NEPAL ELECTRICITY AUTHORITY

(Distribution And Consumer Services Directorate)

POKHARA REGIONAL OFFICE

TANAHUN DISTRIBUTION CENTRE

Chapaghat, Tanahun.

BID DOCUMENT

FOR

TENDER NO: TENDER NO: NEA- TDC-074/75-01 (ST)

CONSTRUCTION OF FIRST FLOOR OF OFFICE BUILDING AT TANAHUN DISTRIBUTION CENTRE

Last date of time of purchase: -	**2074/09/18**	**14:00 hrs**
Last date of time of submission: -	**2074/09/19**	**12:00 hrs**
Date and time of opening:	**2074/09/19**	**14:00 hrs**

Issued to ……..

TABLE OF CONTENTS

Table of Contents

Invitation For Bids

Section - I	Instruction to the Bidders.	(3-7)
Section - II	Sample forms of Bid.	(8-18)
Section - III	General condition of contract. (GCC)	(19-27)
Section - IV	Special conditions of contract (SCC)	(28-29)
Section - V	Sample forms of securities.	(30-31)
Section - VI	Technical Specification	(32- 84)
Section - VII	BOQ.	(5) pages
Section - VIII	Drawings	

Section I

INSTRUCTION FOR BIDDERS

1. Scope of Works:

Nepal Electricity Authority Tanahun Distribution Centre invites Sealed tender for the construction of works as detailed in attached specifications, drawings and the bill of quantities provided herein.

2. Eligible Bidder:

This Invitation for Bids is open to all registered contractors with qualifications as described below:

a) **Up to date Firm/Company Registration Certificate**

b) VAT and PAN Registration Certificates

c) Tax Clearance Certificate(2073/074)

d) A written declaration made by the Bidder stating that the Bidder is not ineligible to participate in the bid; has no conflict of interest in the bid procurement proceedings and has not been punished for the profession or business related offence.

e) Power of Attorney/Decleration of Undertaking.

f) Other documents as needed.

.3. One Bid per Bidder:

Each Bidder shall submit only one bid, A Bidder who submits more than one bid shall cause all the quotations with the Bidder's participation to be disqualified.

4. Cost of Bidding:

The Bidder shall bear all costs associated with the preparation and submission of his bid and the Employer shall in no case be liable for those costs.

5. Site Visit:

The Bidder at his own cost, responsibility and risk may visit the site of the works and acquire all necessary information for preparing the bid and entering into a contract for construction of the works.

6. Content of Bid Form:

The Bid Form comprise the documents listed below:

Invitation for Bids

Instructions to Bidders

Forms of Bid, Letter of Acceptance and Agreement

General Conditions of Contract (GCC)

Special Conditions of Contract (SCC)

Technical Specification

Drawings

Bill of Quantities

Sample Forms of Securities

7. Clarification:

A prospective Bidder may obtain clarification on the Quotation Form from the Employer.

8. Language of Bid:

All documents relating to the bid shall be in English or in Nepali.

9. Documents comprising Bid:

The bid by the Bidder shall comprise the following:

a. Bid and Eligibility Information

b. Bid Security

c. Priced Bill of Quantities

10. Bid Prices:

The contract shall be for the whole works described in scope of works based on the priced Bill of Quantities submitted by the Bidder. The Bidder shall fill in rates and prices for all items of the works in Nepali Rupees. Items for which no rate or price is entered shall be deemed covered by the other rates and prices in the Bill of Quantities and shall not be paid separately by the Employer .All duties, taxes and other levies payable by the contractor under the contract shall be includes in the rates, prices and total Bid Price submitted by the Bidder.

11. Bid Validity:

The Bid Validity is 120 days from the opening of the Bid Documents

12. Bid Security:

The Bidder shall furnish a Bid Security in Nepali Rupees in the amount **NRs.170000.00 (In word:One Lakhs SeventyThousands Only)** . The Bid Security shall remain valid for a period of 120 days after opening of the bid. The **Bid Security shall be in the form of cash voucher deposited in the Bank Account of the Employer specified in the notice for "Invitation for Bids" or a bank guarantee from a bank acceptable to the Employer.**

13. Format and Signing of Bids:

The bid shall be typed or written in indelible ink and shall be signed by an authorized person. Any entries or amendments including alternations, additions or corrections made shall be initialed by the same authorized person.

14. Sealing and Marking of Bids:

The Bidder shall submit his bid in sealed envelopes. The envelope shall be addressed to the Employer specified in the Invitation for bid and shall bear the name and identification number of the bid.

15. Deadline for Submission of Bids:

Bids shall be delivered to the Employer at the address no later than the time and date specified in the Invitation for bid.

16. Late Bids:

Any bid received by the Employer after the deadline shall not be accepted and shall be returned unopened to the Bidder upon request.

17 .Modification and Withdrawal of Bids:

Bids once submitted shall not be withdrawn or modified.

18. Bid Opening:

The Employer shall open the bids in the presence of the Bidder's representatives who choose to attend at the time and in the place as specified in the Invitation for bid. The Employer shall prepare and provide minutes of the bid opening including the information disclosed to those present.

19. Process to be Confidential:

Information relating to the examination, evaluation and comparison of bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any efforts by the Bidder to influence the Employer in the bid evaluation, bid comparison or contract award decisions may result in rejection of Bidder's bid.

20. Examination of Bids:

Prior to the detailed evaluation of Bids, the Employer shall determine whether each bid (a) meets the eligibility criteria defined in Clause 2;(b) has been properly signed; (c) is accompanied by the required securities ; and (d) is substantially responsive to the requirements of the Bidding documents.

21. Evaluation and Comparison of Bids:

21.1 In evaluating the Bids, the Employer shall determine for each bid the evaluated Bid Price by adjusting any corrections for errors. Bids shall be checked by the Employer for Arithmetic errors. Errors shall be corrected by the Employer as follows:

a. where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern; and

b. where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted shall govern

21.2 If the Bidder does not accept the corrected amount, the bid shall be rejected and the Bid Security may be forfeited.

22. Award of Contract:

22.1 The Employer shall decide the award of the contract to the Bidder whose bid is within the approved estimate and who has offered the lowest evaluated Bid Price within the days as stated by NEA regulations after of the opening of the quotation, provided that such Bidder has been determined to be eligible in accordance with the provisions of Clauses 2.

22.2 If the bid, which results in the lowest Evaluated Bid price, is unbalanced or frontloaded in relation to the Employer's estimate of the items of Work to be performed under the contract, the Employer shall ask the bidder to give clarification with detailed rate analysis for any or all items of the Bill of Quantities . If the clarification is found satisfactory then the Employer shall increase at the expense of the bidder the performance security set forth in Clause 25 by an additional 8% of the quoted amount to protect the Employer against financial loss in the event of default of the successful bidder under the contract and if the clarification is found unsatisfactory then the Employer may reject such bid

23. Employer's Right to accept any Bid and to reject any or all Bids:

The Employer reserves the right to accept or reject any bid or to cancel the bidding process and reject all bids, at any time prior to the award of the contract, without assigning any reasons w hat so ever and without thereby incurring any liability to the affected Bidder or Bidders.

24. Notification of Award and Signing of Agreement:

24.1 The Bidder whose bid is accepted and all other participating bidders shall be notified of the award by the Employer.

24.2 The notification (hereafter called the "Letter of Acceptance") to the successful Bidder shall state the sum that the Employer shall pay the Bidder in consideration of the execution, completion, and maintenance of the works as described by the contract. Within 7 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver the Performance Security pursuant Clause 25 and sign the Agreement.

24.3 Inability of the Bidder to make an Agreement within the above stated period shall result in cancellation of the Contract Award and forfeiture of the Bidder's Bid Security, upon which the Contract shall then be awarded to the next successive successful Bidder.

25. Performance Security:

The successful Bidder shall deliver to the Employer a Performance Security in cash or Bank Guarantee acceptable to the Employer equivalent to 5% of the bid amount from a commercial bank in Nepal. Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level of 50% of ((Employer's Estimate)-(15% Of Employer's Estimate)-(Contract Agreement Amount)) to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

26. Additional Securities:

The Bidder may be required to provide additional Performance Security if the Employer determines that the rate quoted by the Bidder in the Bill of Quantities, are too low for execution of the contract. In such case, the Employer shall instruct the Bidder to provide additional 8% security for signing of the Contract Agreement. Bidder's failure to do provide additional security shall result in forfeiture of the Bid Security and award of the Contract to the next lowest evaluated Bidder.

27. Corrupt or Fraudulent Practices:

The Employer shall reject a bid for award if it determines that the Bidder recommended for award of contract has engaged in corrupt or fraudulent practices in competing for the contract in question.

28.Conduct of Bidders :

28.1 The Bidder shall be responsible to fulfill his obligations as per the requirement of the Contract Agreement, Bidding documents, GON's Procurement Act and Regulations.

28.2 The Bidder shall not carry out or cause to carryout the following acts with an intention to influence the implementation of the procurement process or the procurement agreement:

a) Give or propose improper inducement directly or indirectly,

b) Distortion or misrepresentation of facts

c) Engaging or being involved in corrupt or fraudulent practice

d) Interference in participation of other prospective bidders.

e) Coercion or threatening directly or indirectly to cause harm to the person or the property of any person to be involved in the procurement proceedings,

f) collusive practice among bidders before or after submission of bids for distribution of works among bidders or fixing artificial/uncompetitive bid price with an intention to deprive the Employer the benefit of open competitive bid price..

g) Contacting the Employer with an intention to influence the Employer with regards to the bid or interference of any kind in examination and evaluation of the bids during the period after opening of bids up to the notification of award of contract

29. Blacklisting Bidder:

29.1 Without prejudice to any other right of the Employer under this Contract, GON, Public Procurement Monitoring Office may blacklist a bidder for his conduct up to three years on the following grounds and seriousness of the act committed by the bidder:

a) if it is proved that the bidder committed acts pursuant to the Sub - Clause 28.2,

b) if the bidder fails to sign an agreement pursuant to Sub -Clause 24.2,

c) if it is proved later that the bidder/contractor had committed substantial defect in implementation of the contract or had not substantially fulfilled his obligations under the contract or the completed work is not of the specified quality as per the contract ,

d) if convicted by a court of law in a criminal offence which disqualifies the bidder from participating in the contract.

e) if it is proved that the contract agreement signed by the bidder was based on false or misrepresentation of bidder's qualification information,

f) other acts mentioned in the Bidding Data

29.2 A firm declared blacklisted and ineligible by the GON shall be ineligible to bid for a contract during the period of time determined by the PPMO.

Section II

SAMPLE FORMS OF BID, ELIGIBILITY INFORMATION, LETTER OF ACCEPTANCE, SPECIAL INSTRUCTION TO BIDDERS FOR E-BIDDING AND AGREEMENT

Notes on Forms of Bid, Eligibility Information, Letter of Acceptance and Agreement

The Agreement shall incorporate any corrections or modifications to the bid resulting from

Corrections of errors, acceptable deviations or any other mutually-agreeable changes allowed

For the General Conditions.

The bid which the contractor has submitted to the Employer becomes part of the contract

Documents.All the information with regard to the preparation of bid to meet the Employer's requirements

Shall be provided before issuing the bidding documents.The contractor shall provide the remaining information by completing the form.

Bid

We have examined the documents listed in Instruction to Bidders, Clause 4 and offer to execute

The Works in conformity with the Contract for the sum of …….

…….. (In words) ……

…….. (In figures) or such other sum as may be ascertained under the Contract.

This bid shall remain binding until _____ [date]. This bid and your written acceptance of

It shall constitute a binding contract between us.

We understand that the Employer is not bound to accept the lowest or any offer received for the

Works.

Signature _____ Date: _____

Name: _____ Authorised to sign on behalf of (organization

Name): _____

Designation: _____

Office Stamp of the Organization: _____

Eligibility Information

Notes to Bidders

The information to be filled in by Bidders in the following pages shall be used for purposes of eligibility as provided for in Clause 2 of the Instructions to Bidders. This information shall not Be incorporated in the Contract. Attach additional pages as necessary.

1. Eligibility Requirements:

All Bidders shall submit following documents as pre- requisites for eligibility:

a. Constitution or legal status of Bidder: [attach copy]

b. Up to date Registration Certificate: [attach copy]

c. Pan Registration Certificate: [attach copy]

d. Up to date Tax Returns/ Clearance: [attach copy]

e. Power of Attorney/ letter of undertaking : [attach copy]

f. Place of registration: [insert]

g. A written declaration made by the Bidder stating that the Bidder is not ineligible to Participate in the bid; has no conflict of interest in the bid procurement proceedings And has not been punished for the profession or business related offence.

h. Principal Place of business: [insert]

Letter of Acceptance

[Letterhead of the Employer]

Date: _____

To: [name and address of the contractor]

This is to notify you that your Quotation (Bid) dated [date] for execution of the [name of the Contract and identification number, as given in the Invitation for Quotation] for the Contract Price of [insert the amount in Nepalese Rupees in numbers and words] as corrected and modified[2] in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are hereby instructed to contact our office [Office address] to sign the formal agreement on [Date] at [time]. As per the Instructions to Bidders you are also required to submit Performance Security, as specified in the Section VIII Sample Forms of Securities, , consisting of a Bank Guarantee in an approved format or cash deposit voucher in favour of the Employer in the Employer's Bank account [enter account details].

The Employer shall forfeit the bid security, in case you fail to furnish the Performance Security and to sign the contract.

Please convey our unconditional acceptance by signing on the original of this letter and submit the required Performance Security at the time of formal agreement.

Authorized Signature:

Name:

Designation:

Delete “corrected and” or “and modified” if not applicable. See Notes on Standard Form of Agreement, next page.

Agreement

This Agreement, made the [day] day of [month], [year] between [name and address of Employer] (hereinafter called “the Employer”) and [name and address of contractor] (hereinafter called “the contractor”) of the other part.

Whereas the Employer is desirous that the contractor execute [name and identification number of contract] (hereinafter called “the Works”) and the Employer has accepted the bid for _____ [insert the amount in Nepalese Rupees in numbers and words] by the contractor for the execution and completion of such Works and the remedying of any defects therein.

Now this Agreement witnessed as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.

2. In consideration of the payments to be made by the Employer to the contractor as hereinafter mentioned, the contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

3. The Employer hereby covenants to pay the contractor in consideration of the execution and completion of the Works and the remedying of defects wherein, the Contract Price or

such other sum as may become payable under the provisions of the Contract at the times

and in the manner prescribed by the Contract.

In Witness whereof the parties thereto have caused this Agreement to be executed the day and

year first before written.

The Common Seal of

was hereunto affixed in the presence of:

Signed, Sealed, and Delivered by the said

in the presence of:

Binding Signature of Employer

Binding Signature of Contractor _____

SPECIAL INSTRUCTION TO BIDDERS FOR E-BIDDING

A) Bid submission procedure through electronically (e-submission):

- Interested bidders may either purchase the Bidding documents from the Employer's office as specified in the Bid Notice or choose to download the necessary part of bidding documents from e-procurement section of NEA's web site http://www.e-nea-org.np. In case, the Bidder choose to download the bidding documents, prepare his bids on downloaded documents, and submit his bid electronically, the Bidder is required to deposit the cost of bidding document (as specified in the bid notice) in the bank account specified in the IFB. In addition, electronic scanned copy (pdf format) of the Bank deposit voucher shall be also required to be submitted along with the electronic bid files.

- The Bidder shall fill the following documents and forms (in hard copy), signed by the authorized representative and with seal of the company.

S.No.	Document	PDF File name	Requirement	Remarks
1	Form of Bid	Bid form -1	Mandatory	
2	Bid Security (Bank Guarantee)	Bid security-2	Mandatory	
3	Company registration,	Company reg-3	Mandatory	All firms in case of JV
4	VAT registration,	VAT reg-4	Mandatory	All firms in case of JV
5	Tax clearances certificate,	Tax-5	Mandatory	All firms in case of JV
6	Power of Attorney of Bid signatory	Power of att-6	Mandatory	

7	Joint venture agreement	JV doc-7	Mandatory	In case of JV
8	Qualification Information	Qualifications-8	Not Mandatory	
9	BOQ with rate, amount and total amount	BOQ-9	Mandatory	
10	Manufacturers Authorization	Authorization -10	Not Mandatory	NA
11	Technical Data Sheet	TDS-11	Not Mandatory	NA
12	Certification Documents	Certifications-12	Not Mandatory	NA
13	Declaration Form	Declaration-13	Mandatory	

The Bidder shall then scan the completed original documents, forms in PDF files with appropriate filename as shown in the table above. PDF (Adobe acrobat) version must be 4.0 or above. Declaration Letter for Eligibility of Bidder (as mentioned) shall be prepared and scanned and uploaded.

Note: Mandatory means the mentioned files must be included in e-submission and non-submission of such file shall be considered as non-responsive bid.

- For e-submission purpose the Bidder shall, at first, register in the e-procurement section NEA's web site http://www.e-nea.org.np
- After preparing all the required bidding documents in PDF scan files as specified as above, the Bidder shall upload the PDF bid files and submit his complete bid online through e-procurement section of NEA's website http://www.e-nea.org.np within the specified date and time.

- The e-procurement system will accept the e-submission of bid from the date after publishing of notice and will automatically not allow the e-submission of bid after the deadline for submission of bid, as specified above.

- The standard time for e-submission is Nepalese Standard Time as set out in the server of MIS Department of NEA. In case of e-submission of bids, the e-procurement system will, automatically, not allow the e-submission of bid after the deadline for submission of bid.
- When a bidder submits his bid in hard copy the e-procurement section **does not allow** the bidder to submit his Substitution or Modification or Withdrawal through e-procurement section of NEA's web site.

- Bidders may submit his Substitution or Modification or Withdrawal either in hard copy or through e-submission.

- For Substitution of Bid, the Bidder shall follow similar steps with a Substitution letter in PDF file.

- For Modification or Withdrawal of bid the Bidder is required to submit PDF scan copy of their Modification or Withdrawal letter and a written Power of

Attorney of the signatory for Modification/ Withdrawal, duly signed by Authorised Representative/s of the Firm / all authorised Joint Venture partners.

- When a Bidder submits electronic bid by downloading the bidding documents from the NEA's webpage it is assumed that the Bidder prepares his bid by studying and examining all the Bidding documents including specifications and conditions of contract.

- In case, the Bidder choose to download the bidding documents and deposit the cost of bidding document (as specified in the bid notice) in the Project's account such deposited amount shall be verified by the office during bid evaluation process. The bid shall be non-responsive and shall not be evaluated if the specified cost for bidding document is not deposited in the specified account of the Project for the said document.

B) Requirements and Conditions for E-Submission of Bid:

- The Bidder shall submit his bid electronically in PDF files in the manner specified above, and submission of hard copy of "original plus one copy of bid" is not mandatory.

- In case, if both the electronic bid and original bid in hard copy are submitted to the Employer within the bid submission dead line, the Bidder's electronic bid and original bid in hard copy will be accepted for evaluation provided if the facts and figures in hard copy confirm to the PDF files in electronic bid. If there is any discrepancy in fact and figures in the electronic bid and original bid in hard copy it will be treated as two separate bids from one Bidder and hence, both the electronic bid and original bid in hard copy shall be disqualified

- However, for electronically submitted bid in PDF files, the Bidder shall be required to submit documents/ clarifications as specified in ITB clause within 3 days.

- The e-submitted bids must be readable through open standards interfaces. Unreadable and or partially submitted bid files shall be considered incomplete and rejected for further bid evaluation.

