of the job complete in all respects. The system is a modular system, with number of indoors connected to centrally located outdoor units. The outdoor units for all the system shall be air cooled type. All the VRF air conditioners shall be fully factory assembled, wired, internally piped & tested. The outdoor unit shall be pre-charged with first charge of refrigerant. Additional charge shall be added as per refrigerant piping at site. All the units shall be suitable for operation with 415	Each	2.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	<p>V +/- 10%, 50 Hz + 3%, 3 Phase supply for outdoor units; & 220 V +/- 10%, 50 Hz +/- 3%, 1 Phase supply for indoor units.</p> <p>Outdoor units: Outdoors units of the VRV system shall be compact air cooled type. The outdoor unit should comprise of Inverter controlled Twin Rotary Compressor / Scroll Compressor Each module of outdoor unit must have at least 50 % of Variable compressor which can work on Part load Suitable to operate at heat load proportional to indoor requirement. The ODU must deliver COP of minimum 4.7 at 50 % load. The outdoor units must be suitable for up to 225 m refrigerant piping between outdoor unit & the farthest indoor units. Allowable level difference between outdoor unit & indoor units shall be 50 m in case of outdoor unit on top & 40 m in case of outdoor unit at bottom. Allowable level difference between various indoor units connected to one out door unit shall be up to 15 m. The outdoor units shall be suitable to operate within an ambient temperature range of 5 Deg C to 43 Deg C in cooling mode; & -20 Deg C to 15 Deg C in heating mode. The entire operation of outdoor units shall be through independent remotes of indoor units. No separate Start/ Stop function shall be required. Starter for the Outdoor Unit compressor shall be —Direct on Linell type. Inverter compressor of the unit shall start first & at the minimum frequency, to reduce the inrush current during starting. Complete refrigerant circuit, oil balancing/ equalizing circuit shall be factory assembled & tested.</p> <p>Indoor units: The units include pre-filter, fan section and DX coil section. The housing of units shall be light weight powder coated galvanized steel. Units shall have external casing of ABS Plastic for supply and return air.</p> <p>4 Way Cassette type indoor units : These units shall be installed between the bottom of finished slab & top of false ceiling. Unit shall have provision of connecting fresh air without any special chamber & without increasing the total height of the unit (320 mm maximum). The unit must have in built drain pump, suitable for vertical lift of 750 mm. Unit must be insulated with sound absorbing thermal insulation material, Polyurethane foam. The sound pressure level of unit at the highest operating level shall not exceed 46 dB The unit must have drain pump kit if. The drain pump must be suitable to lift drain up to 1000 mm from the bottom of the unit.</p> <p>4 Way Compact Cassette type indoor units: The compact cassette unit should</p>					

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	<p>perfectly fit into ceilings and match the standard architectural modules, without the need to cut ceiling tiles. The flaps fold tightly against the ceiling when operation stops so that the ceiling is affected only slightly even if air conditioning is installed. Designed for simple & easy installation and maintenance. It should be slim in design only 268 mm in height even when an electrical box is located inside the unit. The unit must have drain pump kit if. The drain pump must be suitable to lift drain up to 1000 mm from the bottom of the unit.</p> <p>Concealed duct type units: These units shall be ceiling suspended with suitable supports to take care of operating weight of the unit, without causing any excessive vibration & noise. The cold air supplied by these units will be supplied to the area to be air conditioned, through duct system specified in the tender. Each indoor unit must have electronic expansion valve operated by microprocessor thermostat based temperature control to deliver cooling/ heating as per the heat load of the room. The Sound Pressure level of unit at the highest operating level shall not exceed 38 dB (A), at a vertical distance of 1.5 m below the units with duct connected to the unit. The unit must have provision of adding drain pump kit if required & specified. The drain pump must be suitable to lift drain up to 1000 mm from the bottom of the unit.</p> <p>Wall Mounted Units: Wall mounted units must be compact & stylish design that does not detract from the décor of the room. Each indoor unit must have electronic expansion valve operated by microprocessor thermostat based temperature control to deliver cooling/ heating as per the heat load of the room. The unit must have provision of adding drain pump kit if required & specified. The drain pump must be suitable to lift drain up to 1000 mm from the bottom of the unit. The sound pressure level of unit at the highest operating level shall not exceed 46 dB(A). Refrigerant control in the indoor unit shall be through Electronic Expansion Valve.</p> <p>Installation: The units shall be mounted on ribbed rubber pads for vibration isolation. The contractor shall supply the required charge of refrigerant, lubricant and other consumables, for commissioning and testing of the equipment. All the equipment shall be thoroughly tested and checked for leaks. All safety controls shall be suitably set and a record of all setting shall be furnished to the project supervisor. Providing and fixing M.S. structural support for condensing unit</p>					

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	<p>with vibration isolator pad in-between support and structure and vibration isolation suspender and pads for evaporating units shall be in scope of contractor.</p> <p>Painting: Shop coats of paint that have become marred during transportation or erection shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with enamel paint to match the finish over the adjoining shop- painted surfaces.</p> <p>Condensate Drain Piping: All pipes to be used for condensate drain shall be PVC pipe conforming to IS: 4985 - Class I & all joints should be Gluing or solvent cementing as per manufacturer recommendation.</p> <p>Refrigerant Piping: All refrigerant pipes and fittings shall be type 'L' hard drawn copper tubes and wrought copper fitting suitable for connection with silver solder. The copper thickness of wall shall be 20G/ 22G(0.7 to 1mm). All joints in copper piping shall be swaged joints using low temperature brazing and/ or silver solder. Before jointing any copper pipe or fittings, its interior shall be thoroughly cleaned by passing a clean cloth via wire or cable through its entire length. The piping shall be continuously kept clean of dirt etc. while construction of the joints. Subsequently, it shall be thoroughly blown out using nitrogen. Refrigerant lines shall be sized to limit pressure drop between evaporator and condensing unit to less than 0.2 kg per Sq.cm. After the refrigerant piping installation has been completed the refrigerant piping system shall be pressure tested using, Freon mixed with nitrogen at a pressure of 20 Kg per Sq. cm. (High side) and 10 Kg per Sq. cm (Low side). Pressure shall be maintained on the system for 24 hours. The system shall then be evacuated to a minimum vacuum of 70 cm. of mercury and held for 24 hours, during which time; change in vacuum shall not exceed 12 cm of mercury. All refrigerant piping shall be installed strictly as per the instructions and recommendations of air conditioning equipment manufacturers.</p> <p>Power Supply: Power supply near the indoor unit will be provided by the department with suitable 6A plug point socket & switch. However, where the power requirement is of central control from ODUs, as per the design of the system, the entire power supply then shall be done by the contractor.</p>					
4.1.1	Supply and fixing of ABC Powder based MAP 50, 4Kg Fire Extinguisher Mono Ammonium Phosphate Powder 50, Stored Pressure Type, Pressure Gauge,	Each	6.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	Gross Weight 6.9 Kg, empty weight 2.9 Kg, Can Height 440MM, Diameter 140MM, Discharge Time less than 13 Secs, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Range minimum 4 meters, applicable on Class A,B,C and electrically started Fire, A Rating 2A, B Rating 21B, Can construction : Deep drawn & Co., Mig welded, valve Construction : Forging and Machining, Internal Coating of Can: Epoxy powder coating, External Coating of Can: Epoxy Polyester power coating, Sheet metal thickness: 1.60MM, Helium Leak Detection Tested, ISI and EN Approved, 5 years Warranty with instalert system with Superior quality EPDM Rubber Hosepipe etc., complete					
4.1.2	Supply and fixing Fire Extinguisher Monnex powder 4kg Stored Pressure Type, Pressure Gauge, Gross Weight 7.4Kg, empty weight 3.4 Kg, Can Height 480 MM, Diameter 160 MM, Discharge Time less than 13 Secs, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Range minimum 4 meters, Can construction : Deep drawn & Co., Mig welded, valve Construction : Forging and Machining, Internal Coating of Can: Epoxy powder coating, External Coating of Can: Epoxy Polyester power coating, Sheet metal thickness: 1.60 MM, 5 years warranty. with instalert system with Superior quality EPDM N Rubber Hosepipe etc., complete	Each	6.00			
4.1.3	Providing and fixing of Fire Extinguisher for Lite metal fires SPM-TEC Providing 4kg SPM-TEC Powder Based stored pressure type melting point at 600-650 degree C, Applicable on Class D metal fires in Magnesium, Aluminium, Zinc, Sodium Potassium, Francium, Lithium, Caesium, Pressure Gauge, Gross weight Gross Weight 6.9Kg, empty weight 2.9 Kg, Can Height 440 MM, Diameter 140 MM, Discharge Time less than 15 Secs, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Range minimum 4 meters, Can construction : Deep drawn & Co., Mig welded, valve Construction: Forging and Machining, Internal Coating of Can: Epoxy powder coating, External Coating of Can: Epoxy Polyester power coating, Sheet metal thickness: 1.60 MM, helium leak detection tested, EN approved, 5 years warranty with instalert system with Superior quality EPDM Rubber Hosepipe etc., complete	Each	6.00			
4.1.4	Providing and fixing of Fire Extinguisher for Heavy metal fires SPM-PYRO Providing 6Kg Powder Based stored pressure type melting point at 1200 degree C, Applicable on Class D metal fires in heavy metals, alkali metals and	Each	6.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	alloys Pressure Gauge, Gross weight Gross Weight 9.4Kg, empty weight 3.4 Kg, Can Height 480MM, Diameter 160 MM, Discharge Time less than 16 Secs, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Range minimum 4 meters, Can construction: Deep drawn & Co., Mig welded, valve Construction : Forging and Machining, Internal Coating of Can: Epoxy powder coating, External Coating of Can: Epoxy Polyester power coating, Sheet metal thickness: 1.60 MM, helium leak detection tested, EN approved, 5 years warranty with instalert system with Superior quality EPDM Rubber Hosepipe etc., complete					
4.1.5	Providing and fixing of Fire Extinguisher Clean Agent HCFC 123 Providing 6Kg Stored Pressure Type, Pressure Gauge, Gross Weight 9.4kg. empty weight 3.4 kg Can Height 480MM, Diameter 160 MM, Discharge Time less than 13 Secs, Controllable discharge mechanism (Squeeze grip with easy snap safety seal), Range minimum 4 Meters, applicable on Class A,B,C and electrically started Fire, A Rating 2A, B Rating 21B Can Construction; Deep drawn & CO, Mig welded, Valve Construction: Forging & Machining, Internal Coating of Can : Epoxy Powder coating, External Coating of Can : Epoxy Polyester Powder coating, Sheet metal thickness: 1.60MM, Helium Leak Detection Tested, EN Approved, 5 years warranty with instalert system with Superior quality EPDM Rubber Hosepipe etc., complete	Each	6.00			
4.1.6	Providing CO2 Aluminium - 4.5kg Providing 4.5Kg CO2 Gas Type aluminium body Squeeze grip Fire Extinguisher, Trolley Mounted, Easy Weight Management, Used Unused Mechanism, Squeeze Grip, Gross Weight 11.16Kg. empty Weight 6.66Kg. Can Height 860MM Diameter 140MM, Discharge Time less than10 Secs, Controllable discharge mechanism, Applicable on Class B&C Fire, B Rating 13B, Can Construction : Cold Impact Extrusion, Valve Construction : Forging & Machining, Internal Coating of Can : Not Applicable, External coating of Can : Spray Painting, Aluminium metal ISO & PESO Approved, 3 Year Warranty. complete	Each	6.00			
4.1.7	Providing and fixing of Wireless Smoke Detection Control Panel - 28 Wireless Zone, 2 Hardwired Zone, Tamper Alert, passcode protected, RF Jamming recognition, diagnition, diagnostic feature for RF signal strength between panel and each detector, event reporting using PSTN Telephone line, dialling upto 4 telephone numbers, event reporting as per users choice,	Each	1.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	remote control using telephone line, LCD Screen Display, Intuitive graphic and audible user interphase, Two Way voice interaction, Battery Backup stand by time upto 12 hrs. complete					
4.1.8	Providing and fixing of Smoke Detector Smoke Detector - Fully Supervised Smoke Detector, Photoelectric detection technology for superior detection sensitivity, sound and transmitted alerts for smoke, tamper and low battery, works on power code protocol, easy programming and enrolling to the control panel, Long life 9 volt alkaline or lithium battery simple ceiling mount installation with separate installation bracket. complete	Each	57.00			
4.1.9	Providing and fixing of External Wireless Siren Strobe- a fully supervised Power Code "outdoor (IP55) wireless siren and strobe light, Designed for external installation, Wire free connection between control panel and siren, Convenient and rapid no-mess installation, Separate fire alarm signals, 98 db Piezo siren and high power strobe light, Weather-resistant IP55, Two-way communication for local & remote diagnostic, Plug-in power supply, NIMH rechargeable back up battery, Transmits status, tamper, low battery, supervisor and AC loss messages to the control panel, Tristate tamper switch identifies screw manipulation removal of cover or prying from the wall complete	Each	1.00			
4.1.10	Providing and fixing of Escape Singage for Walls/Floors: Photo luminescent rigid plastic, 2 mm thickness, Printed on High Quality glass paint with UV resistance, 5 years warranty, Material Used - Non Radioactive, non-phosphorous, non toxic and lead free. Available in different types & sizes, Time after removing the light source (in minutes) : 60 minutes, Luminescent intensity (milicandelas * per square meter - mcd/sqm) : 30 mcd/sqm. Luminescent Intensity greater than 0.32 mcd/sqm, Period of Light Decay* (In Minutes) :3100	Sq.cm	2,200.00			
4.1.11	Providing and fixing of Evacuation Plan (Price for 10 + unit): Photo luminescent rigid plastic, 2 mm thickness, Printed on High Quality glass paint with UV resistance, 5 years warranty, Material Used - Non Radioactive, non-phosphorous, non toxic and lead free. Available in different types & sizes, Time after removing the light source (in minutes) : 60 minutes, Luminescent intensity (milicandelas * per square meter - mcd/sqm) : 30 mcd/sqm. Luminescent Intensity greater than 0.32 mcd/sqm, Period of Light Decay* (In Minutes) :3100	Sq.cm	3,745.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
4.1.12	Supplying, Installing testing and commissioning electrically driven jockey pump of capacity 180.0 Lpm at 70.0m. Head with all the necessary accessories viz. Pressure gauges etc., operating on 3Ph 50Hz, 400/440V AC supply including foundation, bolts etc. complete, Control panel shall be per specification stated in Item No.87. (Cost of control panel is not included)	Each	2.00			
4.1.13	FIRE HYDRANT SYSTEM Supplying Installing, testing and commissioning of 63mm mm dia single headed Gun mental Hydrant Valve with flanged inlet, stop valve, spindle and cast iron hand wheel. It has a female instantaneous outlet with Blank Cap and is Hydrostatically tested to 21 Kgf/cm ² pressure having a flow rate of 900 LPM at 7 Kgf/cm ² of pressure with blank cap and wheel as per IS 5290 etc. complete	Each	6.00			
4.1.14	Supplying Installing, testing and commissioning of Gun metal AIR RELEASE VALVE SIZE OF 25mm dia complete	Each	6.00			
4.1.15	Supplying Installing, testing and commissioning of Reinforced Rubber Lined RRL Fire hose of 63mm dia 15m length as per IS 8423 binded with one set of male and Female Instantaneous Gun metal coupling as per IS 903	Each	6.00			
4.1.16	Supplying Installing, testing and commissioning of Hose cabinet made out of 18 gauge M.S. sheet with double glass door with locking arrangement and painted with two coats of Fire red Enamel paint at outer side of the Box and two coats of white enamel paint at inner side of the box is to accommodated 2 Nos. of Fire hose box size 20"x24"x10" complete	Each	6.00			
4.1.17	Supplying Installing, testing and commissioning of Hose reel cabin M.S. Pressed reel of 600mm dia swinging type motion which allows a 180° swing and conforms to IS:884/85.	Each	6.00			
4.1.18	Supplying Installing, testing and commissioning of 19mm dia 36.50m length hose with rubber lining smooth bore, reinforced of natural/ synthetic fibres, a rubber cover finish shall be smooth, fluted or fabric marked with minimum thickness of 1.50mm and to with stand a working pressure of 10Kgf/sqcm confirms & tested as per IS 444	meter	219.00			
4.1.19	Supply, Installation testing and commissioning of approved make heavy tubes (Class 'C') confirming to as per IS1239 Part - I (25mm Nominal bore 4.05mm thick @ 2.97 Kg/m, 32mm Nominal bore 4.05mm thick @ 3.84 Kg/m, 40mm Nominal bore 4.05mm thick @ 4.43 Kg/m, 50mm Nominal bore 4.47mm thick @ 6.17 Kg/m, 65mm Nominal bore 4.47mm thick @ 7.90	meter	181.50			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	Kg/m, 80mm Nominal bore 4.85mm thick @ 10.10 Kg/m, 100mm Nominal bore 5.40mm thick @ 14.40 Kg/m, 150mm Nominal bore 5.40mm thick @ 21.20 Kg/m, Such as Tees elbows check nuts unions, Flanger, Nipples etc. including cutting welding, Trending fixing on walls, ceiling (Using 41-Tech pipe/M.S. angle supports work includes two coats of metal primer and two coats of Red enamel paint etc.in Galvanized Iron Pipes 100 mm dia. complete					
4.1.20	Supplying of four bucket stand along with buckets. Complete	Set	2.00			
4.1.21	Supplying of Hand gloves. Complete	Pair	4.00			
4.1.22	Supplying of first aid box. Complete	Each	2.00			
4.1.23	Supplying of SAFETY MASK. Complete	Each	4.00			
4.1.24	Supplying of FIRST AID CHART with lamination. Complete	Each	2.00			
5.1.1	Storage Unit - wooden - One side laminate: Providing and fixing wooden storage unit one side laminate with 18 mm PLY/PLPB with edge bound for body, 18mm PLY/PLPB with openable shutters and individual locking system for shutter, 9 mm PLY with edge bound for rear portion with Hafele fitting hinges, Hafele locks, Minifix assembly, screw legs, Handles and tower bolt. complete as per specifications, drawings and as directed by Engineer in charge PLY STORAGE 900 mm W X 430 mm D X 750 mm	Each	27.00			
5.1.2	Storage Unit - wooden - One side laminate: Providing and fixing wooden storage unit one side laminate with 18 mm PLY/PLPB with edge bound for body, 18mm PLY/PLPB with openable shutters and individual locking system for shutter, 9 mm PLY with edge bound for rear portion with Hafele fitting hinges, Hafele locks, Minifix assembly, screw legs, Handles and tower bolt. complete as per specifications, drawings and as directed by Engineer in charge PLY STORAGE 900 mm W X 430 mm D X 2100 mm Ht	Each	6.00			
5.1.3	Providing reception counter of 0.45m width and 0.75m high in 20mm ply board carcass; with storage space below and all necessary connections for desktops and other equipment. Visitor counter to be 0.3m width at 0.9m height. Finish: Moulded seamless solid surface.	metre	10.70			
5.1.4	FREE STANDING TABLE FOR CABIN - WITHOUT FRAMES Providing and fixing Free Standing Table for Cabin-without frames consisting of 25 mm thick PLPB table top , 25 mm thick PLPB with edge bonded End table, 18 mm thick PLPB with edge bonded Modesty, Wire manager -ABS plastic grommet one number per table Hardware-Minifix assembly and screw	No.	20.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	leg., as per specifications, drawings and as directed by Engineer in charge 1200 mm W x 600mm D x 750 mm ht (Edge binding table top)					
5.1.5	Providing and Fixing in position modular Under Counter Storage comprising 19mm thk marine ply, 19mm thk marine block shutter, drawers, 1.5 mm thk approved Laminate to all external surfaces, 1 mm thk approved laminate to internal surfaces including necessary hardware, fittings & fixtures like hinges, Drawer Channel, handle, approved adhesive, melamine polish to all exposed surfaces etc. complete as per detail drawing, as specified and as directed by Engineer-in-charge.	Sq.m	34.74			
5.1.6	Providing and Fixing in position Modular Over head Storage Unit comprising 19mm thk Carcase of marine ply, 6mm thk marine ply for back, 19mm thk marine block board shutter, 12mm thk glass shelves with machine polished edges, 4mm thk approved Veneer to all external surfaces, 1 mm thk approved laminate to internal surfaces including necessary hardware, fittings & fixtures like hinges, Handle, Shutter Stopper, Locks, approved adhesive, melamine polish to all exposed surfaces etc. complete as per detail drawing, as specified and as directed by Engineer-in-charge.	Sq.m	2.80			
5.1.7	Supply & installation of Free standing Desk based furniture of specified size as per approved Natural veneer finish with PU coating & design/mock-up/drawing & as per manufacturers specification/standard range. MAIN TOP - 30mm thk Ext. Grade MDF Board with Reverse Waterfall Edging finished by 4mm thk PU coated natural veneer/wooden edges and balanced with 1mm thk laminate - 2200x800 mm Side Credenza with Return Top - 30mm thk Ext. Grade MDF Board with Reverse Waterfall Edging finished by 4mm thk PU coated natural veneer/wooden edges and balanced with 1mm thk laminate - 1200 x 600 mm; Back Credenza TOP - 30mm thk MDF/High Density Board with Reverse Waterfall Edging - 2200 x 600 mm; Under Structure in polished aluminium with polished base Caster Based Pedestal below main table top of approved finish in PU coated 22mm thk veneered Ext. Grade MDF board having three drawers with handles. Hardware like locks, double rail are of HAFELE/HETICH or Equivalent make - 450W X 500D X 700 H Fixed Cabinet below side runner in approved finish in PU coated 22mm thk veneered Ext. Grade MDF board having two drawers with handles in half of the portion & open shelf file storage for other half. Hardware like locks, double	No.	6.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	rail are of HAFELE/HETICH or Equivalent make - 1200 W X 500D X 720 H; Fixed Cabinet below back runner top in approved finish in PU coated 22mm thk veneered Ext. Grade MDF board having two drawers with handles in half of the portion & open shelf file storage for other half. Hardware like locks, double rail are of HAFELE/HETICH or Equivalent make - 2200 W X 500D X 720 H; Data & Cable management Plastic VC Riser manufactured from nylon, POM and ABS for strength and durability MS Powder coated fixed to the bottom of the table having vertical motion, swivel motion, sliding motion and width adjustment for CPU; 2100mm (W)x 2600 mm (D) X 750 mm high Main Table With Veneer finish					
5.1.8	Meeting table -wooden : Providing and fixing meeting table consisting of 25 mm thick PLPB table top edge bounded, 25 mm thick PLPB with edge bonded End table,18 mm thick PLPB with edge bonded Modesty, Hardware-Minifix assembly and screw leg., as per specifications, drawings and as directed by Engineer in charge 1500 mm Dia X900 mm D X 750 mm Ht (6 seater)	No.	5.00			
5.1.9	Meeting table -wooden : Providing and fixing meeting table consisting of 25 mm thick PLPB table top edge bounded, 25 mm thick PLPB with edge bonded End table,18 mm thick PLPB with edge bonded Modesty, Hardware-Minifix assembly and screw leg., as per specifications, drawings and as directed by Engineer in charge 2400 mm Dia X1200 mm D X 750 mm Ht (12 seater)	No.	3.00			
5.1.10	Providing and fixing low height display units 1.2m length and varying width from 0.6m to 0.9m, 0.75 m high storage shelves in aluminium frame with ply board base (0.3 m) and a glass enclosure (0.45 m) on top with glass shelves and lift top frameless cover, 10mm toughened glass panel. Finish: Laminate on base and matching PVC edging. The skirting to be ply latticed structure filled for supporting the weight of the structure complete with hinges, handles and locks.	No.	23.00			
5.1.11	Providing and fixing wall hung bathroom 0.6m wide wash basin counter with a fascia and sides of 0.45m in 25mm thick BWR ply carcass supported on wall with dash fasteners. Finish: Moulded seamless solid surface countertop , front and sides with cutting for basin and bottle trap fixed in water level as per the satisfaction of the Engineer-in-Charge	metre	15.30			
5.1.12	Supply & installation of Free standing Wall side Laboratory Workstations with 30mm thk Ext, Grade MDF Board with Reverse Waterfall Edging of approved	metre	5.00			

