West Bengal State Electricity Distribution Company Limited
(A Govt. of West Bengal Enterprise)
BIDHANNAGAR - II DIVISIONAL OFFICE, BIDHANNAGAR - II DIVISION

Bidhannagar - II Divisional Office, WBSEDCL:
Prafulla Kanan, Krishnapur
Kolkata - 700101
Tel: 033 25767255 **Fax**: 033 25767255
E-mail: dm.bidhannagar2@wbsedcl.in

Regd. Office of WBSEDCL:
Vidyut Bhavan, Block – DJ,
Sector – II, Bidhannagar,
Kolkata – 700 091.
Website:www.wbsedcl.in
Corporate Identity No. (CIN): U40109WB2007SGC113473

NOTICE INVITING e-TENDER

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NIT No. : WBSEDCL/BNDDII/OM/E-TENDER/24-25/06 **Dtd. 26.06.2024**

The DE & Divisional Manager, Bidhannagar-II Division, WBSEDCL invites e-tender for the works detailed below (Submission of Bid through online).

Sl. No.	Name of Work	Estimated Amount	Earnest Money Deposit (EMD)	Completion Time
1	Re-modelling of the Divisional Computer Centre alongwith accommodation of Conference Room at the ground floor of the Bidhannagar-II Divisional office building.	Rs. 3,45,649.00 (Rupees Three Lakhs Forty Five Thousand Six Hundred Forty Nine only)	Rs. 6,913.00 (Rupees Six Thousand Nine Hundred Thirteen only)	30 (Thirty) Days

1. Intending bidders desirous of participating in the tender are to log on to the website https://wbtenders.gov.in for the tender. The tender can be searched by typing WBSEDCL in the search engine provided in the website. Further details of the Tender Notice may be had from the following office: **Office of the Divisional Manager, Bidhannagar-II Division, WBSEDCL, Prafulla Kanan, Krishnapur, Kolkata - 700101**. Bidders willing to take part in the process of e-tendering are required to obtain Digital Signature Certificate (DSC) in the name of person who will sign the tender, from any authorized Certifying Authority (CA) under CCA, Govt of India (viz. nCode Solution, Safescrypt, e-Mudhra). DSC is given as a USB e-Token. After obtaining the Digital Signature Certificate (DSC) from the approved Certifying Authority they are required to register the fact of possessing the Digital Signature Certificates through the registration system available in the website.

2. Tender cost/Tender Fee is abolished as per O.O. No.- 1994 dated 19.05.2021 of the Director (HR), WBSEDCL. All participating bidders are therefore exempted from payment of Tender Fee.

3. Earnest Money Deposit as tabulated above for respective work shall be submitted through online mode through e-Tender portal (https://wbtenders.gov.in). All offline instruments like Bank draft, Pay Order etc. will be stopped for e-tender procurement. In case of unsuccessful/rejected bids, the EMD shall be refunded directly from the e-Tendering portal. However, for successful bids, the EMD will be refunded by WBSEDCL as per norms. Further details in respect of online payment as well as refund of EMD are provided within the EMD clause. This is in accordance to the O.O. No.- 1994 Dated: 19.05.2021 and O.O. No.- 1997 Dated: 14.06.2021 of the Director (HR), WBSEDCL. The bidder shall submit along with the offer necessary documents in support of credential (related to the tender) to WBSEDCL/Other Power Utilities/Other Govt. Departments in earlier occasions towards financial capabilities to the extent of the estimated financial capacity of the tenderer. All bids in the range of -20% to -80% of the estimated rate shall furnish an additionalperformance security in the format given in the annexure which shall be equal to 10% of the tendered amountbefore the issuance of the work order in the form of a Bank Guarantee from any scheduled bank.

4. Both **Technical Bid** and **Financial Bid** are to be submitted concurrently duly digitally signed by the Bidder through the website https://wbtenders.gov.in. (Details of which has been narrated in 'Instruction to Bidders') as per Schedule stated in Sl. No. 10.

5. Eligibility criteria for participation in tender:

i) All categories of intending Bidders who have satisfactorily completed at least one work of similar nature under the authority of State/Central Government, State/Central Government undertaking, Statutory Bodies constituted under the statute of Central/State Government of executed value not less than **Rs. 1.73 lakhs** in a single contract after **1st June'2021 for the abovementioned works**. Completion Certificate indicating Estimated Amount, Value of work-done, and Date of completion of the work and detail communicational address along with contact number of the Client should be submitted by the Bidder. Completion Certificate from the concerned Executive Engineer/District Engineer/Divisional Engineer or equivalent rank and above will be treated as valid credential. [Non-statutory Documents].

ii) All categories of prospective Bidders shall have to furnish the following documents: -

(a) EPF registration with current challan.

(b) I.T Return for last three financial years (i.e. Assessment Year: 2023-24, 2022-23, 2021-22) & PAN Card.

(c) GST registration Certificate/current return & challan.

(d) Professional Tax Paid Certificate or current challan & valid trade license.

(e) ESI Registration along with current return & challan.

(f) Performance as prime contractor for execution of similar nature of work for last seven years and details of works in hand.

(g) Information regarding any past and current litigation with WBSEDCL/WBSETCL/Govt./PSU in which the bidder is involved the party's concerned and disputed amount.

iii) Neither prospective Bidder nor any of the constituent partners had been debarred to participate in any Tender by any Government Department/Semi-Govt./Govt. Undertakings/ Enterprise etc during the last 5 (five) years prior to the date of this NIT. Such debarring will be considered as disqualification towards eligibility. **(A declaration in this respect has to be furnished by the prospective bidders)**. [Non-statutory Documents]

iv) The prospective Bidders or any of their constituent partner shall neither have abandoned any work nor any of their contract have been rescinded during the last 5 (five) years. Such abandonment or rescission will be considered as disqualification towards eligibility. **(A declaration in this respect has to be furnished by the prospective bidders)**. [Non-statutory Documents]

6. The **FINANCIAL OFFER** of the prospective bidder will be considered only if the **TECHNICAL BID** of the Bidder is found qualified by the WBSEDCL. The decision of the WBSEDCL will be final and absolute in this respect. The list of Qualified Bidders of Technical Bid will be displayed in the website.

7. No mobilization advance and secured advance will be allowed.

8. A prospective Bidder shall be allowed to participate in the tender either in the capacity of individual or as a partner of firm. If found to have applied severally in a single job, all his offers will be rejected for that job.

9. Bid shall remain valid for a period not less than 180 (one hundred eighty) days from the last date of submission of Financial Bid / Sealed Bid. If the bidder modifies/withdraws the bid during the validity period of bid, the bid will be cancelled with forfeiture of earnest money deposit (EMD).

10. Date and Time Schedule:

Sl. No.	Particulars	Date & Time
01.	Date of uploading of N.I.T and Tender Documents (online). [Publishing date]	05.07.2024 after 11.00 Hrs
02.	Documents sell / download start date (online).	05.07.2024 after 11.00 Hrs
03.	Bid Submission upload start date (online)	09.07.2024 after 11:00 Hrs
04.	Bid Submission upload end date (online)	16.07.2024 up to 11.00 Hrs
05.	Date for opening of Technical bid (online) for the Bidders	18.07.2024 at 15.00 Hrs
06.	Date of uploading the Final List of Technically Qualified Bidders after Technical Bid Evaluation (online).	To be intimated later.
07.	Date, for opening of Financial Bid (online).	To be intimated later.

11. The Bidder at the Bidders own responsibility and risk is encouraged to visit and examine the site of works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the work as mentioned in the Notice Inviting Tender. The costs of visiting the site shall be at the Bidders own expense.

12. The WBSEDCL reserves the right to accept or reject any offer without assigning any reason whatsoever and is notliable for any cost that might have been incurred by any Bidder at any stage of Bidding.

13. Prospective applicants are advised to note carefully the minimum qualification criteria as mentioned in "Instructions to Bidders" stated in Section – "A" before tendering the bids.

14. Exemption from deposition of earnest money deposit (EMD) shall not be allowed under any circumstances.

15. Conditional / Incomplete tender will not be accepted under any circumstances.

16. The intending Bidders are required to quote the rate online.

17. During scrutiny, if it comes to the notice of the tender inviting authority that the credential or any other paper found incorrect / manufactured / fabricated, that bidder would not be allowed to participate in the tender and that application will be rejected without any prejudice.

18. Canvassing in connection with the tender is strictly prohibited in the Tender submitted by the Contractor.

19. The eligibility of a Bidder will be ascertained on the basis of the documents submitted by a Bidder in support of eligibility criteria. If any document submitted by a Bidder is either Incorrect / manufactured / fabricated or false at any stage, his Tender will be out rightly rejected and legal action will be taken against him.

20. The participating bidders may please note that the successful bidder shall have to submit an Indemnity Bond inthe prescribed format before commencement of the work.

21. The WBSEDCL does not bind itself to accept the lowest bidder and reserves the right to reject any or all tender(s)or to split the whole work to more than one contractor without assigning any reason whatsoever.

22. The WBSEDCL reserves the right to cancel the N.I.T. due to unavoidable circumstances and no claim in this respect will be entertained.