- In addition to electronically submitted PDF files, the Bidder shall be required to submit documents and clarifications as required by the Employer. Non-submission of such documents and or clarifications by the Bidder within specified time may cause forfeiture of Bid Security.

- In case of major discrepancy found between electronically submitted PDF bid files and documents/ clarifications provided by the Bidder, the bid

shall not be considered for further evaluation.

- The Bidder shall attach the Bid Security Guarantee in the format attached in the Bid Document. The Bid Security may be forfeited
  1 → if the Bidder does not respond and/or submit the documents and or clarifications when requested by the Employer.
  2 → if major discrepancy is found between e-submitted bid information and documents/clarifications provided by the Bidder during verification process as requested by the Employer.

C) Bid Opening Process

- Electronically submitted bid shall be opened first at the Bid opening time.
- The e-procurement system allows the Employer to download the e-submitted bid files from the Bidders only after the time for opening the bids.
- The e-submitted bids must be readable through open standards interfaces. Unreadable and or partially submitted bid files shall be considered incomplete and rejected for further bid evaluation.
- After opening of e-submitted bids files, all files shall be printed and recorded at the time of bid opening.
- Envelopes marked with "WITDRAWAL" or "MODIFICATION" or "SUBSTITUTION" and in case of e-submission the files in PDF format under "WITDRAWAL" or "MODIFICATION" or "SUBSTITUTION" shall be opened and read out first. Bids for which acceptable notice of "WITDRAWAL" or "SUBSTITUTION" has been submitted shall not be opened. In case of e-submission bids, the Employer evaluates the bid based on the information as per electronically submitted bid files. For clarification/ verification purpose, the Employer may request the Bidder to submit documents/ clarifications. In case, if the Bidder can not substantiate or provide evidence to prove the information provided in e-submitted bid through documents/ clarifications, the bid shall not be considered for further evaluation and Clause *[bid forfeit]* as above shall be applicable.
- Proposed facility for submission of bid electronically through e-submission is to increase transparency, non-discrimination, equality of access, and open competition. The Bidders are fully responsible to use the e-submission facility in e-procurement section of NEA's website ***http://www.e-nea.org.np*** in specified procedures and in no case the Employer shall be held liable for Bidder's inability to use this facility.

D) Qualification Information

In case of e-Bidding, the Bidder is required to submit the documents to prove minimum qualification requirements only and

E) Bid Security Format

Form of Bid security shall include the provision as 'This Bank Guarantee shall not be withdrawn or released merely upon return of the original Guarantee by the Bidder unless notified by the Employer for the release of the Guarantee'

not the detail documents.

Electricity Authority
Declaration Form (for E-bidding)

S.No	Description	Status			
		Issued to	Issued by	Date of	No. of

		(as applicable)	**(as applicable)**	**Issue**	**Pages**
1	Notarized Power of Attorney from the Company to Sign on Company's behalf (For Single Bidder)				
2	Joint Venture Agreement; ***If any***				
3	Notarized Power of Attorney to Sign the Bid on Company's behalf (Each Partner in case of JV)				
4	Notarized Power of Attorney to Sign the Bid (On Behalf of JV)				
5	Registration Certificate of the Bidder (and each partners in case of JV)				
6	Bid security				
7	Price Schedule				
8	Bid Form				
9	Qualification Forms				

10	Complete Certified Audited Report of the Bidder (and each partner in case of JV)	Year 1				
		Year 2				
		Year 3				
11	Performance(or user) Certificate/s (Bidder)	1				
		2				
		3				
		4				
12	Power of Attorney from the Company to Issue the Manufacturers Authorization					
13	Business License of Manufacturer/s	1				
		2				
		3				
		4				
14	User Certificate/s (Manufacturer)	1				
		2				
		3				
		4				
15	Other Certification (as per requirements)	3				
		4				
		.				

GENERAL CONDITIONS OF CONTRACT.(GCC)

1. General Provisions

1.1 Definitions In the Contract as defined below, the words and expressions defined shall have the following meanings assigned to them, except where the context requires otherwise:

The Contract

1.1.1 "**Contract**" means the Agreement signed between the Employer and the contractor and the other documents listed in the Special Conditions of Contract (SCC).

1.1.2 "**Specification**" means the document as listed in the SCC, and any variation to such Document.

1.1.3 "**Drawings**" means the Employer's drawings of the Works as listed in the SCC, and any variation to such drawings.

1.1.4 "**Bill of Quantities**" means the priced and completed bill of quantities forming part of the sealed Quotation.

1.1.5 "**Bid or Quotation**" means the contractor's priced offer to the Employer for the execution and completion of the Works and the remedying of any defects therein in

Accordance with the provisions of the Contract, as accepted by the Letter of Acceptance.

1.1.6 "**Letter of Acceptance**" means the formal acceptance by the Employer of the **bid** or Tender.

1.1.7 "**Employer**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the contractor) any assignee.

1.1.8 "**Contractor**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the Employer) any assignee.

1.1.9 "**Party**" means either Employer or the contractor.

Date, Times and Periods

1.1.10 "**Commencement Date**" means the date stated in the SCC after the date the

Agreement comes into effect or any other date agreed between the Parties.

1.1.11 "**Day**" means a calendar day.

1.1.12 "**Time for Completion**" means the time for completing the Works as stated in the SCC (or as extended under Sub-Clause 6.3), calculated from the Commencement

Money and Payments

1.1.13 "**Cost**" means all expenditure properly incurred (or to be incurred) by the contractor.

whether on or off the Site, including overheads and similar charges, but does not include profit.

1.1.14 "**Contract Price**" means the sum stated in the Letter of Acceptance as payable to the contractor and adjusted with any Variation Orders and Other Adjustments upon

completion of the works and the remedying of any defects therein in accordance with the provisions of the Contract.

1.1.15 "**Retention Money**" means the aggregate of all money retained by the Employer pursuant to Sub-Clause 10.3

Other

1.1.16 "**Contractor's Equipment**" means all apparatus, machinery, vehicles, facilities and

Definitions

other things required for the execution of the Works but does not include Materials or Plant.

1.1.17 "**Country**" means Nepal.

1.1.18 "**Employer's Liabilities**" means those matters listed in Sub-Clause 5.1

1.1.19 "**Materials**" means things of all kinds (other than Plant) intended to form or forming part of the permanent work.

1.1.20 "**Plant**" means the machinery and apparatus intended to form or forming part of the Permanent Works.

1.1.21 "**Site**" means the places provided by the Employer where the Works are to be executed, and any other places specified in the Contract as forming part of the Site.

1.1.22 "**Variation**" means any change which is a result of unforeseen circumstances that arise as a result of instruction by the Employer/ Engineer under Sub-Clause 9.1.

1.1.23 "**Works**" means all the work and design (if any) to be performed by the contractor including temporary work and any Variation.

1.1.24 "**Permanent Works**" means the permanent works to be executed (Including Plant) in accordance with the Contract.

1.1.25 "**Temporary Works**" means all temporary works of every kind (other than contractor's Equipment) required in or about the execution and completion of the Works and the remedying of any defects therein.

1.1.26 "**Adjudication**" means the procedure to be adopted by the contractor and the Employer in solving the dispute if it is not solved amicably pursuant to Sub-Clause 13.1.

1.2 Interpretation Words importing persons or parties shall include firms and organizations. Words importing singular or one gender shall include plural or the other gender where the context requires.

1.3 Priority of Documents The documents forming the Contract shall to be taken as mutually explanatory of one another. If an ambiguity or discrepancy is found in the documents, the Employer shall issue any necessary instructions to the contractor, and the priority of the documents shall be in accordance with the order as listed in the SCC

.

1.4 Law The law of the Contract is stated in the SCC.

1.5 Communications Where provision is made for the giving or issue of any notice, instruction, or other communication by any person, unless otherwise specified such communication shall be written in the language stated in the SCC as shall not be unreasonably with held or delayed. If a notice given pursuant to Sub Clause 1.5 fails to be delivered due to failure to trace the address of the party then the notice shall be published as public notice in a National daily newspaper and when the notice is so published then the notice shall be considered to be delivered to the concerned party.

1.6 Statutory The contractor shall comply with the laws of the countries where activities are

Obligations	performed. The contractor shall give all notices and pay all fees and other charges in respect of the Works.

2. The Employer

2.1 Provision of Site	The Employer shall provide the Site and right of access thereto at the times stated in the SCC.
2.2 Permits and Licenses	The Employer shall, if requested by the contractor, assist him in applying for permits, licenses or approvals which are required for the Works.
2.3 Employer's Instructions	The contractor shall comply with all instructions given by the Employer in respect of the Works including the suspension of all or part of the Works.
2.4 Approvals	No approval or consent or absence of comment by the Employer or the Employer's representative shall affect the contractor's obligations.

3. Employer's Representatives

3.1 Authorized Person	`One of the Employer's personnel shall have authority to act for him. This authorized person shall be as stated in the SCC, or as otherwise notified by the Employer to the contractor.
3.2 Employer's Representative	The Employer may also appoint a firm or individual to carry out certain duties. The appointee may be named in the SCC, or notified by the Employer to the contractor from time to time. The Employer shall notify the contractor of the delegated duties and authority of this Employer's representative.

4. The Contractor

4.1 General Obligation	The contractor shall carry out the Works properly and in accordance with the Contract. The contractor shall provide all supervision, labour, Materials, Plant and contractor's Equipment which may be required? All Materials and Plant on Site shall be deemed to be the property of the Employer. During continuance of the of the contract, the contractor and his sub-contractors shall abide at all times by all labour laws, including child labour related enactments, and rules made there under. A child who has not attained the age of fourteen years shall not be employed in any work as a labourer.
4.2 Contractor's Representive	The contractor shall submit to the Employer for consent the name and particulars of The person authorized to receive instructions on behalf of the contractor.
4.3 Subcontracting	The contractor shall not subcontract the whole of the Works. The contractor shall not subcontract any part of the Works without the consent of the Employer.
4.4. Performance Security	As stated in the SCC, the Contractor shall deliver to the Employer no later than the date specified in the Letter of Acceptance.

5. Employer's Liabilities

5.1 Employer's Liabilities

In this Contract, Employer's Liabilities mean:

a) War, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country,

b) Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country,

c) Riot, commotion or disorder by persons other than the contractor's personnel and other employees, affecting the Site and/or the Works.

d) Use or occupation by the Employer of any part of the Works, except as may be specified in the Contract,

e) Design of any part of the Works by the Employer's personnel or by others for whom the Employer is responsible,

f) Any operation of the forces of nature affecting the Site and/or the Works, which was unforeseeable or against which an experienced contractor could not reasonably have been expected to take precautions

g) A suspension under Sub-Clause 2.3 unless it is attributable to the contractor's failure,

h) Any failure of the Employer,

i) physical obstructions or physical conditions, other than climatic conditions, encountered on the Site during the performance of the Works, which obstructions or conditions were not reasonably foreseeable by an experienced contractor and which the contractor immediately notified to the Employer,

j) Any delay or disruption caused by any Variation,

k) Any change to the law of the Contract after the date of the contractor's offer as stated in the Agreement,

l) losses arising out of the Employer's right to have the permanent work executed on, over, under, in or through any land, and to occupy this land for the permanent work, and

m) Damage which is an unavoidable result of the contractor's obligations to execute the Works and to remedy any defects.

6. Time for Completion

6.1 Execution of the Works

The contractor shall commence the Works on the Commencement Date and shall proceed expeditiously and without delay and shall complete the Works within the Time for Completion.

6.2 Programme

The contractor shall submit to the Employer a programme for the Works within the time stated in the SCC

6.3 Extension of Time The contractor shall be entitled to an extension to the Time for Completion if he shall be delayed by any of the Employer's Liabilities. The contractor shall submit an Application to the Employer for extension of time, stating the causes for delay, 7 days before the expiry of the Contract completion date. On receipt of an application from the contractor, the Employer shall consider all supporting details provided by the contractor and shall extend the Time for Completion as appropriate.

6.4 Liquidated Damages for Delay If the contractor fails to complete the Works within the Time for Completion, the contractor's liability to the Employer for such failure shall be to pay the amount stated in the SCC for each day for which he fails to complete the Works.

7. Taking-Over

7.1 Completion The contractor may notify the Employer when he considers that the Works are complete.

7.2 Taking-Over Notice The Employer shall notify the contractor when he considers that the contractor has completed the Works stating the date accordingly. Alternatively, the Employer may notify the contractor that the Works, although not fully complete, are ready for taking over, stating the date accordingly. The Employer shall take over the Works upon the issue of this notice. The contractor shall promptly complete any outstanding work and, subject to Clause 8, clear the Site.

8. Remedying Defects

8.1 Remedying Defects The Employer may at any time prior to the expiry of the period stated in the SCC, notify the contractor of any defects or outstanding work. The contractor shall remedy at no cost to the Employer any defects due to the contractor's design, materials, plant or workmanship not being in accordance with the Contract. Failure to remedy any defects or complete outstanding work within a reasonable time of the Employer's notice shall entitle the Employer to carry out all necessary work at the contractor's cost.

8.2 Uncovering and Testing The Employer may give instruction as to the uncovering and/or testing of any work. Unless as a result of any uncovering and/or testing it is established that the contractor's design, materials, plant or workmanship are not in accordance with the Contract, the Contractor shall be paid for such uncovering and/or testing as a Variation in accordance with Sub-Clause 9.2.

9. Variations and Claims

9.1 Right to Vary The Employer may instruct Variations.

9.2 Valuation of Variations Variations shall be valued as follows:

a) where appropriate, at rates in the Contract, or

b) In the absence of appropriate rates, the rates in the Contract shall be used as the basis for valuation or

c) At appropriate new rates, as may be agreed or which the Employer considers appropriate.

9.3 Right to Claim If the contractor incurs cost as a result of any of the Employer's Liabilities, the contractor shall be entitled to the amount of such cost. If as a result of any of the Employer's Liabilities, it is necessary to change the Works, this shall be dealt with as a Variation.

9.4 Variation and Claim Procedure The contractor shall submit the Employer an itemized make-up of the value of Variations and claims within 7 days of the instruction or of the event giving rise to the claim. The Employer shall check and if possible agree the value. In the absence of agreement, the Employer shall determine the value.

10. Contract Price and Payment

10.1 Valuation of The Works The Contract Bill of Quantities and the approved Variation quantities shall be used to calculate the valuation of the works completed .The contractor shall be paid for the quantity of work done at the rate in the Bill of Quantities or rate agreed pursuant to clause 9.2 for varied works.

10.2 Payments Certificates The Contractor shall submit to the Employer monthly statements of the estimated value of the works completed less the cumulative amount certified previously. The Employer shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor

10.3 Payments The Employer shall pay to the contractor, A sum subject to remeasurement at the rates offered by the Bidder in the bill of quantities prepared by the Employer

10.4 Payment of Retention One half of the retention shall be repaid by the Employer to the contractor within 30 days upon expiry of Defects Liability Period and the Employer has certified that the Notified defects have been corrected. The remainder of the retention shall be paid by the Employer to the contractor within 7 days after submission of evidence document from the concerned Internal Revenue Office that the contractor has submitted his Income Returns

10.5 Advance a) The Employer may make advance payment to the contractor of the amounts stated in the SCC within 30 days, against provision by the contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of them Guarantee shall be progressively reduced by the amounts repaid by the contractor. Interest will not be charged on the advance payment.

b) The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the contractor, following the schedule of completed percentages of the Works as indicated in SCC

10.6 Local Taxation & Value Added Tax a) The prices quoted by the Contractor shall include all taxes that may be levied in accordance to the laws and regulations in being in Nepal.

b) The Contract is not exempted from value added tax. The Contractor shall pay VAT in the concerned VAT office within time frame specified in VAT regulation.

11. Termination of Contract

11.1 Default by Contractor If the contractor abandons the Works, refuses or fails to comply with a valid instruction of the Employer or fails to proceed expeditiously and without delay or is, despite a written complaint, in breach of the Contract, the Employer may give notice referring to this Sub-Clause and stating the default.

If the contractor has not taken all practicable steps to remedy the default within 15 days after the contractor's receipt of the Employer's notice, the Employer may, by a second notice given within a further 22 days, terminate the Contract. The Contractor shall then demobilize from the Site leaving behind Materials and Plant and any contractor's Equipment which the Employer instructs in the second notice to be used until the completion of the Works.

11.2 Default by Employer If the Employer fails to pay in accordance with the Contract, or is, despite a written complaint, in breach of the Contract, the contractor may give notice referring to this

Sub-Clause and stating the default. If the default is not remedied within 7 days after the Employer's receipt of this notice, the contractor may suspend the execution of all or parts of the Works. If the default is not remedied within 30 days after the Employer's receipt of the contractor's notice, the contractor may, by a second notice given within a further 22 days, terminate the Contract. The contractor shall then demobilize from the Site.

11.3 Insolvency If a Party is declared insolvent under any applicable law, the other Party may by notice terminate the Contract immediately. The contractor shall then demobilize from the Site leaving behind, in the case of the contractor's insolvency, any contractor's Equipment which the Employer instructs in the notice is to be used until the completion of the Works.

11.4 Termination by Convenience Notwithstanding the above, the Employer shall be entitled to terminate the Contract in public interest, at any time at the Employer’s convenience, by giving notice of such termination to the contractor.

11.5 Payment upon Termination After termination, the contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following: a) Any sums to which the contractor is entitled under Sub-Clause 9.4,

b) Any sums to which the Employer is entitled,

c) if the Employer has terminated under Sub-Clause 11.1 or 11.3, the Employer shall be entitled to a sum equivalent to 20% of the value of those parts of the Works not executed at the date of the termination,

d) if the contractor has terminated under Sub-Clause 11.2 or 11.4, the contractor shall be entitled to the Cost of his suspension and demobilization together with a sum equivalent to 10% of the value of those parts of the Works not executed at the date of termination The net balance due shall be paid or repaid within 30 days of the Notice of termination.

12. Risk and Responsibility

12.1 Contractor's Care of the Works

The contractor shall take full responsibility for the care of the Works from the Commencement Date until the date of the Employer's notice under Sub-Clause 7.2. Responsibility shall then pass to the Employer. If any loss or damage occurs to the Works during the above period, the contractor shall rectify such loss or damage so that the Works conform to the Contract.

12.2 Force Majeure

If a Party is or shall be prevented from performing any of its obligations by Force Majeure, the Party affected shall notify the other Party immediately. If necessary, the contractor shall suspend the execution of the Works and, to the extent agreed with the Employer, demobilize the contractor's Equipment

If the event continues for a period of 90 days, either Party may then give notice of termination which shall take effect 30 days after the giving of the notice. After termination, the contractor shall be entitled to payment of them unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

a) Any sums to which the contractor is entitled under Sub-Clause 9.4,

b) The Cost of his suspension and demobilization,

c) any sums to which the Employer is entitled.

The net balance due shall be paid or repaid within 30 days of the notice of termination.

13. Resolution of Disputes

13.1 Adjudication

If any dispute shall arises out of or in connection with the Contract, including any valuation or other decision of the Employer, then the parties shall attempt to settle such dispute amicably. However if the dispute is not settled amicably then the dispute shall be referred to the Adjudicator. The adjudicator shall be any person agreed by the Parties. In case of disagreement the Employer shall request Nepal Council of Arbitration (NEPCA) for appointment of the Adjudicator.

13.2 Amicable Settlement

If either Party is dissatisfied with the decision of the adjudicator attempt shall be made to resolve the dispute amicably.