Sl. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	design/mock-up/drawing & as per manufacturers specification/standard range. Under structure with 1.2mm GI cabinet with powder coted finish. 4000 Wx600 mm D (size to be verify on site)					
5.2.1	Meeting table -wooden : Providing and fixing meeting table consisting of 25 mm thick PLPB table top edge bounded, 25 mm thick PLPB with edge bonded End table,18 mm thick PLPB with edge bonded Modesty, Hardware-Minifix assembly and screw leg., as per specifications, drawings and as directed by Engineer in charge 1500 mm Dia X900 mm D X 750 mm Ht (6 seater)	No.	5.00			
5.2.2	Meeting table -wooden : Providing and fixing meeting table consisting of 25 mm thick PLPB table top edge bounded, 25 mm thick PLPB with edge bonded End table,18 mm thick PLPB with edge bonded Modesty, Hardware-Minifix assembly and screw leg., as per specifications, drawings and as directed by Engineer in charge 2400 mm Dia X1200 mm D X 750 mm Ht (12 seater)	No.	3.00			
5.2.3	Providing High back executive chair (450x570mm) with 360 degree swivel, posture control with multilocking position Synchronized Mechanism; Tilt Tension Adjustment; 100 mm Adjustable arm from 95 to 110 mm having four directional adjustment with PU padded; Aluminium Die Cast Chrome finish with Nylon Twin Caster Wheels Minimum 5 Nos, of 60 to 70 mm diameter pedestal base; Backrest has adjustable Lumber Support; Pressed and moulded plywood with poly propylene back cover on seat and back; Seat finish: Foam laminated Mesh Fabric	No.	4.00			
5.2.4	Providing Medium Back Chair with Castors – P.U material for noiseless movement. Base – Nylon Base. Hydraulic gas lift with height adjustment. Arm rest – P.P arm rest with foam padding and composite leather cover. Composite leather seat with cut foam.	No.	12.00			
5.2.5	Providing office chair with 360 degree swivel, posture control with multilocking position Synchronized Mechanism; Adjustable arm from 95 to 110 mm having four directional adjustment with PU padded; Aluminium Die Cast Chrome finish with Nylon Twin Caster Wheels Minimum 5 Nos, of 60 to 70 mm diameter pedestal base; High Backrest with symmetrical lumber support; Seat material: polyurethane foam covered with mesh fabric; Foam laminated Mesh Fabric seat cover; Seat 550x470 mm	No.	42.00			
5.2.6	Providing vintage looking hardwood legs and armrest L shaped 4 seater sofa upholstered with high density foam cushioned seats in 20 mm ply board and seasoned solid wood frame. Finish: chenille fabric	No.	12.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
5.2.7	COMFORT - THREE SEATER SOFA Upholstered with fabric and high density polyurethane foam seat. Teak wood frame. Mild steel chrome plated / Wooden legs. Design as approved by Engineer-in-charge	No.	1.00			
5.2.8	COMFORT - SINGLE SEATER SOFA: Upholstered with fabric and high density polyurethane foam seat. Teak wood frame. Mild steel chrome plated / Wooden legs. Design as approved by Engineer-in-charge	No.	30.00			
5.2.9	Providing 0.45x0.35x0.45m (LxBxH) side table in natural polished seasoned sheesham wood with four legs and top in tapered and rounded table top edge	No.	3.00			
5.2.10	Providing 0.9x0.5x0.75m (LxBxH) coffee table in natural polished seasoned sheesham wooden table with four legs and top in tapered and rounded table top edge.	No.	12.00			
5.2.11	Revolving circular 450mm dia hydraulic chair; 110 mm Height Adjustment; 850 mm Overall Chair Height; Glass Fibre Nylon With minimum 5 Nos ABS/Nylon Twin Caster wheels Pedestal Base; 50 mm thk Polyurethane Foam Used In Seat	No.	7.00			
5.2.12	Providing puffs with high density foam cushioned seats and hardwood legs . Finish: chenille fabric	No.	7.00			
5.2.13	Providing display case with 25mm thick commercial ply board base with black veneer 250mmx250mm ; 10mm thick non reflective laminated safety glass with two inner films glass enclosure of 300mm height on top for medium sized museum displays. Edge with wooden beading groove to fit the glass enclosure and linear slim locking provision	No.	8.00			
5.2.14	Providing 12 mm HDF rigid heavy base for museum display. Box of 0.6x0.6 (LxW) and 0.3m height fixed in tapered edge with no edges visible. Filled with waffle type HDF boards structure inside for support and rigidity.	No.	9.00			
5.2.15	Providing and fixing tapered MDF shelves on display boards for text labels. Fixing with rawl plugs shelf fitting in cement board.	metre	43.20			
5.2.16	Providing and installing auditorium push back recliner chair; Width from chair arm rest to arm rest: 22inch; Height of the chair: 38inch- 42 inch; Armrest (Handle) : Plastic or PU; Leg : Chair leg will be fixed 3-5 mm M.S Sheet ; Inner material : Moulded PU; Inner structure : Wooden Frame or Iron Frame in Seat Back.; Spring : Coil Spring for Push Back Mechanism; Sliding Mechanism : Roller & Ball Cage arrangement for Sliding Mechanism without any disturbing noise; Push Back Mechanism	No.	30.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	: 14gauge and 16 gauge; Upholstery : Fabric of approved design & quality.					
6.1.1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge. All kinds of soil	Cu.m	155.30			
6.1.2	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete. Moorum/Hard Copra	Cu.m	142.99			
6.1.3	Providing and laying in position cement concrete for PCC beds of specified grade excluding the cost of centering and shuttering - All work up to plinth level : Cement Concrete grade M-15 (nominal mix) with 20mm maximum size of stone aggregate	Cu.m	10.22			
6.1.4	Providing and laying in position cement concrete for PCC Footing of specified grade excluding the cost of centering and shuttering - All work up to plinth level : Cement Concrete grade M-20 (nominal mix) with 20mm maximum size of stone aggregate	Cu.m	10.37			
6.1.5	Centering and shuttering including strutting, propping etc. and removal of form work for : Foundations, footings, bases for columns	Sq.m	19.97			
6.1.6	Centering and shuttering including strutting, propping etc. and removal of form work for : Columns, piers, abutments, pillars, posts and struts	Sq.m	341.11			
6.1.7	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cu.m	42.67			
6.1.8	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement : Cement Concrete Grade M-20 (nominal mix) with 20mm maximum size of stone aggregate	Cu.m	38.02			
6.1.9	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases up to floor two level excluding the cost of centering, shuttering, finishing and reinforcement with Cement concrete grade M-20 (Nominal Mix with	Cu.m	10.50			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	20 mm maximum size of stone aggregate					
6.1.10	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more	Kg	14,590.96			
6.1.11	Smooth finishing of the exposed surface of R.C.C. work with 6 mm thick cement mortar 1:3 (1 Cement : 3 fine sand).	Sq.m	176.57			
6.1.12	Providing and fixing hand rail of approved size by welding etc. to steel ladder railing, balcony railing, staircase railing and similar works, including applying priming coat of approved steel primer. E.R.W. tubes	Kg	137.90			
6.2.1	Steel work in built up tubular in rectangular hollow tubes etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete in Electric resistance or induction butt welded tubes	Kg	329.97			
6.2.2	Supply, installation, erection, fixing, testing and commissioning of Machine Roomless and Gearless Frequency Control Drive System 5 Passenger Automatic Lift for shaft size of 1.8m x 2.0m with front opening. The installation should include supply of stainless steel interior lift car finish, smooth and silent energy efficient mechanism, wear resistant SS and glass operating panel equipped with touch screen buttons and floor indicators, complete with all traction systems, fittings, fixtures, including required civil and mechanical works and making it good, etc. for a minimum 5 year warranty and on site maintenance services. As per the specification section of this bidding document.	Each	1.00			
6.2.3	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required. In stringers, treads, landings etc. of stair cases, including use of chequered plate wherever required, all complete	Kg	129.53			
6.2.4	Making plinth protection 50mm thick of Cement concrete grade M10 (Nominal Mix with 20 mm maximum size of stone aggregate) over 75mm bed by dry brick ballast 40mm nominal size well rammed and consolidated and grouted with fine sand including finishing the top smooth.	Sq.m	5.70			
6.2.5	Finishing walls with Acrylic Smooth exterior paint of required shade. New work (Two or more coat applied @ 1.67 litre/10 sqm over and including base coat of water proofing cement paint applied @ 2.20 kg/ 10 sqm).	Sq.m	73.99			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
6.2.6	Extra for applying water proofing cement paint as primer, applied @ 2.2 kg/ 10 sqm, instead of primer for exterior finishing	Sq.m	73.99			
6.2.7	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 litre/ 10 sqm over an under coat of primer applied @ 0.80 litre/ 10 sqm of approved brand and manufacture	Kg	16.61			
6.3.1	Steel work in built up tubular in circular hollow tubes etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete in Electric resistance or induction butt welded tubes	Kg	11,838.00			
6.3.2	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete:	Kg	847.80			
6.3.3	Providing corrugated Galvanised sheet roofing including vertical/curved surface fixed with polymer coated J or L hooks, bolts and nuts 8mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in horizontal/vertical or curved surfaces) excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required. 1.00mm thick with zinc coating not less than 275gm/m ²	Sq.m	10.00			
6.3.4	Providing and fixing of approved quality of weather proof, fire retardant, water proof, sound proof 8mm thick flexible plywood of 8"X4" (2440 mm x 1220 mm) flexible plywood. sheet, easily bent by hand with bend radius less than 25mm ideal for tight radius work in long or cross grain appropriate for stained, painted, plastered, veneered or given any other finish, confirming to BWP grade as per IS: 710 (1976). Complete with all fixtures and fittings including hoisting on desired surface of desired shape and size and complete fixing to the steel sections, trusses, etc.	Sq.m	584.75			
6.3.5	Providing and fixing of 1.0 mm thick Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process sheets conforming to IS 277 : 2003 Complete with all fixtures and fittings including, cutting, on site profiling, hoisting on desired surface of desired shape and size and complete fixing to the steel sections, trusses, etc. of approved quality, texture and colour	Sq.m	320.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
6.3.6	Providing and fixing of 5mm thick High Density Soundproof Membrane of following specifications: of minimum size : 4m x 1.22m; Extreme soundproofing 25db; Density: 2000 kg/m ³ ; high Pliability at -20°C; Tensile strength 30 N/cm ² ; Elongation 300%; Crushing strength 4.84 kg/cm ² ; Weight 10 kg/m ² ; High acoustic insulation, combined with flexion-pliable elements (sheet plaster, carrier board); Flexible High elongation capacity; Easy to handle and adaptable to uneven surfaces; Hot and cold-resistant. Self-extinguishing; Excellent ageing-resistance; Rot-proof complete with all fixtures and fittings including, cutting, on site profiling, hoisting, pasting/gluing on desired surface of desired shape and size and complete fixing to the steel sections, trusses, walls, false ceilings, etc. of approved make and quality or of Texsa Tecsound or equivalent product	Sq.m	264.75			
6.3.7	Supply, installation, erection, and of fixing of PTFE Teflon coated woven fibre glass acoustical and projection lining membrane of minimum 9mm thickness with minimum specifications: fire retardant/flame resistant, self cleaning, heat shield type, high sound absorbent, nominal weight 0.33 kg/Sq.m, nominal thickness of 0.35 mm, with minimum average breaking strength 66 kg/cm, minimum average trapezoidal tear 15 kg, etc. Complete with all fixtures and fittings including, cutting, on site profiling, hoisting, fixing, pasting/gluing on desired surface of desired shape and size and complete fixing to the steel sections, trusses, walls, false ceilings, etc. of approved make and quality	Sq.m	264.75			
6.3.8	Brick work with chimney brick of class designation 40 in superstructure above plinth level upto floor 2 level including the cost of scaffolding in : Cement mortar 1:4 (1 cement : 4 coarse sand)	Cu.m	44.83			
6.3.9	Providing and laying of cement mortar in flooring Cement mortar 1:2 (1 cement : 2 fine sand).	Cu.m	19.47			
6.3.10	Providing and laying of anti static acoustic linoleum flooring of 3.5mm nominal thickness with static charge less than 2 Kv; slip resistance; fire rated; with impact sound reduction characteristics; Castor chair resistance; Residual indentation; Colour fastness; Chemical resistance, Bacteriostatic properties. Complete with laying and tightening and gluing on the prepared base with uPVC liners, battens, etc. with complete fixtures and fittings. Colour, quality, texture and other features approved by the Engineer in Charge	Sq.m	108.17			
6.3.11	Coursed rubble masonry (first sort) with hard stone in foundation and plinth with	Cu.m	24.12			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	: Cement mortar 1:6 (1 cement : 6 coarse sand)					
6.3.12	Extra for coursed rubble masonry with hard stone (first or second sort) in superstructure above floor 2 level for every floors or part thereof	Cu.m	40.70			
6.3.13	Pointing on stone work with cement mortar 1:3 (1 cement: 3 fine sand) Flush/ Ruled pointing	Sq.m	67.84			
6.3.14	Cement plaster 1:3(1 cement : coarse sand) finished with coat of neat cement 20 mm cement plaster	Sq.m	67.84			
6.3.15	Stone work (machine cut edges) for wall lining etc. (vener work) backing filled with a grout of 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand) including pointing in white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade : (To be secured to the backing by means of cramps which shall be paid for separately) 40 mm thick Red sand stone - exposed face fine dressed with rough backing.	Sq.m	194.36			
6.3.16	Supply and fixing on existing walls with 600mm x 600mm x 50mm thick Pyramid Shaped Sound Proofing Acoustical Foam Panels complying to nominal specifications: High rate of sound-absorption and insulation; Compact structure ,stable form ,light weight and safe construction Eco-Friendly Product; Noise reduction coefficient: 95; Excellent echo reduction 3D pyramid pattern; Light weight, open cell polyurethane foam complete with all fixtures and fittings, colour texture and quality approved by the engineer in charge	Sq.m	67.84			
7.1.1	Earth work in surface excavation not exceeding 30 cm in depth but exceeding 1.5 m in width as well as 10 sqm on plan including getting out and disposal of excavated earth upto 50 m and lift upto 1.5 m, as directed by Engineer-in-Charge: All kinds of soil	Sq.m	637.85			
7.1.2	Excavating trenches of required width for pipes, cables, etc. including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m: All kinds of soil Pipes, cables etc. exceeding 300 mm dia but not exceeding 600 mm	meter	241.20			
7.1.3	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete. Moorum/Hard Copra	Cu.m	92.90			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
7.1.4	Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti-termite treatment (excluding the cost of chemical emulsion) : Along the external wall below concrete or masonry apron using chemical emulsion @ 2.25 litres per linear metre including drilling and plugging holes etc.: With Chlorpyriphos/ Lindane E.C. 20% with 1% concentration	meter	119.00			
7.1.5	Supplying chemical emulsion in sealed containers including delivery as specified. Chlorpyriphos/ Lindane emulsifiable concentrate of 20%	Litre	119.00			
7.2.1	Providing and laying cement concrete in kerbs, steps and the like at or near ground level excluding the cost of centering, shuttering and finishing. 1:1½:3 (1 Cement: 1½ coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cu.m	25.83			
7.2.2	Brick work with well burnt chimney bricks in bulls patent trench kiln ,crushing strength not less than 25kg /sqcm and water absorption not more than 20% in foundation and plinth Cement mortar 1:4 (1 cement : 4 coarse sand) (for toe walls)	Cu.m	29.17			
7.2.3	Brick work with chimney brick of class designation 40 in superstructure above plinth level upto floor 2 level including the cost of scaffolding in : Cement mortar 1:6(1 cement : 6 coarse sand)	Cu.m	20.87			
7.2.4	Providing and fixing at or near ground level precast cement concrete in kerbs, edgings etc. as per approved pattern and setting in position with cement mortar 1:3 (1 Cement : 3 coarse sand), including the cost of required centering, shuttering complete. 1:1½:3 (1 Cement: 1½ coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size). (u drains)	Cu.m	3.36			
7.2.5	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required. In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	Kg	290.78			
7.2.6	40 mm thick rubbed stone local flagstone flooring over 20 mm (average) thick base of cement mortar 1:5 (1 cement : 5 coarse sand) with joints 3 mm thick, side buttered with cement mortar 1:2 (1 cement : 2 stone dust) admixed with pigment to match the shade of stone and pointing with same mortar. in white sandstone	Sq.m	244.10			
7.2.7	40 mm thick fine dressed stone flooring over 20 mm (average) thick base of cement mortar 1:5 (1 cement : 5 coarse sand) with joints finished flush. (on existing steps and well platforms)	Sq.m	148.72			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
7.3.1	Providing, fixing, installation, testing and commissioning of solar bollard light As per MNRE specification for Solar Photovoltaic Lighting Systems & Power Packs for - WHITE - LED (W-LED) Based Solar Lighting with Batten type Luminary; 12000 Volts Sealed maintenance free Lead acid Battery; Ceiling mounted 9 watt White light emitting diode (W-LED); Light Output: 25 Lux; Crystalline silicon solar cells; PV Module Certification for humidity, freeze and damp heat tests certificate conforming to IEC 61215 Edition II / BIS 14286 from an NABL or IECQ accredited laboratory; 5 Years Warranty For Solar Home Lighting System; 25 Years Warranty For Pv Module; 2 Years Warranty For Battery	Each	20.00			
7.3.2	Providing, fixing, installation, testing and commissioning of head mounted solar panel sensor fitted 10W easy assemble solar lamp post of: assembly height of 68-inch lamp post in 3 pieces or a 79-inch lamp post in 4 pieces; 3-Inch OD Fitter post; built in decorative weather resistant and rust-resistant powder-coated cast aluminium; solar LED head mount with auto dawn to dusk operation; solar SMD LED light bulb with 10 year night operation (1,00,000 hours); efficient solar-powered technology with built-in Lithium-Ion batteries that charge daily by the sun, which at dusk turn on LED Light Bulb with 11 super-bright SMD LEDs; and pole mount lamp head manufactured in rust resistant, weather resistant powder-coated cast aluminium and bevelled glass panes of 22.5-inches in height. Complete with all fixture, fittings and on situ civil works.	Each	20.00			
7.3.3	Providing Integral type Cast Iron bench With arms and Backrest; Dimensions (LxBxH) 1500x700x400 mm; 20mm Mild Steel main frame, 12mm MS seat and backrest; Cast Iron Arms; 4 Legs; Black colour enamel Finish on all MS surfaces;	Each	4.00			
7.4.1	Supplying and stacking of good earth at site including royalty and carriage upto 5 km complete (earth measured in stacks will be reduced by 20% for payment).	Cu.m	27.84			
7.4.2	Supplying and stacking at site dump manure from approved source, including carriage upto 5 km complete (manure measured in stacks will be reduced by 8% for payment) : Screened through sieve of I.S. designation 4.75 m	Cu.m	27.84			
7.4.3	Spreading of sludge, dump manure and/or good earth in required thickness as per direction of officer-in-charge (cost of sludge, dump manure and/ or good earth to be paid separately)	Cu.m	27.84			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
7.4.4	Mixing earth and sludge or manure in the required proportion specified or directed by the Officer-in-charge	Cu.m	55.67			
7.4.5	Grassing with selection No. 1 grass including watering and maintenance of the lawn for 60 days or more till the grass forms a thick lawn, free from weeds and fit for mowing including supplying good earth, if needed (the grass and earth shall be paid for separately). With grass Turf	100 Sq.m	2.08			
7.4.6	Preparation of beds for hedging and shrubbery by excavating 60 cm deep and trenching the excavated base to a further depth of 30 cm, refilling the excavated earth after breaking clods and mixing with sludge or manure in the ratio of 8:1 (8 parts of stacked volume of earth after reduction by 20% : one part of stacked volume of sludge or manure after reduction by 8%), flooding with water, filling with earth if necessary, watering and finally fine dressing, leveling etc. including stacking and disposal of materials declared unserviceable and surplus earth by spreading and leveling as directed, within a lead of 50 m, lift up to 1.5 m complete (cost of sludge, manure or extra earth to be paid for separately)	Cu.m	4.43			
7.4.7	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20% : 1 part of stacked volume of manure after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any, with all leads and lifts (cost of manure, sludge or extra good earth if needed to be paid for separately) Holes 60 cm dia, and 60 cm deep:	Each	8.00			
7.4.8	Providing and Displaying of Wadelia trilobata plant, full of leaves in 15 cm size of Poly bags & as per direction of the officer-in-charge.	Each	200.00			
7.4.9	Providing Plant Marigold jaffri orange/yellow/Russet colour well developed with fresh & healthy foliage with 40 to 50 flowers in bloom specimen plant 60 to 75 cm ht in 25 cm Earthen Pot/Plastic Pot.	Each	40.00			
7.4.10	Providing Plant Daisy well developed with fresh & healthy foliage in full bloom in 20 cm Earthen Pot/Plastic Pot.	Each	10.00			
7.4.11	Providing Plant Geranium double variety having 30 cm ht., in different colour well developed with fresh & healthy foliage (3 in one) well bloomed in 25 cm Earthen Pot/Plastic Pot.	Each	5.00			
7.4.12	Supply and stacking of plant Hibiscus rosasinensis of height 90-105 cm., bushy in big size HDPE bag (for topiary hedge)	Each	5.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
7.4.13	Supply and stacking of Plumeria alba plant of height 165-180 cm. with 3-4 branches and thick stem in big size HDPE bags as per direction of the officer-in-charge	Each	8.00			
7.4.14	Plantation of Trees, Shrubs, and Hedge at site i/c watering and removal of unserviceable material's as per direction of officer in charge (excluding cast of plant & water) Tree Plant	Each	4.00			
8.1.1	Android Based Tablet integrated with Biometric Identification Device Housed in Rugged Casing; capacitive Touch Screen with 16 million colours; Screen Resolution (Pixel) 1024 x 600; 4GB Internal storage; 16GB Storage Expandability upto (Through micro SD Card); 0.3 Mega Pixel Front camera; 120 min Battery Backup; LAN(Ethernet) Interface only; Standard + Micro Both USB Cable Connectivity; 20 Queue Throughput (Number of people to mark attendance within one minute);4mm Thick Plastic Device Casing Material; IP 65 Ingress Protection Rating	No.	1.00			
8.1.2	Wall mounted 32 inch LED TV Resolution (Pixels): (1366 x 768) HD Ready; MEGA CONTRAST Static contrast Ratio (Min 1000:1); VGA, USB and HDMI port; Power cable, batteries, wall mount support; 3 year warranty; 65 watt power consumption; 4 star energy rating	No.	9.00			
8.1.3	Floor mounted with pedestal processor based media kiosk with 1.6mm mild steel enclosure; screw less chassis; 22 inches display screen; Antiglare & overlay tempered vandal resistant glass thickness - 3 mm; Capacitive Colour LED touch Screen; Screen Resolution 1920 x 1080 pixels; Dual Core or higher processor; 3.5 GHz Processor Speed; Window 10 Operating System (Pre-loaded); 8 GB Memory; 1000 GB HDD storage; I/O ports: VGA, USB 2.0, USB 3.0, Land, Audio In/Out, 90 Watt Max. Power Consumption	No.	1.00			
8.1.4	Floor mount thin client based vertical tall Computer Kiosk Intel Quad core /4gb Memory/500gb Hdd/Sub 2.0-4,Usb 3.0-2/With 21.5 Inch Display. 1.6mm thk Mild Steel Enclosure; Antiglare & overlay tempered vandal resistant glass thickness - 3 mm; Capacitive Colour LED touch Screen; Screen Resolution 1920 x 1080 pixels; Window 10 Operating System (Pre-loaded); 120 Watt Max. Power Consumption; VGA, LAN, Audio In/Out Ports;	No.	13.00			
8.1.5	Providing and installing interactive touchscreen LCD monitor ; Screen Size (Diagonal) - 65 Inch; Screen Type – Multi Touch; Panel Technology - Vertical Alignment (VA); Native Resolution - 1920 x 1080 (Full HD) Pixels; Static Contrast Ratio (Minimum)	No.	5.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	– 5000; Native Resolution: 1920 x 1080 (Full HD) Pixels; Aspect Ratio 16:9; Brightness 350 Nits; Viewing Angle (Horizontal: Vertical) 178:178 Degree; Response Time: 6.5 milli seconds; Inbuilt Speakers; Dimensions (L X B) 152.1x95.2 cm x cm; 3 Year Warranty with All Components, Attachments, Cabling, And Fixtures to Make The System Fully Operational. Make: Samsung, LG or equivalent					
8.1.6	Providing and installing data video wall panel with controller wall mount structure and required connectivity cable , 46 INCH x 4 NO TOTAL 92 INCH WITH MEDIA PLAYER WITH TOUCH INTERACTIVE PANNEL. Diagonal Screen Size - 2336 mm; Dimension(L x W x T) - 1171X734X277 mm x mm x mm; Horizontal Resolution - 0.53025 Pixel; Bazel Width - 3.4 mm; Response Time - 8 milli sec.; DVI-D I/O Port; HDMI Input Port; Analog RGB Input Port; Display Port (Input); External Control Interface RS232C in/out, RJ45; Availability Of Data Wall Controller (For Multi-screen Viewing); All Components, Attachments, Cabling, And Fixtures Which May Not Be Explicitly Specified In The Specifications, But Are Necessary To Complete The System Installation And Make The System Fully Operational, Shall Be Supplied Without Extra Cost.; BIS Registration As Per The Provision Ofs Of Gazette Of India Notification No. S.O. 2357(E) Dated 07/09/2012 Amended Upto Date, If Applicable; 3 years Warranty. Make: Samsung, LG or equivalent	No.	1.00			
8.1.7	Providing and installing 65 inch Large Format Display; LED Backlit; Screen Size (Diagonal) 67.5 - 69.5 cm; Panel Type Vertical Alignment (VA); Resolution 1920 x 1080 Pixels; Aspect Ratio 16 : 9; Brightness 350 Nits; Static Contrast Ratio (Min.) 600 : 1; Viewing Angle (Horizontal : Vertical) 178 : 178 Degree; Response Time: 5 millisecond; with Antiglare Coating, Split Screen Feature, Picture-in-Picture (PiP) Feature, Inbuilt Speakers, VGA Port, HDMI Port, DVI-D Port, Display Port, Mounting Arrangement, TCO Certification, 1 year warranty, 6 Energy Star Rating, Power Consumption In Operating Mode (Max.) 90W; Make: Samsung, LG or equivalent	No.	5.00			
8.1.8	Providing, installing, testing and commissioning of a virtual mirror (try on dresses) experience will computer kiosk Quad core /4gb Memory/500gb Hdd; Antiglare & overlay tempered vandal resistant glass thickness - 3 mm; Capacitive Colour LED touch Screen; Screen Resolution 1920 x 1080 pixels; 30- 42 inch display screen portrait	No.	1.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	mounted; with motion and gesture sensors; recording and providing live feedback, ability to send images over network; complete with necessary hardware, mounting installation and software.					
8.1.9	Providing, installing, testing and commissioning of a virtual mirror (try on jewellery) experience will computer kiosk Quad core /4gb Memory/500gb Hdd; Antiglare & overlay tempered vandal resistant glass thickness - 3 mm; Capacitive Colour LED touch Screen; Screen Resolution 1920 x 1080 pixels; 20- 22 inch display screen portrait mounted; with motion and gesture sensors; recording and providing live feedback, ability to send images over network; complete with necessary hardware, mounting installation and software.	No.	1.00			
8.1.10	Providing laptop Intel Core i3-7100U (2.4 GHz, 3 MB cache, 2 cores); 4 GB DDR4 RAM; 1TB HDD; NVIDIA 930MX Graphics; Preinstalled Windows 10 Professional Operating System	No.	12.00			
8.1.11	HD 180 Over-Ear Wired Headphones; intra-aural Ear coupling; Omnidirectional Pick-up pattern; Dimensions (L x W x D) 26.9 x 18.8 x 9.8 cm; 1 year On site OEM Warranty	No.	5.00			
8.1.12	Providing audio system with one sub woofer and two tower speaker with AUX, USB, Bluetooth input slots	No.	3.00			
8.1.13	Providing and installing a body tracking depth sensor with infrared emitter and infrared depth sensor; a multi array microphone and an RGB camera; 3-axis accelerometer complete with AV cabling and tracking mount	No.	6.00			
8.1.14	Providing VR headset with 1200x1080 resolution per eye; Refresh rate 90HZ; OLED Display; 110 degree field of view; Inbuilt mic and headphones; Hand held aim, touch and remote controller; complete with operating system SDK and software, cabling and adapter.	No.	2.00			
8.1.15	Providing and Installing Multimedia Short throw front projector; 3500 Brightness (Lumens); 1024 x 768 (XGA) Native Resolution; 110% Zoom; 4:3 Aspect Ratio; Automatic Keystone Correction; I/O Ports: HDMI/DVI, Analog RGB In/Out, USB, Wi fi, Audio In/ Out; 260 W Power Consumption in Normal Mode; Dimensions 296x120x221mm; 3 year ON Site OEM Warranty	No.	7.00			
8.1.16	Projector ceiling mount kit 4 feet with 15mts VGA and Power Cable.	No.	7.00			
8.1.17	Rack Server E5-2620 v4, 8 core x 2, 2.10 GHz with 20 MB smart cache memory, 85 watt Processor; 32 GB Memory; 32 GB DDR4 RAM Upgradable Upto 1536 GB; 2x1 TB GB HDD; Server Scalability To Be Achieved	No.	1.00			