Divisional Manager
Bidhannagar-II Division
WBSEDCL

West Bengal State Electricity Distribution Company Limited
(A Govt. of West Bengal Enterprise)
BIDHANNAGAR - II DIVISIONAL OFFICE, BIDHANNAGAR - II DIVISION

Bidhannagar - II Divisional Office, WBSEDCL:
Prafulla Kanan, Krishnapur
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Tel: 033 25767255 **Fax**: 033 25767255
E-mail: dm.bidhannagar2@wbsedcl.in

Regd. Office of WBSEDCL:
Vidyut Bhavan, Block – DJ,
Sector – II, Bidhannagar,
Kolkata – 700 091.
Website:www.wbsedcl.in
Corporate Identity No. (CIN): U40109WB2007SGC113473

INSTRUCTION TO BIDDERS

SECTION - A

1. General guidance for e-Tendering:
Instructions/Guidelines for electronic submission of the tenders online have been annexed for assisting the contractors to participate in e-Tendering.

2. Registration of Contractor:
Any contractor willing to take part in the process of e-Tendering will have to be enrolled & registered with the Government e-Procurement System of West Bengal, through logging onto http://www.wbtenders.gov.in (the web portal) the contractor is to click on the link for e-Tendering site as given on the web portal.

3. Digital Signature certificate (DSC):
Each contractor is required to obtain a Class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders from the approved service provider of the National Informatics Centre (NIC) on payment of requisite amount. Details are available at the Web Site stated in Clause 2 above. DSC is given as a USB e-Token.

4. Downloading of Tender documents:
The contractor can search & download N.I.T. & Tender Document(s) electronically from computer once he logs on to the website mentioned in clause 2 using the Digital Signature Certificate. This is the only mode of collection of Tender Documents.

5. Participation in more than one work:
A prospective bidder shall be allowed to participate in the job either in the capacity of individual or as a partner of a firm. If found to have applied severally in a single job all his applications will be rejected for that job.

6. Submission of Tenders:
General process of submission: Tenders are to be submitted online to the website stated in Cl. 2 above, in two folders at a time, one in Technical Proposal & the other is Financial Proposal before the prescribed date & time using Digital Signature Certificate (DSC). The documents are to be uploaded in the form of virus scanned copy duly Digitally Signed. The uploaded Documents will get encrypted (transformed into non readable formats).

A. Technical proposal
The Technical proposal should contain scanned copies of the following in three covers (folders).
A-1. Statutory Cover Containing two covers (folders)-(a) NIT (b) Draft & (c) Annexures/forms.
a. **NIT folder** containing Downloaded and uploaded copies (Digitally Signed) of the following: -
i. NIT.
ii. General conditions of contract and specification for works
iii. Additional Terms & condition if any
b. **Annexure/Forms Folder** containing
i. Undertaking by the bidder (Annexure-I)
ii. Letter of Bid for the work (Annexure-II)
iii. Declaration by the bidder (Annexure-III).

A-2. Non statutory cover containing
(a) EPF registration with current challan.
(b) I.T Return for last three financial years (i.e. Assessment Year: 2023-24, 2022-23, 2021-22) & PAN Card.
(c) GST registration Certificate/current return & challan.
(d) Professional Tax Paid Certificate or current challan & valid trade license.
(e) ESI Registration along with current return & challan.
(f) Performance as prime contractor for execution of similar nature of work for last seven years and details of works in hand.
(g) Information regarding any past and current litigation with WBSEDCL/WBSETCL/Govt/PSU in which the bidder is involved the party's concerned and disputed amount.

(h) Credential of at least one similar nature of work under State/Central Government, State/Central Government undertaking, Statutory Bodies constituted under the statute of Central/State Government of value not less than Rs. 1.73 lakhs in a single contract after 1st June'2021 for the work. Scanned copy of work order and completion certificate, as stated in 5(i) of e-NIT.

B. Financial Proposal (in one cover/folder): It contains Bill of Quantities (BOQ). The rate to be quoted in the BOQ on "**percentage basis**" in the space marked for quoting rate (either excess, less or at par i.e, 0.00%). Quoted rate will be encrypted in the B.O.Q. under Financial Bid.
Note: -Failure of submission of any of the abovementioned documents (as stated in A1 and A2) will render the tender liable to summarily rejected for both statutory & non statutory cover.

THE ABOVE STATED NON-STATUTORY/TECHNICAL DOCUMENTS SHOULD BE ARRANGE IN THE FOLLOWING MANNER

"Click" the check boxes beside the necessary documents in the My Document" list and then "click" the tab "Submit Non-Statutory Documents" to send the selected documents to Non-Statutory folder. Next Click the tab "Click to Encrypt and upload" and then click the "Technical" Folder to upload the Technical Documents (Statutory documents).

Sl. No.	Category Name	Sub-Category Description	Details
A.	**Certificates**	**Certificates**	***(a) EPF registration with current challan.*** ***(b) I.T Return for last three financial years (i.e. Assessment Year: 2023-24, 2022-23, 2021-22) & PAN Card.*** ***(c) GST registration Certificate/current return & challan.*** ***(d) Professional Tax Paid Certificate or current challan & valid trade license.*** ***(e) ESI Registration along with current return & challan.*** ***(f) Performance as prime contractor for execution of similar nature of work for last seven years and details of works in hand.*** ***(g) Information regarding any past and current litigation with WBSEDCL/WBSETCL/Govt/PSU in which the bidder is involved the party's concerned and disputed amount***
B.	**Credential**	**Credential**	***Credential of at least one similar nature of work under State/Central Government, State/Central Government undertaking, Statutory Bodies constituted under the statute of Central/State Government of value not less than Rs. 1.73 lakhs in a single contract after 1st June'2021 for the work. Scanned copy of work order and completion certificate, as stated in 5(i) of e-NIT.***

A. Technical Proposal:
i) Opening of Technical proposal: - Technical proposals will be opened by authorized Representatives of WBSEDCL from the web site stated using their Digital Signature Certificate.
ii) Intending tenderers may remain present if they so desire.
iii) Cover (folder) statutory documents will be opened first & if found in order, cover (Folder) for non-statutory documents will be opened. If there is any deficiency in the statutory documents the tender will be summarily rejected
iv) Decrypted (transformed in to readable formats) documents of the non-statutory cover will be downloaded & handed over to the authorized representatives of WBSEDCL
v) Uploading of summary list of technically qualified tenderers:

a. Pursuant to scrutiny & decision of the authorized representatives of WBSEDCL the summary list of eligible tenderers & the serial number of work for which their proposal will be considered will be uploaded in the web portals.
b. While evaluation the authorized representatives of WBSEDCL may summon any of the tenderer & seek clarification / information or tenderer/s may be asked for producing original hard copy/s of any of the documents already submitted & if these are not produced within the stipulated time frame, their proposals will be liable for rejection.

B. Financial proposal
i. The financial proposal should be one cover (folder) containing bill of quantities (BOQ) the contractor is to quote the rate (Percentage Excess/ Less/ At par (0.00%)) online in the space marked for quoting rate in the BOQ.
ii) Only downloaded copies of the above documents are to be uploaded virus scanned & Digitally Signed by the contractor.

7. RESPONSIBILITY OF BIDDERS:
a. WBSEDCL will not assume any responsibility regarding information gathered, interpretations or conclusions made by the bidder or regarding information, interruption or deductions the bidder may derive from the data furnished by the WBSEDCL. Verbal agreement or conversation with any officer, employee of WBSEDCL either before or after the execution of the contracts, shall not affect or modify any of the terms or obligations contained in the contract.

b. It shall be the responsibility of the bidders to determine and to satisfy themselves by such means as they consider necessary or desirable as to all matters pertaining to this contract including in particular all factors that may affect the cost, duration and execution of the works. It must be understood and agreed that such factors have properly been investigated and considered while submitting the bid.

c. Claim, whatsoever, including those for financial adjustment to the contract awarded under these specifications and documents will not be entertained by the purchaser. Neither any change in time schedule of contract nor any financial adjustments arising thereof shall be permitted by the purchaser, which are based on the back of such clear information of its effect on the cost of the contract to the bidder.

d. The bidder is expected to examine carefully all instructions, conditions, forms, schedules terms, annexure, specifications and drawings in the bidding document. Failure to comply with the requirements of bid submission will be at the bidder's own risk. Bids, which are determined to be not substantially responsive to the requirement of the bidding document, will be rejected.

8. COST OF BIDDING
Tender cost/Tender Fee is abolished as per O.O. No.- 1994 dated 19.05.2021 of the Director (HR), WBSEDCL. All participating bidders are therefore exempted from payment of Tender Fee.

9. CLARIFICATION OF BIDDING DOCUMENT
Should there be any discrepancy or obscurity in the meaning of any clauses of the bid document or if there be any query of the intending bidder, the bidder shall set forth in writing such discrepancies, doubt, obscurity or queries and submit the same to WBSEDCL, marked to **The Divisional Manager, Bidhannagar-II Division, WBSEDCL,** Prafulla Kanan, Krishnapur, Kolkata – 700101 within the date specified for this purpose. The clarification given in the pre-bid discussion shall be final and binding on the bidder.

10. BID PRICES
a. The bidder shall quote their price in the appropriate format in percentage excess/at par/ less the estimated price.
b. The quoted price should be firm. There will be no price variation during the pendency of the contract period or thereafter. Bidders are in no way allowed to get any escalation of price against this contract.
c. Prices indicated in the schedule of prices deemed **to exclude of Construction Labour Welfare Cess (1%)** & **'Goods and Services Tax'** but include all the levies/duties/taxes/cess & all other incidentals payable as per statute. Goods and Services Tax shall be paid extra as per statute.