14. Conduct of Bidders

14.1

The Bidder shall be responsible to fulfill his obligations as per the requirement of the Contract Agreement, Bidding documents, GON's Procurement Act and Regulations.

14.2

The Bidder shall not carry out or cause to carryout the following acts with an intention to influence the implementation of the procurement process or the procurement agreement:

h) Give or propose improper inducement directly or indirectly,

i) Distortion or misrepresentation of facts

j) Engaging or being involved in corrupt or fraudulent practice

k) Interference in participation of other prospective bidders.

l) Coercion or threatening directly or indirectly to cause harm to the person or the property of any person to be involved in the procurement proceedings,

m) Collusive practice among bidders before or after submission of bids for distribution of works among bidders or fixing artificial/uncompetitive bid price with an intention

To deprive the Employer the benefit of open competitive bid price..

n) Contacting the Employer wit an intention to influence the Employer with regards to the bid or interference of any kind in examination and evaluation of the bids during the period after opening of bids up to the notification of award of contract

15. Blacklisting

Bidder

15.1 Without prejudice to any other right of the Employer under this Contract, GON, Public Procurement Monitoring Office may blacklist a bidder for his conduct up to three years on the following grounds and seriousness of the act committed by the bidder:

g) If it is proved that the bidder committed acts pursuant to the Sub - Clause 14.2,

h) If the bidder fails to sign an agreement pursuant to Instruction to Bidders Sub Clause 24.2,

i) If it is proved later that the bidder/contractor had Committed substantial defect in implementation of the contract or had not substantially fulfilled his obligations under the contract or the completed work is not of the specified quality as per the contract ,

j) If convicted by a court of law in a criminal offence which disqualifies the bidder from participating in the contract.

k) If it is proved that the contract agreement signed by the bidder was based on false or misrepresentation of bidder's qualification information,

l) Other acts mentioned in the Bidding Data

15.2 A firm declared blacklisted and ineligible by the GON shall be ineligible to bid for a contract during the period of time determined by the PPMO.

SPECIAL CONDITIONS OF CONTRACT (SCC)

This SCC forms part of the Agreement

[Note: with the exception of the items for which the Employer's requirements have been

Inserted, the Bidder shall complete the following information before submitting his bid]

Items	Clause	Data
Documents forming the Contract listed in the order of priority Document a. The Agreement b. Special Conditions of Contract c. General Conditions of Contract d. The Technical Specifications e. The Drawings f. The Bill of Quantities g. ……..(if any) h. ……(if any)	1.1.1	Document identification
Time for Completion	1.1.12	6 (Six) months from the date of work order
Law of Contract	1.4	Arthik prashasan Binimayabali 2068 NEA and Applicable Law of Nepal (latest Amendment)
Language	1.5	English or (in Nepali version).
Provision of Site	2.1	NEA,Tanahun distribution centr Chapaghat Tanahun
Authorized Person	3.1	Chief,DCS Tanahun Distribution center
Name and address of Employer's representative (if known)	3.2	Employees deputed by the employer
Performance security (if any): Amount: Form:	4.4 4.4	5% of the contract price under the Contract. performance security shall be increased at the expense of the Bidder to a level of 50% of ((Employer's Estimate)-(15% Of Employer's Estimate)-(Contract Agreement Amount)) to protect the Employer against financial loss in the event of default of the successful Bidder
Time for the submission of programme	6.2	Within 16th days of the commencement date
Liquidated Damages for Delay	6.4	0.05% of the Contract Price per day up to a maximum of 10% of sum stated in the Agreement
Period for notifying defects	8.1	365 days* calculated from the date stated in the notice under Sub-Clause 8.1.

SECTION V

SAMPLE FORMS OF SECURITIES

Bid Security Form

Whereas …….Hereinafter called the bidder has submitted its bid dated ……..……for know all men by these presents that We……of ……....Having our registered office at ……..Hereinafter called the Bank are bound unto, Nepal Electricity Authority, Hereinafter called the NEA in the sum of ……..for Which Payment will and truly be made to the said NEA, the Bank binds itself, its successors and assigns, by these presents. Sealed with the common seal of the bank this …….Day of ……., 2015.

The conditions of this obligation are:

1 .If the Bidder withdraws its Bid during the period of Bid validity specified by the Bidder on the the

Bid Form; or

2 If the Bidder, having been notified of the acceptance of its bid by the NEA during the period of Bid validity:

(A) Fails or refuses to execute the contract Form, when requested; or

(B) Fails or refuses to furnish the Performance Security, in accordance with the instructions to Bidders:

We undertake to pay the NEA up to the above amount, according to, and upon receipt of, its first written demand, without the NEA having to substantiate its demand provided that in its demand the NEA will note the amount claimed by it is due to it owing to the occurrence of one or both of two above –stated conditions, specifying the occurred condition or conditions. This guarantees will remain in force up to and including **120(one hundred twenty) days** after the period of Bid Validity. And any Demand in Respect thereof should reach the Bank not later than the date.

. NAME OF THE BANK

……

By……

Authorized Representative

……..

Signature of Witness

Name of Witness……. Address of Witness……

Performance security Form

To

The DCS Chief
Nepal Electricity Authority
Tanahun Distribution Center
Chapghat Tanahun (Nepal)

Sub: Performance Bond

Dear Sir/(s)

Whereas M/S …….. (Contractor) has undertaken **……** In pursuance of contract No, …… offer no ……. dated ……...herein after called, the contract and whereas it has been stipulated by you in the said Contract that the contractor shall furnish NEA with a Bank Guarantee by a recognized Bank for the sum specified therein as security for compliance with the contractor's performance obligation in accordance with the contract.

And whereas we have agreed to give the contractor a Guarantee:

Thereafter, we hereby affirm that we are Guarantors and responsible to you on behalf of the contractor up to a total of NRS……..……and we undertake to pay you

Upon your first written demand declaring the contractors in default under the contract without any argument of any sum or sums as specified by you within the limit of NRS. …… as aforesaid, without your needing to prove or to show grounds for reasons for your demand of the sums specified therein.

This Guarantee is valid until……..

……

Name of the Guarantor

……

Authorized Signature

For

Title

Dated ……Address……

SECTION VI

TECHNICAL SPECIFICATIONS AND STANDARDS

A. GENERAL NOTES FOR CONTRACTOR AND DEFINITIONS

1.1 The work shall be carried out according to the specifications whether specifically mentioned in it or not. No extra in any form shall be paid unless it is definitely stated as an item in the Bill of Quantities. Whenever the specifications are not given or ambiguous, decision of the Engineer shall be considered as final and binding.

1.2 The work shall be related to the drawings, which the contractor is presumed to have studied. Nothing extra will be paid for any item because of its shape, location or other difficult circumstances, even if the schedule makes no distinction as long as the item is shown in the drawing.

1.3 The sources of materials stated in the specifications are those, from which materials are generally available. However, materials not conforming to the specifications shall be rejected even if they come from the stated sources. The contractor should satisfy himself that sufficient quantity of material of acceptable specification is available from the stated or other sources.

1.4 Where terms "Engineer", "Contractor", "Works" etc. are used, they shall have the meaning defined in the Conditions of Contract or defined in the subsequent specification.

1.5 "Employer" shall mean

NEPAL ELECTRICITY AUTHORIT
TANAHUN DISTRIBUTION CENTER
CHAPGHAT TANAHUN

1.6 "Site Engineer" shall mean the employees deputed by the Employer.

1.7 The requirements of specifications under (2) General (3) Materials shall be fulfilled by the Contractor without extra charge including transportation or any other taxes involved that is the item rates quoted shall be deemed to have taken these into account.

A-1 GENERAL REQUIREMENT

A.1.1 Work to be as per Specification

The work shall be carried out according to the specifications where specifically mentioned in it or not. No extra in any form shall be paid unless it is definitely stated as an item in the Bill of Quantities.

Where the specifications are not given or are ambiguous, the relevant Indian Standard and further amendments or decision of the Engineer shall be considered as a final and binding.

The rate entered in the Bill of Quantities shall include the costs to maintain the materials as per specification.

The Engineer shall have such authority to maintain the materials as per specification, workmanship where strictly stated in specification or not.

A.1.2 Tendered Rates

The rates in the offer to be paid to the Contractor for Works shall be inclusive of materials, its procurement, freight, insurance if any, overhead and profit as well as transportation and loading & unloading, storing, hire and use of the equipment and tools to be employed and cost of wages of labor, tests and cost of temporary works and site installation like store and buildings, and other facilities, etc. with profit, price escalation risk, loss, wastage, custom, duties, taxes, design, drawing if necessary etc. to fulfill all duties and liabilities as laid out in the Contract. All these costs make the unit price for the built-in position at site as per drawing and as per direction and approval of the Engineer.

A.1.3 Work to go simultaneously

The work shall be carried out simultaneously by providing facilities for Electrical, Plumbing, Sanitary, Water Supply, Telecommunication and other services such that final fittings of fixtures is eased. The facilities shall include for electrical and telecommunication services, making holes in shuttering for conduits, sanitary pipes,

fan hooks etc. However, no extra payment shall be admissible for such works and shall be deemed to have taken these into consideration while quoting the rates of respective items of Bill of Quantities.

A.1.4 Works Related to Drawing

The work shall be related to the drawing, which the Contractor is presumed to have studied. Nothing extra will be paid for any item for its shape, location or other difficult circumstances, even if the schedule makes no distinction as long as the item is shown in the drawings.

A.1.5 Indicated Source – Guideline only

The source of materials stated in the specifications (if any) are those from which materials are generally available. However, materials not conforming to specifications shall be rejected even if they come from the stated sources. The Contractor should satisfy himself that sufficient quantity of material of acceptable quality is available from the stated or other sources.

A.1.6 Requirement to be Fulfilled

The requirements of these specifications shall be fulfilled by the Contractor without extra charge including transportation or any other taxes involved i.e. the item rates quoted shall be deemed to have taken these into account.

A.1.7 Drawing, Instruction & Measurement

All the work shall be done according to the drawings and instruction of the Engineer. The Contractor shall arrange to test materials and or portions of the work at his own cost in order to prove their soundness and sufficiency. If after any such test and in the opinion of the Engineer any work or position of work is found to be defective or unsound the Contractor shall pull down and re-execute the same at his own cost, otherwise, the Engineer could remove the defective work at his own cost & the cost is deducted from the next billing of the Contractor. Defective materials shall be removed within 24 hours of instruction of the Engineer under this Clause from the site.

The Contractor shall submit shop drawings or setting drawings & bar bending schedules to the Engineer for approval at least one week before execution of the work.

A.1.8 Preparing & Clearing the Site

The site described and shown on the plans plus 30 m. all around the building shall be cleared of all abstractions, loose stones and materials, unsuitable top soil, rubbish of all kinds as well as brushwood and trees. No trees shall be removed/cut without prior permission of the Engineer. After the construction work completed the site should be clear by removing all kinds of unsuitable topsoil, loose stones materials all complete as per instruction of the Engineer.

A.1.9 Quality of Works

Materials, tools, plants and workmanship shall be of standard quality and the best of several kinks available and as approved by the Engineer.

A-2 MATERIAL SOURCE INSPECTION AND TESTING

A.2.1 Materials to be as per Specification

The materials supplied and used in the works shall comply with the requirements of the specifications. These shall be new, except as may be provided elsewhere in the contract or permitted by the Engineer in writing. The materials shall be manufactured, handled and used in a professional manner to ensure completed work in accordance with the Contract. Where an Indian Standard is specified, the latest version of the standard quoted shall be considered to apply.

A.2.2 Sources

The sources of kinds of materials shall not be changed at any time without written permission of the Engineer. If the product from any source proves unacceptable at any time, the Contractor shall make such arrangements as may be necessary to assure supply of acceptable material, either by alterations in plant operations or by a change of source. Claims for increase in costs, which may be occasioned by such

alterations or changes, will not be given consideration even if the source of the unacceptable material was designated in the Contract as a source of material.

When any manufactured product, whether new or used, is furnished by the Employer, the location at which such materials will be delivered to the Contractor will be designated in the Contract. In such cases the Contractor shall haul the materials from the designated store to the point of use and compensation for such hauling will be considered to be included in the Contract unit price for placing the materials in the finished work. If the materials are delivered at unidentified location, a separate transportation cost shall be paid.

A.2.3 Procurement Program & Samples Test

The Contractor shall give immediate notification to the Engineer of the placing of orders for shipment of materials to permit testing; he shall furnish without charge all samples required; and he shall afford such facilities as the Engineer requires for collecting and forwarding such samples.

The Contractor shall not make use of or incorporate into the work, the materials which are not found to comply with the requirements of the specification, except that any materials which have a satisfactory record of compliance with the specifications may, at the discretion of the Engineer, be used until the tests are completed. If the materials fail to pass the tests, no further use thereof shall be made until the Contractor has taken steps satisfactory to the Engineer to correct the deficiencies. When required by the Engineer, preliminary samples of the character and quantity prescribed shall be submitted by the Contractor or producer for examination and shall be tested in accordance with the methods referred to in the specifications. The acceptance of a preliminary sample shall not be construed as acceptance of materials from the same source delivered later. Only the materials actually delivered for the work will be considered, and their acceptance or rejection will be based on the results of the test and inspections prescribed in these specifications.

All samples shall arrive well in advance for testing and approvals keeping in mind the time required for the final procurement & arrival of the approved materials at the project site. This time factor shall conform to the program of works and procurement of materials program above mentioned.

A.2.4 Inspection and Acceptance of Materials

Final inspection of material will be made only at the site of the work. The Engineer reserves the right to sample, inspect and test materials throughout the duration of the work, and to reject any materials which are found to be unsatisfactory at the time of use. A preliminary inspection of materials may be made at the source for the convenience of the Contractor, but the presence of the Engineer at the source shall not relieve the Contractor of the responsibility of furnishing materials, which comply with these specifications. The Engineer shall have free entry at all times to those parts of any plant, which concern the manufacture, or production of the materials ordered.

A.2.5 Defective Materials/ Defective Works

All materials, which do not conform to the requirements of the contract, will be rejected whether in place or not. They shall be removed immediately from the site unless otherwise permitted by the Engineer. No rejected materials, the defects of which have been subsequently corrected, shall be used in the work unless approval in writing has been given by the Engineer. Upon failure of the contractor to comply promptly with any order of the Engineer given under this Clause, *the Engineer shall have authority cause the removal and replacement of rejected materials and to deduct the cost thereof from any monies due to the Contractor.*

The permanent work executed on the site shall be as per drawing, specification & instruction. The presence of Engineer during the execution of work shall not the proof of the work as per drawing & specification. The Engineer shall be free to remove any defective work executed at site even at his presence at any time even after the completion of work and the cost due to this shall be deducted from any monies due t6o the Contractor.

A.2.6 Trade Names and Alternatives

For convenience in designation in the contract, certain articles or materials to be incorporated the work may be designated under a trade name or the name of a manufacturer and his catalogue information. The use of an alternative article or material, which is of equal quality and of the required characteristics for the purpose intended, will be permitted, subject to the following requirements.

a) The burden of proof as to the quality and suitability of alternatives shall be upon the Contractor and he shall furnish all information necessary as required by the Engineer. The Engineer shall be the sole judge as to the quality and suitability of the alternative articles or materials and his decision shall be final & binding.

b) Wherever the specifications permit the substitution of a similar or equivalent materials or article, no tests or action relating to the approval of such substitute materials will be made until the request for substitution is made in writing by the contractor accompanied by complete data as to the equality of the material or article proposed. Such request shall be made to provide ample time to permit approval without delaying the work.

A.2.7 Foreign Materials

Materials which are manufactured produced or fabricated outside Nepal shall be delivered to a distribution point within site, unless otherwise required in these specification or the special provisions, where they shall be retained for a sufficient period of time to permit inspection, sampling and testing. The contractor shall supply the facilities and arrange for any testing required at his own cost. All testing by the contractor shall be subject to witnessing by the Engineer.

The manufacturer, producer or fabricator of foreign material shall furnish to the Engineer a "Certificate of Compliance" with the specifications where required. In addition, certified factory test reports clearly identifiable to the lot of material shall be furnished where required in these specifications or otherwise requested by the Engineer. Where structural materials requiring factory test reports, are obtained form foreign manufactures, such material shall be furnished only from those foreign manufactures who have previously established, to the satisfaction of the Engineer, the sufficiency of their in-plant quality control, as deemed necessary by the Engineer or his representative, to give satisfactory assurance of their ability to furnish material uniformly and consistently in conformance with these specifications. At the option of the Engineer, such sufficiency shall be established whether by submission of detailed written proof thereof or through in-plant inspection by the engineer or his representative.

A- 3 THE MATERIALS FOR CONSTRUCTION

A.3.1 Water

Water shall be clean and free from oil, waste, acid or other organic matter in solution or suspension. Water shall be from municipal mains or tank or well. Storage tank for water shall be of sufficient size and, as directed by the Engineer. The contractor shall make his own arrangements for supply or water.

A.3.2 Earth

Earth for filling and terracing shall be free from all rubbish, organic matters, weeds etc. All clods shall be first broken-down before the earth it used for filling.

A.3.3 Sand

Sand shall be clean riverbed sand of approved quality and free from salt, clay lumps, dust or other organic impurities. If required by the Engineer it shall be washed with clean water. Coarse sand for concrete work shall be from Local River or from any other source as approved by the Engineer and shall conform to concrete specification.

A.3.4 Portland Cement

Cement shall comply with Nepali or other made as approved by the Engineer. If Indian Cement of approved brand by the Engineer is used, the Contractor should provide the cube test results in each delivery before using to the Engineer. At any time the Engineer shall reject any Indian Cement without giving any reason to the Contractor. When stored in bags, these shall be raised 30 cm above the ground and stacked in rows of 10 bags high, 60 cm clear from the walls, in dry place such that it will be sufficiently protected from moisture and contamination, and that the consignments can be used up in the order in which they are received. The necessary cement shall be screened at Contractor's expense to remove any lumps. No cement which has become damaged shall be used in work, but shall be immediately removed from the work and replaced by the contractor at his own expense.

Cement shall be delivered on the site in bags with an unbroken seal fixed of the makers and plainly marked with the name of brand and the manufacture.

If desired, tests shall be made by taking random samples of cement from stores or elsewhere from the works. The selection of samples and procedure for testing shall comply with appropriate India Standard.

A.3.5 Cement Mortar

Cement mortar shall be of proportions specified for each type of work in the drawing or bill of quantities. It shall be composed of Portland cement, sand and water. The ingredients shall be accurately gauged by measure and shall be well and evenly

mixed together in a mechanical mixer, care being taken not to add more water than is required. No mortar that has begun to set shall be used.

If hand mixing is allowed it shall first be mixed dry. Water will then be added and whole mixed again until it is homogeneous and of uniform colour. Not more that one bag of cement or that quantity which can be consumed within half an hour shall be mixed at one time. If desired by the Engineer test of the cement mortar shall be carried out as per IS: 3085-1955.

A.3.6 Aggregates and Grading

All aggregates shall be machine made or as specified & approved by the Engineer, shall conform to latest IS 383. Aggregates shall be from hard stone to sizes as specified under items of works. *In general 37 mm maximum gauge shall be used for mass concrete in foundation and 19mm down gauge, graded aggregate for R.C.C. work.*

37-mm gauge aggregate shall be such that not more than 5 percent shall exceed 37 mm and not less than 25 percent smaller that 19-mm. No piece shall be in any case be larger than 45 mm. It shall be screened free from dust or other foreign materials.