Sl. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	Within The Box & Without Adding Nodes; single hot plug fans Server View Suite Software incl. Server View Installation Manager, Management Software und Tools; along with complete chassis and mounting installation.					
8.1.18	Digital Copier and Laser Printer With Separate Drum and Toner A3 Platen/Flatbed Size; 6144 RAM size (MB); 320 Hard Disk Capacity(GB); 60 Minimum Speed per Minute in A4 Size-Colour (PPM); 30 Minimum Speed per Minute in A3 Size-Colour(PPM); 300000 Duty Cycle/Month (Number of Prints)	No.	1.00			
8.1.19	Providing water dispenser with hot, cold, normal water options; Floor Mounted; 20 litres/hr. Cooling capacity; 10 litres/hr. Heating Capacity; Plastic Cabinet; copper cooling and Heating chambers;	No.	2.00			
8.1.20	Providing and installing DVR Recording Device; 4 Non-IP based Video input Channels for HVR; 4 Number of Video Input Channels; 1 Number of Video Output Channels; Plastic Housing construction; HD (1280 x 720) Recording Resolution complete with all installation equipment.	No.	1.00			
8.1.21	Providing compact audio guide; Body pack receiver; Easy to hang on belt; Hi tech, light weight, rechargeable lithium battery with 3 hours battery backup; 200m transmission distance from portable transmitter and 250m from stationary transmitter; multi unit charging case; 100 independent channels and earphone output.	No.	15.00			
8.1.22	Providing and installing periphery projection planetarium projector with Black Projection Technology with adjustable frame; Imager resolution: WQXGA 1600p (2560 x 1600 native); Contrast ratio 2,500,000 : 1 (static); Colour rendition 30 bit RGB (3 x 10 bit); Projection lens Zeiss Digigon 108 (2 channels) or equivalent; Dimensions: 513 x 621 x 540 mm (including lens); Power requirements: 110-127 V~ / 220-240 V~, 50/60 Hz max. 1000 W (3400 BtU/h); Resolution approx. 3k to 6k video; Edge blending: electronic. Make: Zeiss Powerdome Velvet or equivalent. 3 year on site warranty	No.	2.00			
8.1.23	Providing and installing central projection planetarium projector with combined fibre optic and LED lighting technology with control program; modular projection system with didactic functions; manual and fully automatic operation; 40-75% reflectivity; Integrated lift, lifting height: 530 mm; Azimuth rotation, unlimited and position able; Alphanumeric display (on dome edge); metallic anthracite / matt black projection instrument; Height, max./min.:	No.	1.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	2750 / 1725 mm; Diameter, substructure: 780 mm; complete with control panel; control computer; operating system and operating software. Providing in-depth training on the operation and management of the projection system. 3 year on site warranty					
8.1.24	<p>Providing and installing surround sound system for planetarium integrated with all part equipment. Loudspeakers: Full-Range-Driver Array; 4 x 4.5-inch full-range drivers for legendary reliability 120° x 60° Articulated design covers a very wide area; 73 Hz - 15 kHz Frequency Range; 119 dB Peak SPL for sound-reinforcement and foreground music; Rugged, lightweight enclosure with threaded inserts for easy installations</p> <p>Modular Bass Loudspeaker: 4 x 5.25" (133 mm) high-excursion woofer. Amplifier: Power levels matched to the most popular speakers used by entertainers; Optimized for maximum real-world headroom into 4- and 8-ohm speaker systems; Lightweight; Subwoofer/satellite built-in crossover Sound Processor: Real-time control, and the ability to program and store custom scenes; Simplified front panel LCD menus and controls; USB port Channel Mixing Console: 12-Channel Mixing Console; Max. 6 Mic / 12 Line Inputs (4 mono + 4 stereo); 2 GROUP Buses + 1 Stereo Bus; 2 AUX (incl. FX); 1-Knob compressors; Internal universal power supply; Metal chassis Assistive Listening System: T45 professional transmitter; Up to 1000' operating range; OLED display, push-button menus; Microprocessor controlled; Accommodates any number of listeners; Adjustable power output; Combo XLR, 0.25" TRS inputs</p> <p>All-In-One System: Dual-channel, high-performance UHF wireless system 1/4" audio cable, AC adapter and rackmount kit included</p> <p>Microphone: Condenser element; Cardioid Pickup Pattern; 20" gooseneck with flexible top and bottom; Internal Selectable Hi-pass filter; XLR connector; Flange-mount included Multistage windscreen; 9-52 Volt Phantom Power Operation Complete with 3 year on site warranty</p>	No.	1.00			
9.1.1	Human Resource deployment for content development including digital and physical content for all installations, media kiosk interaction and other information print media. Job: Design a holistic museum and planetarium experience. This position ensures that the museum visitor's experience is of the highest quality and fulfilment by	year	1.00			