11. EARNEST MONEY
Earnest Money Deposit amounting to **Rs. 6,913.00 (Rupees Six Thousand Nine Hundred Thirteen only)** shall be submitted through online mode through e-Tender portal (https://wbtenders.gov.in). All offline instruments like Bank draft, Pay Order etc. will be stopped for e-tender procurement. In case of unsuccessful/rejected bids, the EMD shall be refunded directly from the e-Tendering portal. However, for successful bids, the EMD will be refunded by WBSEDCL as per norms. Further details in respect of online payment as well as refund of EMD are provided within the EMD clause. This is in accordance to the O.O. No.- 1994 Dated: 19.05.2021 and O.O. No.- 1997 Dated: 14.06.2021 of the Director (HR), WBSEDCL. The bidder shall submit along with the offer necessary documents in support of credential (related to the tender) to WBSEDCL/Other Power Utilities/Other Govt. Departments in earlier occasions towards financial capabilities to the extent of the estimated financial capacity of the tenderer. Exemption from deposition of earnest money deposit (EMD) shall not be allowed under any circumstances.

12. PROCESS TO BE CONFIDENTIAL
12.1 After the opening of bids, information relating to the examination, clarification, evaluation and comparison of bids, and recommendations concerning the award of contract shall not be disclosed to bidders or other persons not officially concerned with such process.

12.2 Any effort by a bidder to influence WBSEDCL or other connected in the process of examination, clarification, evaluation and comparison of bids, and in decisions concerning the award of contract, may result in the rejection of his/their bid.

13. TIME SCHEDULE

The basic consideration and the essence of the contract shall be the strict adherence to the time schedule specified in the NIT.

14. EVALUATION AND COMPARISON OF BIDS

14.1 On examination of document submitted under different covers WBSEDCL will evaluate and compare the bid, determined to be substantially responsive at each step.
14.2 Evaluation of bid will include and will take into account:
14.2.1 Cost of construction/erection including taxes & duties etc.
14.2.2 The owner shall evaluate and compare only the bids determined to be substantially responsive.
14.2.3 The bids shall be evaluated on the basis of total price for the entire scope of work covered under this bid document.
14.2.4 Evaluated bid price of all bidders shall be compared among themselves to determine the lowest evaluated bid and as a result of this comparison, the lowest bid will be selected for award of contract.
14.2.5 Conditional rebate, if any, offered by any bidder shall not be considered in Bid evaluation.

15. TAXES, DUTIES AND OTHER LEVIES

a. The contractor shall be solely responsible for the taxes that may be levied on the contractor's persons or on earnings of any office employee and shall hold the purchaser indemnified and harmless against any claims that may be made against the purchaser. The purchaser does not take any responsibility what- so-ever regarding taxes
under Indian Income Tax Act, for the contractor or his personnel. If it is obligatory under the provisions of Indian Income Tax Act, deduction of Income Tax at source shall be made by the purchaser.
b. All other taxes/duties/levies/cess payable by the bidder shall be included in the bid price and no claim on this behalf will be entertained by the owner.

16. LAWS GOVERNING CONTRACT

The contract shall be construed according to acts/laws in force in the country and shall be under the jurisdiction of Calcutta High Court.

17. LANGUAGE AND MEASURES

All documents pertain to the contract including specifications, schedule, notice, correspondences, operating and maintenance instructions, drawings or any other writings be written in English language. The metric system of measurement shall be used exclusively in this contract.

18. CORRUPT OR FRAUDULENT PRACTISE

WBSEDCL expects that bidders/contractors observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the owner defines for the purpose of this provision, the terms set forth below as follows:
18.1 **"Corrupt practice"** means the offering giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution, and
18.2 **"Fraudulent Practice"** means misrepresentation of facts in order to influence a procurement process of the execution of a contract to the detriment of the owner, and includes collusive practice among bidders (Prior to or after bid submission) designed to establish bid prices at artificial no-competitive levels and to deprive the owner of the benefits of free and open competition.
18.3 WBSEDCL Will reject a proposal for award if the owner determines that the bidder recommended for award has engaged in corrupt or fraudulent practice in competing for the contract in question.
18.4 Will declare a Firm ineligible either indefinitely or for a stated period of time if owner any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing the contract.

19. INSURANCE

The successful bidder on awarding of contract shall arrange, secure and maintain all insurance as may be pertinent to the work and obligatory in terms of law to protect the interests of WBSEDCL against all perils. The form & the limit of such insurance together with underwriting in each case shall be acceptable to WBSEDCL. However, irrespective of such acceptance the responsibility to maintain adequate insurance coverage at all times during the period of contract shall be bidder's alone.

20. CORRECTNESS AND SUFFICIENCY OF RATES QUOTED IN THE TENDER

The bidder shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for work and the rates and prices stated in the schedule of works. The rates and price quoted shall cover all obligation of the bidder under the contract and all materials, labour etc. necessary for proper completion and maintenance of the work.

21. PENALTY FOR SUPPRESSION / DISTORTON OF FACTS

If any Bidder fails to produce the original hard copies of the documents (especially Completion Certificates and audited balance sheets), or any other documents on demand of the Tender Committee within a specified time frame or if any deviation is detected in the hard copies from the uploaded soft copies or if there is any suppression, the tender committee will take actions deem fit against such defaulting Bidder.
The Employer reserves the right to accept or reject any Bid and to cancel the Bidding processes and reject all Bids at any time the prior to the award of Contract without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the ground for Employer's action.

22. AWARD OF CONTRACT

The Bidder who's Bid would be accepted will be notified by the authorized official through acceptance letter/Letter of award. The notification of award will constitute the formation of the Contract. The Agreement as per enclosed format in G.C.C. will incorporate all agreements between the Tender Accepting Authority and the successful bidder. All the tender documents including N.I.T. & B.O.Q. will be the part of the contract documents.

23. AMENDMENT OF BIDDING DOCUMENTS

a. At any time prior to the deadline for submission of bids, WBSEDCL may, for any reason whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by issuing amendments. Any such amendment shall be part of the bidding document.

b. Such amendment(s) will be published on the same website mentioned above. Owner will bear no responsibility or liability arising out of non- pursuance of the same in time or otherwise by the bidder. In order to afford prospective bidders reasonable time in which to take the amendment in to account in preparing their bids, the owner may, at its discretion, extend the deadline for submission of bids. Such amendments, clarification etc. shall be binding on bidders and will be given due consideration by the bidders while they submit their bids and invariably enclose such documents as a part of the bids.

ANNEXURE –I

PROFORMA FOR UNDERTAKING TO BE SUBMITTED BY THE BIDDER (For genuineness of the information furnished on-line and authenticity of the documents produced before Tender Committee for verification in support of his eligibility)

I._____, Partner/Legal Attorney/Accredited representative of M/S_____, solemnly declare that:

1. We are submitting Tender for the Work _____against Tender Notice No_____Dated_____
2. None of the Partners of our firm is relative of employee of W.B.S.E.D.C.L.
3. All information furnished by us in respect of fulfilment of eligibility criteria and qualification information of this Tender is complete, correct and true.
4. All documents/credentials submitted along with this Tender are genuine, authentic, true and valid.
5. If any information and document submitted is found to be false/incorrect any time, department may cancel my Tender and action as deemed fit may be taken against us, including termination of the contract, forfeiture of all dues including Earnest Money and banning/delisting of our firm and all partners of the firm etc.

Signature of the Tenderer

Dated_____

ANNEXURE-II

Format of Letter of Bid

LETTER HEAD OF BIDDER (AS ENROLLED ONLINE ON e-tendering PORTAL OF NIC)

To.
The Tender Committee

Sub: Letter of Bid for the work
_____
_____
_____

Ref: 1. NIT No_____dated_____
2. Tender Id No_____

Dear Sir,
We offer to execute the work as per our offered bill of quantity in accordance with the conditions of the NIT document as available in the website. The details of the EMD being submitted by us has been furnished on-line.
This Bid and your subsequent Letter of Acceptance/Work Order shall constitute a binding contract between us.
We hereby confirm our acceptance of all the terms and conditions of the NIT document unconditionally.

Signature of the Tenderer

Dated_____

ANNEXURE-III

Dated: _____

DECLARATION BY THE TENDERER

I/We have inspected the site of work and have made myself/ourselves fully acquainted with local conditions in and around the site of work. I /We have carefully gone through the Notice Inviting Tender and other tender documents mentioned therein. I/We have also carefully gone through the 'Bill of Quantities'.

My/Our tender is offered taking due consideration of all factors regarding the local site conditions stated in this Detailed Notice Inviting Tender to complete the proposed construction in all respects.

I/We promise to abide by all the stipulations of the contract documents and carry out and complete the work to the satisfaction of the department.

I/We also agree to procure tools and plants, at my/our cost required for the work.