19-mm gauge aggregate shall be such that not more than 5 percent shall exceed 25 mm and not less than 20 percent smaller that 12-mm. No piece shall be in any case be larger than 27.5 mm. It shall be screened free from dust or other foreign materials. If otherwise, all aggregate shall be as given in R.C.C specification.

If proper gauge of aggregate is not being obtained sieving may be insisted upon in which case the Contractor shall supply necessary materials, sieves and labour at his own cost.

The Contractors shall supply samples of the aggregate for the purpose of making preliminary tests of concrete to the Engineer. Method of sampling of aggregate for concrete be as per IS: 2430-1969 and method of test for aggregate for concrete shall be as per IS:2386.

A.3.7 Bricks

Brick shall be oil moulded or of quality approved by the Engineer, free from grit and other impurities such as lime, iron and other deleterious salts. Brick shall be well burnt, sound, hard, with sharp edges, gives metallic ringing sound when struck with a mallet and be of uniform size. The normal size of brick shall be *230x122x56 mm*. No brick after 24 hours immersion in water shall absorb more water than 25 percent

of its weight. Strength of the brick shall be greater than 10 N/mm^2. Brick to be used for exposed brickwork shall be best selected from the lots with sharp edges and even surfaces. If required the strength test of the brick shall be done as per IS: 3945.

A.3.8 Glazed Ceramic Tiles

Glazed ceramic wall tiles and fittings for internal walls shall be of given size as per drawing or as directed by the Engineer and shall conform to the requirements of IS specifications. Sample of the tile to be use shall be submitted to the Engineer for his approval. Approval should be taken before bulk purchase. All the tiles supplied shall conform to the approved samples in all respect.

A.3.9 Marble

It shall be of good quality having smoothed hard surface, regular in shape, size & uniform thickness, of good appearance any type of crack free & of sharp edges. It shall be free from cracks and other defects conforming to the requirement of IS: 1130-1969. Marble shall be the best available in market having uniform colour & sizes or as per instructions. Sample of the marble to be used shall be submitted to the Engineer & his approval should be taken before bulk purchase. All the marble supplied shall conform to the approved samples in all respect.

A.3.10 Semi-Glazed Tiles

Semi-Glazed tiles shall be of Spartek or equivalent approved quality and shall be of given sizes with square edges. Broken tiles shall not be used. Sample of the tiles to be used shall be submitted to the engineer & upon his approval bulk purchase be made. All the tiles supplied shall conform to the approved samples in all respect.

A.3.11 Scaffolding

Scaffolding shall consist of steel and necessary battens and planks. All scaffolding members before installation shall be checked for their strength and stiffness and tied up properly. Preferably steel scaffolding should be used and it shall be erected on double supports. *Holes shall not be made in wall for supports.* Planks shall be fixed and tied together. In case of finishing work such as plastering, painting and distempering, no part of the scaffolding should touch the structure. Where ladders

are used, gunny bags shall be tied up at the ends to prevent any damage to work by sliding or tipping.

A.3.12 Timber

Timber shall be hard timber (Sal, Sisau, Asna, Jamun) perfectly dry, well seasoned, free from knots, cracks, shakes and other defects and any appearance of rot & as approved by the Engineer.

A.3.13 Reinforcing Steel

Reinforcing steel shall comply with the Indian Standard Specification and approved Brand by the Engineer. The surface shall be free form filings, loose rust, mill scale, paint, oil, grease, adhering earth, or any other material that in the opinion of the Engineer may impair the bond between the concrete and the reinforcement or that causes corrosion of the reinforcement or disintegration of the concrete. Only tested steel shall be used unless otherwise specified. Steel greater than 6 mm diameters shall be torsteel as per IS: 1786-1979 or IS: 1139-1966 and comply with similar relevant standards. Torkari reinforcement shall be of grade 550 conforming to IS: 1786-1985.

The brand & test results shall be submitted to the Engineer for his approval, before purchase. If the Engineer could not conform to the company test results provided by the contractor, the contractor shall make the arrangement for sample tests as required by the Engineer.

A.3.14 Glass

Sheet or plate glass shall be of approved quality & thickness as stated in the Bill of Quantities and visually clear when viewed from any direction. It shall be colorless, clear and free form bubbles waves and all other defects.

A.3.15 Paints and Primers

These shall be ready mixed freshly sealed tins of approved make and shall be conforming to the requirement of IS: 102-1962. The contractor shall approve the color, type & brand before purchase from the Engineer.

A-4 GENERAL ITMES

A.4.1 Insurance of Works, Materials and Equipment

The contractor shall insure for works and equipment as stipulated in related Clauses of the Conditions of Contract from an approved agency/institution by the Engineer. The Engineer has sole responsibility & authority to approve any required insurance policy of an agency institution to fulfill the requirements. Before taking insurance premium, the Contractor shall submit the detailed policy of insurance for the approval of the Engineer.

A.4.2 Insurance of Workmen for Accident

The Contractor shall insure against such liability as stipulated in related Clauses of the Conditions of Contract and submit the policy document to the Engineer within stipulated date for his approval. The insurance shall cover as per Contract Data for each number of accident and number of accidents unlimited.

A.4.3 Maintain First Aid Facility

Contractor shall maintain first aid facility at all the times at construction site.

B.3 STONE SOLLING IN FOUNDATION AND FLOOR

B.3.1 Materials

The stone shall be hard, tough, sound and durable. No stone shall be more than 15cm (6”) in size and quality of stone should be per material specification, and should be approved by the site engineer.

B.3.2 Laying

Stones should be laid its natural bed to approved level.

B.3.3 Measurement

Measurement shall be in cubic ft of exact length, breadth and depth. Rate shall include **all** materials, labor, etc, all complete.

B.5 PLAIN CEMENT CONCRETE WORK IN FOUNDATION AND FLOOR

Plain cement concrete in foundation and floors shall be done with cement, sand and stone ballast including mixing, laying, finishing to approved level, lines and dimensions & curing, including adjustment & protection of sides etc. required to complete concrete work.

B.5.1 Material Proportion and Grade

The material Proportion for the grade of the concrete as given below is for guide line only.

i) Concrete M20 – (1:1.5:3) : 1 cement, 1½ sand, 3 coarse aggregates.
ii) Concrete M15 – (1:2:4) : 1 cement, 2 sand, 4 coarse aggregates.
iii) Concrete m10 – (1:3:6) : 1 cement, 3 sand, 6 coarse aggregates.

Actual proportion must be determined by mix design at the site with materials to be used at permanent works.

B.5.2 Mixing

Mixing shall be done in a mechanical mixer. However, in special cases, and for small batch hand mixing may be allowed by the Engineer with the following procedure. All the materials shall be accurately gauged in boxes and thoroughly mixed dry at least thrice on a water tight platform of adequate size, till the color is uniform and then twice when wet. Water shall be added gradually and not more than necessary to sufficiently wet the materials. Concrete shall be mixed up to a quantity which can be used within half and hour. Each mix shall however be not larger than consuming one bag of cement. All such mix shall be placed distinct from each other.

In case hand mixing is allowed, the contractor shall put in 10 percent more cement than specified/required without extra charge.

B.5.3 Strength of Concrete

Concrete shall be as specified in IS code. The compressive strength of the concrete at 28 days shall not be less than 10 N/mm^2 for M10 grade 15 N/mm^2 for M15 grade and 20 N/mm^2 for M20 grade or such other strength as described on the drawings. The compressive strength shall be ascertained by standard tests described in IS code

B.5.4 Laying

Concrete shall be laid in horizontal layers and gently vibrated by mechanical vibrator and tamped by hand spreading to bring it to line and level as shown in the drawing or as directed by the Engineer.

B.5.5 Curing

After laying, the concrete shall be kept wet for fifteen days. In case of hot weather, it shall be covered with gunny bags which shall be kept constantly wet. Other work on concrete shall not start until after three days of laying the concrete. If the Jute or gunny bags is kept to cover the concrete the Engineer could make his own arrangement to keep the concrete constantly wet and the cost thereof be deducted from any monies due to the contractor.

B.5.6 Measurement

Measurement shall be taken for the actual length, width and height (thickness) shown in the drawing and shall be in cubic feet. The rate shall include for laying, compacting and curing all complete.

B.6 PLAIN CEMENT CONCRETE FOR R.C.C. WORKS

Plain cement for RCC columns, beams, slabs, lintels, footings, DPC band and all kinds of RCC works shall be prepared from approved quality of cement, sand and stone ballast and shall be mixed, laid and cured as described hereafter.

B.6.1 Material Proportion and Grade

The material proportion for the grade of the concrete is given as guide line only actual proportion must be determined by design mix at the site with the ingredients which will be used in permanent works.

i. Concrete M20 - (1:1.5.3): 1 cement, 1.5 sand 3 coarse aggregates.

ii. Concrete M15 - (1:2:4): 1 cement, 2 sand 4 coarse aggregates.

B.6.2 Strength of Concrete

The compressive strength of the concrete at 28 days shall not be less than 20 N/mm^2 for M20 grade concrete and 15 N/mm^2 for M15 grade concrete. The compressive strength shall be ascertained by standard tests as specified in IS code.

B.6.3 Preparation of Concrete

The concrete shall be prepared by careful measurement of all the ingredients forming the concrete. The aggregate shall be measured by volume in approved container. The measurement shall be done without, compacting the aggregate, and necessary allowances shall be made for bulking due to moisture in the fine aggregate as instructed by the Engineer. The cement shall be weighed or ascertained by predetermined volume. The proportion shall be adopted as per the mix design. The minimum cement shall not be less than 1.5 percent of weight of

concrete or 360 kg cement per cubic feet concrete having sufficient workability to enable it to be well compacted and to be worked into the corners or the shuttering and around the reinforcement to give the specified surface finish and to have the specified strength. The resulting consistency shall be maintained throughout the work and approved tests shall be conducted from time to time to ensure the maintenance of this consistency.

B.6.3.1 Hand Mixing: Normally hand mixing is not allowed, however if it has to be carried out it shall follow the following procedure. Mixing shall be done in masonry platform or sheet. Cement and sand shall be mixed dry thoroughly and then this dry mix of cement and sand shall be placed over a stack of coarse aggregate and the whole mixed dry, at least three times to have a uniform mix. Water shall then be added slowly and gradually while being mixed, to give a plastic mix of the required workability. If hand mixing is allowed 10% more cement shall be added than specified without extra charge.

B.6.3.2 Machine Mixing: Coarse aggregate, sand and cement in required proportion shall be put into the concrete mixer. The machine shall then be revolved to mix materials dry and the water shall be added gradually to the required quantity. The mixing should be thorough to give a plastic mix of uniform color and consistency. Approximately 2 to 3 minutes rotation would be required for thorough mixing. Mixed concrete shall then be unloaded on a masonry platform or on a sheet tray or on transporting equipment.

B.6.3.3 Slump: Regular slump test should be carried out to control water and to maintain the required consistency. A slump of 75 to 100 mm will be allowed for building works. Slump test shall be carried out and when necessary or as instructed and shall be done at the contractor's expense.

B.6.4 Design of Concrete Mixes

Prior of the commencement of the work the contractor shall prepare a mix design for the grade of concrete to be used in the work and shall submit full details of the mix designs to the Engineer for his approval. The mix design shall be carried out as per IS: 1026-1982. The mixes shall be designed to produce an average concrete cube crushing strength at 28 days after casting not less than the strength specified in article B.8.2 above.

For each mix design, the contractor shall provide the Engineer with the following minimum data.

i. Design mix of concrete

ii. Grade designation

iii. Type of cement

iv. Type of aggregate, maximum nominal size of aggregate

v. Aggregate gradation & their specific gravity

vi. Water cement ratio

vii. Workability, compaction factor

viii. Quantity of admixture if any

ix. 28 days compressive strength on which design is based.

Mix design shall be submitted for each grade of concrete proposed for use in the work. The cost of preparing mix design & of testing shall be born by the contractor.

B.6.5 Preliminary Trail mixes & Test of Concrete

The proportion of cement fine & coarse aggregate & water determined by the mix design shall be used in preliminary trial mixes of concrete made & tested for strength & workability as per IS specification in the presence of the engineer.

Six compression test cubes shall be made by the contractor in the presence of the engineer for each trial mix. The cubes shall be cured, stored and three cubes tested at 7 days & three cubes tested at 28 days.

The following shall be the minimum average strength of the cubes tested:

Concrete Grade	Minimum crushing strength	
	7 days	28 days
M15	10 N/mm^2	15 N/mm^2
M20	15 N/mm^2	20 N/mm^2

If the average value or the compression strength at 28 days is less than the required concrete strength, the contractor shall redesign the mix and test again until satisfactory result is obtained.

B.6.6 Transportation of Concrete

The concrete shall be transferred from the mixer to the work site by approved means which do not cause separation or otherwise impair the quality of the

concrete. Concrete shall not be carried to a distance more than 100 m unless in a manner as approved by the Engineer.

B.6.7 Placing of Concrete

The shuttering shall be realigned and rubbish's shall be removed before placing concrete. Shuttering shall have to be wetted by approved means. The interval of mixing water to cement and aggregate to placing shall not be more than 30 minutes. Except where otherwise approved concrete shall not be dropped from a height or handled in a manner which shall cause segregation. Accumulation of set concrete on reinforcement shall be avoided. Concrete shall be placed directly on its permanent position and not be worked along the shuttering to that position. Each layer of concrete, while being placed, shall be consolidated by approved methods of ramming, tamping, roding or mechanical vibration to form a dense material with all surfaces free from honey combing and tolerably free from water and air holes or other blemishes. Any water accumulating on the surface of newly placed concrete shall be removed by approved means and further concrete shall be placed therein until such water is removed.

Unless otherwise stated, concrete shall be placed in a single operation to the full thickness of slab, beam and similar members and shall be placed in horizontal layers not exceeding 30 cm. It shall not be more than 1 m deep for walls, columns and similar deep members. Concrete shall be placed continuously until completion of the part of the work between construction joints, as specified.

Vibration and compaction shall be done within 1.5 hours of the mixing. All concrete shall be vibrated with a high frequency vibrator of approved make and excess vibration shall be avoided.

Care shall be taken not to disturb the reinforcement by the laborers during the works. All holes, pocket and opening for various services, fittings, etc. shall be shall be provided as directed. All necessary inserts in concrete works for curb, angles, pipes, cable supports, brackets ceiling , clamps for light and fans etc. shall be fixed where necessary. Care should be taken to see that all the inserts and other fitting shall not be disturbed during placing concrete and vibrating them.

B.6.10 Curing

After about two hours of laying when concrete has begun to harden it shall be kept damp by covering with gunny bags or wet sand for 24 hours, and then cured by flooding with water by making mud wall 75 mm high or by covering with wet sand or any other approved means to keep the concrete damp continuously for 15 days.

B.7 FORMWORKS FOR RCC WORKS

B.7.1 Scope of Works

Formwork shall be rigidly constructed out of the timber or steel or pre-cast concrete or other approved materials and shall be true to the shape and dimensions described. If timber stuttering are to be sued then the timber shall be well seasoned, free from loose knots adhering grout, projecting nails, splits and other defects that may mark the concrete.

All joints, except as here-in-after specified shall sufficiently be tight to prevent leakage of cement grout and to avoid the formation of fins or other blemishes. Any faulty joints shall be caulked.

Connection shall be constructed to permit easy removal of the shuttering and shall be either nailed, screwed, bolted, clamped, wired or otherwise secured to retain correct shape during compaction of the concrete by tamping, ramming, vibration or other means. Bolt holes in the concrete shall be made good after removal of bolts. If wire ties be approved, the end shall be concealed and measures taken to prevent rust stains on the concrete face.

Top shuttering shall be provided to concrete faces where the slope exceeds 1 in 2.5 such shuttering shall be counter weighed or otherwise anchored against floating. Shuttering shall be provided true to line and braced and strutted to prevent deformation under the weight and pressure of concrete, constructional loads, wind pressure and other forces. The deflection shall not exceed 4 mm.

Calculations and designs of the shuttering shall be submitted for approval before construction if required and as directed by engineer.

Beams and slab shuttering shall be so erected that the shuttering on beam sides and slab soffits can be removed without disturbing the beam bottom boards. Reproping of beams shall not be permitted except when props are reinstated to relieve the beam of loads in excess of the design load as her-in-after specified. Vertical props shall bear upon work sufficiently mature to carry the load. The contractor shall be responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it. Also the safety and the adequacy of centering and scaffolding shall be the sole responsibility of the contractor. If at any state of work, during or after placing concrete shall be removed and work redone at contractor's risk and cost. Column boxes as forms for column shall not be more than 2 meters height.

B.7.2 Coating on Shuttering/forms

All faces of shuttering and moulds in contact with wet concrete shall be treated with form oil or other approved coating. Such coating shall not be injurious to the concrete, and shall not become flaky to be removable by rain or wash water or

liquids that retard the setting of cement. Such coating only is applied to the shuttering when described or instructed. Mould oils, retarding liquids, and similar coatings shall be kept free from contact with the reinforcement.

All faces of shuttering and moulds in contact with wet concrete shall be treated with form oil or other approved coating. Such coatings shall not be injurious to the concrete, and shall not become flaky to be removable by rain or wash water or liquids that retard the setting of cement. Such coatings only are applied to the shuttering when described or instructed. Mould, oils, retarding liquids, and similar coatings shall be kept free from contact with the reinforcement.

B.7.3 Removal of Shuttering

Shuttering shall be removed by gradually easing without jarring and only in the presence of competent supervisor. Before removal of shuttering, the concrete shall be properly examined.

The contractor shall record on the drawings or elsewhere the date on which each part of the work is concreted and the date on which the shuttering is removed.

Not withstanding any limitations or other requirement of the specifications relating to the period elapsing between placing concrete and removing shuttering the assessment of such period and any damage of other consequences arising therefrom shall be the contractor's entire responsibility.

The period shall be increased by an approved number of days if the hardening of the concrete is delayed due to low temperature or other causes. The shuttering removal period shall be increased or decreased as directed by the Engineer.

B.7.4 Stripping Time

In no circumstances shall forms be struck off until the concrete reaches strength of at least twice the stress to which the concrete may be subjected at the time of striking.

The strength referred to shall be that of using the same cement and aggregates with the same proportions and cured under conditions of temperature and moisture similar to those existing on the work. The formwork should be left longer as it would assist the curing. In normal circumstances (generally where temperatures are above 20^0 C) and where ordinary cement in used, forms may be struck after expiry of following periods.

B.7.4.1 Walls, columns vertical sides of beams – 24 to 72 hrs. or as decided by the Engineer.

B.7.4.2 Removing of props under beams & slabs:

1) Spanning upto 4.5 meters 14 days or as directed by the Engineer

2) Spanning over 4.5 meters 21 days or as directed by the Engineer

3) All other works 21 days or as directed by the Engineer

The shuttering shall have to be kept for a period as required to do so by the Engineer.

B.7.5 Measurement

Measurement shall be in square feet. Dimensions to be considered in computing the area shall be the length and width of the surface of contact with the concrete. Measurement of formwork shall include all works including staging and removal all complete.

B.8 REINFORCING STEEL FE 500 TMT FOR RCC WORKS

B.8.1 Scope of Works

All reinforcing steel greater than 6 mm dia for reinforcing the concrete shall comply with the requirement of Indian Standard 1786-1966 for Tor Steel or of equivalent internationally acceptable standard.