SI. No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)	Amount in Words
	maintaining the scientific and aesthetic integrity of exhibits and dioramas. Provide appealing content for all digital screens/ kiosk for visitor interaction; Provide animated/ video/any other viewing format for all virtual reality medium in museum. Design and provide aesthetic placement/ framing all museum objects, artefacts and artwork. Provide print/ digital advertising for museum events, signage and museum collection labels. Provide and install museum collection information display boards. Provide any digital or printed content for planetarium over and above the pre installed sky/planet show with the control panel. Design and fabrication of museum dioramas and all 3D exhibit components.					
9.1.2	Providing and installing integrated software for kiosk display including portable USB license dongle; Multimedia content: Images, Photos, Videos and Audio; Customisable graphical user interface; flexible navigation structure; support for plugins; Deployment and content update; Multi language support; Support for multi touch gesture; Integration of cloud storage services complete with on-site manufacturers support.	per Kiosk	22.00			
9.1.3	Microsoft Office Professional 2016 For 1 Windows PC laptop- Lifetime license with Activation Key Card; fully installed versions of outlook, publisher, access, word, excel, PowerPoint, one note for each user	Users	12.00			

MATERIALS TO BE ISSUED BY THE DEPARTMENT

Not Applicable

Annexure – L

(See clause 21 of Section 2 of ITB)

LETTER OF ACCEPTANCE (LOA)

No.: _____

Date: _____

M/s. _____
(Name and address of the Contractor)

Subject: _____
(Name of the work as appearing in the bid for the work)

Dear Sir (s),

Your bid for the work mentioned above has been accepted on behalf of the [Name of Authority], at your bided offer as per scope of work given therein. You are requested to submit within 15 (Fifteen) days from the date of issue of this letter:

- a) The performance security/performance guarantee of Rs. _____ (in figures) Rupees _____ (in words only). The performance security shall be in the shape of term deposit receipt/ bank guarantee of any nationalized / schedule commercial bank.
- b) Sign the contract agreement.

Please note that the time allowed for carrying out the work as entered in the bid is 8 (eight) months including rainy season, shall be reckoned from the date of signing the contract agreement.

Signing the contract agreement shall be reckoned as intimation to commencement of work and no separate letter for commencement of work is required. Therefore, after signing of the agreement, you are directed to contact Engineer-in-charge for taking the possession of site and necessary instructions to start the work.

Yours faithfully,

EXECUTIVE ENGINEER

Annexure – M

(See clause 22 of Section 2 of ITB)

PERFORMANCE SECURITY

To,

(Name of Employer)

(Address of Employer)

WHEREAS _____ (name and address of the Contractor) (hereinafter called the “Contractor”) has undertaken, in pursuance of Letter of Acceptance No. _____ dated _____ to execute _____ (Name of Contract and brief description of Works) (hereinafter called the “Contract”).

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, upto a total of Rs. _____ [amount of Guarantee]* Rupees _____ (in words), such sum being payable in the types and proportions of currencies in which the contract price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of Rs. _____ [amount of Guarantee]* as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand. We also state that you are no way required to justify the demand raised to us.

We further agree that no change or addition to or other modification of the terms of the Contract of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until 3 (three) months from the date of expiry of the Defect Liability Period.

Signature, Name and Seal of the Guarantor

(Name of the Bank)

(Address, Phone No., Fax No., E-mail Address, of Signing Authority)

Date: _____

* An amount shall be inserted by the Guarantor, representing the percentage the Contract Price specified in the Contract including additional security for unbalanced Bids, if any and denominated in Indian Rupees.

SECTION - 3

CONDITIONS OF CONTRACT

Part – I: General Conditions of Contract [GCC]

Table of Clauses of GCC

Clause No.	Particulars	Clause No.	Particulars
	A. General	21	Payments for Variations and / or Extra Quantities
1	Definitions		
2	Interpretations and Documents	22	No compensation for alterations in or restriction of work to be carried out.
3	Language and Law	23	No Interest payable
4	Communications	24	Recovery from Contractors
5	Subcontracting	25	Tax
6	Personnel	26	Check Measurements
7	Force Majeure	27	Termination by Engineer in charge
8	Contractor's Risks	28	Payment upon Termination
9	Liability For Accidents To Person	29	Performance Security
10	Contractor to Construct the Works	30	Security Deposit
11	Discoveries	31	Price Adjustment
12	Dispute Resolution System	32	Mobilization and Construction Machinery Advance
	B. Time Control	33	Secured Advance
13	Programme	34	Payment certificates
14	Extension of Time		E. Finishing the Contract
15	Compensation for Delay	35	Completion Certificate
16	Contractor's Quoted percentage	36	Final Account
	C. Quality Control		F. Other Conditions of Contract
17	Tests	37	Currencies
18	Correction of Defects noticed	38	Labour
	D. Cost Control	39	Compliance with Labour Regulations Defect Liability Period
19	Variations - Change in original	40	Audit and Technical
20	Extra Items	41	Deaths and Permanent Invalidity of Specifications, Designs, Drawings etc. Contractor
		42	Jurisdiction

A. GENERAL

1. DEFINITIONS

- 1.1 "Bill of Quantities" means the priced and completed Bill of Quantities forming part of the Bid.
- 1.2 "Chief Executive Officer" means the executive officer as defined under the relevant section of the article of association;
- 1.3 "Completion" means completion of the work, as certified by the Engineer-in-Charge, in accordance with provisions of agreement.
- 1.4 "Contract" means the Contract between the Employer and the Contractor to execute, complete and/or maintain the work. Agreement is synonym of Contract and carries the same meaning wherever used.
- 1.5 "Contract Data Sheet" means the documents and other information which comprise of the Contract.
- 1.6 "Contractor" means a person or legal entity whose bid to carry out the work has been accepted by the Employer.
- 1.7 "Contractor's bid" means the completed bid document submitted by the Contractor to the Employer.
- 1.8 "Contract amount" means the amount of contract worked out on the basis of accepted bid.
- 1.9 "Completion of work" means completion of the entire contracted work. Exhaustion of quantity of any particular item mentioned in the bid document shall not imply completion of work or any component thereof.
- 1.10 "Day" means the calendar day.
- 1.11 "Defect" means any part of the work not completed in accordance with the specifications included in the contract.
- 1.12 "Drawings" means drawings including calculations and other information provided or approved by the Engineer-in-Charge.
- 1.13 "Department" means Gwalior Smart City Development Corporation Limited, Gwalior as the case may be.
- 1.14 "Employer" means the party as defined in the Contract Data, who employs the Contractor to carry out the work. The employer may delegate any or all functions to a person or body nominated by him for specified functions. The word Employer/Government/Department wherever used denote the Employer.
- 1.15 "Engineer" means the person named in contract data sheet.
- 1.16 "Engineer in charge" means the person named in the contract data.
- 1.17 "Equipment" means the Contractor's machinery and vehicles brought temporarily to the Site for execution of work.
- 1.18 "Executive Director" means the executive director of the Board as appointed under the provision of the article of association;
- 1.19 "Government" means Government of Madhya Pradesh.
- 1.20 "In Writing" means communicated in written form and delivered against receipt.
- 1.21 "Material" means all supplies including consumables used by the Contractor for incorporation in the work.
- 1.22 "Stipulated date of completion" means the date on which the Contractor is required to complete the work. The stipulated date is specified in the Contract Data.
- 1.23 "Specification" means the specification of the work included in the Contract and any modification or addition made or approved by the Engineer-in-Charge.
- 1.24 "Start Date" means the date 14 days after the signing of agreement for the work. However, the employer may extend this time limit by another 14 days, as and when required.
- 1.25 "Sub-Contractor" means a person or corporate body who has a Contract (duly authorized by the employer) with the Contractor to carry out a part of the construction work under the Contract.

1.26 "Temporary Work" means work designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the work.

1.27 "Tender/Bid, Tenderer/Bidder" are the synonyms and carry the same meaning where ever used.

1.28 "Variation "means any change in the work which is instructed or approved as variation under this contract. The maximum variation shall be permitted upto 20% of contract value.

1.29 "Work" the expression "work" or "works" where used in these conditions shall unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the work by virtue of contract, contracted to be executed, whether temporary or permanent and whether original, altered, substituted or additional.