_____

Signature of Tenderer

_____

Postal address of the Tenderer

GENERAL CONDITIONS OF CONTRACT
AND
SPECIFICATION FOR CIVIL WORK

GENERAL CONDITIONS OF CONTRACT AND SPECIFICATION FOR CIVIL WORKS

1. **DEFINITION OF TERMS:**
In writing these General Conditions of Contract, Specification and Bill of quantity/bidding schedule (schedule of work) the following words shall have normally the meanings here-in- after indicated unless there is something in the subject matter of content inconsistent with such construction.

The **Company/ purchaser/ Owner/ Department** shall mean the WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LTD, having its Office at Vidyut Bhavan, Block-DJ, Sector-II, Kolkata-700091. The **Engineer-in-Charge/Controlling Officer** shall mean the Engineer designated by the Company for the purpose of this contract.

Company's **representative** shall mean any person or persons of consulting firm appointed and remunerated by the Company to supervise, inspect, test and examine workmanship and materials of the work under this scope.

The **Contractor** shall mean the Bidder who will be awarded with the contract by the Company and shall include the contractor's executor's administrators, successors and permitted assignees.

The **"Sub-Contractor**" shall mean the person named in the Contract for any part of the works or any person to whom any part of the contract has been sublet by the contractor with the consent in writing of the Engineer-in-charge and will include the legal representatives, successors and permitted assigns of such persons.

Equipment/materials shall mean and include all type of construction equipment & materials etc. required for true and satisfactory completion of the work under this contract.

Workmanship shall mean the method/manner in which the jobs of the different items, whether included in the schedule or not but are required for true & satisfactory completion of the work under this contract, are executed.

General conditions shall mean all the clauses of General conditions of the proposed contract stated hereinafter. The specification shall mean the specification annexed to or issued with the General Conditions and shall include the schedule and drawings attached thereto. The terms **Services** shall mean all works to be undertaken by the contractor as laid down under the head "scope of contract" or elsewhere in the specification enclosed. When the words "approved", "subject to Approval", "As directed", "Accepted", "Permitted" etc. are used, the approval, judgment, direction etc. are understood to be a function of Company.

Month shall mean calendar month.

"Writing" shall include any manuscript, type written, printed or other statement reproduced in any visible form.
The work **"Site**" shall mean the site of proposed work as detailed in the specification or any other place where the work is to be executed under the contract.

"Date of Contract" shall mean the date on which notification of award of contract/letter of award has been issued.

"Zero Date" will be reckoned as the date of handing over the site.

2. SCOPE OF WORK:
Scope of work includes "Re-modeling of the Divisional Computer Centre along with accommodation of Conference Room at the ground floor of the BNDD-II office building." The proposed contract comprises of construction, completion and maintenance of the work during the contract period including defect liability period, as required. It includes provision of all labour, material, constructional plant, temporary work and everything whether temporary or permanent nature required for such construction, completion and maintenance so far as the necessity of providing the same is specified in or responsible to be inferred from the contract. The different items of work have been elaborated in the schedule of work.

3. Submission of Tender:
Please refer to Sl. no 6 of Instruction to Bidders.

4. Performance Bond/Security Deposit:
In respect of successful Bidder, the Earnest Money deposit on acceptance of Tender shall be converted as a part of the Security Deposit. The successful bidder shall have to submit balance Earnest money, if required, to make the initial Security money amounting to 2% of the contract price after placement of Letter of acceptance/Letter of award within specified period. Balance of Security Deposit equivalent to 10% (Ten percent) of contract amount shall be realized by recovering from the progressive bill @ 8% (Eight percent) of the amount of each such bill. In all cases, the amount of recovery of the Final Bill will be so adjusted as to make the total amount of Security Deposit equivalent to 10% (Ten percent) to the value of work so executed.

5. Refund of Security Deposit:
Refund of Security deposit shall be subject to Company's right to deduct/appropriate its dues against the contractor or under this contract or any other contract. The performance Bond/Security Deposit for all type of Bids shall be released only after satisfactory expiry of the guarantee period and certified as such by the controlling officer of the work upon written request by the contractor under following conditions:

5.1 In case of building works or other similar nature of works the defect liability period shall be considered 06 (six) month or expiry of one full monsoon period, i.e. June to September whichever is later and any defects such as leakages in roof, effloresces in walls, dampness, defects in drainage etc should be rectified to the satisfaction of the engineer.
5.2 All types of Manufacturers' guarantee/warranty wherever applicable are to be issued/revalidated in the name of owner by the contractual agency. In case of building works or similar nature of works the defect liability period shall be considered six months or expiry of one full monsoon period, i.e. from June to September whichever is later.

6. Refund of Earnest Money:
In case of unsuccessful/rejected bids, the EMD shall be refunded directly from the e-Tendering portal. However, for successful bids, the EMD will be refunded by WBSEDCL as per norms. Further details in respect of online payment as well as refund of EMD are provided within the EMD clause.

7. FORFEITURE OF EARNEST MONEY/ BID GURANTEE:
Earnest money/Bid guarantee shall be forfeited in case of following:
7.1 If during the period of validity, the bidder withdraws/modifies its bid as a whole or in part.
7.2 If the bidder deviates from any clarification/confirmation given by him subsequent to submission of his bid.
7.3 In case of successful bidder, if the Bidder fails:
7.3.1 To accept LOI/Order unconditionally and sign contract
7.3.2 To furnish the contract performance bond wherever applicable.

8. DEFECT LIABILTY PERIOD
8.1 The term "defect liability period" shall mean the period of **Six (06)** months from the Date of completion of the work. If any defect is found within the defect liability period the contractor shall be liable to rectify/replace the materials at their own cost and responsibility.
8.2 In case any defect of work is detected by the controlling officer within the period of six months, the defect liability period shall continue beyond six months.
8.3 Defects/rectification work so notified shall have to be attended and completed satisfactorily within the specified date or as deemed fit by the Controlling Officer. For faithful & due fulfilment of all obligations, this defect liability period shall be covered by Security Deposit submitted by the contractor detailed in clause 5.0.
8.4 After completion of defect liability period, and on completion of satisfactory rectification of defects, if any reported within the defect liability period, and on receipt of the application from the contractor the controlling Officer of the work will recommend release of security deposit.

9. MANNER OF EXECUTION OF CONTRACT AGREEMENT
9.1 The successful bidder has to submit acceptance of the LOI/order within **10(ten)** days from the date of issue of the Letter of Intent/order. The successful bidder shall be required to execute an Agreement on a non-judicial stamp paper of Rs 100/- with the company with all related documents for satisfactory execution of the work.
9.2 The agreement shall be signed on a date and time to be mutually agreed upon in the office of the controlling officer of the work and the same has to be signed by both the parties within 30 days from date of acceptance of the order. Power of attorney of the authorized representative of the contractor who will sign the contract agreement on behalf of the contractor is to be submitted before signing of the agreement.
9.3 The agreement shall be signed in original and three (3) photo copies. The original agreement shall be retained by the Company and a copy will be handed over to the Contractor.

10. GENERAL REQUIREMENT
10.1 The contractor shall execute, complete and maintain the work as per direction of the Controlling Officer/Engineer-in-Charge of the work or his representative
10.2 **Contractor to submit programme:** Within 14 (fourteen) days from the date of issue of letter of intent/order, the contractor shall submit a programme showing the order, procedure and method in which he proposes to carry the work.
10.3 **Contractor's staff at site**: The Contractor shall provide at site his authorized representative duly approved by the controlling officer (approval may be withdrawn for a person, if necessary). The contractor and/ or his authorized representative is to be constantly on the work and shall give whole time supervision of the same. Such authorized agent or representative shall receive (on behalf of the contractor) direction and instructions from the Controlling Officer/ Engineer-in-charge or his representative.
10.4 **Removal of persons employed at site**: The Controlling Officer/ Engineer-in-Charge shall be at liberty to ask the contractor to remove from the site any person, employed by the contractor in the execution of work, who in the opinion of the Controlling Officer/ Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties and such persons shall not be again employed upon the work without the permission of the Controlling Officer/ Engineer-in-Charge.
10.5 **Setting out**: The contractor shall be responsible for the true and proper setting out of the work and for the correctness of the position, levels, dimensions and alignments of all parts of the work. If any time during the progress of the work any error shall appear or arise in the positions, levels, dimensions or alignments of any part of the work, the contractor on being asked to rectify by the Controlling Officer/ Engineer-in-Charge or his representative shall at his own expense rectify such error to the satisfaction of the Controlling Officer/ Engineer-in-charge.
10.6 **Protection of work**: The Contractor shall in connection with the work provide and maintain at his own cost all lights, guards, fencing and watching when and where necessary if required by the company or by any competent authority for the protection of the work or for the safety and convenience of the public or others.
10.7 **Care of works:** From the commencement to the completion of the works, the Contractor shall take full responsibility for the care of permanent works, therefore and of all temporary works and in case of any damage, loss, or injury to works or to any part thereof or any temporary works due to any cause whatsoever shall at his own cost repair and make good the same, so that at completion the works shall be in good order and condition and in conformity in every respect with the requirements of the contract. The contractor shall take every practicable precaution not to damage or to cause injury to any adjoining or other properties or to any persons. However even if any damage or injury occurs, the contractor shall be responsible in meeting the necessary claims and demands as may be required.