B.8.2 Certificates and Test for Reinforcement

For each consignment of reinforcement used in the work the contractor shall, if required, supply a certificate giving the ultimate strength, yield stress and elongation and the result of the cold bond test for each type and each size of bar or wire. Tests for the purpose of obtaining the information shall conform to India standard. For each consignment of bars used in the works, the contractor shall supply the Engineer with a further certificate warranting that all the bars in the consignment are made from mild steel complying with Indian standard specification.

If reinforcement be supplied for which the marker's test certificate or other records are not available or where in the Engineer's opinion the material has been subjected to corrosion or other deleterious effects, the Engineer shall as many test pieces as he thinks necessary and the contractor shall supply and deliver the test pieces, free of cost and without reimbursement & shall pay the cost of preparing the sample and testing them.

B.8.3 Dimensions of reinforcement

The size of reinforcement bar or wire described on the working drawing or elsewhere shall be the minimum and the rolling margin and other tolerances shall be above this size.

The length of a reinforcement bar shall not be less than the length on the drawing or elsewhere and shall be not more than 25 mm in excess of that length.

B.8.4 Bending Reinforcement

Before bending the reinforcing steel, the contractor will have prepared the shop drawings showing the bar bending schedule for approval. Reinforcement bars shall be bent by approved means producing gradual and even motion.

Bars shall comply with the dimensions described in the drawings. Overall dimensions of bent or internal dimensions of bending for the like shall be within a tolerance of 20 mm. Any discrepancies or inaccuracies found by the contractor in the drawings or other document shall be immediately reported to the Engineer, whose interpretation and requirements relating thereto shall be accepted. The internal radius of bends shall be not less than twice the size of the bars unless described to the contrary on the bending lists or elsewhere in the drawing. Hooks and other end anchorage bends for mild steel shall be bent to an internal radius of the links shall be half the size of bar embraced by binder, stirrups or links.

B.8.5 Fixing Reinforcement

Reinforcement shall be accurately fixed by approved means maintained in the positions as described or as directed by the Engineer. Bars intended to be in contact shall be securely wired together at all such points with No. 16 gauge soft iron tying wire.

Binders stirrups and links shall tightly embrace the bars with which they are intended to be in contact and shall be securely wired or, if approved, spot- welded thereto.

reinforcement shall be lapped joined or spliced only at the positions described or as instructed by the Engineer. Splices and the like found to be necessary elsewhere shall be formed only if and as instructed. Where practicable, bars in each member shall be assembled and fixed in the form of a rigid cage or skeleton before placing in the moulds or shuttering.

Immediately, before concreting the reinforcement shall be checked for position and cleanliness. Measure shall be taken to ensure that reinforcement remains correctly in position with required cover during the placing and compacting of the concrete. Reinforcement projecting from work being concreted or already concreted shall not be bent out of its correct position for any reason unless approved and shall be

protected form deformation or other damage. Reinforcement left for future extensions shall be thoroughly coated with cement grout wash or encased in concrete or otherwise protected form corrosion as instructed.

B.8.6 Cover to reinforcement and spacing of bars

Cover to reinforcement and spacing of bars shall be as per drawing and instruction. If cover is not specified these shall be as per IS: 456-1978.

B.8.7 Measurement:

Measurement of steel reinforcement shall be by weight in kg. or ton. Computation of the weight shall be from the sizes and length of bars described in the working drawing or as per approved shop drawing. No allowances in weight shall be made for cutting to waste, rolling margin, extra length or tolerances and the binding wires. Laps, chairs and spacer reinforcement shall be measured separately at actual.

B.10 HARD WOOD FOR DOOR, WINDOWS FRAMES/SHUTTERS

B.10.1 Scope of Works

Wood work in doors, windows frames and shutters with good finish of approved carving works (if any) including fixing with necessary fixtures all complete as per drawing and instruction.

B.10.2 Timber

Timber to be used for the work shall be from a hard wood timber of mature growth, the sapwood being entirely removed. It shall be uniform in substance, straight in fibre, free from large, loose dead or cluster knots, flaws, shakes, wasp, cup spring, twist bends and defects of any kind. It should be free from spongy, brittle, flaky or brushy condition and bore holes.

All timber shall be seasoned and be free from decay, any harmful fungi and insect attacks and from any other damage of harmful nature which will affect the strength, durability, appearance or its usefulness for the purpose for which it is required.

The timber shall be of best quality specified in the item. The samples of the timber to be used shall be submitted for the approval of the Engineer. The samples of the approved timber to be used shall be deposited in the office of Engineer for the purposes of comparison.

The color shall be uniform as far as possible. The darkness of color amongst color species of timber being generally a sign of strength and durability.

B.10.3 Sawing

All scantlings shall be sawn in straight lines and planes and of uniform thickness and full measurement from end to end and shall be sawn in the direction of the grain. They shall be sawn with such sufficient margin as to secure specified dimensions, lines and planes after being wrought.

The timber shall be properly planed and wrought in workman like manner. Joints shall be true to fit properly and of the kind directed by the Engineer.

Contractor shall be responsible for supplying and fixing in position, fixture and fastenings in the door shutters as per specifications and drawings and as directed by the Engineer.

B.10.4 Preservatives

All timber for carpentry and joinery placed contact with masonry or concrete shall be given a coating of coal tar before being fixed in position. The rates quoted for woodwork shall provide for such treatments.

B.10.5 Protection

Fine edges of the timber frames or other joinery edges shall be protected form damage by rough trade during the construction by providing casing of appropriate materials securely fixed to member by approved means.

B.10.6 Cover Moulds

In areas where the door or window chaukhats are fixed flush with wall or plaster surface, teakwood cover moulds of size 40x12 mm shall be given the same finish as the main frame and overlap the masonry/plaster by at least 25 mm.

Tolerance of ± 3 mm will be allowed for each wrought face on the sizes specified and indicated in the drawings, except where described as "finished" in which case no tolerances will be allowed.

B.10.11 Hold Fasts

These shall be of M.S. flat with an end split into two and turned for anchorage into cement concrete blocks 1:2:4. The holdfasts shall be fixed to an adequately sized recess in the door frames with 30 mm screws. There shall be one such holdfast in each side of frames of upto 76 cm height, 2 on each side of upto152cm height and 3 numbers on each side of frames more than 152cm height. The positions of the holdfasts shall be as shown on the drawings with minor adjustment to suit brick courses or as directed by the Engineer proceeds and not fixed afterwards. These concrete blocks shall neither be measured separately nor any deduction is made in brick work for these blocks.

Door frames when abutting on R.C. C. members shall be fixed to R.C.C. members with raw plugs with 50 mm long and wooden screws of required size. Screw heads shall be sunk into frame and plugged properly.

B.10.12 Measurement

Costs incurred in providing and fixing holdfast including concrete blocks shall be incorporated into the tendering rates for the woodwork for which they are intended, and shall not be measured separately.

The cost incurred in carving the frames and or lattice and painting shall be incorporated onto the tendered rates of the woodwork for which they are intended, and shall not be measured separately. The unit of measurements shall be as follows:

i. Hard Wood Door/windows Chaukat is cubic meter
ii. Hard Wood Door/Windows Shutters in square meter

B.11 FLUSH DOOR SHUTTERS

Flush door shutters with approved plywood fitted on approved pine wood frame , including fixing with 3 nos.10 cm hinges per leaf ,2 nos .Aluminium tower bolts of 30 cm length ,one number mortise lock ,wooden cleats and required number of screws etc. as per drawing ,all complete,.....

B.11.1 Material

i. Timber –as per material specification.

ii. Fixtures and fastenings – providing and fixing in position the following fixtures and fastening in the door shutters, per every leaf :-

- Mortise lock of approved quality -1 no.
- aluminum 30 cm long tower bolt ,with screws -1 no.
- aluminum 15 cm long tower bolt ,with screws -1 no.
- 10 cm long hinges with screws -3 no.
- wooden cleats with screws and hinges -2 no.

All fixtures and fastenings to be used shall be approved by the Site Engineer and shall be fixed as specified. They shall be new sound and strong .they shall be of the best quality and workmanship .The size, shape, design and finish shall be as directed by the Site Engineer and deposited in his office for reference. All fixtures shall be fixed to the jointing in a secure and efficient manner. Any of the fixtures damaged during fixing shall be removed and new once fixed in their place ,and

the surface of the joinery made good where affected ,at the Contractor's expense .When the type is not mentioned in the drawing ,or item ,it shall be hung or swing as directed by the Site Engineer .

ii.Plywood-Plywood shall be approved Indian manufacture of standard quality. It shall be bonded with synthetic resin of interior type unless otherwise stated .Where stated to be of exterior type it shall be weather –proof samples of materials and their source of manufacture must be approved by the Site Engineer ,before being used in the work .

B.11.2 Construction

The hollow core flush door shall be of single leaf or of double leaves .The thickness of hollow core flush door shall be of 38mm, the face panels to be of commercial plywood glued on both sides .The timber frame shall be constructed of stiles ,top bottom rails and minimum two intermediate rails, each segment ,battens not less then 100mm wide or as per detailed drawings. In each segment , battens not less then 25mm wide shall be fixed, in such a way that the voids are equally distributed and the voids area in any segment is less than 300 cm ..2 or as per drawing and as directed by the Site Engineer. The thickness referred to is for finished thickness and no tolerance is allowed .All doors are to be provided with Indian rubber door stops. Levelling of the surface shall be carried out during each stage of construction, i.e. fabrication of core and bonding of the plywood .thickness of the core shall be checked for uniformity before bonding the plywood .The plywood forming the face panel shall not be less then 3mm in thickness . The plywood shall be glued under pressure on both faces of the core . In the case of double leaved shutters ,the meeting of the stiles shall be rebated not less 20mm or as per drawing .The rebating shall be either splayed or square type or as per detail drawing . All four edges of the door shutters shall be square .The shutter shall be free from twist or warp in its plane . Both faces of door shutter shall be a smooth and of even texture.

B.11.3 Measurement

The measurement of hollow core flush door shutter shall be taken in square feet for finished work in closed position . Overlaps of two shutters shall not be measured .The rate shall be for complete work, including all materials and labor complete .

B.12 FIXED GLAZING

Fixed glazing for windows and ventilations with 4mm glass ,including wooden beads or putty , nails etc. as per drawing ,all complete ,in m...2 .

(a) materials

i)timber :as per materials specification .

ii)glass: as per materials specification .

b)Construction:

The glass is fitted in the frame which is fixed. The glass pane shall be fixed in 15mm rebate, in the wooden frame, leaving 1.5mm clear gap around for expansion. The rebate shall be painted before glasses are fixed. The putty should be of the best quality, made of finely powdered whiting and linseed oil, kneaded into a stiff paste. First, a thin layer of putty (back putty) shall be fixed in position by a few small nails, and then putty (front putty) shall be applied and pressed in position and finished off neatly in such a manner that no putty projects beyond the rebate. The putty shall then be painted with an approved paint. In case wooden fillets are provided, the wooden fillets should be fixed in the rebate by moulded wooden fillets should be fixed in the rebate by moulded wooden fillets around and fixed with nickel screws, inserting a strip of felt or rubber in the rebate under the glass to act as a cushion. The wooden fillets shall be finished with approved painting.

B.12.1 Measurement

Measurement shall be taken in square feet of fixed glazing, including putty or wooden beads, materials labor etc. all complete.

B.13.3.1 Structural Steel

Structural steel sections shall be hot rolled weldable sections conforming to relevant IS specifications. Connections to structural steel members shall be welded. No bolting or drilling of holes shall be done unless approved in writing by the Engineer.

The contractor shall arrange for factory inspection of the doors and windows frames during construction. The frames shall be either brought to the site by the contractor after manufacturing it in factory or it shall be manufactured in site. The frames shall be erected in position as per detail drawings submitted by the contractor and approval by type Engineer. The frames shall be given a coating of red metal priming before erection in position.

B.13.3.2 Welding Materials

Welding materials shall conform to relevant Indian standard.

B.13.3.3 Anchor

Provide all anchor bolts and expansion screws on bolts or other types of anchorage required for building into walls and ceilings. Where it is necessary to secure metal to concrete, masonry or steel work supply anchor bolts, nuts and similar to the respective divisions for fastening.

B.13.4 Standard Tolerance

- Definition: An extruded section is a section whose geometry does not form a void and which is ling in relation its cross sectional dimensions.
- Cross sectional dimensional tolerance = + 1.45 mm.
- Straightness tolerance (L = length in meter) = 3 degrees maximum
- Flatness (flat surface) tolerance (W = width in millimeter = 0.004 x W mm)

B.13.5 Workmanship

B.13.5.1 Fabrication (General)

Fabricate the work true to dimension, square, plumb and level. Joints and intersection member shall be accurately fitted with adequate fastenings.

Finished work shall be free from distortion and defects detrimental to appearance and performance. Welding shall be done by a fully qualified welder complying with CSA W59.1-1970. File or grind exposed welds smooth and flush. Do not leave grinding marks.

Unless otherwise specified, noted or approved, all connections shall be welded.

Where welding is not possible connections shall be bolted or secured in an approved manner. Exposed fastenings shall be countersunk, bolts cut off flush with nuts and made as inconspicuous as possible. Exposed fastenings where approve shall be of the same material, color and finishes as the base metal in which they occur.

Metal members shall be isolated where necessary in an approved manner to prevent corrosion due to unless approved in writing by the Engineer.

Design, fabrication, erection and materials of this division shall comply as applicable to al other divisions of this specification.

B.13.5.2 Measurement

Measurement of the completed work shall be in square feet including all the fixtures and glass panes where applicable as per the BOQ. Rate shall also include the cost of erection all complete.

B.14 FLUSH WOODEN DOOR SHUTTERS

B.14.1 Description

The specifications cover the providing and fixing of flush door shutters inclusive of knob or mortise lock. The shutter may be single, double or more numbers in a door. The design shall confirm to drawing and Engineers instruction.

B.14.1.1 Timber and Plywood

Timber shall be as per the specification of materials. Plywood used shall be 8 mm thick and of approved quality.

B.14.1.2 Fixtures and fastenings

All fixtures and fastenings shall be heavy or of approved and quality and shall be new sound and strong. It shall be of best quality and workmanship, the size shape, design and finish shall be as shown on drawings or as directed by the Engineer and deposited in his office for reference.

Unless otherwise specified, each leaf shall be hung with two butt hinges. Each door shall be furnished with mortise lock of approved quality.

A superior door closer has approved quality and make shall be provided for each door.

All the fixtures shall be fixed to a joiner in a secure and efficient manner. Any of the fixtures damaged during fixing shall be removed and new ones fixed in their place and the surface made good where affected at contractor's expense. The metal socket shall be providing to 1 bolts where the shoots enter brick, stone, concrete. These shall be securely fixed flush with the surface into mortises and cemented. Mortise plates over holes shall use in situations where the shoots enter wood.

Parliamentary hinges shall be counter sunk on leaf edge and wood frame to depth equal to the thickness of the flap of the hinge.

B.14.2 Finishing

Finishing shall be done as per the drawing and specification and to the satisfaction of the Engineer. Hard wood leaping shall be provided for all the flush door shutters.

B.14.3 Measurement

The measurement shall be in square meter of shutter work complete by measuring the length and breadth of the shutters in elevation. The rate shall include cost of fixtures, materials and labors all complete paint if applied shall be measured separately.

B.15 GLAZED WINDOW SHUTTERS

B.15.1 Description

The shutter shall be of single, double or more leaf type as per drawing or instruction of the Engineer. Thickness of shutters shall be 38mm and made of hard wood. They will be fitted with two numbers of 100mm hinges.

The workmanship shall be of best quality and of correct size.

B.15.2 Materials

B.15.2.1 Timber

All timber used shall be hard wood as per materials specification

B.15.2.2 Glass Panes

The glass panes shall be clear 4mm thick or 6 mm thick as provided in BOQ. It shall be free from shacks, bubbles, air holes, veins blisters or any other defects. it shall be of uniform thickness. Sample shall be approved by the Engineer before bulk purchase of glass panes by the contractor.

B.15.2.3 Putty

Putty shall be glazing putting in sealed thins. It shall be of normal consistency no power, thinner of other additives shall be mixed on the putty.

B.15.3 Finishing

All windows shall have glazing fixed on outside face or as shown on drawing with wooden beads and putty. the glass shall be cut to size to fit slightly loose. the beads shall be of hard timber as shown in the drawing. First a thin layer of putty is pressed

along the rebate then the glass is pressed over which another layer or putty is laid and then wooden bead pressed and fixed with panel pins. The panel pins shall be spaced not more than 30mm apart.

B.15.4 Measurement

It shall be measurement in square of the glazed shutter inclusive of rubber channel, wooden bead and putty. The rate shall be included for providing rubber channel, putty wooden beads, glass panel pins etc, and labor complete.

B.16 CEMENT PLASTER WORK

Cement and plastering on floor, wall ceiling etc. of good finish including racking the joint & wetting the masonry surface to be plastered including curing the works all complete with specified proportion of cement, sand and of specified thickness.

B.16.1 Material

Cement as per material specification

Sand as per material specification

B.16.2 Proportion

As specified in the schedule or BOQ

B.16.3 Mixing

Mixing shall be done in specified proportion meeting the requirement of BOQ and as per materials specification.

B.16.4 Plastering

The cement plaster mortar used for plastering shall be in the specified proportion as in items of BOQ. The surface on which plaster is to be done shall be made rough by either raking out the joints to at least 6 mm deep or hacking/chiseling the surface & cleaning with wire brush. The surface shall be free from, greasy spots and efflorescence if any. The surface shall keep wet before plastering is commenced. To ensure required thickness & a true surface, the patches of plaster (15cm*15cm) shall be provided on the surface in plumb & plane at about 1.8m apart (horizontally & vertically) over entire surface. Then the surface shall be finished uniform & smooth in plumb level surface. Curing shall be done for seven days. The water patty shall be made where necessary without any extra cost.

The average thickness of plaster shall be as specified, however, nothing extra shall be admissible if the average thickness is more than specified. All corners, angles, junction shall be truly vertical & horizontal to be carefully & neatly finished rounding of junction joints etc. shall be done as require without any extra cost. The finished plaster surface shall be smooth & uniform without patch or joint marks.

B.16.5 Decorative plastering

The plastering shall be done as per above except that the decorations shall be as per design drawing and instruction. Sample decorative plaster shall either be drawing in detail or may be physically shown at the site. The contractor shall carry out the work to the satisfaction of the Engineer.

B.16.6 Measurement

Measurement shall be in square feet of the surface over which plaster has been done. Opening of less than 1 sqm. shall not be deducted and nothing extra shall be paid for finishing jambs, soffits and the sides of such opening.

The decorative plaster shall be measured flat in elevation with length and width taken as the maximum dimension of the decorative works. No projections and depressions shall be measured.

B.17 3mm Thick Cement Punning

Cement sand (1:1) punning on floor, skirting, dado etc. shall be carried out including wetting the surface mixing, laying and rubbing with steel trowel to a hard smooth & shining surface and curing for at least 7 days.

B.17.1 Materials

Cement as per material specification

Sand as per material specification

B.17.2 Proportion

Proportion shall be 1 part cement & 1 part sand

B.17.3 Mixing

In specified proportion as per materials specifications.

B.17.4 Punning

Before applying cement sand punning the surface shall be cleaned of any dust or loose particles. The average thickness of punning shall not be less than 3mm the pattern of the surface should be as per instruction of the Engineer. The coat shall be finished by rubbing with a steel trowel & any depression shall be filled and rubbed to a shining surface. All corners and edges shall be rounded. The contractor shall prepare a sample square meter of the punning as per instruction of the Engineer, after which all punning executed, shall confirm with the respective approved sample. All punning shall be finished smooth, even & truly level. It shall be kept wet for 7 days.