1.30 "Work Plan" means the implementation plan, including phasing of works, physical completion milestones and other such details that the Employer shall seek from time to time with respect to tracking progress of the works.

2. INTERPRETATIONS AND DOCUMENTS

2.1 Interpretations: In the contract, except where the context requires otherwise:

- a. words indicating one gender include all genders;
- b. words indicating the singular also include the plural and vice versa.
- c. provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing;
- d. written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record;

2.2 Documents Forming Part of Contract:

1. NIT with all amendments.
2. Instructions to Bidders
3. Conditions of Contract:
 - i. Part I General Conditions of Contract and Contract Data; with all Annexures
 - ii. Part II Special Conditions of Contract.
4. Specifications
5. Drawings
6. Bill of Quantities
7. Technical and Financial Bid
8. Agreement
9. Any other document (s), as specified.

3. LANGUAGE AND LAW

The language of the Contract and the law governing the Contract are stated in the Contract Data.

4. COMMUNICATIONS

All certificates, notice or instruction to be given to the Contractor by Employer/Engineer shall be sent on the

address or contact details given by the Contractor in [Annexure H of ITB]. The address and contract details for communication with the Employer/Engineer shall be as per the details given in Contract Data Sheet. Communication between parties that are referred to in the conditions shall be in writing. The notice sent by facsimile (fax) or other electronic means (email) shall also be effective on confirmation of the transmission. The notice sent by registered post or speed post shall be effective on delivery or at the expiry of the normal delivery period as undertaken by the postal service. In case of any change in address for communication, the same shall be immediately notified to Engineer-in- Charge

5. SUBCONTRACTING

Subcontracting shall be permitted for contracts value more than amount specified in the Contract Data with following conditions.

- a. The Contractor may subcontract up to 25 percent of the contract price, only with and after the approval of the Employer in writing, but will not assign the Contract. Subcontracting shall not alter the Contractor's obligations.
- b. The following shall not form part of the sub-contracting:
 - i. hiring of labour through a labour Contractor,
 - ii. hiring of plant & machinery
 - iii. the purchase of Materials to be incorporated in the works
- c. The Sub-Contractor will have to be registered in the appropriate category in the centralized registration system for Contractors of the GoMP.

6. PERSONNEL

6.1 The Contractor shall employ for the construction work and routine maintenance the technical personnel as provided in the Annexure I-3 of Bid Data sheet, if applicable. If the Contractor fails to deploy required number of technical staff, recovery as specified in the Contract Data will be made from the Contractor.

6.2 If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within three days and has no further connection with the Works in the Contract.

7. FORCE MAJEURE

7.1 The term "Force Majeure" means an exceptional event or circumstance:

- a) Which is beyond a party's control,
- b) Which such party could not reasonably have provided against before entering into the contract,
- c) Which, having arisen, such party could not reasonably have avoided or overcome, and
- d) Which is not substantially attributed to the other Party

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

- (i) War, hostilities (whether war be declared or not), invasion, act of foreign enemies),
- (ii) Rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war,
- (iii) Riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel,
- (iv) Munitions of war, explosive materials, ionizing radiation or contamination by radio activity, except as may be attributed to the Contractor's use of such munitions, explosives, radiation or radio activity, and
- (v) Natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity,

7.2 In the event of either party being rendered unable by force majeure to perform any duty or discharge any responsibility arising out of the contract, the relative obligation of the party affected by such force majeure shall upon notification to the other party be suspended for the period during which force majeure event lasts. The cost and loss sustained by either party shall be borne by respective parties.

7.3 For the period of extension granted to the Contractor due to Force Majeure the price adjustment clause shall apply but the penalty clause shall not apply. It is clarified that this sub clause shall not give eligibility for price adjustment to contracts which are otherwise not subject to the benefit of Price adjustment clause.

7.4 The time for performance of the relative obligation suspended by the force majeure shall stand extended by the period for which such cause lasts. Should the delay caused by force majeure exceed twelve months, the parties to the contract shall be at liberty to foreclose the contract after holding mutual discussions.

7.5 A Party affected by an event of Force Majeure shall notify the other Party of such event as soon as possible to the occurrence of such event, providing evidence of the nature and cause of such event, and shall similarly give notice of the restoration of normal conditions as soon as possible.

7.6 The Parties shall take all reasonable measures to minimise the consequences of any event of Force Majeure.

8. CONTRACTOR'S RISKS

8.1 All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract are the responsibility of the Contractor.

8.2 All risks and consequences arising from the inaccuracies or falseness of the documents and/or information submitted by the Contractor shall be the responsibility of the Contractor alone, notwithstanding the fact that designs/drawings or other documents have been approved by the department.

9. LIABILITY FOR ACCIDENTS TO PERSON

The Contractor shall be deemed to have indemnified and saved harmless the Government and/or the employer, against all action, suits, claims, demands, costs etc. arising in connection with injuries suffered by any persons employed by the Contractor or his subcontractor for the works whether under the General law or under workman's compensation Act, or any other statute in force at the time of dealing with the question of the liability of employees for the injuries suffered by employees and to have taken steps properly to ensure against any claim there under.

10. CONTRACTOR TO CONSTRUCT THE WORKS

10.1 The Contractor shall construct, install and maintain the Works in accordance with the Specifications and Drawings as specified in the Contract Data

10.2 In the case of any class of work for which there is no such specification as is mentioned in contract Data, such work shall be carried out in accordance with the instructions and requirement of the Engineer-in-charge. In the event of any disparity between the written specifications and BIS provisions, the provisions in BIS shall prevail.

10.3 The Contractor shall supply and take upon himself the entire responsibility of the sufficiency of the scaffolding, timbering, Machinery, tools implements and generally of all means used for the fulfilment of this contract whether such means may or may not approved of or recommended by the Engineer.

11. DISCOVERIES

Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Engineer of such discoveries and carry out the Engineer's instructions for dealing with them.

12. DISPUTE RESOLUTION SYSTEM

12.1 No dispute can be raised except before the Competent Authority as defined in Contract data in writing giving full description and grounds of Dispute. It is clarified that merely recording protest while accepting measurement and/or payment shall not be taken as raising a dispute.

12.2 No issue of dispute can be raised after 45 days of its occurrence. Any dispute raised after expiry of 45 days of its first occurrence shall not be entertained and the Employer shall not be liable for claims arising out

of such disputes.

12.3 The Competent Authority shall decide the matter within 45 days.

12.4 Appeal against the order of the Competent Authority can be preferred within 30 days to the Appellate Authority as defined in the Contract data. The Appellate Authority shall decide the dispute within 45 days.

12.5 Appeal against the order of the Appellate Authority can be preferred before the Madhya Pradesh Arbitration Tribunal constituted under Madhya Pradesh Madhyastham Adhikaran Adhiniyam, 1983.

12.6 The Contractor shall have to continue execution of the works with due diligence notwithstanding pendency of a dispute before any authority or forum.

B. TIME CONTROL

13. PROGRAMME

13.1 Within the time stated in the Contract Data, the Contractor shall submit to the Engineer for approval a Programme showing the general methods, arrangements, order, and timing for all the activities in the Works for the construction of works.

13.2 The program shall be supported with all the details regarding key personnel, equipment and machinery proposed to be deployed on the works for its execution. The Contractor shall submit the list of equipment and machinery being brought to site, the list of key personnel being deployed, the list of machinery/equipment being placed in field laboratory and the location of field laboratory along with the Programme

13.3 An update of the Programme shall be a Programme showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining Works, including any changes to the sequence of the activities.

13.4 The Contractor shall submit to the Engineer for approval an updated Programme at intervals no longer than the period stated in the Contract Data. If the Contractor does not submit an updated Programme within this period, the Engineer may withhold the amount stated in the Contract Data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Programme has been submitted.

13.5 The Engineer's approval of the Programme shall not alter the Contractor's obligations

14. EXTENSION OF TIME

14.1 If the Contractor desires an extension of time for completion of the work on the ground of his having been unavoidably hindered in its execution or on any other grounds, he shall apply, in writing, to the Engineer-in-charge, on account of which he desires such extension. Engineer-in-charge shall forward the aforesaid application to the competent authority as prescribed.

14.2 The competent authority shall grant such extension at each such occasion within a period of 30 days of receipt of application from Contractor and shall not wait for finality of work. Such extensions shall be granted in accordance with provisions under clause -7 and/or clause- 15 of this agreement.

14.3 In case of the work already in progress, the Contractor shall proceed with the execution of the works, including maintenance thereof, pending receipt of the decision of the competent authority as aforesaid with all due diligence.

15. COMPENSATION FOR DELAY

15.1 The time allowed for carrying out the work, as entered in the agreement, shall be strictly observed by the Contractor.

15.2 The time allowed for execution of the contract shall commence from the date of signing of the agreement. It is clarified that the need for issue of work order is dispensed with.

15.3 In the event milestones are laid down in the Contract Data for execution of the works, the Contractor shall have to ensure strict adherence to the same.

15.4 Failure of the Contractor to adhere to the timelines and/or milestones shall attract such liquidated damages as is laid down in the Contract Data

15.5 In the event of delay in execution of the works as per the timelines mentioned in the contract data the Engineer-in-charge shall retain from the bills of the Contractor Amount equal to the liquidated damages to be levied until the Contractor makes such delays good. However, the Engineer-in-charge may accept bankable security in lieu of retaining such amount.

15.6 If the Contractor is given extension of time after liquidated damages have been paid, the engineer in charge shall correct any over payment of liquidated damages by the Contractor in the next payment certificate.

15.7 In the event the Contractor fails to make good the delay until completion of the stipulated contract period (including extension of time) the sum so retained shall be adjusted against liquidated damages levied.

C. QUALITY CONTROL

17. TESTS

17.1 The Contractor shall be responsible for:

- a. Carrying out the tests prescribed in specifications, and
- b. For the correctness of the test results, whether performed in his laboratory or elsewhere.

17.2 The Contractor shall have to establish field laboratory within the time specified and having such equipment as are specified in the Contract Data.

17.3 Failure of the Contractor to establish laboratory shall attract such penalty as is specified in the Contract Data.

17.4 Ten percent of the mandatory tests prescribed under the specifications shall be got carried out through Laboratories accredited by National Accreditation Board of Laboratories (NABL) by the Engineer-In –Charge and the cost of the such testing shall be deducted from the payments due to Contractor.

18. CORRECTION OF DEFECTS NOTICED DURING THE DEFECT LIABILITY PERIOD

18.1 The defect liability period of work in the contract shall be the as per the Contract Data Sheet.

18.2 The Contractor shall promptly rectify all defects pointed out by the Engineer well before the end of the Defect Liability Period. The Defect Liability Period shall automatically stand extended until the defect is rectified.

18.3 If the Contractor has not corrected a Defect pertaining to the Defect Liability Period to the satisfaction of the Engineer, within the time specified by the Engineer, the Engineer will assess the cost of having the Defect corrected, and the cost of correction of the Defect shall be recovered from the Performance Security or any amount due or that may become due to the Contractor and other available securities.

D. COST CONTROL

19. VARIATIONS CHANGE IN ORIGINAL SPECIFICATIONS, DESIGNS, DRAWINGS ETC.

19.1 The Engineer in charge shall have power to make any alterations, omissions or additions to or substitutions for the original specifications, drawings, designs and instructions, that may appear to him to be necessary during the progress of the work and the Contractor shall carry out the work in accordance with any instructions which may be given to him in writing signed by the Employer, and such alterations, omission, additions or substitutions shall not invalidate the contract and any altered, additional or substituted work, which the Contractor may be directed to do in the manner above specified, as part of the work, shall be carried out by the Contractor on the same conditions in all respects on which he agree to do the main work.

19.2 The time for the completion of the work shall be extended in the proportion that the altered, additional or substituted work bears to the original contract work and the certificate of the Engineer in charge shall be conclusive as to such proportion.

20. EXTRA ITEMS

20.1 All such items which are not in the priced Bills of Quantities (BOQ) shall be treated as extra items.

21. PAYMENTS FOR VARIATIONS AND/ OR EXTRA QUANTITIES

21.1 The rates for the additional (Extra Quantities), altered or substituted work/ extra items under this clause shall be worked out in accordance with the following provisions in their respective order: -

a. The Contractor is bound to carry out the additional (Extra quantity), work at the same rates as are specified in the contract for the work. The maximum variation shall be permitted upto 20% of contract value.

b. If the item is not in the priced BOQ and is included in the Schedule of Rate (SOR) of the department, the rate shall be arrived at by applying the quoted tender percentage on the SOR rate.

c. If the rates of the altered or substituted work are not provided in applicable SOR-such rates will be derived from the rates for a similar class (type) of work as is provided in the contract (priced BOQ) for the work.

d. If the rates are for the altered, substituted work cannot be determined in the manner specified in the sub clause (c) above-then the rates for such composite work item shall be worked out on the basis of the concerned schedule of rates quoted by the Contractor.

e. If the rates of a particular part or parts of the item is not in the schedule of rates and the rates for the altered, or substituted work item cannot be determined in the manner specified in sub clause (b) to (d) above, the rate for such part or parts will be determined by the Competent Authority as defined in the Contract data on the basis of the rate analysis derived out of prevailing market rates when the work was done.

f. But under no circumstances, the Contractor shall suspend the work on the plea of non- acceptability of rates on items falling under sub clause (a) to (e). In case the Contractor does not accept the rate approved by Engineer in charge for a particular item, the Contractor shall continue to carry out the item at the rates determined by the Competent Authority. The decision on the final rates payable shall be arrived at through the dispute settlement procedure.

22. NO COMPENSATION FOR ALTERATIONS IN OR RESTRICTION OF WORK TO BE CARRIED OUT.

22.1 If at any time after the commencement of the work, the Government, for any reason whatsoever, not require the whole or any part of the work as specified in the bid to be carried out, the Engineer in charge shall give notice in writing of the fact to the Contractor and withdraw that whole or any part of the work.

22.2 The Contractor shall have no claim to any payments or compensation whatsoever, on account of any profit or advantage which he might have derived from the execution of work in full or on account of any loss incurred for idle men and machinery due to any alteration or restriction of work for whatsoever reason.

22.3 The Engineer in charge may supplement the work by engaging another agency to execute such portion of the work, without prejudice to his rights.

23. NO INTEREST PAYABLE

No interest shall be payable to the Contractor on any payment due or awarded by any authority.

24. RECOVERY FROM CONTRACTORS

Whenever any claim against the Contractor for the payment arises under the contract, the Department shall be entitled to recover such sum by:

a) Appropriating, in part or whole of the Performance Security and additional Performance Security, if any; and/or Security deposit and/or any sums payable under the contract to the Contractor.

b) If the amount recovered in accordance with (a) above is not sufficient, the balance sum may be recovered from any payment due to the Contractor under any other Contracto/agreement of the department, including the securities which become due for release.

c) The department shall, further have an additional right to effect recoveries as arrears of land revenue under the M.P. Land revenue Code.

25. TAX

25.1 The rates quoted by the Contractor shall be deemed to be inclusive of the commercial tax and other levies, duties, cess, toll, taxes of Central and State Governments, local bodies and authorities.

25.2 The liability, if any, on account of quarry fees, royalties and any other taxes and duties in respect of materials actually consumed on public work, shall be borne by the Contractor.

25.3 Any Changes in the taxes due to change in legislation or for any other reason shall not be payable to the Contractor.

26. CHECK MEASUREMENTS

26.1 The department reserves to itself the right to prescribe a scale of check measurement of work in general or specific scale for specific works or by other special orders.

26.2 Checking of measurement by superior officer shall supersede measurements by subordinate officer(s), and the former will become the basis of the payment.

26.3 Any over/excess payments detected, as a result of such check measurement or otherwise at any stage up to the date of completion of the defect liability period specified in this contract, shall be recoverable from the Contractor, as per clause 24 above.

27. TERMINATION BY ENGINEER IN CHARGE

27.1 If the Contractor fails to carry out any obligation under the Contract, the Engineer in charge may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time.

27.2 The Engineer in charge shall be entitled to terminate the contract if the Contractor

a. Abandons the works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the contract;

b. the Contractor is declared as bankrupt or goes into liquidation other than for approved reconstruction or amalgamation;

c. without reasonable excuse fails to comply with the notice to correct a particular defect within a reasonable period of time;

d. the Contractor does not maintain a valid instrument of financial Security, as prescribed;

e. the Contractor has delayed the completion of the Works by such duration for which the maximum amount of liquidated damages is recoverable;

f. If the Contractor fails to deploy machinery and equipment or personnel or set up a field laboratory as specified in the Contract Data.

g. if the Contractor, in judgment of the engineer in charge has engaged in corrupt or fraudulent practices in competing for or in executing the contract;

h. Any other fundamental breaches as specified in the Contract Data.