10.8 **Workmen's Compensation for accident or injury to any workman:** The Company shall not be liable for damages or compensation payable as per provision of law in respect or consequence of any accident or injury to any workmen or other person in the employment of the contractor. The contractor shall have to pay all claims, demands, preceding costs, charges and expenses whatsoever in respect thereof or in relation thereto.Insurance policy covering provisions for workmen's compensation for all the workmen to be engaged by the contractor is to be made by him.
10.9 **Facilities for other Contractors:** The Contractor shall afford all reasonable Facilities for any other contractor employed by the company in execution on or near the site of any work not included in the contract**.**
10.10 **Clearing site on completion:** On Completion of the work the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary work of every kind and leave the whole of the site and work clean and in good and tidy condition to the satisfaction of the Controlling Officer/ Engineer- in-charge.

11. CHANGE OF QUANTITY
The quantity mentioned in the schedule of work is provisional. The company reserves the right to vary the quantities as may be necessary but such variation shall be limited to ±25% (plus or minus twenty five percent) of the contract price. Payment shall be made as per execution.

12. GOODS AND SERVICES TAX:
Goods and Service Tax shall be paid extra as per prevailing statute.

13. LABOUR LICENSE:
Contractor will have to obtain Labour License in respect of the above work as per Contract Labour (Regulation & Abolition) Act, 1970 as early as possible.

14. COMPLIANCE OF LABOUR LAWS:
The contractor shall comply all statutory labour laws to protect the labourers engaged by them. In this connection the contractor will be required to execute an indemnity bond (as per specimen enclosed as Annexure-B) after placement of letter of intent/ order.

15. NIGHT AND HOLIDAY WORK:
If any work of permanent nature is to be carried out in three shifts and/or in Sundays & Holidays, prior written permission of the Controlling Officer shall have to be obtained.

16. DEDUCTIONS OF PROVIDENT FUND & REMITTENCE THEREOF IN RESPECT OF CONTRACT LABOURERS:
In respect of casual workers or workers engaged for any job for a very short duration or sporadic nature having no employer-employee relationship (for example Soil testing, repair of transformer etc done by outer agency) and engaged in works which are neither preparatory, nor incidental, nor any way connected with the main operation of the establishment, deduction of provident fund and remittance thereof in respect of the contract labours will not be applicable. However, it is further clarified that no mechanical approach should be adopted in deciding the applicability of the Act and each case should be considered on its own merits.

17. VARIATION, OMISSION, ADDITION & ALTERATION:
The Contractor shall not modify the work except under direction in writing by the Company. The quantities provided in the Schedule of work are provisional only, which may vary up to any extent or may be deleted altogether. The quoted rate of each item shall remain firm till completion of contract. The Company reserves the right to alter, amend, and omit or otherwise vary the quantities as may be necessary but such variation will be limited to ± 25% (plus or minus twenty five percent) of the contract price. Payment shall be made as per actual execution.

18. PAYING AUTHORITY:
Payment will be made by the **Manager (F & A), Bidhannagar-II Division.**

19. SUPPLEMENTARY WORKS:
Whenever supplementary work becomes unavoidable for completion of the work in all respect, the Contractor shall bring the matter to the notice of the Controlling Officer and submit their proposal. However, the controlling officers shall have the right to advise the contractor to proceed with such item (s) of work. Rates for supplementary item shall be arrived at as given hereunder:
19.1 The rates of all supplementary items shall be decided on pro-rata basis from the existing items in the contract.
19.2 When above clause no 19.1 shall not be applicable the rates shall be taken from P.W.D(WB) schedule of rates for building works, sanitary & plumbing works & PWD(WB)(Roads) schedule prevailing at the time of submission of bids plus/minus the contractual rate of quotation.
19.3 When clause no 19.1 & 19.2 above shall not be applicable, the rates should be analyzed, to the mutual acceptance from present market rates of different elements involved in the item, against documentary evidence, with contractor's profit as 10% and 1% cess towards BOCWWC Act,1996. In that case contractual rate of quotation will not be applicable.
Controlling Officer's decision regarding finalization of rate of non-scheduled item(s) shall be final and binding upon the contractors.

20. MEASUREMENTS AND TERMS OF PAYMENT
20.1 All items of work carried out by the contractor in accordance with the provision of the contract having a financial value shall be entered in the measurement book/ log book etc. as prescribed by the company so that a complete record is obtained of all works performed under the contract and the value of work can be ascertained and determined there from.
20.2 Measurement shall be taken jointly by the supervisory officer or his authorized representative and by the contractor or his authorized representative. Every measurement thus taken shall be signed and dated by both the parties.
20.3 In the event of failure on the part of the contractor to attend or send his authorized representative after receiving the information to countersign or record objection within a week from the date of measurement, the measurement taken by the Engineer-in-charge/controlling officer or his authorized representative shall be taken to be correct measurement of the work done.
20.4 Progressive R/A bills against the prayer of the contractor, for an amount of minimum 20 %of the ordered value or as deemed justified by the controlling officer shall be released against certification by the controlling officer after deducting the amount already paid or other amounts as may be deductible. The bills shall be released within 45 (Forty Five) days of its submission if all formalities as per terms of the contract is

maintained. The final bill shall be released on completion of the work in all respect and fulfilment of all contractual obligations by the contractor.

20.5 The company reserves the right to recover/ enforce recovery of any overpayments detected after payment as a result of post-payment audit or technical examination or by any other means, notwithstanding the fact that the amount of disputed item, if any, of the contractor exceeds the amount of such overpayments and irrespective of the fact whether such disputed claims of the contractor are subject matter of arbitration or not. The amount of such overpayment may be recovered from subsequent bill, under the contract, failing that from contractor's claim under any other contract with the company or from contractors' security deposit or from the amount retained or the contractor shall pay the pay the overpayment on demand.

21. COMPLETION OF CONTRACT

All works under the contract must be completed by period of completion mentioned in NIT while portions of work as per programme settled in consultation with the controlling officer shall be completed by the date stipulated in the programme. It is to be noted that time is the essence of the contract and any default on the part of the contractor to complete the work within the stipulated date/dates aforesaid or within the time as may be extended in writing by the controlling officer subject to the payment of liquidated damages, the company shall have the right , without prejudice to any other clauses, to terminate the contract forthwith and to take possession of balance work/ materials and have the same allotted to any other agency and the contractor shall be liable to compensate the loss that may be occasioned to the Company on that account. Any letter in writing by The Controlling Officer shall be treated as conclusive on behalf of the Company.

22. DEFECTIVE MATERIAL

If in the opinion of the Engineer-in-Charge/ Controlling Officer, any of the materials brought to the site for use are not of the quality or kind specified in the contract and/ or are unfit for work, he shall be at liberty to order the removal of the said materials and the contractor shall remove the same within 24 (twenty four) hours after notice has been given to him, and if he fails to remove them within the time the Engineer may cause them to be removed anywhere at the risk of the contractor and any cost incurred in so doing shall be deducted from the dues to the contractor under the contract.

24. MATERIAL AND WORKMANSHIP

All the work shall be executed with the materials as specified and with best workmanship and/or in the best manner to the satisfaction of the Engineer-in-Charge/ Controlling Officer**.**

25. EXTENSION OF TIME:

If the work is suspended due to reasons beyond the control of the contractor, the contractor shall immediately give notice in writing within 7(seven) days to the controlling officer for each occasion. On receipt of such notice, the controlling officer may verify the matter and agree to extend the completion period as may be reasonable but without prejudice to other terms and conditions of the contract as the case may be if the reasons behind the suspension of work are found to be justified.

26. LIQUIDATED DAMAGES:

26.1 If the contractor fails to complete the work successfully within the time specified in the contract or any extension thereof, the company shall recover from the contractor as liquidated damages a sum of half percent (0.5%) of the contract value of works for each calendar week of delay or part thereof of delay subjected to Force Majeure.

26.2 The total recovery against liquidated damage shall not exceed ten percent (10%) of the contract value of the work

An extension of time without imposition of liquidated damage, may be granted for delay in execution of work provided there is no fault whatsoever on the part of the contractor. Such extension may only be granted on the basis of application to be submitted by the contractor who has to establish that the extension of time required by him was not due to his fault.

27. COMPANY'S RIGHT TO TERMINATE THE CONTRACT:

If the contractor neglects or fail to proceed with the work proportionate to the scheduled time of completion or fails to complete the work within scheduled time of completion or within extended time approved by the company, the company shall have right to terminate the order, Letter of intent, after giving notice in writing to the contractor. If the contractor fails, after 14(fourteen) days" of such notice, to proceed with the work in the manner notified, the company shall terminate the contract and call the contractor to take joint measurement along with the Engineer for finished portion of work. If the Contractor does not appear for a joint measurement, ex party measurement taken by the company will be taken as final.

In that case, the company shall take possession of the work site and may engage other agency to complete the work. Extra cost, if incurred to get the unfinished work done through other agency, will be realized from him, from his pending bills and security deposit. If the contract is terminated as above, the contractor shall have no claim for compensation against the company for any loss or deterioration of any materials that he may have collected or engaged or entered into on account of the work.

28. QUALITY OF WORK/MATERIAL AND MODE OF MEASUREMENT:

As regards to the specification of materials, execution of work and the mode of measurement relevant stipulation of P.W.D schedule of rates (applicable at site of work) in this respect shall be applicable. The Contractor shall arrange and provide all necessary facilities along with necessary manpower for inspection, testing and measurements at his own cost.