Waterproofing compound shall be added to cement sand mortar where specified.

B.17.5 Measurement

Measurement shall be in square meter measuring the actual dimensions of the works undertaken.

B.21 WATER PROOF CEMENT PAINT ON WALLS AND CEILING

Applying three coasts of water proof cement paint (snowcem, durecem or equivalent) of approved color over one coat of cement primer on plastered surface to give even shade. The sample of the water proofing compound and it's specification shall be submitted to the Engineer for his approval before mass procurement.

B.21.1 Materials

All the paining materials shall be ready mixed type in sealed tins of approved marks. Waterproofing cement paints shall be obtained from approved brand manufactures as specified by the Engineer.

All materials required for the work are to be delivered to the site in their containers with seal, etc. unbroken and are to be clearly marked with manufactures name and trademarks and description of contents and color.

B.21.2 Mixing

Only fresh waterproof cement paint shall be used. Hard or set paint shall not be used. The contents shall be made loose by rolling and shaking the container before opening the container. First a paste shall be prepared by mixing 2 parts of cement paint powder with one part of water by volume. Immediately after this the mix

should be thinned by adding another one part of water to have a uniform solution of paint.

Paint shall be mixed and applied strictly in accordance with the manufactures instruction and with the approval of the Engineer.

B.21.3 Application

Before painting is commenced on surface, all dirts and foreign matter shall be completely removed. The surface shall be wetted by sprinkling of water with fine spray. The surface shall be sprayed several times with a few minutes intervals between each spraying to allow the moisture to soak into the surface with hair brushes in a number of coats to get uniform finish. After the first coat of the paint has hardened, it shall be cured with fine water spray at least for 24 hours before the second coat is applied. It shall kept damp at least for seven days.

B.21.4 Measurement

The measurement shall be in square meter and shall be net for the plastered surface. This will include cost of scaffold, ladders, curing all complete.

B.23 ENAMEL PAINT

Painting in steel or wood surface with enamel (ready made) paint of approved made and color in two coats over two coat of primer in properly sanded surface for high class finish, all complete.

B.23.1 Material

Primers and Paints

Primers and paints shall be of approved quality and of approved manufacture, as specified. These materials shall be ready mixed and on sealed tins with required quantity stocked at site. These materials shall confirm to the requirement of IS: 102-1962

B.23.2 Preparation of the surface

All surface shall be clean of all dirts, dust and all unevenness shall be rubbed down smooth with sand paper. In case of surface having knots and nail holes, they should be filled in stopping and knotting materials. The knotting materials shall consist of pure shellac dissolved in methylated sprit. For stopping, 'Russian tale or putty' shall be used.

The later should consist of two parts of whiting (powered chalk) one part of white lead mixed together in double boiled linseed oil and well kneaded. The surface thus

treated shall be allowed to dry up and then sand papered. Otherwise a ready made approved putty may be used.

B.23.3 Application

After preparing the surface, the priming cost shall be applied with hairbrushes. Thereafter a topcoat shall be applied. Another coat shall be applied after the previous coat is dry. Care should be taken that dust or other foreign materials don't steel or otherwise made approved putty may be used.

In following the above procedure, the materials to be used will depend upon the type of paint specified and only such materials as were consistent with a particular type and brand shall be used. The same brand of materials will be used for various coats. All paints shall be used and applied as per manufacture's specification. The paints shall be applied with bristle brushes and not horsehair ones. The paint shall be allowed. Painting to false ceiling and acoustic materials such as thermo cole, perforated acoustic tile, soft noart etc. shall be done by spray painting only.

B.23.4 Measurement

No separate measurement of this is essential because this is include in the rate of steel materials and finishing.

B.25.1 Galvanized Steel Barbed Wire For Fencing .

Follow IS 278:2009 Forth Revisions.

B.25.2 Measurement

The measurement shall be in Running Feet .

B.26.1 Angle Section .

Follow IS 808: 1989

The measurement shall be in Kg .

C. WATER SUPPLY, SANITATION AND PLUMBING WORKS

C.1 GENERAL

Requirements specified in the civil works section forms a part of this section. In case where the specifications given are found insufficient, the latest Indian Standard shall hold good. The workmanship shall be the best of its kind and shall conform to the specifications or Indian Standard or equivalent standard to be approved by the Engineer.

The sanitary, plumbing, water supply and other related works are to be laid to alignments and grades shown on the drawings but subject to such modifications as shall be ordered by the engineer from time to time to meet the requirements of the work.

The units used in this section are both FPS and MKS system depending on the general commercial practice, however, it is the contractor's responsibility to render the goods and supplies in such a way that the ease of interchangeability must be maintained for future repairs and maintenance.

All water supply and sanitary fixtures, pipes and pipe fittings, traps, etc. Which are to be embedded into the concrete or masonry work or other building work shall be placed in position and embedded or counseled at the time of casting concrete, masonry or other structural construction work. If unavoidable, space for the locations of such fittings, pipe lines and traps, etc, shall be marked suitably and the cuttings or disturbing of the construction work shall proceed only after due approval of the consultant/owner.

The contractor shall be responsible for the adequacy and efficiency of the entire system and in his opinion if he finds any serious objection on the system shown on the drawings, he shall set forth his objection or hi suggestions to ensure adequacy and efficiency of the said system and notify the consultant/owner before proceeding with the work.

C.2 SHOP DRAWINGS

The contractor shall submit to the consultant within three months after award of the contract all shop and setting drawings or diagrams necessary in order to make clear the work intended or to show its relation to adjacent work of other trades.

The contractor shall make any changes in such drawings or diagrams which the engineer may require from time to time.

Details on shop drawings submitted for approval shall show clearly the relations of the various parts to the main members and lines of the structure, and where correct fabrication of the work depend upon field measurements such measurements shall be made by the contractor and noted on the drawings before being submitted for approval. The location, service, dimensions, ratings, performance and function of such items shall be clearly indicated. Where manufacturer's publications in the form of catalogues, pamphlets or other data sheets are submitted in lieu of prepared shop drawings such submission shall indicate specially the item for which approval is required, identification of items shall be made in ink. Submissions showing only general information are not acceptable.

Shop or setting drawings or diagrams, which do not bar the approval stamp of the engineer, shall not be used in the work. Before submitting shop drawings for approval of the engineer the contractor must check these drawings and verify that the equipment meets the requirements of the specifications and drawings. All the shop drawings must be stamped "Approved" or "Approved as noted" and show any deviations from drawings or specifications. Any such drawings not properly checked will be returned to the contractor marked "Not Approved". Upon completion of the project and before final acceptance, the contractor shall provide three copies of approved shop drawings and brochures of all equipment correctly identified as they appear on the contract.

C.3 MATERIALS

Unless specifically mentioned otherwise all the applicable codes and standards updated and in force published by the Bureau of Indian Standards (IS) or equivalent B.S. standard and its subsequent revision and all other standards which may be published by them before construction work starts, shall govern in respect of design, workmanship, quality and properties of material and method of testing. Some of these available standards are listed below:

I.S	651	1980	Specification for salt glazed stoneware pope and fittings
I.S	778	1984	Specification for gunmetal gate, check valves for water
I.S	782	1983	Specification for caulking lead
I.S	1172	1971	Basic requirements of water supply, drainage and sanitation
I.S	1239	1982	Specification for M.S. or G.I. pipes
I.S	1879	1975	Specification for GI fittings
I.S	1985	1988	Specification for UPVC spigot and socket soil, waste and vent pipes and fittings and accessories
I.S	1729	1974	Specification for cast iron manhole covers and frames for use in drainage work
I.S	1719	1979	Specification for cost iron spigot and socket soil, waste and vent pipes and fittings and accessories
I.S	1742	1983	Code of practice for building drainage

I.S	2064	1973	Code of practice for selection, installation and maintenance of sanitary appliances.
I.S	2065	1983	Code of practice of water supply in buildings
I.S	771	1979	Specification for vitreous China Sanitary Wares.
I.S	1966	1963	Specification for R.C.C. hume pipe.

C.4 CUTTING AND MAKING GOOD

Contractor shall provide all necessary holes, chases in structural members as building work proceeds. Wherever holes are cut or left originally in c0oncrete surface they shall be made good with cement concrete M15 grade and the surface restored as in original condition. no shall be paid for cutting the chases unless stated otherwise.

C.5 PVC PIPES INSTALLATION

Before use at site, all PVC pipes shall be tested by filling up with water for at least 10 minutes. After filling, pipes shall be struck with a hammer and inspected for blow holes and cracks. All defective pipes shall be rejected and removed from the site.

PVC pipes for sewer, waste and rain water shall be further tested after installation, by filling up the stack with water. All opening and connections shall be suitably plugged. The total head shall however not 10 meters exceed. All pipes shall be fixed in gradient towards the out-fall drain. Pipes inside toilets shall be concealed or otherwise as shown on the drawings.

C.5.1 SPECIFICATION OF MATERIALS

C.5.1.1 Polyvinylchloride (PVC) Pipes

Where specified, waste and sewer pipes shall be threaded PVC light duty pipes conforming to ASTM-D-1785. Wall thickness and working pressure shall be as follows:

Nominal Dia.	Wall thickness		Working pressure Kg/Sq. cm
	Outside	Thickness in	

	Dia.	mm	
40mm	48.1	3.7	11.5
50mm	60.2	3.9	9.5
65mm	72.8	5.2	10.5
75mm	88.7	5.5	9.0
100mm	114.1	6.0	7.5
125mm	141.0	6.6	6.5
150mm	168.0	7.1	6.0
200mm	218.7	8.2	5.5

Pipes shall be of color specified by the Engineer. Threaded fitting for PVC pipes shall include tees, bends, elbows reducers, y-tees, siphons, detachable joint and plugs. Outlets of suitable diameter for connection to the appliance shall be provided. PVC pipes shall be jointed as recommended by the manufacturers. Fixing of HDPE pipes shall be done in the best workmanship.

C.5.1.2 Galvanized Steel Pipes and Fittings

All water supply pipes inside the building and where specified shall be galvanized steel tubes conforming to IS 1239-1964 of class specified seamless screwed and socketed. When class is not specified they shall be medium class.

Fittings shall be malleable iron galvanized fittings of approved make. All fittings shall have manufacturer's trade mark stamped on it. Fittings for G.I. pipes shall include couplings, elbows, bends, tees, reducers, nipples, plugs, unions of approved makes.

Pipe and fittings shall be jointed with screwed fittings. Care shall be taken to remove burr from the end of the pipe after cutting by a round file. Genuine red lead with grommet and a few stands of fine hemp shall be applied before fixing. All pipes shall be fixed in accordance with layout and alignment shown on the drawings. As far as possible, G.I. pipes inside toilets shall be fixed in wall well above the floor.

G.I. pipes in shafts and other locations shall be supported by G.I. holder bat clamps to enable dismantling later on. Unions shall be provided near each gunmetal valve, stop cock or check valve and at an interval of 20m on straight runs.

C.5.2 Testing

All pipes, fittings and valves shall be tested by hydrostatic pressure of 7 kg for medium class. Pressure shall be maintained for a period of at least tow hours without appreciable drop in the pressure after fixing at site.

In addition to the testing carried out during the construction, contractor shall test the entire installation after connections to the overhead tanks or plumping system or mains. He shall rectify all leakages, and shall replace all defective materials in the system.

After commissioning of the water supply system, contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. The valves which do not operate effectively shall be replaced by new ones at his cost and tested as above.

S.W. pipes shall be carefully laid to the levels and gradients shown on the plan and sections with socket up the gradient. the mortar (1:1) for joint shall be finished off neatly outside the socket at an angle of 45 degrees.

All joints shall be tested to a head of 2.5 M of water above the top of the highest pipe between the two manholes. Any joint found leaking or sweating shall be remade or embedded in 15 cm thick layer of cement concrete m15, 30 cms in length and section retested at contractor's expenses.

C.6 CAST IRON PIPES AND FITTINGS

All the soil and waste water pipes shall be CI pipes of approved make and diameter as shown in drawings and bill of quantities. The pipes shall have lead joints of approved type.

All the pipes and fittings shall have ISI mark on it. Fittings shall include bends, elbows, tees, Y-tees reducers, etc. as per the requirement of the drawings. CI pipes on ceilings shall be suitably supported where as on shafts they shall be clipped on walls with approved brackets and clits.

C.6.1. Smoke Test

All CI pipe and fittings including joints shall be tested by a smoke test and left in working order after completion. The smoke test shall be carried out as stated below:

Smoke shall be pumped into the drains at the lowest and from a smoke machine which consists of a blower and a burner. The materials usually burnt are greasy cotton waste which generates pungent smoke which is easily detectable by light as well as by smell if leaking at any point of drain. During testing if any joint is found leaking the same shall be rectified by the contractor at no extra cost.

C.7 VALVES AND BALL COCKS

Valves shall be heavy gunmetal full way gate valves or non return valves conforming to IS 778-1962 (class – I). Valves shall be tested at manufacturer's works to a pressure of 21kg/sq.cm. and shall have manufacturer]s name stamped on it. All valves shall be approved by the engineer before use.

Ball cocks used for storage tanks shall be high pressure ball cocks with brass lever rods and polythene ball floats. The ball floats shall conform to Indian standards which shall be hammer tested.

C.8 BRASS FITTINGS

All brass stop cocks and bib cocks shall be heavy type bright finished with renewable leather washers conforming to IS 781-1967. The weight shall be as below:

Diameter	Stop cocks	Bib cocks
15mm	0.40 kg.	0.40 kg.
20mm	0.75kg.	0.75kg.
25mm	1.30kg.	1.25 kg.

C.9 PLASTIC CYLINDRICAL VERTICAL STORAGE TANKS

Contractor shall provide and install plastic cylindrical vertical roof storage tanks of syntax make or equivalent as shown on the drawings and specified in the Bill of Quantities. Tanks shall be provided with manhole cover with locking arrangements.

The tank shall have inlets, outlets, scour and overflow pipes, of specified sizes, sockets for float level, switches and interconnection if required. Overflow pipes shall be provided with a mosquito proof brass grating. Scour pipes of size as mentioned shall be provided with a bend pipe piece and gate valve terminating outside the tanks wall with a plug at the end of the pipe.

C.10 SANITARY FIXTURES AND ACCESSORIES

Sanitary ware, accessories and chrome plated (CP) fitting shall be of the best quality, approved by the engineer. Wherever particular makes are mentioned, the choice or selection shall be made by the engineer.

All fixtures and fittings shall be provided with all such accessories that are required to complete the item in working condition whether or not specifically mentioned in the specification, bill of quantities. Color of sanitary ware, when specified shall be selected by the engineer. Fixtures shall conform to IS 2556-1967.

All fittings and fixtures shall be fixed in a neat workmanlike manner true to level at heights shown on drawings and in accordance with the manufacturer's recommendations. Care shall be taken to fix all inlet and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, tilling or terrace or wall shall be made good by the contractor at his cost.

When directed, contractor shall fix fixtures and accessories in a sample room for the approval of the engineer. Sample room fixtures may be reused on the works if undamaged, but no additional payment for fixing or dismantling shall be admissible.

C.11 ORRISSA PAN

W.C. pan shall be 588mm long Orrissa type or as specified in the bill of quantities. Each W.C. pan shall be provided with one 100mm dia. porcelain 'P' or 'S' trap with vent and with automatic flush pipe system complete set.

The W.C. pan shall be fixed in level in a neat workmanlike manner. The W.C. and trap shall be set in cement concrete grade M15 mix. Joints between W.C. and flush pipe shall be made with a putty on white lead and linseed oil and caulked well.

C.12 EUROPEAN W.C. SET

European W.C. set shall be wash down set of double trap symphonic type with automatic flush pipe system complete as specified in the bill of quantities.

Each W.C. shall be provided with heavy duty solid bakelite seat cover and of color as specified in the bill of quantities or directed by the engineer.

C.13 URINALS AND DIVISION PLATES

Urinals shall be standing type large flat back of 400x350x600mm size. Each urinal shall be provided with one 40mm dia chromium plated brass bottle trap with pipe to wall and wall flange.

Urinals shall be fixed to wall by concealed hangers, brackets, brass screws as required and recommended by manufactures. It shall be provided with 20mm flush valve with flush pipe and bends.

Standard division plate shall be fixed in between two urinals as shown in drawings.

C.14 WASH BASIN

Wash basin shall be of size specified. These shall be fixed on walls as shown in the drawing and as per instruction. Wash basins shall have one 15mm, CP pillar cock, 32mm dia. CP waste with chain and plug, 32mm CP bottle trap with CP pipe to wall and flange. The basins shall have 15mm CP angular value, 500mm long connector flexible metal finished pipes with couplings at both ends all complete. All CP fittings shall be of heavy duty to class make.

C.15 STAINLESS STEEL KITCHEN SINK

Stainless steel kitchen sink shall be of size specified. This shall be fixed on R.C.C. slab as shown in the drawings and as per instruction. Kitchen sink shall have one 15mm CP swivel pillar cock 15mm CP angular stop cock, 15mm PVC connector with both ends coupling, 40mm CP waste coupling with plug, stay and chain, 40mm CP 'S' trap.

C.16 MIRRORS

Mirrors shall be of approved make 5.5mm thick. All edges shall be rounded off. Mirrors shall be fixed on a backing of 6mm thick commercial board or on plastic mounting and fixed to wall with brass screws and washers. Mirrors shall be of beveled or leveled edge of sizes as specified and shall be clear when viewed from any directions.

C.17 MISCELLANEOUS WHITE GLAZED FITTINGS

White glazed fittings eg. Toilet paper holders, soap dishes, robe hooks, etc. shall be of white glazed vitreous China of the same color and shade as that of the main fittings. All fittings shall be fixed in wall in a neat workmanlike manner. Recess in walls, where required shall be provided. All fittings shall be fixed with brass screws, where required.

C.18 TOWEL RAILS

Towel rails shall be of CP brass with two brackets. The size of the rail shall be as specified. The brackets shall be firmly fastened by brass screws to wooden plugs or plastic plugs firmly embedded in the wall.

C.19 CLAMPS

Holder bat clamps shall be of standard design and fabricated from M.S. flat 40 x 3mm with 12mm bolts and nuts. They shall be painted with tow coats of black bitumen paint before fixing. Holder bat clamps shall be fixed in cement concrete 1:2:4.

Where holder bat clamps are to be fixed on RCC column, wall or beam they shall be fixed with 40 x 3mm flat iron 'U' type clamps with anchor fasteners of approved design. Rates for both types of clamps shall be the same and no addition or deduction shall be made.

Structural clamps shall be fabricated from mild steel structure section eg. rods, angles, channels, flats as per drawing. Contractor shall provide all nuts, bolts, welding and painting the clamps with one coat of red oxide.

C.20 CP FLOOR TRAPS

CP floor traps shall be fixed in position as shown on plans or as directed by the engineer. The slope of the flooring shall be so maintained that the floor trap shall easily take the total water.

C.21 INSPECTION CHAMBER

inspection chamber hall be made as per requirement and direction. The inspection chamber shall be made with brickwork in 1:4 cement mortar, concrete base of M15, 12mm plaster with 1:4 cement sand mortar and 1:1 cement sand punning with proper benching. The cover shall be of RCC using grade M15 concrete with necessary lifting keys.