27.3 In any of these events or circumstances, the engineer in charge may, upon giving 14(Fourteen) days' notice to the Contractor, terminate the contract and expel the Contractor from the site. However, in the case of sub paragraph (b) or (g) of clause 27.2, the Engineer in charge may terminate the contract immediately.

27.4 Notwithstanding the above, the Engineer in charge may terminate the contract for convenience by giving notice to the Contractor.

28. PAYMENT UPON TERMINATION

28.1 If the contract is terminated under clause 27.3, the Engineer-in-Charge shall issue a certificate for value of the work accepted on final measurements, less advance payments received up to the date of issue of the certificate, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed as indicated in the Contract Data.

28.2 Payment on termination under clause 27.4 above, the Engineer shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the works, and the Contractor's costs of protecting and securing the works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law.

28.3 If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be recovered as per clause 24 above.

29. PERFORMANCE SECURITY

The Contractor shall have to submit performance security and additional performance security, if any, as specified in Bid data sheet at the time of signing of the contract. The Contractor shall have to ensure that such performance security and Additional performance, if any; security remains valid for the period as specified in the Contract data.

30. SECURITY DEPOSIT

30.1 Security deposit shall be deducted from each running bill at the rate as specified in the contract data. The total amount of security deposit so deducted shall not exceed the percentage of contract price specified in the Contract data.

30.2 The Security may be replaced by equivalent amount of bank guarantee or fixed deposit receipt assigned to the Employer, with validity up to 3 (three) months beyond the completion of defect Liability Period/ Extended Defect Liability Period.

30.3 The Security deposit shall be refunded on completion of defect liability period.

31. PRICE ADJUSTMENT

31.1 Applicability

1. Price adjustment shall be applicable only if provided for in the Contract Data.
2. The price adjustment clause shall apply only for the works executed from the date of signing of the agreement until the end of the initial intended completion date or extensions granted for reasons attributed to the Employer by the Engineer.
3. The Contractor shall not be entitled to any benefit arising from the price adjustment clause for extension in the contract period for reasons attributed to the Contractor.
4. In the Force Majeure event the price escalation clause shall apply.

31.2 Procedure

1. Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants in accordance with following principles and procedures and as per formula given in the contract data.
2. The price adjustable shall be determined during each quarter from the formula given in the contract data.
3. Following expression and meaning are assigned to the work done during each quarter:
$$R = \text{Total value of work during the quarter. It would include the amount of secured advance granted, if any, during the quarter, less the amount of secured advance recovered, if any during the quarter, less value of material issued by the department, if any, during the quarter.}$$
4. Weightages of various components of the work shall be as per the Contract Data.

31.3 To the extent that full compensation any rise or fall in costs to the Contractor is not covered by the provisions of this or clauses in the contract, the unit rates and prices included in the contract shall be deemed amounts to cover the contingency of such other rise or fall in costs.

31.4 The index relevant to any quarter, for which such compensation is paid, shall be the arithmetical average of the indices relevant of the calendar month.

31.5 For the purpose of clarity it is pointed out that the adjustment may be either positive or negative, i.e. if the price adjustment is in favour the same shall be recovered from the sums payable to the Contractor.

32. MOBILIZATION ADVANCE

32.1 Payment of advances shall be applicable if provided in Contract Data.

32.2 If applicable, the Engineer bearing advance payment to the Contractor of the against provision by the Contractor of an unconditional Bank in nationalized/Scheduled banks, in the name as stated in the in the

advance payment. The Guarantee shall remain effective been repaid, but the amount of the guarantee shall be progressively repaid by the Contractor.

32.3 The rate of interest shall be as per Contract data.

32.4 The advance shall be recovered as stated in the Contract data by deducting proportionate amounts from payment otherwise due to the Contractor. No account shall be taken of the advance payment or its recovery in assessing valuations of work done, variations, price adjustments, compensation events, or liquidated damages.

33. SECURED AND CONSTRUCTION MACHINERY ADVANCE

33.1 Payment of secured advance shall be applicable if provided in Contract data.

33.2 If applicable, the Engineer in Charge shall make interest bearing advance payment to the Contractor of the amounts stated in the Contract Data, against provision by the Contractor of an unconditional Bank Guarantee in a form and by nationalized/ scheduled banks, in the name as stated in the Contract Data, in amounts equal to the advance payment. The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Contractor.

33.3 The rate of interest chargeable shall be as per Contract Data.

33.4 The construction machinery advance, if applicable, shall be limited to 80% of the cost of construction machinery and admissible only for new construction machinery.

33.5 The advance payment shall be recovered as stated in the Contract Data by deducting proportionate amounts from payment otherwise due to the Contractor. No account shall be taken of the advance payment or its recovery in assessing valuations of work done, variations, price adjustments, compensation events, or liquidated damages.

34. PAYMENT CERTIFICATES

The payment to the Contractor will be as follows for construction work:

- a. The Contractor shall submit to the engineer monthly statement of the value of the work executed less the cumulative amount certified previously, supported with detailed measurement of the items of work executed.
- b. The engineer shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
- c. The value of work executed shall be determined, based on the measurements approved by the Engineer/Engineer in charge.
- d. The value of work executed shall comprise the value of the quantities of the items in the Bill of quantities completed.
- e. The value of work executed shall also include the valuation of variations and compensation events.
- f. All payments shall be adjusted for deductions for advance payment, security deposit, other recoveries in terms of contract and taxes at source as applicable under the law.
- g. The Engineer may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.
- h. Payment of intermediate certificate shall be regarded as payments by way of advance against the final payment and not as payments for work actually done and completed.
- i. Intermediate payment shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or be considered as an admission of the due performance of the Contractor any part thereof, in any respect or the occurring of any claim.
- j. The payment of final bill shall be governed by the provisions of clause 36 of GCC.

E. FINISHING THE CONTRACT

35. COMPLETION CERTIFICATE

35.1 A completion certificate in the prescribed format in Contract data shall be issued by the Engineer in charge after physical completion of the work and successful handover to respective agencies owning different heads with their respective clearance certificates.

35.2 After final payment to the Contractor, a final completion certificate in the prescribed format in the contract data shall be issued by the Engineer in charge.

36. FINAL ACCOUNT

36.1 The Contractor shall supply the Engineer with a detailed account of the total amount that the Contractor considers payable for works under the Contract within 21 days of issue of certificate of physical completion of works. The Engineer shall issue a Defects Liability Certificate and certify any payment that is due to the Contractor within 45 days of receiving the Contractor's account if it is correct and complete. If the account is not correct or complete, the Engineer shall issue within 45 days a schedule that states the scope of the corrections or additions that are necessary. If the Account is still unsatisfactory after it has been resubmitted, the matter shall be referred to the competent authority as defined in the Contract data, who shall decide on the amount payable to the Contractor after hearing the Contractor and the Engineer in Charge.

36.2 In case the account is not received within 21 days of issue of Certificate of Completion as provided in clause 35.1 above, the Engineer shall proceed to finalize the account and issue a payment certificate within 28 days.

F. OTHER CONDITIONS OF CONTRACT

37. CURRENCIES

All payments will be made in Indian Rupees.

38. LABOUR

38.1 The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

38.2 The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Engineer may require.

39. COMPLIANCE WITH LABOUR REGULATIONS

39.1 During continuance of the Contract, the Contractor and his sub-Contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to construction industry are given in the Contract data. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/byelaws/Acts/Rules/ regulations including amendments, if any, on the part of the Contractor, the Engineer/Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer. The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

I. The Contractor or its sub-Contractors shall be solely responsible for complying with all statutory provisions relating to manpower engaged by, for, or through them. In the event of any liability on GSCDCL by virtue of its being principal employer due to failure of the Contractor or its sub-Contractors to comply with all applicable labour legislations, the Contractor and its sub-Contractors Bidder shall indemnify and/or reimburse the amount payable by GSCDCL, if any on this account.

II. If any accident, any injury or physical harm to any person is caused during operations within the contract period, the Contractor and its sub-Contractors, as the case may be the Contractor sub56 Contractors shall be solely responsible and shall bear all the cost and consequences' associated with

such eventualities. The Contractor and its sub-Contractors also agrees and undertakes to indemnify and keep indemnified GSCDCL, its directors/ employees/ agents and its consultants.

39.2 Construction Safety. The Contractor should be well conversant with technical as well as administrative and legal aspects of safety and judicial pronouncement. The Contractor shall all times take all reasonable precautions and safety measures to maintain safety of personnel and property. The Contractor shall, at its own expenses and throughout the period of the contract ensure appropriate and suitable arrangements for health, safety and hygiene requirements for the surroundings. The State and Central Government prevailing all Statues in this regard must be complied in letter and spirit throughout the period of contract.

40. AUDIT AND TECHNICAL EXAMINATION

Government shall have the right to cause an audit and technical examination of the works and the final bill of the contract including all supporting vouchers, abstract etc. To be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the Contractor under the contract or nay work claimed by him to have been done under the contract and found not to, have been executed, the Contractor shall be liable to refund the amount of overpayment and it shall be lawful for government to recover the same from him in the manner prescribed in clause 24 above and if it is found that the Contractor was paid less than what was due to him, under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by government to the Contractor.

41. DEATH OR PERMANENT INVALIDITY OF CONTRACTOR

During continuance of the contract, the Contractor and his sub- Contractor s shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications, and bye laws of the state or central government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the state or the major labour laws that are applicable to construction industry are given in the contract data. The Contractor shall keep the employer indemnified in case any action is taken against the employer by the competent authority on account of contravention of any of the provisions of any Act or rules made their under, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules regulations including amendments, if any, on the part of the Contractor, the engineer/employer shall have the right to deduct from any money due to the Contractor including his amount of performance of security. The employer/engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the employer. The employees of the Contractor and the Sub- Contractor in no case shall be treated as the employees of the employer at any point of time.

42. JURISDICTION

This contract has been entered into the State of Madhya Pradesh and its validity, construction, interpretation and legal effect shall be subjected to the exclusive jurisdiction of the courts in Gwalior or of the courts at the place where this contract/agreement is entered into. No other jurisdiction shall be applicable.

CONTRACT DATA SHEET

Clause Reference	Particulars	Data
1.14	Employer	Gwalior Smart City Development Corporation Limited (GSCDCL)
1.15	Engineer	Engineer as notified by employer
1.16	Engineer In Charge	Executive Engineer of GSCDCL
1.22	Stipulated period of completion	8 Months including rainy season
3	Language	English
	Law of Contract	Indian Contract Act 1872
4	Address & contact details of the Contractor	As per "Annexure – H"
	Address & contact details of the Employer/Engineer-phone, Fax, e-mail.	-
5	Subcontracting permitted for contract value	Permitted till 25 percent of the contract price
6	Technical Personnel to be provided by the Contractor	As per 'Annexure-I' (Format I-3)
	Penalty, if required Technical personal not employed	As per Annexure – I (Format: I - 3)
10	Specifications	As per "Annexure – E"
	Drawings	As per "Annexure – N"
12	Competent authority for deciding dispute under Dispute resolution system	Chief Executive Officer, GSCDCL, Gwalior
	Appellate Authority for deciding dispute under Dispute resolution system	Executive Director, GSCDCL, Gwalior
13	Period of submission of updated construction program	15 days after signing of contract agreement and every month thereafter.
14	Competent authority for granting time permission	Executive Director, GSCDCL, Gwalior
15	Milestones laid down for the contract	Annexure O
	If yes, details of milestone	As per "Annexure O"
	Compensation (to Employer) for Delay	As per "Annexure P"
17	List of equipment for lab	As per Annexure I
	Time to establish	30 days from date of signing of the Agreement
	Penalty for not establishing lab	Rs. 50,000/- per month (or part thereof) of delay
18	Defects Liability Period for Civil Work	36 months after physical completion of the work
21	Competent authority for determining the rate	Executive Director, GSCDCL, Gwalior
27	Any other condition for breach of contract	-
28	Penalty	Penalty shall include (a) Security deposit as per clause 30 of General conditions of contract and the percentage to apply to the value of work not completed representing the Employer's additional cost for

		<p>completing the works shall be 20 percent.</p> <p>(b) Liquidated damages imposed as per clause 15 or performance security (Guarantee) including additional performance security (Guarantee), if any, as per clause 29 of General conditions of contract, whichever is higher.</p>
29	Performance guarantee (Security) shall be valid up to	Till issue of physical completion certificate as per Clause 35.1.
30	Security deposit to be deducted from each running bill	At the rate of 5%
	Maximum limit of deduction of Security Deposit	5% of final contract amount
31.1 (1)	Price adjustment shall be applicable	Yes
31.2 (4)	Weightages of Component in the work	As per Annexure R
32	32.1 Mobilization Advance applicable	Yes
	32.2 If yes, unconditional Bank Guarantee	As per format in Annexure S1
	32.3 If Yes Rate of Interest	10%
	32.4 If Yes, Type and Amount that can be paid	upto 10% of the Contract Amount
	32.5 If Yes, Recovery of Payment	@10% of the Advance from each running bill (third running bill onwards)
33	33.1 Secured Advance Payable	No
	33.2 If Yes, Amount of Secured Advance	No
	33.3 If Yes, Conditions for Secured Advance	No
	33.4 If Yes, Recovery of Secured Advance	No
35	Completion Certificate – after physical completion of work	As per Annexure – U
	Final Completion Certificate – after final payment on completion of the work.	As per Annexure – V
39	Salient features of some of the major labour laws that are applicable	As per Annexure – W

DRAWINGS

Annexure-O

(See clause 13 of Section 3 of GCC)

DETAILS OF MILESTONE

The time allowed for the carrying out the work as detailed below:

8 (eight) months including rainy season for construction shall be strictly observed by the Contractor and shall be deemed to be essence of the contract and shall be reckoned immediately from the date of signing of Agreement to commence the work issued to the Contractor.

The work shall, throughout the stipulated period of contract, be proceeded with all due diligence keeping in view that time is the essence of the contract. The Contractor shall be bound in all cases, to complete

- 1/8th of the whole work before 1/4th of the whole time allowed under the contract has elapsed,
- 3/8th of the work before 1/2 of such time has elapsed
- 3/4th of the work before 3/4 of such time has elapsed.

COMPENSATION FOR DELAY

If the contractor fails to achieve the milestones, and the delay in execution of work is attributable to the contractor/the Employer shall retain an amount from the sums payable and due to the contractor as per following scale -

- i. Slippage up to 25% in financial target during the milestone under consideration - 2.5% of the work remained unexecuted in the related time span.
- ii. Slippage exceeding 25% but Up to 50% in financial target during the milestone under consideration 5% of the work remained unexecuted in the related time span
- iii. Slippage exceeding 50% but Up to 75% in financial target during the milestone under consideration -7.5% of the work remained unexecuted in the related time span.
- iv. Slippage exceeding 75% in financial target during the milestone under consideration -10% of the work remained unexecuted in the related time span.

Note: For arriving at the dates of completion of time span related to different milestones, delays which are not attributable to the Contractor shall be considered. The slippage on any milestone is if made good in subsequent milestones or at the time of stipulated period of completion, the amount retained as above shall be refunded. In case the work is not completed within the stipulated period of completion along with all such extensions which are granted to the Contractor for either Employer's default or Force Majeure, the compensation shall be levied on the contractor at the rate of 0.05% per day of delay limited to a maximum of 10% of contract price. The decision of Executive Director, GSCDCL shall be final and binding upon both the parties.

LIST OF EQUIPMENT FOR QUALITY CONTROL LABORATORY

As per Annexure I (Form 1-4)

PRICE ADJUSTMENT

Weightages of components in all the works under the project are determined by the Authority, as below:

S. No.	Component	Weightage (K)
1	Materials	50% (K1)
2	POL	15% (K2)
3	Labour	35% (K3)

Adjustment for Materials Component

The source for the wholesale price index for all commodities shall be the publication of the Economic Advisor to the Govt. of India published in the Reserve Bank of India, Bulletin.

$$V_m = 0.85 \times P_o \times K_1 \times [(M_2 M_1) / M_1]$$

Where,

V_m = Amount of price adjustment in Rs. for the Materials Component

P_o = Value of work executed as per the bills, running or final during quarter, less the cost of materials supplied to the Contractor, at fixed rate and recovered from the particular bill. In the case of materials brought to site, for which any advance is granted in the quarter the value of materials shall be added and for which advance has been recovered during the quarter shall be deducted. Furthermore, the value of such materials as assessed by the Engineer-in-charge (and not the reduced amount for which secured advance has been paid) shall be considered for this purpose.

K_1 = The factor representing all materials to be arranged for all works ancillary/temporary works and overheads etc.