29. DEPARTMENTAL MATERIALS:

Departmental materials shall not be issued to the contractor for the work except under special circumstances.

30. DEDUCTION OF TAXES AND CESS FOR BOCWWC ACT, 1996:

If it is obligatory under the provision of Income tax Act 1961 and West Bengal VAT Act 2003 (VAT on works contract) to deduct tax at source then the same will be deducted from the bills as applicable. The contractor is required to follow the Building and other Construction Workers welfare Act, 1996. Registration of his establishment under section-7 of the Building and other Construction Worker's (Regulation and condition of service) Act, 1996 is to be made after the contract is awarded. 1% cess towards BOCWWC Act, 1996, will be deducted from its total amount of each bill. For this deductions certificate will be issued as per rules**.**

31. FORCE MAJEURE:
The Contractor shall not be liable to pay any liquidated damage for delay/failure to perform the contract for reasons of force majeure such as acts of God, acts of the public enemy, acts of Governments, fire, flood, epidemics, quarantine restriction, strikes, freight embargos and provided that the contractor shall within 10(ten) days from the beginning of such delay notify the Company in writing of the cause of delay. The Company shall verify the facts and grant such extension as found to be justified without imposing liquidated damage. The department shall not be responsible or liable to pay any compensation for any interruption in your work at the site due to strike, lockout, riot earthquake, flood, cyclone or civil commotion or any other force of accident due to any reason beyond control. The department shall not be held responsible to or liable to pay for any interruption in your work at the site arising out of resistance from the local public due to any resistance towards work.

32. SUB-LETTING OF CONTRACT:
The contractor shall not, without the written consent of the Company, assign or sublet his contract or any part thereof, other than for raw materials, or for any part of the work provided that any such consent shall not relieve the contractor form any obligation, duty or responsibility under the contract. In the event of sub-letting of contract or any part thereof is permitted, the fact that such permission has been accorded shall not establish any contractual relationship between the approved Sub-vendor and WBSEDCL of any of his liabilities and obligations under the contract.

33. ENGINEERS DECISION:
Controlling Officer's decision is final in respect of all matters which are left to the decision of the Controlling Officer including the granting or with-holding of certificates. If, in the opinion of the contractor, a decision made by the Controlling Officer is not in accordance with the meaning and intent of the contract, the contractor may file with the Controlling Officer, within 7 (seven) days after receipt of the decision, a written objection to the decision. Failure to file an objection within the allotted time will be considered as an acceptance of the Controlling Officer's decision and the decision shall become final and binding.

34. LIABILITY OF ACCIDENTS AND DAMAGE:
The Contractor shall be responsible for the loss, damage or depreciation of the Company's materials while in their custody and until the same is taken over by the Company. Until the completed work is taken over by the Company the contractor shall also be liable for and shall indemnify the Company in respect of all injury to person or damage to properly resulting from the negligence of the contractor or his workmen or sub-contractor or from defective workmanship etc.

35. LANGUAGE AND MEASUREMENT:
All documents pertaining to the contract including specifications, schedule notices, correspondences, operating and maintenance instruction, drawings or any other writings be written shall in English language. The metric system measurement shall be used exclusively in this contract.

36. SETTLEMENT OF DISPUTES:
All disputes concerning question of act arising under the contract shall be decided by the owner/company on receipt of written appeal by the contractor. Any dispute or differences arising out of or in connection with this contract shall to the extent possible be settled amicably and where settlement cannot be reached then such disputes shall be subject to settlement under the jurisdiction of Calcutta High Court.

37. COMPLEITION OF WORK:
Completion of the work means completion of the work in totality and acceptance/takeover of the same by the Company. Partial or phase wise completion will have no bearing towards consideration of guarantee/defect liability period.

38. CONTROLLING OFFICER: The **Divisional Manager**, **Bidhannagar Division-II** shall be the Controlling Officer for each work.

39. Technical Controlling Officer: The Divisional Engineer (C) of **Bidhannagar Regional Office** is the Technical Controlling Officer of the work under whose guidance and direction the work will be executed**. The AE(C)/DE(C)** of **Bidhannagar Regional Office** is the Supervising Officer of the work, who will supervise the work under the technical guidance of the Technical Controlling Officer**. The Jr. Engineer (C)** of **Bidhannagar Regional Office** will be the Site Engineer for the work.

40. NODAL OFFICER: The Manager (HR&A), Bidhannagar-II Division shall be the Nodal Officer.

41. IDLE LABOUR/MACHINERY:
Whatever the reasons may be no claim for idle labour and machinery, additional establishment cost, hire and labour charges of tools & plants would be entertained by the Company, under any circumstances.

42. SAFETY RULES:
The bidder shall also provide necessary fencing and lights to protect the public from accident. Fire extinguishers shall be kept by the bidder at the side of works where there is risk of fire hazard. Adequate washing facilities shall be provided near the place of work. When the work is done near any place where there is risk of drowning, all necessary equipments shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions shall be made for prompt first aid treatment of all injuries likely to be sustained during the course of work. These safety provisions shall be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work spot. The persons responsible for compliance of code shall be named by the bidder. To ensure effective enforcement of the rules & regulations relating to safety precautions, the arrangement made by the bidder shall be open to inspection by the employer and WBSEDCL. Notwithstanding the above clauses there is nothing in those to exempt the bidder from the operations of any other Act or Rule in force in the Republic of India. All storage, handling & use of flammable liquids shall be under the supervision of qualified persons. First aid arrangements with the degree of hazard and with no. of workers employed shall be maintained in a readily accessible place throughout the whole of working hours.

REPORTING OF ACCIDENT:

All accidents, major or minor, must be reported immediately to WBSEDCL and the contractor will provide first aid to the injured person immediately. The injured person shall report to the First Aid Station along with the Injured on work" form as per appropriate proforma duly filled in quintuplicate and submit to the Medical Officer of the First Aid Station.

SERIOUS INJURIES:
In case of serious injuries, the following procedure shall be adopted by the contractor.
i) To provide first aid at his own First Aid Station.
ii) To take the injured person to the hospital along with the "Injured on work" form duly filled in.
iii) To report the accident to WBSEDCL.

FATAL ACCIDENT:
Fatal accidents must be reported immediately to WBSEDCL as well as to the Police.

PENALTY:
Failure to observe the Safety Rules will make the contractor liable to penalty by way of suspension of work and termination of contract. Adequate arrangement for proper lighting & guarding shall be made at the work site.

43. EQUIPMENT & MACHINERIES:
For timely completion of the work the bidder/contractor must have to deploy all necessary equipment, tools & tackles and machineries e.g. J.C.B., Hot-mix-plant, Boiler, transit mixer etc. to execute the work at a time to perform all works simultaneously as per requirement of WBSEDCL.

44. RISK PURCHASE:
In the event of failure of the contractor to execute the work timely and/or to the satisfaction of WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LTD., the order/Letter of Award may be terminated prematurely and the balance work may be got done through any other agency at risk and cost of the contractor.

Additional Conditions of Contract: -
1. The work shall be inspected time to time by WBSEDCL representatives. The contractor shall provide all facilities for such inspection free of cost. Notwithstanding any inspection of site, WBSEDCL shall have the right to reject any work not conforming to the specification without being liable for any explanation or compensation. The authorized representative of WBSEDCL shall have the free access to the work site, contractor site and store.
2. During the execution of work, if any problem arises which is not covered by the specification, the contractor shall seek necessary clarification and instruction from WBSEDCL, such instruction shall be binding on the contractor and shall be observed in full.
3. The contractor shall make his own arrangement for labour, construction equipment, tools and tackles and construction materials, construction water, office/ labour accommodation, water supply, sanitation etc.
4. Electricity for construction purpose, is supplied by WBSEDCL, the charge shall be borne by the Contractor at the rate specified by the WBSEDCL. The contractor cannot claim any compensation for any failure in such supply caused due to any reason whatsoever in case of non-availability of electricity for construction purpose from WBSEDCL. The contractor will have to arrange for the same at his own cost.
5. The contractor shall strictly follow the construction safety rules, regulations, and instructions issued from time to time in absence of any particular reference the contractor shall refer to relevant Indian standard and also the State Government rules and regulations.
6. The contractor shall take all precautions during execution, especially while excavating underground works, such as cables, pipe lines, drains etc. and provide all possible protection to these works and in case any materials got damaged, rebuilt them at his own cost.
7. All guarantees and test certificates obtained by the contractor during the execution of work shall be transferred to the WBSEDCL before issue of final payment.
8. The contractor shall provide all necessary storage at the site in specified areas for all the materials such as timber, cement, lime and such other materials which are likely to deteriorate by the action of Sun, winds, rain or other natural cause due to exposure in the open in such manner that all such materials shall be duly protected from damage by weather or any other cause. All such stores shall be cleared after completion of the work and the entire site shall be clean and free from debris. All materials shall be stacked in such a manner as to facilitate rapid and easy checking of such materials.
9. The cost of testing materials shall be borne by the contractor.
10. All works are to be carried out with due regard to the convenience of the occupants of the premises or road users and with close coordination with other contractors who may be working in the area. All arrangements/ programmes of work must be adjusted accordingly. All precautions must be taken to guard against chances of injury or accidents to other occupants, users and workers. The contractor must see that all damages to any property, which in the opinion of the controlling officer are due to work of the contractor, are promptly rectified as per direction and to his satisfaction. The construction work must be done in such a way as not to dislocate or disturb any sewerage system and other existing structures.
11. It must be clearly understood that WBSEDCL is indemnified by the contractor against payment of any compensation or award on account of any accident, injuries and damages and if any such payment has to be made by WBSEDCL under order of appropriate authorities, the same shall be recovered from the contractor.
12. Any services if affected by the work must be restored by the contractor on emergency basis at his own cost.
13. After completion of the work, the finishes shall be of high quality and of approved standard.
14. No omission or ambiguities in the drawing or in the specification will relieve the contractor from responsibility for material and completeness of the work.
15. The contractor shall not off-load the contract or part thereof to any subcontractor without obtaining written permission from the controlling officer of the work. In the event of sub-letting of contract or part thereof. In the event sub-letting of contract is permitted, the fact that such permission has been accorded shall not establish any contractual relationship between approved sub-contractor and WBSEDCL of any of his liabilities and obligations under the contract.