C.22 ELECTRIC PUMP

Electric pump shall be of specified BHP centrifugal pump of required capacity. The pump shall be installed with suction and delivery connection, motor starter, foot valve, gate valve washout tee with gate valve. It shall be rested on concrete foundation with necessary electrification.

C.23 COMMISSIONING AND TESTING

Before commissioning and testing of fixtures, contractor shall ensure that all soil waste stacks and drainage system are connected to the respective manholes and the out-fall sewer. He shall also ensure that the water supply system has been commissioned and tested.

Fixtures shall be cleaned and all debris and dirt removed. All stickers, labels, etc. shall be removed with hot water.

Cold water shall be let in each fixtures individually. The fixtures shall then be observed for any leakage or drip at inlet and outlet connections. The rate of flow for each fixtures shall be adjusted by control valves. All defective parts shall be replaced and re-tested.

On satisfactory testing and commissioning of the fixtures, contractor shall clean all fixtures and accessories by a suitable detergent and handover in the absolutely clean and usable condition.

D. ELECTRICAL WORKS

D.1 General

All electrical works related to this project shall be carried out to the highest degree of technical quality and workmanship accepted for this category of work. Special attention shall be given to rigorous application of safety codes and accepted practices so that with the completed works, operation of electrical services may add to the overall efficiency of function to be performed without in any way detracting for the safety aspects required.

Installation of electrical services shall be undertaken in a safe, simple, systematic and orderly fashion giving attention to labeling of circuits, colour codes and numbering of cables so that the completed installation can be effectively maintained by personnel with nominal understanding of electrical engineering. All electrical instruments, cable, fans, electrodes points etc. and the manufacturers shall submit to the Engineer for his approval. In no case the system shall procure without pre-approval of the Engineer.

D.2 System

Electrical power will be available at 400/230 VAC, three phase, four wire, 50Hz directly from the power utility or from an outdoor sub-station where conversion of utility voltage will take place. Hence all systems except where specifically specified as High Tension (HT) works, shall be rated for this degree of incoming supply. All erection set-up, tools, appliances and safety precautions to be used by the contractor for electrical services within the building shall also be suitable for work under this Low Tension (LT) class of work.

D.3 Standards

Where not specified within this specification, all materials and workmanship used in the installation work shall be in accordance to the latest edition of the related Indian Standard Specification (IS:732-Code of Practice of Electrical Wiring Installation System Voltage not exceeding 650V) or equivalent.

Notwithstanding the stipulation of above standards, local electrical coded for electrical services in buildings, where such exist, shall also be followed. Adequate consideration shall also be given to compliance of the equipment and works with local environmental conditions such as temperature, altitude, humidity, dust, vermin, attitude of personnel who will occupy the premises etc.

D.4 Scope of Work

D.4.1 The scope of works generally requires:

a. supply and delivery of all required materials, fixtures, electrical equipment and appliances:
b. setting, wiring, fixing and electrical installation of required materials, fixtures, electrical equipment and appliances;
c. testing and commissioning of the entire electrical installation and;
d. any other required works,
e. the Contractor shall perform the following work in addition to furnishing and delivering of the equipment, material and accessories.
    i) Assembling at site
    ii) Erection and Complete installation
    iii) Testing of equipment
    iv) Commissioning of all equipment prior to trial operation
    v) Trial operation and all necessary adjustments prior to initial operation
    vi) Obtaining Engineer's approval & written acceptance to initial operation

The works undertaken by the contractor shall e fully coordinated with the civil works so that all electrical works are set and finished in conformity with the building structural and architectural works. The work schedule shall also be coordinated so that no component of work schedules is interrupted owing to defective programming. Works to be undertaken are categorized under the following major sections:

a. laying of electrical conduit, outlet boxes, pull boxes and conduit accessories required for the electrical wiring of the system;
b. Wiring in concealed conduit or directly buried cables to achieve desired electrical sub-circuits for the given electrical layout;
c. installation of and termination of wiring to light fixtures, ceremonial lights, outdoor lights, signage, power outlets, ceiling fans, controlling switches, fire alarms, call bells, exhaust fans, etc,
d. installation of mains and sub-mains cable form the utility LV take-off terminal (or the sub-station) to the main switchboard and from the main switchboard to distribution panels;
e. installation of main switch board and distribution panels;
f. installation of earthing system;
g. all other works required including testing, commissioning, etc.

Work indicated shall include all civil and electrical works required to achieve a satisfactory electrical installation, whether or not such are specifically outlined in these specifications. The entire installation shall be suitable for a three phase, four wire, 400/230 VAC, 50 Hz system.

D.5 Installation drawings

Prior to commencing the electrical works, the Contractor shall provide to the Engineer, a set of drawings to the scale 1:50 showing detailed conduit layout and writing drawings showing all details such as the route and size of the conduit, number and size of cables in the conduit, location of outlet boxes, openings or duct outlets in civil works if required, routing and dimensions of cable trenches, etc.

This drawing shall be prepared in complete co-ordination with and understanding of the civil and architectural works which will actually be undertaken. The drawing shall be immediately modified and approved if any changes in design are undertaken, and a record of such amendments shall be kept. A set of the up-dated and approved drawings shall be available at the site at all times for inspection by the Engineer.

D.6 Shop Drawings

Prior to commencing procurement, the Contractor shall submit for approval, shop drawings showing layout, dimensions, materials used, standards specified for the fabrication or procurement of items such as the main switchboard, distribution panels and other items for which custom design is necessary.

D.7. Samples

Prior to commencing procurement, the Contractor shall submit to the Engineer for his approval, technical description, related catalog brochures and a sample of all cable, conduit accessories, switches, power outlets, lamps, fluorescent tubes, fixtures, etc. which are to be procured and installed.

D.8 Location of Fixtures

Location of conduit, fixtures, switches, outlets, distribution boards and other electrical equipments and appliances shall generally be in accordance with the updated construction drawings; and in accordance with the specifications and mounting heights and location details mentioned therein. Notwithstanding the guidelines given in the drawings and specifications, the location of all electrical items, equipment and appliances in the buildings shall be approved by the Engineer prior to commencement of electrical installation works.

D.9 Conduit

Electrical conduit used in the final sub-circuits of the electrical services shall be rigid, non-metallic (PVC) conduit of an approved manufacturer conforming to IS:2509 and shall be used only with corresponding approved accessories.

The size of the conduit shall be in accordance with the number and size of electrical cables to be drawn into the conduit. The number of cables that may be drawn in a conduit shall be as specified in the table below or as stipulated in the appropriate section of the IS code or equivalent.

Cable size (sq.mm)	No of cables in conduit size (mm)				
	16	19	25	32	38
1.5	4	6	10	14	-
2.5	3	5	10	14	-
4.0	2	3	6	10	14
6.0	-	2	5	8	11

The conduits shall be of following sizes:

a. ½" PVC pipe for light ckt, speaker ckt, call bell ckt.

b. ¾" PVC pipe for power ckt, telephone ckt.

c. 2" PVC for sub-mains.

Conduit shall be embedded in building structural works and conduit runs shall be straight and shall follow the shortest route between points or as shown in electrical drawings.

Wherever necessary, bends or diversion may be achieved by bending the conduit or by employing approved bends, inspection boxes, elbows or similar fitting.

Conduit accessories such as ceiling outlets, junction boxes shall be of approved quality. The physical integrity of the conduit and accessories as an integral electrical component shall be ensured by approved means such as the use of water-resistant cement bonding on all unscrewed conduit joints and termination, and use of rubber gaskets in entry points to junction boxes or outlets or other approved means.

Conduit embedded in civil works shall include an 18 SWG galvanized 'fish' wire inserted during the time of conduit laying to facilitate drawing in a cables at later stage.

D.10 CABLES

D.10.1 Scope of Works

Electrical cable used in the installation shall generally be of the following types:

1. Flexible cable for connection to fixtures, appliances and equipment from terminal points in outlet boxes, junction boxes, etc;
2. Final sub-circuit cable used for wiring from the distribution board to the terminal box, junction box, etc;
3. Sub-mains cable used for electrical distribution from the main switch board to several power distribution boards within the buildings;
4. Mains cable used to interconnect the main switchboard in the building to the tap-off point in the power utility service.

D.10.2 Flexible Cable

Flexible cables used for the purpose mentioned shall not be less than twin core, 48/0.2mm size, with copper conductor and thermoplastic insulation.

Where a light fitting is uprooted by one or more flexible cord, the maximum weight to which the twin flexible cords may be subjected shall be as follows:

Cross-sectional area of twin flex (sq.mm)	No./dia. of wires no./mm	Max. permissible weight (kg)
1.5	48/0.20	3.5
2.5	80/0.20	8.8
4.0	128/0.20	14.0

D.10.3 Final Sub-circuit Cable

Cables used for wiring in final sub-circuits shall feature high conductivity, stranded copper conductors with PVC insulation rated at 500 VAC.

Color coding of cables shall be maintained in the cables used in the final sub-circuits in accordance with the following plan:

1. Phase I – Red;
2. Phase II – Yellow;
3. Phase III – Blue;
4. Neutral – Black;
5. Earth – Green

Cable sizes used in the final sub-circuits standardized as follows unless indicated in the drawings or specified elsewhere:

1. single core, stranded, 4 sq.mm (7/0.85mm) cable for indoor power circuits; and
2. single core, stranded, 2.5 sq.mm cables (3/1.06mm) for indoor lighting and low power circuits.

Phase and neutral conductors in these cables shall be of the same cross-sectional area. A separate conductor of the size specified herein or indicated in the drawings shall be used in both types of sub-circuits for earth continuity.

D.10.3 Mains and Sub-mains Cables

D.10.4.1 General

The elecrical cable shalll be of 660/1100 volt insulation grade armoured/unarmoured power cable and as approved by the Engineer. The cable shall be used for mainsuppy, walkway lighting, garden lighting or focade lighting etc. The cables shall be of 4, $3^{1/2}$, 2 or 1 core aluminium/conductors. Cable shall be strictly in accordance with IS 1554(I) 1976.

D.10.4.2 Cables Laying

The cable shall be so laid that they shall not interfere with underground structures. All water pipes sewerage lines or other underground structures which come exposed by excavation shall be properly supported and protected from injury until the filling has been rammed perfectly in places and around them.

Excavation shall generally be in ordinary alluvial and hard soil and trench shall be dug to a uniform depth of 3 feet and wide enough for laying the number of cables required. Back filling shall be done with shifted sand to eliminate stones and hard lumps, to a depth of 10 cm both above and below the cable. A layer of full size bricks shall be laid on the cables to avoid mechanical injury to cable.

Road crossing shall be avoided wherever possible. Whenever a cable is to be laid across the road/drain/culvert a R.C.C. hume pipe of suitable diameter shall be embeded and the cable shall be inserted through the pipe. The end of the pipe shall be plugged to avoid collection of water in the pipe. Cable routes shall be indicated in the as built drawing and shall be submitted to the Engineer.

If two or more cables are laid in the same trench, cable shall be kept in sufficient gap to avoid derating of the cable. All the cables following the same routes shall be

laid in the same trench. Cable shall not be allowed to cross each other as far as possible or as instructed by Engineer.

The Cable shall be laid by mounting the drum of the cable on drum carriage. Where the carriage is not available the drums shall be mounted on a properly supported axle, and the cable laid out from the top of the drum. In no case the cable shall be colled on.

Cable entry into the building or across the building shall be made through the holen in the plinth and recessed in the floor and fixed to the wall or partition or ceiling and directed by means of saddle clamps. R.C.C hume pipes shall be provided well in advance for service entries. The pipes shall be filled with sand and plugged with cement concrete avoid entry of water.

Straight through joint shall not be allowed in the underground cables. In case of damage of cable during transportation or laying the Contractor shall inform to the Engineer. Such case only one straight through joint shall be allowed. Straight through joint of conductor shall be done by solderless crimping type cable jointer and the joint portion shall by properly insulated by high voltage type.

The rate quoted for cable shall include supply and installation of all firing materials and labours as mentioned in the above specification.

D.11 OUTLETS

D.11.1 General

The outlets shall comprise of switches, power sockets, telephone socket, speaker and call-bell sockets and the filling outlets along with the metal boxes (square type). The outlets boxes shall be of 18 SWG galvanized steel. All the outlets shall be flushed in the walls and the ceilings. The Contractor shall submit the outlets and its company to the Engineer for his approval.

D.11.2 Power Outlets

Power outlets conforming to IS 1293 – 1977 shall be three pin switch sockets rated at 5/15 A, single phase. The outlets shall have an earth connection. Safety features shall be incorporated to ensure that when any appliance is plugged in, its earth continuity is first maintained prior to mating of the phase and neutral pins. Additional safety features shall include shutters, illuminated indicators and shrouded terminals. High grade brass sheet metal contact tubes shall ensure tight, spark-free contacts with mating plugs.

Controlling switches shall have high current capacity silver and silver cadmium oxide contacts, bounce free snap action, wiping action and making and breaking mechanism with minimum arcing.

All electrical parts shall be enclosed in a sturdy porcelain or thermoplastic housing. The power outlets shall preferably be screwed onto the junction box through a metal mounting plate. The cover plate over the switch socket assembly shall be of brass screwed onto the metal frame.

The outlets shall be flush mounted by means of recessed junction boxes which have been fabricated precisely for the fixture dimension. Such boxes shall be constructed of sturdy galvanized sheet steel and shall feature conduit knockouts on all sides. Rubber gaskets shall be provided along the knockouts through which conduit will enter so that a watertight continuity of electrical installation is maintained.

At specific locations indicated in drawing, light switches shall be fitted into a recessed switch panel to centralize switching in circulation areas and to discourage tampering with the control of these appliances. Such switch panels shall be constructed of sheet steel and shall house the related drawings. Dimensions of the panel shall be maintained to the minimum required. The panels shall feature a robust hinged lockable cover flush with the finished surface of the room wall. The exterior shall be painted to conform with interior décor.

D.11.3 Switch

The switch shall be one piece multiple gang and square (3"x3" approx.) type. Its colour shall be white. It shall be of standard quality as approved by the Engineer. The rating shall be SAMP, 230v single pole.

D.11.4 Power Socket

The power socket shall be white colour and square (3"x3" approx.) in construction. It shall be three pined 5/15 Amp 230 volt switch socket combined and interlocked type. The rating shall be higher for heavy duty equipments as instructed by the Engineer.

D.11.5 Telephone socket

The power socket shall be white in colour and square (3"x3" approx.) in construction.

D.11.6 Speaker Socket

Speaker socket shall be of 5 Amp rating. Its size be square & colour shall be white.

D.11.7 Bell-push

Bell push shall be of rating, 230v single pole 5 Amp. Its size shall be square and colour shall be white.

D.11.8 Installation

i) Switch shall be fixed at the walls 1.5 m above the finished floor and at locations shown in drawing & as directed by the Engineer.

ii) Power, Telephone and Call bell sockets shall be fixed at the walls 20cm above the finished floor and they shall be as shown in drawing & as instructed by the Engineer.

D.12 CEILING AND WALL FANS

Ceiling and wall fans of an approved manufacture by the Engineer shall be of the type and sweep diameter as shown in drawings or the Bill of Quantity. Fan regulators shall be remote controlled wired unit featuring at least 3-speed push button type selectors. Ceiling fans shall be suspended from the ceiling on-J-hooks which are bonded to reinforcement rods of ceiling structural works. Contractor shall make all necessary arrangements of chiseling the slab, welding hooks, plastering and finishing all complete at his own cost.

D.13 EXHUST FANS

Heavy duty fans of an approved manufacture by the Engineer shall be of the type and sweep as shown in drawing or in Bill of Quantity. It shall have integral metal units suitable for installation on walls or single or double pane windows and shall feature two-speed push-button type selectors. The fans shall be capable of delivery rate of not less than 700m3/h at 1200 rpm. A steel louvered shutter shall be provided to close off the fan opening.

D.14 LIGHT FIXTURES

Incandescent and fluorescent light fixtures shall be supplied and installed as shown in the drawings. Major types of fixtures are briefly described below. All fixtures

described shall be of an approved manufacture indicated in the drawings or the bill of quantities. If fixtures of an alternate manufacture are offered, sufficient testimony must be provided to substantiate its equality with the product recommended.

a. Fluorescent fixtures shall generally be surface mounted with 1x18 W, 4x18W, 1.36W or 2x36W energy efficient "TL" D fluorescent tubes good colour rendering qualities with sturdy, corrosion free metal body and mounting channel with required type of reflectors, diffusers or optical assemblies. High quality, low loss, high accuracy current set ballast chokes shall feature copper windings. High quality starters shall be of an approved manufacturer capable of generating adequate voltage to quickly ignite the type of tube used. A glow switch and a radio interference suppresser capacitor shall be built into the starter assembly which shall be moulded from high quality white poly-carbonate canister with good insulation characteristics.

b. Ceiling incandescent luminaries in single or multi-configuration shall generally be 250mm diameter clear glass spheres housed in a non-corrosive sturdy spun metal body. A 60/100W Argenta incandescent lamp shall be used with such fixtures.

c. Incandescent wall fixtures shall generally be decorative light fixtures compatible with interior décor. The fixtures shall have one or two 60/100W Argenta lamps as shown in the drawings. The lamps shall be enclosed in a 250mm diameter high quality clear glass sphere. The housing shall be of sturdy non-corrosive spun metal (brass).

d. Energy efficient lamps complete with their holder and ballast of the type specified in the drawings shall be either mounted independently or mounted inside a luminaries as specified in the drawings. Light from the lamps shall be a warm glow similar to that form GLS lamps.

e. Special type of functional incandescent fixtures for use in the lighting of outdoors, or for hazard signals and accent lighting shall be used as specified. These include spotlights, down-lights, floodlights and aviation obstruction lights.

f. Light fixtures used for outdoor application either as post-top lanterns, street lights, recessed fixtures or wall brackets shall be integrally weatherproof with rubber gaskets or other approved means to exclude entry of water.

   Where PTLs or street lights have to be installed outdoors these shall be fitted with energy efficient 9 W lamps and mounted on specified galvanized steel tubes finished with anti-corrosive paint. Erection works shall include the construction of adequate foundation block in cement concrete for these poles. Wiring to the outdoor units shall be in specified size controlled by photoelectric switches set to switch on and switch off the lights on predetermined ambient light conditions.

g. Festival lights for use during ceremonial occasions shall feature 25W coloured pygmy lamps of assorted colours spaced at 300mm intervals and fitted to weatherproof lamp holders which are installed inconspicuously into the building surface by mounting clips.

h. Signage lights to provide guidance to personnel and functions within the remises (eg. parking, exit, etc.) shall be fabricated of sturdy sheet housing with 2 mm thick translucent acrylic plastic screens fixed to the metal housing with aluminium angles. Signage letters also made of colored acrylic plastic 2mm thick and not less than 100 mm in height shall be glued to the main screen. Illumination shall be provided by a minimum of 1x18W fluorescent luminaries installed within the housing.

i. Lights tracks shall be used where flexibility of luminaire type and position is required. The tracks shall be single track circuits unless specified. The track shall be supplied with one spotlight per meter of track. Lights in the tracks shall be capable of being dimmed continuously by means of low-loss electronic dimmers housed in the respective lighting panels.

   All metal parts of light fixtures installed within the premises shall be effectively earthed.

D.15 FIRE ALARM SYSTEM

The fire alarm system within the premises shall comprise of equipment of an approved manufacture and shall feature a distinctively audible siren/horn specifically designed for such purposed and which is actuated by any one of several strategically placed push buttons, access to which requires the breaking open of the transparent plastic cover to the junction box which houses the push button.