M_1 = Base cost index

M_2 = Current Cost index

Adjustment for P.O.L Component

The source for working out the price adjustment on P.O.L. the representative items for reference shall be the costs of High Speed Oil only at the nearest HSD Supply Depot.

$$V_p = 0.85 \times P_o \times K_2 \times [(D_2 -$$

$D_1) / D_1]$ Where,

V_p = The amount of price adjustment in

Rs. P_o = As mentioned herein before

K_2 = A factor representing the component of transportation cost connected with completion of work under the contract.

D_2 = Current price per litre of HSD D_1 = Base price per litre of HSD

Adjustment for Labour Component

The source for such indices being publication of Labour Bulletin Bureau, Govt of India published in the Reserve Bank of India Bulletin, on component representing Labour cost i/c all types of benefits and amenities etc.

$$V_L = 0.85 \times P_o \times K_3 \times [(L_2 L_1) / L_1]$$

Where,

P_0 = As mentioned herein before

V_L = Amount of price adjustment in Rs. for the Labour Component

K_3 = A factor representing component of Labor cost i/c benefits, amenities etc. to be incurred by the Contractor for their work i/c all allied/ancillary/temporary works and overheads etc.

L_2 = Current cost index for industrial workers.

L_1 = Base Consumer cost index for industrial workers.

The following principles shall be followed while working out the adjustments:

- To the extent that full compensation for any rise or fall in the costs to the Contractor is not covered by the provision of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.
- If the Contractor shall fail to complete the works within the stipulated period of completion under the contract, the adjustment of prices thereafter, until the date of completion of the works shall be made using either the indices or prices relating to the stipulated time for completion or the current indices or prices whichever is more favorable to the Engineer-in-Charge. Provided that if any extension of time is granted for reasons beyond the control of the Contractor, the above provisions shall apply only to the adjustment made after the expiry of such extension of time.
- The price adjustment shall be evaluated for each of the interim payment certificate submitted by the Contractor.
- The following items are not to be included in the price adjustment calculations:
 - Recovery of Liquidated damages.
 - Recovery of Retention money, with holding and release.

ANNEXURE – S1

(See clause 32 of Section 3 of GCC)

BANK GUARANTEE FORMAT

FOR MOBILIZATION AND CONSTRUCTION MACHINERY ADVANCE

WHEREAS _____ (name of the Bidder) (hereinafter called "the Bidder") has submitted his Bid dated _____ for the work of _____ (name of _____ Contract herein after called the "Bid").

KNOW ALL PEOPLE by these presents that we _____ (name of Bank) of _____ [name of country] having our registered office at _____ (hereinafter called "the Bank") are bound unto _____ (name of the Authority) in the sum of _____ * for which payment well and truly to be made to the said name of the (Authority Name) the Bank itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____

THE CONDITIONS of this obligation are:

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid.

OR

(2) If the Bidder having been notified to the acceptance of his bid by the name of the Executive Engineer during the period of Bid validity

- (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or
- (b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders.

We undertake to pay to the (name of the Executive Engineer) up to the above amount upon receipt of his first written demand, without the (Authority) having to substantiate his demand, provided that in his demand of (name of the Authority) will note that the amount claimed by him is due to him owing to the occurrence of one or any of the two conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date 180 ** days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the (name of the Authority), notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

Date: _____

Witness: _____ (signature, name, address & seal)

* The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Bid Data Sheet at reference 17.

** EMD should be valid for a period of 180 days or more

Deleted

Annexure- T

(See clause 33 of Section 3 of GCC)

BANK GUARANTEE FORM FOR SECURED ADVANCE

Not Applicable

Annexure - U

(See clause 35 of section 3 -GCC)

PHYSICAL COMPLETION CERTIFICATE

Name of Work: _____

Agreement No.: _____ Date: _____

Amount of Contract Rs: _____

Name of Agency: _____

Used MB No.: _____

Last measurement recorded

a. Page No. & MB No.: _____

b. Date: _____

Certified that the above-mentioned work was physically completed on..... (Date) and taken over on..... (Date) and that I have satisfied myself to best of my ability that the work has been done properly.

Date of issue: _____

Engineer in Charge
Gwalior Smart City Development Corporation Limited, Gwalior

Annexure-V

(See clause 35 of section 3 -GCC)

FINAL COMPLETION CERTIFICATE

Name of Work: _____

Agreement No.: _____ Date: _____

Amount of Contract Rs: _____

Name of Agency: _____

Used MB No.: _____

Last measurement recorded

a. Page No. & MB No.: _____

b. Date: _____

Certified that the above-mentioned work was physically completed on_(date) and taken over on_____(date).

Agreement amount Rs. _____

Final amount paid to Contractor Rs. _____

Incumbency of officers for the work

I have satisfied myself to best of my ability that the work has been done properly.

Date of Issue: _____

Engineer in Charge
Gwalior Smart City Development Corporation Limited, Gwalior

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE

(a) Workmen Compensation Act 1923: - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

(b) Payment of Gratuity Act 1972: - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed the prescribed minimum years (say, five years) of service or more or on death the rate of prescribed minimum days' (say, 15 days) wages for every completed year of service. The Act is applicable to all establishments employing the prescribed minimum number (say, 10) or more employees.

(c) Employees P.F. and Miscellaneous Provision Act 1952: The Act Provides for monthly contributions by the Employer plus workers at the rate prescribed (say, 10% or 8.33%). The benefits payable under the Act are:

- i. Pension or family pension on retirement or death as the case may be.
- ii. Deposit linked insurance on the death in harness of the worker.
- iii. Payment of P.F. accumulation on retirement/death etc.

(d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(e) Contract Labour (Regulation & Abolition) Act 1970: - The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The principal Employer is required to take Certificate of Registration and the Contractor is, required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ prescribed minimum (say 20) or more contract labour.

(f) Minimum Wages Act 1948: - The Employer is to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads, runways is scheduled employment.

(g) Payment of Wages Act 1936: - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

(h) Equal Remuneration Act 1979: - The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against female employees in the matters of transfers, training and promotions etc.

(i) Payment of Bonus Act 1965: - The Act is applicable to all establishments employing prescribed minimum (say, 20) or more workmen. The Act provides for payments of annual bonus 'within the prescribed range of percentage of wages to employees drawing up to the prescribed amount of wages, calculated in the prescribed manner. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. States may have different number of employment size.

(j) Industrial Disputes Act 1947: - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(k) Industrial Employment (Standing Orders) Act 1946: - It is applicable to all establishments employing prescribed minimum (say, 100, or 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and gets these certified by the designated Authority.

(l) Trade Unions Act 1926: - The Act lays down the procedure for registration of trade unions of workmen and

Employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(m) Child Labour (Prohibition & Regulation) Act 1986: - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulations of employment of children in all other occupations and processes. Employment of child labour is prohibited in building and construction industry.

(n) Inter -State Migrant Workmen's (Regulation of Employment & Conditions of Service) Act 1979:

The Act is applicable to an establishment which employs prescribed minimum (say, five) or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter- State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as Housing, Medical-Aid, Travelling expenses from home up to the establishment and back etc.

(o) The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: - All the establishments who carry on any building or other construction work and employs the prescribed minimum (say, 10) or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding

2% of the cost of construction as may be modified by the Government., The Employer of the establishment- is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodations for workers near the-work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

(p) Factories Act 1948: - The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. it is applicable to premises employing the prescribed minimum (say, 10) persons or more with aid of power or another prescribed minimum (say, 20) or more persons without the aid of power engaged in manufacturing process.

SECTION 3:

Conditions of Contract

Part II Special Conditions of Contract [SCC]

1. General

The data and information given in the Contract Document are based on the investigations, planning and designs carried out so far. The data considered for the project planning have been included in the bid documents. The Contractor shall, therefore, satisfy himself about the adequacy and accuracy of the said data/information and interpretation thereof and collect fresh data/additional data/information and carry out/conduct further investigations and studies and get the approval of same from the employer. The Employer shall not be responsible for the accuracy/adequacy of the data/information and interpretation thereof by the Contractor.

2. Sufficiency of Bid

2.1 The Contractor shall be deemed to have visited and carefully examined the Project Site and it's surrounding to have satisfied himself to the nature and conditions of the means of transport and communications, whether by land or air, as available at present and as to possible interruptions thereto including the access and regress conditions for the Site. The Contractor is also deemed to have made enquiries, examined and satisfied himself as to the sites source for obtaining sand, stones, bricks and other materials, the sites for disposal of surplus materials and accommodation for depots, colonies, workshops and other infrastructure facilities as may be necessary for executing and completing the Works, as also the sub-soil water and variations thereof, storms, prevailing winds, climatic conditions and all other similar matters affecting the works including law & order.

2.2 Any neglect or omission or failure on the part of the Contractor in obtaining necessary and reliable information upon the foregoing or any other matter affecting the Contract shall not relieve him from any risks or liabilities or the entire responsibility for the completion of the Works in accordance with the Contract.

3. Incentive for Early Completion

In the event that the Contractor completes the work ahead of scheduled completion time, a bonus @ 1% (one percent) of the contract price per month computed on per day basis, shall be payable to the Contractor, subject to a maximum limit of 5% (five per cent) of the contract price. The amount of bonus, if payable, shall be paid along with final bill after completion of work.

5. Safety, Security and Protection of the Environment

- i. The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations.
- ii. The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of the Works. This shall wherever possible be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated.
- iii. The Contractor shall take all the necessary precautions and abide by relevant rules and regulations of safety which are presently in force and which may come into force during the currency of the contract.

- iv. The Contractor shall also take such other additional precautions and resort to such other additional safety measures as may be directed from time to time by the Engineer-in-charge. Violation of any rules, regulations and guidelines contained herein will entail immediate termination of the contract.
- v. In the event of any spoil, debris, waste or any deleterious substance from the Site being deposited on any adjacent land, the Contractor shall immediately remove all such material and restore the affected area to its original state to the satisfaction of the Employer.
- vi. The Contractor shall prevent any interference with the supply to or abstraction from, and prevent any pollution of, water resources (including underground percolating water) as a result of the execution of the Works.
- vii. The Contractor shall at all times ensure that all existing water courses / bodies within, and adjacent to the Site are kept safe and free from any debris and materials arising from the Works.
- viii. The Contractor shall devise and arrange methods of working to minimize dust, gaseous or other air-borne emissions and carry out the Works in such a manner as to minimize adverse impacts on air quality.
- ix. The Contractor shall utilize effective water sprays during delivery manufacture, processing and handling of materials when dust is likely to be created, and to dampen stored materials during dry and windy weather. Stockpiles of friable materials shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement, except where this is contrary to the Specification.
- x. In the event that the Contractor is permitted to use gravel or earth roads for haulage, he shall provide suitable measures for dust palliation, if these are, in the opinion of the IMC officials necessary. Such measures may include spraying the road surface with water at regular intervals.
- xi. The Contractor shall take all necessary measures so that the operation of all mechanical equipment and construction processes on and off the Site shall not cause any unnecessary or excessive noise, taking into account applicable environmental requirements. The Contractor shall use all necessary measures and shall maintain all plant and silencing equipment in good condition so as to minimize the noise emission during construction works.
- xii. The Contractor shall control the disposal of all forms of waste generated by the construction operations and in all associated activities. No uncontrolled deposition or dumping shall be permitted. Wastes to be controlled shall include, but shall not be limited to, all forms of fuel and engine oils, all types of bitumen, cement, surplus aggregates, gravels, bituminous mixtures, etc. The Contractor shall make specific provision for the proper disposal of these and any other waste products, conforming to local regulations and acceptable to the Project Manager.
- xiii. The Contractor shall plan and provide for remedial measures to be implemented in the event of occurrence of emergencies such as spillages of oil or bitumen or chemicals.
- xiv. The Contractor shall provide the Employer with a statement of the measures he intends to implement in the event of such an emergency which shall include a statement of how he intends to provide personnel adequately trained to implement such measures.
- xv. Should any pollution arise from the Contractor's activities he shall clean up the affected area immediately at his own cost and to the satisfaction of the Project Manager, and shall pay full compensation to any affected party.

Note: - In addition to above Contractor shall have to follow the instruction of IS codes for security and Safety (As per Handbook on construction And Safety Practices: SP 70: 2001)

6. Protection of Trees and Vegetation

The Contractor shall ensure that no trees or shrubs or waterside vegetation are felled or harmed except for those required to be cleared for execution of the Works. The Contractor shall protect trees and vegetation from damage to the satisfaction of the Employer. No tree shall be removed without the prior approval of the Employer and any competent authorities. Should the Contractor become aware during the period of the Contract that any tree or trees designated for clearance have cultural or religious significance he shall immediately inform the Employer and await his instructions before proceeding with clearance. In the event that trees or other vegetation not designated for clearance are damaged or destroyed, they shall be repaired or replaced to the satisfaction of the Employer, who shall also impose a penalty of twice the commercial value of any timber affected, as assessed by the Employer.

7. Water Supply

The Contractor shall make his own arrangements at his own expense for water supply for construction, sectional testing if any and other purposes.

8. Relations with Local Communities and Authorities

In setting and operating his plant and facilities and in executing the Works the Contractor shall at all-time bear in mind and to the extent practicable minimize the impact of his activities on existing communities. Where communities are likely to be affected by major activities such as road widening or laying of utility lines or the establishment of a camp, large borrow pit or haul road, he shall liaise closely with the concerned communities and their representatives and if so directed, shall attend meetings arranged by the Employer to resolve issues and minimise impacts on local communities.

9. Fire Prevention

The Contractor shall take all precautions necessary to ensure that no vegetation or property/ies along the line of the road outside the area of the permanent works is affected by fires arising from the execution of the Works. The Contractor shall obtain and follow any instructions of the competent authorities with respect to fire hazard when working in the vicinity of gas installations. Should a fire occur adjacent to the project road for any reason, the Contractor shall immediately suppress it. In the event of any other fire emergency in the vicinity of the Works the Contractor shall render assistance to the civil authorities to the best of his ability. Any scrub or plantation damaged by fire considered by the Employer to have been initiated by the Contractor's staff or labour shall be replanted and otherwise restored to the satisfaction of the Employer at the Contractor's expense.

10. Interference with Traffic and Adjoining Properties

In case any operation connected with the works necessitates diversion, obstruction or closure of any road, waterway or any other right of way, the approval of respective competent authorities shall be obtained well in advance by the Contractor. In case the Contractor's operations obstruct access to adjacent properties, the Contractor shall be responsible to provide reasonable temporary access to the affected parties. In case the Contractor fails to provide adequate temporary facilities, this shall be deemed to be an Uncorrected Defect and the Employer shall have the right to engage a third party to correct the Defect and the cost of such correction will be deducted from the Contract Price.

11. Arrangement for Traffic During Construction

10.1 General

The Contractor shall at all times, carry out work on the City/Urban road in a manner creating least interference to the flow of traffic while consistent with the satisfactory execution of the same. For all works involving improvements to the existing urban road, the Contractor shall, in accordance with the directives of the Engineer as well as the Traffic Police, provide and maintain, during execution of the work, a passage for traffic either along a part of the existing carriageway under improvement or along a alternative diversion route. Before taking up any construction, the Contractor shall prepare a Traffic Management Plan for each road and submit it to the Engineer for prior approval. This plan should include inter alia:

A qualified safety officer with support staff to serve as a site safety team

Provision of traffic safety devises as per IRC:SP 55 with the following specifications:

- Signages of retro-reflective sheet of high intensity grade
- Delineators in the form of cones/drums made of plastic/rubber having retro-reflective red and white bands, at a spacing of 5 m along with a reflective tape to be tied in between the gaps of cones/drums. A bulb preferably using solar energy is to be placed on the top of the cone/drum for delineation in the dark hours and night.
- Barricades using iron sheet with adequate iron railing/frame painted with retro-reflective paint in the alternate yellow and black & white stripes. Warning lights at 5 m spacing shall be mounted on the barricades and kept lit in dark hours and night.
- Road markings with hot applied thermoplastic paint with glass beads.
- Safety measures for the workers engaged including personal protection equipment
- First aid and emergency response arrangements

10.2 Passage of Traffic along a Part of the Existing Carriageway under improvement

- For widening/strengthening existing carriageway where part width of the existing carriageway is proposed to be used for passage of traffic, treated shoulders shall be provided on the side on which work is not in progress. The treatment to the shoulder shall consist of providing at least 300 mm moorum layer properly rolled and compacted in a width of at least 1.5 m and the surface shall be maintained throughout the period during which traffic uses the same to the satisfaction of the Engineer.
- After obtaining permission of the Engineer, the treated shoulder shall be dismantled, the debris disposed of and the area cleared as per the direction of the Engineer.

10.3 Traffic Safety and Control

The Contractor shall keep the roadway under construction open to traffic and pedestrian movement with proper drainage arrangement and smooth surface condition. Suitable ingress and egress shall be provided as necessary for all intersecting roads and for all abutting properties. Its purpose shall be to protect people from associated hazards and to prevent trespassing into the construction zone.