16. A complete list of execution/ deviation from the tenderer scope of work shall be clearly indicated. Similarly, if any departure, commission of substitution from stipulated specification is made. This fact should be clearly indicated in the offer with reasons. However, WBSEDCL shall have the absolute discretion to summarily reject such offers.
17. WBSEDCL"s representative may during progress of work, order for re-execution of part or whole of the work executed, found not in accordance with the approved drawings / specifications/ instructions. No extra claims shall be entertained for re-execution or altering or such work
18. The contractor shall provide sufficient strong and stable staging as to ensure safety of the labourers and structures.
19. The contractor shall dismantle and remove the staging and other temporary structures like Stores, offices, labour camps etc. on completion of work, clear and clean the site where such temporary facilities were built and restore the same to original condition.
20. Materials brought to the site shall not be removed from the site without the written consent of the WBSEDCL. The contractor shall submit well in advance for approval of samples, specimens as the WBSEDCL may demand from time to time. Any materials brought to the site and rejected by the WBSEDCL shall be removed by the contractor from the site of work immediately.
21. All materials including reinforcing steel, cement for concrete work, sanitary, plumbing and carpentry fittings shall be procured after approval of brand and make by WBSEDCL.
22. All bricks have to submerge in vats before put to use. Curing shall be done with proper care.
23. The contractor has to make arrangement for temporary cover to enable civil construction works to continue if interrupted due to rains during monsoon.
24. If necessary extra items beyond S.O.W are executed the unit rate shall be as per the rates of PWD, West Bengal on the date of bid opening. Those items which are not covered under PWD rates shall be based on analysis of rate as applicable, on mutual agreement.
25. Bar chart showing all activities needs to be submitted before commencement of work.
26. Depth of the tube well, if any shall be complied with Public Health Engineering Directorate recommendations.
27. All drawings supplied with the bid documents are tentative/ for guidance only.
28. WBSEDCL shall not be liable under any circumstances for any accident/ untoward incidents, if happened during execution of works.
29. The contractor shall submit test certificate from the appropriate authority for palatable of drinking water indicating presence of arsenic and other chemicals, if any.
30. If specification of any items of work is not covered in the bid documents the same shall be guided from PWD schedule of rates.
31. All dismantled departmental materials shall have to be returned to store/ disposed and stacked in a place (within 200m lead) provided by the purchaser without any extra cost to WBSEDCL.
32. Mode of measurement shall be followed as described in PWDSOR, unless otherwise stated.

TECHNICAL SPECIFICATIONS OF CONTRACT

TECHNICAL SPECIFICATION FOR GENERAL CIVIL WORK

1. GENERAL

1.1. Scope of work: This technical specification is general in nature & description. The relevant description of a particular item shall be guided by the item description in the Schedule of Rates of this Bid Document. THE PWDSOR along with relevant IS Specifications and the National Building Code shall have to be followed as a general guideline. In case of any dispute/discrepancy, the decision of the Engineer-In-Charge and/or Technical Controlling Officer shall be final & binding on the bidder.

The work contemplated under this contract includes General Construction for the aforesaid project, all as detailed in the Bill of Quantities, Specifications and Drawings.

Such other works which are not included in the aforesaid Bill of Quantities are generally intended to be executed through a separate agency. Notwithstanding the above, the WBSEDCL (West Bengal State Electricity Distribution Company Limited) reserve the right to order additional works under the same Contract. The WBSEDCL also reserve the right to omit any item of work included in the aforesaid Bill of Quantities and award the same to any other Contractor or not perform it at all at their discretion and the Contractor shall not have any claim because of the same. The Contractor for this work shall be required to work in co-operation and co-ordination with other agencies on site and give them all reasonable assistance and help for the execution of the work in an efficient manner all as directed. The words "approved" or "as directed" shall be deemed to convey approval or the discretions of WBSEDCL.

1.2 Indian Standard Specifications: The particular Specifications for the work is as detailed hereinafter. These specifications shall be read in conjunction with the relevant Indian Standard Specifications and the obtainable local practice as detailed in various regional handbooks of practice and the work shall be executed accordingly. Where the specifications in any of the standards are at variance with the specifications detailed herein, the specifications herein shall govern. In case of any ambiguity/contradiction among different specification, the decision of WBSEDCL shall be final and binding on the Contractor.

1.3 Quality of materials & General Standards of work: The Contractor under this contract commits himself to use first class materials and assumes full responsibility for the quality of all material incorporated or brought for incorporation in the work. The work shall be executed in accordance with best engineering practice and as per direction of WBSEDCL.

In all possible cases, sample approved shall be done by the Contractor from WBSEDCL before bringing in the materials in bulk at site and the approved sample shall be well preserved at site at the risk and cost of the Contractor as a ready reference. Over and above, the submission of test certificate by the manufacturer, WBSEDCL may instruct further sample testing from Govt. Laboratories/ testing houses at the risk and cost of the Contractor for submission of test reports to become eligible for payment for those particular items used at work.

In all possible cases, where the warranty of manufacturers are sought for by WBSEDCL, the Contractor shall submit the cross warranty in the form and manner as directed by WBSEDCL including workmanship etc. along with the manufacturer's warranty certificate.

The relevant IS and PWD specification shall have to be complied with for all possible cases. The relevant clauses of GCC shall also be applicable and should be read in conjunction with technical specification of this contract

1. In case of any anomaly / contradiction, decision of WBSEDCL shall be final and binding on Contractor.
2. No extra claim shall be admissible for sample testing, sample approval, testing of sample at site etc to the Contractor and shall be considered as deemed to have been included in the rates quoted by the Contractor.

1.4 Power for construction: Construction power may be provided by WBSEDCL, if applied for by the Contractor as per prevailing rules and regulations of WBSEDCL. However, all charges for the construction power shall have to be borne by the Contractor. The relevant clause may also be referred to GCC in this regard.

Alternatively, the Contractor shall have to arrange required capacity D.G. set at his own cost, risk and responsibility to work. Necessary permission to operate DG set to be obtained from the concerned authority by the Contractor.

Arrangement of DG may also be kept for exigencies or power failure.

1.5 Scaffolding: All scaffolding and ladders required for the proper execution of the work shall be provided by the Contractor. The scaffolding should be stout and strong to prevent any collapse or displacement. Proper measure for safety of workmen working on scaffolding should be taken by the Contractor.

1.6. Measurements: The mode of measurements, wherever possible is specifically mentioned in these documents, where it has not been mentioned, it shall be as per provision of the PWDSOR and relevant Indian Standards IS 1200. All the measuring equipments, labour, manpower and other accessories necessary, shall be provided by the Contractor at his own risk and cost.

1.7 Tools and plant: The bidder along with his bid furnish a list of tools, plant and machinery which he intends to use for the works (as per proforma, if enclosed with the bid document). The list should indicate the exact type of machine, its capacity, and year of manufacture, kind and capacity of propelling force, spare parts readily available and all other pertinent informations. The Contractor is obliged to use all the machinery mentioned in his list mentioned or others as required and instructed if WBSEDCL considers it necessary.

1.8 Setting out: The Contractor shall set out the building or other involved works after clearing the site and get the same approved by the owner. It shall be the responsibility of the Contractor to install substantial reference marks, bench marks etc. and maintain them as long as required by the owner. The Contractor shall assume the full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of the work.

1.9 Surveying and Staking: It is the express responsibility of the Contractor to bring to site all surveying instruments necessary for the marking out, fixation of levels, etc. and conduct these survey operations himself with utmost accuracy. The Contractor shall put-up stable bench marks etc. as necessary for the work. Representative (s) of WBSEDCL may become present when this work is being carried out and will inspect all these operations with the Contractor's assistance. The Contractor shall be entirely responsible for accurate setting out of the work and he shall at his own expense make good any defects arising from errors in line and levels.

Before commencement of excavation, spot levels on an approved grid covering the entire plot shall be taken by the Contractor in consultation with the owner and a proper record of these levels shall be kept jointly signed by the Contractor and the owner.

1.10 Dewatering: Dewatering of accumulated water in all locations on jobsite from whatever source or cause until the virtual completion of the entire work shall be done by the Contractor at his own expense and shall not be separately paid for. The rate quoted by the Contractor shall be deemed to be inclusive of this.