D.16 CALL BELLS/CHIMES

Call bells for application in selected rooms shall feature a well modulated audible tone/chime generated by electronic circuitry and shall generally be of the musical type with multiple intensity selection. The bells or chimes shall be actuated by remote control push button station or robust portable foot-switch which shall be wired to terminals in a wall-outlet box through a two meter length of tough flexible cable.

D.17 FUSES

High rupturing capacity (HRC) fuse links and fittings used in the installation to provide back-up protection for miniature circuit breakers shall conform to IS 2208. As these fused also provide protection to cables outgoing from the main distribution board they shall be capable of providing close protection.

D.18 FUSE-SWITCHES

Fuse-switches shall comply with IS 4064 totally enclosed, fully shrounded with silver plated contacts to ensure high level contact efficiency. The fuse-switches shall have double break contacts ensuring complete isolation of the fuse-switches when the

unit is in the OFF position. The action of the switch shall be positive with quick-make and quick-break mechanism independent of the speed of the operator.

D.19 MINIATURE CIRCUIT BREAKERS (MCBs)

Miniature Circuit Breakers shall be used to protect final sub-circuits from the distribution board. Circuit breakers shall be in accordance with IS 9928 or equivalent and shall be an approved manufactures and shall incorporate the following safety features:

a. thermal overload protection
b. magnetic short circuit protection
c. at least 3KA breaking capacity at 415VAC, 50Hz

Individual MCBs shall be grouped and interlocked to provide multi-pole configurations as specified in the drawings. Assembly of MCBs in a distribution board shall be done on DIN type rails that will allow front mounting of the MCBs with brass screws.

The body of the MCBs shall preferably be of thermosetting glass filled polyester to provide maximum safety against terminal burn-outs and fire hazards.

D.20 MOULDED CASE CIRCUIT BREAKERS (MCCBs)

MCCBs used shall be dead-front, compact units, suitable for use in switchboards. The operating mechanism shall feature quick-make and quick-break contacts with a trip-free handle. De-ion arc chutes are preferred to minimize arcing between breaker contacts. Tripping on fault is clearly indicated by the operating handle which comes to a position between the ON and OFF when tripping occurs.

Protective features shall include

a thermal elements of the indirectly heated bimetallic for delayed overload protection

b magnetic trip for instantaneous response to short circuits.

Clear indication shall be given to indicate the breaker having tripped automatically on fault. The MCCB shall be rated for a breaking capacity not less than 10KA at 415 VAC, 50Hz.

D.21 DISTRIBUTION BOARDS (DBs)

Electrical distribution boards used in the electrical installation shall be manufactured from at least 16 SWG sheet steel, shall be suitable for flush mounting, and shall be painted with two coats of enamel over two coats of primer,

the painted color conforming with surrounding décor. The boards shall be integral units with appropriate conduit knockouts from top and bottom. The construction shall be sturdy and shall feature dust-proof and vermin proof design. The interior shall have space for incoming and outgoing cables. Distribution boards shall be complete with:

a. appropriately rated bus bars;
b. neutral link and earth terminal
c. labeling of circuit breakers
d. clearly printed schedule of circuits and
e. hinged front cover with locking device.

The distribution boards shall normally have two incomees each with its own distinct distribution scheme: one from the mains and one from the standby generator. Though incorporated into a single housing assembly, these circuits shall be adequately segregated.

The number and configuration of miniature circuit breakers and their rating shall be as shown in the appropriate drawings. The back of miniature circuit breakers shall be mounted on a metal brackets which can be detached from the distribution board frame.

D.22 MAIN SWITCH BOARD

The main switch board used in the installation shall be a modular, free standing, dead front, extendible unit fabricated from sheet steel not less than 16 SWG and painted with two coats of primer and finished in navy enamel.

The switch board shall be complete with:

a. copper bus bars of suitable rating
b. lifting lugs and cable entry knockouts
c. earth terminals and neutral links
d. clearly labeled incoming and outgoing switch-fuses or MCCBs
e. 0-300V flush mounted voltmeters with phase selector switch
f. 0-300A, type flush mounted, ammeter with phase selector switch and
g. other accessories as specified in drawings.

The switchboard design shall feature dust, moisture and vermin proof characteristics.

D.23 WIRING

Wiring in the final sub-circuits shall be lopped with cable termination in the distribution box and the related outlet box of the fixture or appliance. Use of intermediate junction boxes shall be discouraged. Joints in cable within the conduit shall be prohibited.

Cable shall be pulled into the conduit only after civil structural works are complete and outlet boxes, etc. have been fixed satisfactorily.

Where it becomes necessary to terminate or join final sub-circuit cable in outlet boxes, such termination and joints shall be made in an approved manner in terminal rows. Use of tape to joint or bond cables in the outlet or junction boxes shall be prohibited.

D.24 EARTHING AND TESTING

D.24.1 General

This specification shall cover the earthing materials and the procedures for both earthing and testing of the entire installation. The contractor shall furnish main earth connections between all apparatus and conduit as required by the Indian codes and as specified herein or as shown in the drawing and instruction of the Engineer.

D.24.2 Earthing Set

The earthing sets shall consist of the following:

a. 600x600x3.15mm electrolytic coper plate as earth electrode,

b. about 1m long 19mm G.I. pipe and other required accessories for watering,

c. cement concrete works of ratio 1:4:8 for watering arrangement as per drawing and Instruction,

d. charcoal and salt filling as required,

e. hinged MS cover with MS frame at the top of earthing system (refer drawing); and

f. earth conductor or strip shall not less than 100 sq.mm in cross-sectional areas.

D.24.3 Procedure

The earthing point shall be minimum 2m away for the building foundation. Earthing copper wire shall be hard drawn 8 SWG or size specified in the Bill of Quantities.

Earthing copper wire shall be fixed with suitable copper fixing clips or ring type clips in case of conduits and cables as required.

Joints between wires shall be done by solderless "pressure" connectors. Underground joints shall not be permitted in any case.

In making earth connection advantage must be taken to avail the permanently moist soil available in the vicinity of the building.

D.25 LIGHTING ELECTRODE

A lighting electrode of an approved manufacture shall be installed on the building roof to provide protection to the premises in case of lighting strikes. The electrode shall be effectively grounded by means of a copper strip not less than 100 sq.mm in cross-section to an earthling station.

D.26 CABLING

Laying of cables between two points shall follow the following methods:

a. laying of cables directly in the ground, in outdoor applications and
b. laying or supporting of cables in cable trays, trenches and ducts, or clipped on to the walls or structural members of the building.

Where cables are to be laid direct in ground these shall be laid in cable trenches at least 3 feet m below ground surface. The cable laid shall be covered with 100 mm fine sand and protected on the top with transverse bricks across the trench cross-section. The trench shall then be back filled and compacted.

Where cable routes run under hard surfaces, or where cables have to be run inside masonry or structural components inside buildings. Such cables shall be run through rigid PVC conduit. The diameter of the conduit shall ensure that the cables occupy less than half of the cross sectional area of the conduit.

D.27 TESTS

The contractor shall submit for approval, a technical description of the method which will be applied to test the electric integrity of the entire installation including the measurement of obtained station earthing impedance and the insulation resistance of the installation tests shall be conducted on the completed installation to clean the following:

a. polarity: to verify that all terminals are correctly connected with regard to line, neutral and earth
b. insulation test between line and neural conductors: to verify the Megger reading between live and neutral conductors is not below 1 megaohm with all switches and fuses on fixtures and lamps out

c. insulation test between all non-earthed conductors and the earth on a live system is not below 1 megaohm from Megger reading

d. earth resistance test including the earth-loop test and

e. other tests to verify safety and integrity of the installation.

D.28 AS-INSTALLED DRAWINGS

After all tests on the completed installation have been approved, the contractor shall submit tow copes along with the original set of as-installed electrical drawings in hard-bound covers for subsequent maintenance and operation. These shall clearly indicate:

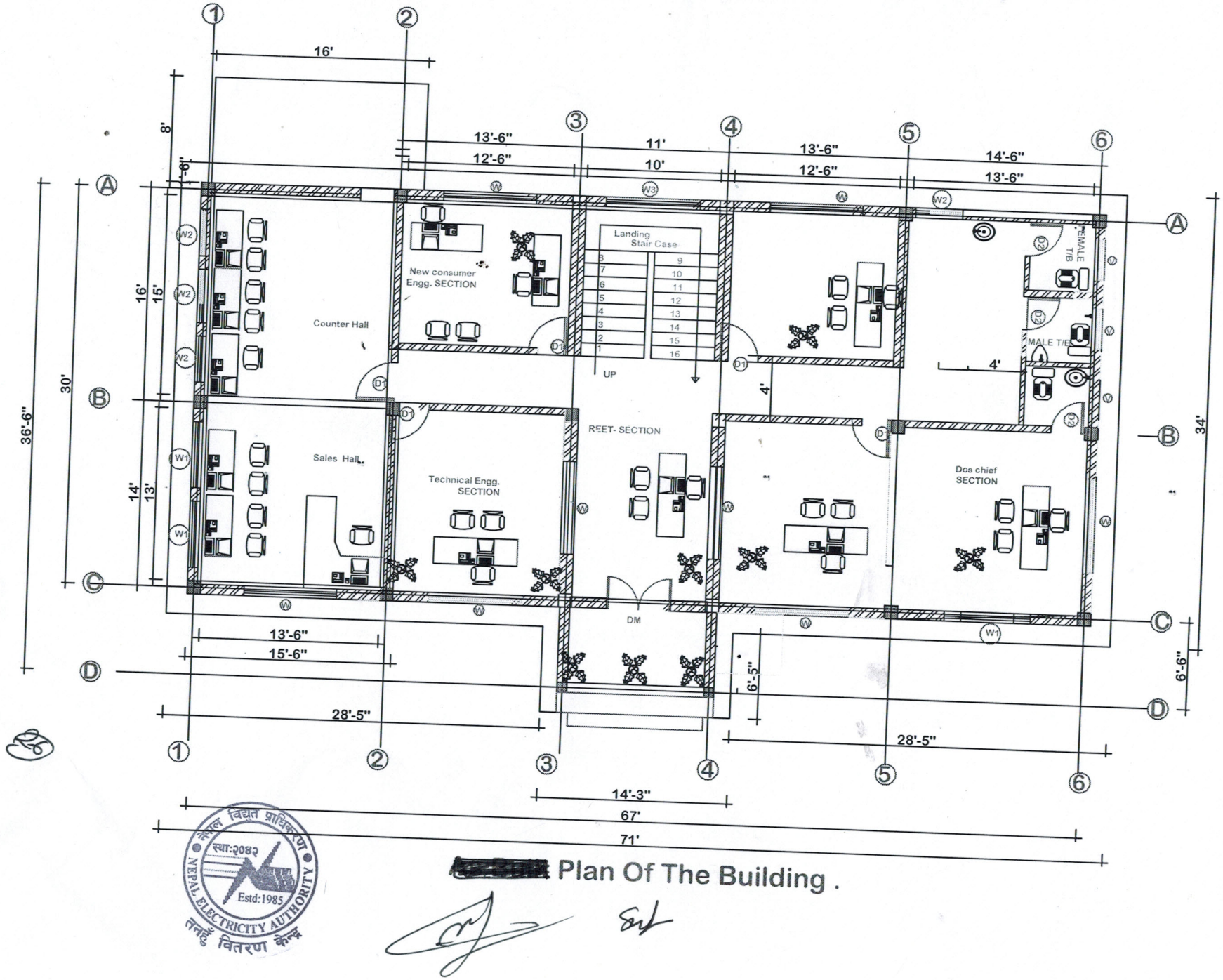
a. conduit runs and sizes with the number and size of cables enclosed in the conduit and the location of intermediate conduit accessories such as pull boxes, outlets, etc

b. distribution patterns and circuits in main and sub-distribution and the controlling switch gear

c. location of each stations and conductors

d. location of all electrical appliances, equipment and components;

e. **underground** and **overground** cable routes, sizes, cables trays and ducts provided.



Plan Of The Building .

नेपाल विद्युत प्राधिकरण
स्था:२०४२
NEPAL ELECTRICITY AUTHORITY
Estd:1985
तनहुँ वितरण केन्द्र

NEPAL ELECTRICITY AUTHORITY

(An Undertaking of NG)

Tanahun Distribution Centre

Damauli, Tanahun

BILL OF QUANTITIES							
TITLE: Construction of first floor Office Building at Tanahun Distribution Center							
SN	**PARTICULARS**	**UNIT**	**TOTAL QUANTITY**	**UNIT RATES**		**TOTAL PRICE (NRs)**	**REMARKS**
				IN FIGURE(NRs)	**IN WORDS(NRS)**		
A	**CIVIL WORKS**						
1	Site clearance work & Preperation of Site before and after construction work including dismental of old existing structure and Preparation of reinforcement of column and laying out as per drawing all complete as per Specification & instruction of site engineer.	sq ft	4020.000				
2	Plain Cement Concrete (1:2:4) for **all floor works** with supplying approved quality Ordinary Portland Cement, sand and crushed stone aggregate including mixing, laying and curing all complete in perfect line and level as per the drawing, specification and instruction of site engineer	cu.ft	505.150				
3	**Masonry works:-**						
3.1	Providing and laying of First class brick wall work for all walls in 1:4 cement sand mortar using first class chimney made brick, finishing to approved line and level and curing as per drawing, specification as per instruction of site engineer.	cu.ft	2637.713				
4	**Steel Reinforcement Works:-**						
4.1	Providing and placing in positions of approved brand of tor-steel fe415, fe450 reinforcement in all RCC works including cutting, cranking, bending, in position with 18/20 gauge annealed binding wire and necessary lapping as per drawings, specification and instruction of site engineer.	kg	6351.054				
5	**Form works:-**						
	Providing and placing of shuttering and centering of 19mm thick water proof ply form-works with necessary seasoned hardwood propping, staging, bracing and nut bolting in perfect line and level including removal of Form work as per drawing, specifications and instruction of site engineer for;						

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5.1	Beam	ft²	2059.795				
5.2	Slab	ft²	2646.375				
5.3	Column	ft²	1068.000				
6	**Concrete Works (PCC for RCC):- (1:1.5:3)**						
6.1	Providing and laying of PCC (1:1.5:3) for RCC work with approved quality of cement sand and aggregate well graded 20mm and down gauge including vibration, compaction finishing to approved line and level and proper curing for 28 days as per drawing, specification as per drawing specification as per instruction of engineer.	ft³	1905.509				
7	**Wood and Aluminium Work for Door and Window .**						
7.1	Sal wood works for **Chaukhats / frames** for doors, windows, and ventilations with good finish of approved quality of seasoned sal wood including fixing with MS holdfast all complete as per design, specification & instruction of site engineer.	ft³	16.988				
7.2	Making and fixing of single/double pannelled door with 38 mm thick approved quality seasoned Sal wood **fully paneled shutter** for **outer door** and fixing it with all its accessories including hinges, brass locking set, handle, tower bolt etc. of aluminium / brass, cleaning all complete as per the design, drawing, specification and instruction of site engineer.	ft²	20.499				
7.3	Making and fixing of flush door Flush door with 32mm thick sal wood frame & 6 and 8mm commercial plywood shutter and fixing it with all its accessories including hinges, brass locking set, handle, tower bolt etc. of aluminium / brass, cleaning all complete as per the design, drawing, specification and instruction of site engineer.	ft²	163.992				
7.4	Making and fixing Door shutter with 32mm thick sal wood frame and fixing of 26gauge aluminum sheet on one side and other side is commercial 6mm thick ply wood door and fixing it with all its accessories including hinges, brass locking set, handle, tower bolt etc. of aluminium / brass, cleaning all complete as per the design, drawing, specification and instruction of site engineer.	ft²	51.248				

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7.3	Supplying and fixing of section **101 mm*45mm* 1.2mm** Aluminum Sliding windows panels and 5mm thick glass including sliding door at all complete as per instruction of site engineer.	ft²	288.000				
7.4	Making and fixing **mosquito proof wire net shutter fow windows** in approved quality aluminum frame of reuired size of window , fitting with all its accessories for window all complete as per the drawing, specification and instruction of site engineer	ft²	150.000				
8	**Grill works:-**						
8.1	Making & fixing M.S. grill work including red oxide paint all complete as per specification & instruction of site engineer	kg	321.073				
9	**Plastering works:-**						
9.1	Providing and laying of 12.50 mm thick plaster upto required line and perfect smooth level as per site condition in 1:4 cement sand mortar on all **surface**s including necessary scaffolding packing of joints and proper curing for 15 days as per drawing , specification and instruction of site engineer.	ft²	14956.510				
10	**Flooring works :-**						
10.1	Providing and laying of 3 mm thick plain cement **punning work**s (1:1) on flooring with approved quality of cement, sand finishing to approved line and level and curing for 28 days as per drawing specification as per instruction of site engineer.	ft²	4546.730				
10.2	Approved quality Porcelein **glazed tile work** in 1:4 Ordinary Portland Cement sand mortar in **Toilet, and Bathroom** in perfect line & level all complete as per drawing , specification & instruction of site engineer.	ft²	300.000				
10.3	Approved quality Porcelein **non glazed tile work** in 1:4 Ordinary Portland Cement sand mortar in **Toilet, and Bathroom** in perfect line & level all complete as per drawing , specification & instruction of site engineer.	ft²	75.000				

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10.4	Providing and laying of **Marble works on floor spaces of Ground floor and** of approved quality over 20mm thick or more mm thick cement sand mortar in 1:4 on floor and skirting in perfect line and level with double modeling nosing and granite polishing with proper curing as per drawing specification and instruction of engineer all complete.	ft²	764.959				
10.5	Providing and laying of **Marble Skirting works on floor and stair case** in perfect line and level with double modeling nosing and polishing with proper curing as per drawing specification and instruction of engineer all complete.	R.ft	259.050				
11	**Painting Works:-**						
11.1	Providing and applying two coat of **weather coat painting** works over one coat of primer of approved quality and color over specified **outer surfaces** and snowcem for inner surfaces to give and even and uniform surface including scaffolding etc. as per specification and instruction of site engineer.	ft²	11759.380				
11.2	Providing and applying of one coat redoxide/primer and 2 coat of approved brand Enamel/Aluminium painting of approved quality and color with over specified **doors/ windows, metal works surfaces** to give and even and uniform surface as per specification and instruction of site engineer.	ft²	1944.000				
11.3	Ralling work for stair case Stair case Railing (2" sq pipe balustrarted 5"*3" hand railing , 4"*4"*3'6") and Barandah railing	rf	51.000				
12	**Metal works:-**						
12.1	Truss Fabrication and Welding Work by 2" 1.8 mm Black iron pipe .	Kg	36.576				
12.2	Black Iron Pipe (1.5") 1.8mm for Purline and Ralling on top and Barandah (1"*1" sq) pipe and (1.8 mm Thk)	r ft	698.155				
13	Coloured CGI Sheet 26 Gauge 0.41mm Heavy	ft²	232.500				
					Total of A		

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B	**SANITARY WORKS**						
1	All Sanitary works should be as per specification and instruction of site engineer.	lot	1.000				
C	**ELECTRICAL WORKS**						
1	All Electrical works should be as per specification and instruction of site engineer.	lot	1.000				
D					**Total of (A+B+C)**		
E					**13% VAT on "D"**		
F					**Total of (D+E)**		

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