The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, marking, flags, lights, drums, traffic cones, delineators and flagmen as per the traffic management plan submitted by the Contractor and approved by the Engineer. An agreed phased programme for the diversion of traffic on the urban road shall be drawn up in prior consultation with the Engineer and the Traffic Police.

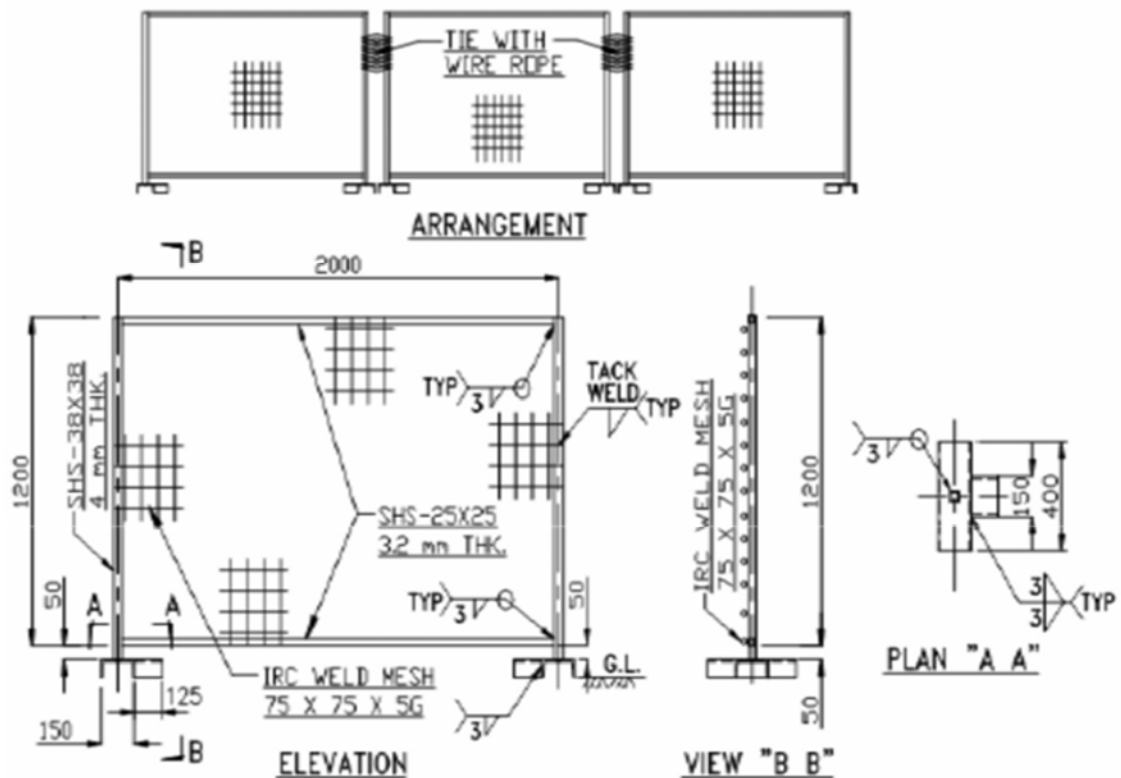
The Contractor shall keep all signs in proper position, clean and legible at all times.

The barricades erected on either side of the carriageway/portion of the carriageway closed to traffic, shall be of strong design to resist violation, and painted with alternate black and white stripes. On each approach, at least two signs shall be put up, one close to the point where transition of carriageway begins and the other 120 m away. The signs shall be of approved design and of reflective type, as directed by the Engineer. Two persons with red / green flag and whistle to be deputed at both ends of the barricades to regulate traffic. Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings, painted drums or a similar device to the directions of the Engineer. At night, the passage shall be delineated with lanterns or other suitable light source.

No material to project / spill beyond barricades.

This work item shall include all labour, equipment and services involved in the erection, maintenance, moving, adjusting, cleaning, relocating and storing of signs, barricades, drums, traffic cones and delineators furnished by the Contractor as well as all labour and equipment involved in the maintenance of traffic lanes and detours, for maintenance of traffic.



10.4 Maintenance of Diversions and Traffic Control Devices

Signs, lights, barriers and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time they are required and as directed by the Engineer. Such temporary ways shall be kept free of dust by frequent applications of water.

12. Transport of Contractor's Equipment or Temporary Works

Where the Contractor intends to use a particular route for the haulage of large quantities of materials he shall consult well in advance with any affected communities and submit in advance for the Employer's approval a plan including but not limited to the proposed route, the existing condition of the pavement and bridges, the estimated number and type of vehicle movements per day, a programme for monitoring the condition of the pavement and structures, and measures for limiting vehicle speeds and dust nuisance in built-up areas. The Employer reserves the right to disallow certain haul routes should these in his opinion cause or be likely to cause unreasonable nuisance or hazards to the public. The Employer's approval will not remove the Contractor's obligations under this Sub-Clause to prevent and repair damage to roads or his liability for compensation for any accidents caused by his vehicles.

13. Work in Monsoon and Dewatering

The execution of the work may entail working in the monsoon also. The contractor must maintain labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No special/ extra rate will be considered for such work in monsoon. The Contractor's rate shall be considered inclusive of cost of dewatering required if any and no extra rate shall be payable on this account.

14. Site Clearance

Before handing over the work to the Authority, the Contractor shall remove all temporary structure like the site offices, cement godown, stores, labour hutments etc., scaffolding rubbish, left over materials tools and plants, equipments etc., clean and grade the site to the entire satisfaction of the Engineer-In-Charge. If this is not done the same will be got done by GSCDCL at his risk and cost.

15. Site Documents

The following site documents shall mainly be maintained by the Contractor at site:

- Copy of contract documents and drawings.
- Computerized bill format.
- Site Order Book.
- Material testing registers / Quality Inspection Reports.
- Measurement books on computerized format.
- Progress bar chart.
- Sample approval register.
- Hindrance Register.
- Work Diary.
- Deviation/variation order registers.
- Cement consumption register.
- Reinforcement registers.
- Concrete cube test register.
- Slump test register.
- Silt content and sand bulkage register.

16. Safety Guidelines

- i. Proper and correct lifting methods shall be adopted.
- ii. All lifting tools, tackles and wires ropes etc. shall be of tested quality for safe working loads. Wire ropes shall be of sound construction without any splaying.
- iii. It is mandatory for all jobs done at a height of 2.5 M and more to use fall arrestor type safety belts & safety nets.

- iv. While carrying out work in confined areas, proper ventilations and lighting arrangement should be made by the Contractor. Adequate precautions shall be taken while the work is in progress to ensure that naked light, fire, welding or any other hot work is not in progress in the vicinity of the area where painting is being carried out.
- v. If the work is to be carried out at height, safety of the personnel is of utmost importance. Therefore, all necessary precautions must be taken by the Contractor and he has to obtain work permit from authorized official of GSCDCL for working at height before start the work.
- vi. In addition to the above, Contractor has to adhere to the following safety checklist:
 - A. CIVIL WORKS
 - During excavation, the excavated earth must be dumped at a safe distance from the edge of excavation. In no case, this shall be less than 1.5 meters from the top edge of the excavation.
 - Safe cross walkways are to be provided at distances not more than 30 meters along a continuous trenching for pipelines etc.
 - Hard hats (safety helmets), rubber boots, safety shoes, and hand gloves, etc are required to be provided for supervising as well as other working personnel by the Contractor.
 - Keep a watch on buried cables and underground systems. Ladders, gangways are to be provided at convenient places for carrying out required works. Ladders shall be firmly secured to ground and rungs of the ladders shall be properly secured and safe.
 - Install Barricading as per IS code with the marking "Gwalior Smart City Works".
 - B. ELECTRICAL WORKS
 - All temporary electrical connections should be got done to conform to statutory regulations and a certificate obtained from the authorities. The connection and the wiring to be maintained by competent and licensed supervisors and wiremen. As far as possible, the cables are to be safely buried to ensure free access to equipment and machineries movements.
 - Hard hats (safety helmets) made out of insulating material to be used by personnel working in 'live' areas like substations, etc.
 - Safety boots, necessary hand-gloves as required, shall be used.
 - 'Earthing' of machineries and equipment shall be ensured. No open/ bare connections allowed. The arrangements should be checked periodically for damages to insulation and loose connections, etc and rectified so that the wiring becomes non-hazardous.
 - The areas of working during nights shall be properly illuminated with floodlights and hand- lamps as per the demand of the job.
 - Danger signals and safety tags in the live areas shall be demonstrated properly. All connections to be switched off after the working hours.
 - Isolation switches and main switches shall be accessible easily. Necessary precautions should be taken while excavating earthing pits.
 - C. MECHANICAL WORKS
 - Hard hats (safety helmets), safety belts, eye goggles, face shields, safety boots, hand-gloves, respirators, etc as required/ directed shall be used.
 - Proper, correct and safe lifting methods shall be adopted
 - All lifting tools tackle and wires ropes etc shall be of tested quality for safe working loads. Wire ropes shall be of sound construction without any splaying.
 - Checks to be exercised for broken wires and core proportion in the main body of the wire ropes to be rejected. Manufacturer's guidelines/ standards instructions are to be followed for using wire ropes and slings with broken wires. Experience and common sense is of immense help.
 - Usage of hoisting belts/ safety belts is must for personnel working at higher elevations.

- Only safe gangways / walkways shall be used for movement of personnel. Short cuts shall be avoided.
- Check connections to headman anchors before hoisting.
- All live wires to be crossed during hoisting shall be made dead near the vicinity of the area during hoisting/ rigging.
- Avoid keeping the loads supported by hoisting equipments for an unreasonable length of time.
- Ropes, cables, and slings must be protected with pads or wooden blocks at sharp edges.

D. GENERAL

- Safety starts from the individual on the job. Experience and common sense shall be generously used. In case of any doubt regarding safety, Engineer-in-Charge can be consulted.
- Proper communication and alertness on the job is to be ensured.
- Manholes and openings for ducts etc shall be kept properly covered.
- Correct tools and tackles should be used for every work. Make shift tools and tackles will result in accidents.
- Fire-fighting equipment shall be placed at designated locations and kept unobstructed.
- Do not use loose clothing, neckties, and etc. while on the job.
- Safety precautions recommended by the manufacturers/ vendors shall be strictly adhered to.
- All machinery, tools and tackles shall be maintained properly, and clearly.

17. Encumbrances in Construction Area, including Trees and Utilities -

1. The Contractor shall be responsible to coordinate with service provider / concerned authorities for cutting of trees, shifting of utilities and removal of encroachments etc. and making the site unencumbered from the project construction area required for completion of work. This will include initial and frequent follow-up meetings / actions / discussions with each involved service provider / concerned authorities. The Contractor will not be entitled for any additional compensation for delay in cutting of trees, shifting of utilities and removal of encroachments by the service provider / concerned authorities. Payment for cutting of trees and shifting of utilities as required by the concerned department shall be made by the Employer. The entire cut material will be property of the Contractor and no cost of such material shall be recovered from the Contractor which shall be appropriately considered by the Contractor in his bid.
2. Drawings scheduling the affected encumbrances such as trees and services like water pipes, sewers, oil pipelines, cables, gas ducts, electricity lines, accessories, telephone poles and OFC cables etc. included in the contract document shall be verified by the Contractor for accuracy of scope.
3. The Employer will make payments to the respective service provider / authorities for cutting of trees and shifting of utilities, wherever required. The Contractor will obtain necessary approval from such Authorities after payments by the Employer and also in cases where payments are not required to be made for such shifting. The Employer will also write to all concerned departments/ service provider organization for expediting and facilitating cutting of trees, shifting of utilities and removal of encroachment etc.
4. Any services affected by the Works must be temporarily supported by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of the Works. It shall be deemed to be part of the Contract and no extra payment shall be made for the same.
5. The Contractor may be required to carry out certain works for and on behalf of the various bodies and he shall also provide, with the prior approval of the Engineer, such assistance to the various bodies as may be authorized by the Engineer.

18. Supply of Colored Record Photographs

The Contractor shall, at his own cost, arrange to take colour photographs at various stages / facets of the work including interesting and novel features of the work as directed by the IMC officials and supply two copies of colour record photographs mounted in the albums including negatives with specification and these shall be kept by Employer.

19. Public Awareness / Information Display

The Contractor shall, at his own cost, arrange to provide, erect and maintain necessary display boards/ banners etc as directed by IMC officials at selection points of project site giving such information as considered necessary for public awareness/ information.

20. Completion Drawings

The Contractor is required to submit the completion drawings (As built Drawings) for the work done by him. However the completion drawings for works done and covered underground, it is essential to prepare the completion drawing as soon as the work is done and before backfilling.

The drawings have to be prepared in digital format in AUTO-CAD, it is therefore made mandatory that the completion drawings of the cross section of road with all utilities, Road Plan, Inspection Chambers, Rainwater Catch pit, L-section of road etc, shall be submitted along with the running account bills for all the works carried out during the period.

The completion drawing should provide adequate data to enable finding the exact location of the system in ground at a later date by any other new person. It should also provide the data related to material, class and size of the line, its depth in ground, Invert Levels and levels in the manholes. The details will be provided from Chainage-wise in details and the plan layout of the roads along with Cross section and L-section on the reference map should be updated and submitted along with the bill. Two hard copies of the drawings will also be submitted along with the soft copy.

21. Execution of work according to Time Schedule

The Bidder shall include in his bid, a detailed construction programme of executing the project, describing broadly the technology and construction methodology major components of the project including traffic diversion plan, deployment of machinery, submission of drawings and design. The programme shall be supplemented with Master Control Network. The employer reserves the right to request for change in Master Control Network after discussions with the successful bidder. Mutually agreed Master Control Network shall form part of the Contract.

The Contractor has to start construction works in the fronts available at particular road site. This shall be planned in close consultation with the Engineer-In-Charge and in coordination with the concerned authorities / departments / local groups.

The Works shall be executed and performed in accordance with the Master Control Network (Work Programme) which shall clearly indicate the interlinking / interdependencies of all the works of the Contract.

The Programme shall be reviewed jointly by the Employer/ Engineer and the Contractor, at least once in a month where-in the hold ups/delays, if any, in the progress of Works, with reference to the agreed Schedule shall be given Special Attention. Necessary modifications (updating / Revisions) of the Programme, within the overall Time for Completion, shall be carried out by mutual agreement between the Employer/ Engineer and the Contractor.

22. Working Procedure

The Contractor shall be required to adopt a Working Procedure based on the following:

- Protection of properties along the project roads and their activities / operations such that these suffer minimum (if any) adverse effects as a result of construction activities.
- Observe all local requirements related to work and traffic restrictions (for example, transportation of material during particular times of a day or week, use of manual labour / smaller vehicles for carriage of material to / from narrow lanes) as may be specified by GSCDCL from time to time.
- Avoid disruption of any public utility network and promptly restore the same in case of any unavoidable disruption at his own cost and time without causing any discomfort to people as well as businesses.
- Provide for all temporary arrangements essential to allow normal operations / living conditions for people as well as businesses.

23. Coordination of Works

Due to the peculiar nature and location of the project, and in view of the objective of proper laying of all utility services, the specialist will need to work simultaneously and ensure proper mutual coordination to avoid any hardships to the community. GSCDCL reserves the right to schedule the order of performance of Work in such a manner as will minimize interference within different works involved. As shown in the table below, three works will be needed to be taken up simultaneously.

Description of Work	Implementation Strategy
1. Roads widening / improvement and laying of Footpath, Central Divider, RCC Cable Duct, RCC Pipes for OFC, Telecom Lines and Gas Pipeline, Storm Water Drainage Pipe and Chambers, including appurtenances signages, road markings and adjunct structures.	Removal of old road in stretches / phases and shifting of electric poles, laying of new CC Road with central divider and storm water drainage pipes and chambers, provide for crossing of utility pipes for future demand at regular intervals, laying pipes for OFC and Gas, construction of RCC Duct, construction of foot-path after laying of utility services.
a. Water supply network (transmission / distribution) including all appurtenances and structures – upto house connections	Laying of utility services network including structures and appurtenances in designated widths with additional excavation if any after excavation by Contractor 1 for road, proper finishing of chamber / manhole top levels after footpath construction by Contractor 1. New user-end connections, abandonment of old connections / pipes.
b. Sewerage pipes and manholes – upto house connections	
c. Power cables (HV / LV), Substations, Distribution Boxes / Feeder Pillars etc. upto house connections and Street-lighting.	Laying of HV/LV cables in RCC Ducts upto Distribution Boxes / Feeder Pillars, Installation of compact substations, street lighting poles installation. New user-end connections.

24. Material Storage

All materials shall be stored as per IS:4082.