1.1.11. Access to site, approach roads and roads within the premises: The Contractor shall at his own cost provide all approach roads required for the purpose of carrying out the work in the most expeditious and efficient manner and shall remove the temporary roads on completion. He shall acquaint himself thoroughly regarding condition and suitability of public roads leading upto the limits of the premises and will provide vehicles for transportation of materials which meet the requirements of these road conditions. It shall also be responsibility of the Contractor to maintain at his own cost these roads till the construction are completed. The tenderer shall also acquaint himself with local laws and By laws and complying with all police and traffic requirements.

2. EARTH WORK

2.1 Excavation

Excavation for trenches over areas and for pits, etc. shall be done to widths, lines and levels as shown in drawings or to such lesser or greater widths lines and levels as directed. The bottom and side of excavation shall be trimmed to required levels, profile, etc. watered and thoroughly rammed. Where the Contractor excavated below required level in good ground inadvertently or carelessly they shall make up the void in concrete (1:5:10) at his own expense. In general, during excavation the Contractor shall take necessary precaution to retain earth (viz sal ballah piling, shoring etc) so that the earth will not slide or fall down to avoid any accident and hamper the progress of work at his own risk & responsibilities. They will take necessary step to prevent the damage the adjacent structure or existing services. They shall repair and make good any such damage at their own expense to the satisfaction of the owner. A suitable path for men and materials around the excavated pit should be maintained throughout the work.

2.2 Shoring

The sides of excavation should be timbered and supported in such a way as is necessary to secure these from falling in and the shoring shall be maintained in position as long as necessary . The Contractor shall be responsible for the proper design of the shoring to be approved by the owner to hold the sides of the excavation in position and ensure safety of persons and properties. The shoring shall be removed as directed after the items for which it is required are completed. Unless & otherwise mentioned in the schedule of quantities , no extra payment will be made for shoring, unless & otherwise specifically instructed in writing by WBSEDCL over and above the general requirement as mentioned in clause no. 1.2.1 under the heading "Excavation" in this tender document.

2.3 Dewatering

All water which may get accumulated in excavations during the progress of work from whatever cause or source, shall be bailed or pumped out as necessary. The rate for excavation shall be deemed to include for the same.

2.4 Silver sand filling

Filling sand may be silver sand having silt content less than 5% by weight and 300mm compacted thick layers will be spread, wetted & saturated to achieve the compaction . However for any special case, WBSEDCL may instruct filling by sand other than silver sand which the Contractor shall comply .The specification etc shall be guided by relevant IS code.

2.5 Filling

Filling under floors or other places indicated shall be done by fine sand or silver sand brought from outside by the Contractor. The material should generally be good quality. Filling shall be done in layers not exceeding 15 cms. thick and each layer shall be fully inundated and consolidated properly by 8 to 10 tones power rollers in the case of where floor is coming or pneumatic rammers wherever conditions permit. If it is not possible, the consolidation shall be done by hand rollers and pneumatic/plate vibrator followed by hand rammer. The surface of the filling shall be finished true to lines and levels as required. The filling shall be compacted in such a manner as to guarantee full stability. The compaction shall be such that minimum relative density obtained on testing is 90%.In general, test shall be performed for every 1000 M2 of compacted area. The filling final level after compaction then cutting and ready to take up soling work under the floor item, shall be checked by WBSEDCL.

2.6 Disposal of excavated materials: All materials unearthed shall be removed from the site of excavation and disposed off during excavation with prior written permission of WBSEDCL from the site in an approved manner with the approval of local authority. The disposal of the materials can be in any of the following ways as directed by WBSEDCL:

1. Removal of surplus material outside the plot for disposal.

2. Removal of surplus materials to a particular place / dumping ground as directed by the owner . No extra claim on any account will be entertained. The Contractor must also secure the approval of the owner regarding the quantity of surplus materials to be removed prior to commencement of this item of work.

2.7 Back filling: All shoring and form work shall be removed after their necessity ceases and trash of any sorts shall be cleaned out from the excavation. All space between foundation masonry or concrete and sides of excavation shall be refilled to the original surface with approved excavated materials in layers 15 cm in thickness watered and rammed. The filling shall be done after concrete or masonry is fully set and done in such a way as not to cause undue thrust on any part of the structure. Where suitable excavated materials is to be used for refilling, it shall be brought from the place where it is temporarily stacked and used in refilling.

No excavation of foundation shall be filled in or covered up until all measurements of excavation, masonry, concrete and other works below ground level are jointly recorded . Black cotton soil shall not be used for back filling or in plinth filling.

2.8 Measurements: Measurements for all excavation, filling, carting away and earthwork shall be in solid measure. The rates quoted by the tenderers are thus for solid measure units. The following factors shall be applied to obtain quantities of solid measure.

- Excavation: No reduction in volume (as per drawing area).
- Filling: Volume shall be determined and consolidated by levels taken before and in layers after compacted filling and by measuring the length and breadth as required.

The mode of measurement for various types of excavations shall be as under:-

a) In case of trenches, pits and areas, measurements shall be on the basis of size of foundation & the depth of bottom of foundation (bottom of bed concrete if provided) formation. Surface dressing shall be measured in plan projection only.

b) In case of pipe trenches and drains, measurement of width of trench shall be diameter of the pipe plus an allowance of 50 cms. to allow for collars, flanges etc.

c) The relevant clauses of IS Code and/or PWDSOR shall be applicable.

2.9 Sub-grade conditions: Sub soil investigation report will be provided by WBSEDCL, if sought for by the Contractor in writing.

2.10 Brick Soling: Where brick soling is required to be provided, it shall conform to the following specifications:-

It shall be flat of the bricks touching each other as per item. Soling shall be closely packed leaving no interstices or gaps. The interstices to be filled with fine sand and shall be sprayed with water. If crevices appeared between two bricks after spraying with water it shall be mended again by spreading fine sand.

3. CONTROLLED CONCRETE, PLAIN & REINFORCED CONCRETE

3.1 General: Concrete and reinforced concrete work shall be carried out generally in conformity with the latest Indian Standards IS : 456 except for provisions indicated herein below. All work is to be carried out with utmost precision and upto date scientific know-how and the Contractor shall employ thoroughly competent staff to achieve the highest standards.

3.2 Cement: Cement for the work shall be either of ordinary Portland Cement conforming to the latest Indian Standards IS:8112 – 1989 for 43 grade and IS 12269 -- 1987 for 53 grade or Portland Pozzolana Cement conforming to IS 1489 (Part 1) 1991- specification (fly ash based), IS 1489 (Part 2) 1991 - specification (Calcined clay based) or Portland Slag Cement as per IS:455 (with latest revision), as instructed & approved by the E-I_C and/or Technical Controlling Officer for the work and of the best normal setting quality unless a quick setting quality is expressly instructed in the specifications or otherwise during the course of the work by WBSEDCL. If directed the Contractor shall purchase Portland cement as fresh as possible after manufacture and where there is reason to believe the cement has been long stored, WBSEDCL may demand a Laboratory Test Certificate regarding the character of cement and the Contractor shall furnish the same at no extra cost. WBSEDCL shall reject any cement which in its opinion does not meet the required standards.
The list of manufactures for cement shall be as per the list provided in the bid document and/or PWDSOR and/or as instructed in writing by WBSEDCL. Any field or laboratory test for cement, if asked for by WBSEDCL shall be carried out at the risk and cost of the Contractor as per provision of relevant IS codes.
All bags and containers in which cement is packed shall be stored in a dry, weather-tight, properly ventilated structure with adequate provision against absorption of moisture. The Contractor shall at all times maintain for the inspection of WBSEDCL, a log book indicating the receipt of cement ,brand and agent from whom obtained and the age of cement. Cement which has caked or perished by being wet or otherwise shall on no account be used on the work. Cement shall be consumed on the works in the same sequence as that of their receipt at site. Cement reclaimed from cleaning of bags or from spillage from containers or otherwise shall on no account be used. The cement is to be stacked in an orderly and accessible way to permit WBSEDCL physical verification of existing stock at all points of time. The Contractor has to ensure furnishing a copy of manufacturer batch test certificate along with every lot of supply.
If so felt, WBSEDCL may instruct the Contractor for further testing of cement in Govt. laboratories/testing houses as has been detailed in the relevant clause of GCC, over and above the submission of test certificates at the risk and cost of the Contractor.
3.3 Sand: Sand: fine aggregate shall generally conform to latest Indian Standards (IS:383). Sand shall be natural sand, crushed gravel sand or crushed stone sand at the discretion of WBSEDCL. Use of sea sand is prohibited. It shall be composed of hard siliceous material and shall be clean and of sharp angular grit type. Sand shall be properly graded minimizing all voids.
Its grading shall fall within the limit of grading zone I , II for non-plastering work and Zone III for plastering work, of Table 1 (Ref clause no 3.1.4.3 of CPWD specifications 1996 , revised to 2000 vide page no 33 .).
Allowance for bulking of sand shall be made. Silt content on sand should not be more than 5%. Laboratory equipment such as measuring jars etc. are to be kept at site for time to time checking of bulkage and silt content.
For sand testing periodicity may be given at the rate of every 150 cum of concrete work of all kinds (apart from RMC) and part thereof. For plastering work however, a separate periodicity of testing in term of every 500 SQM of plastering of any thickness irrespective of number of coats and part thereof is to be adopted. For brick masonry one test for 100 cum or part thereof for masonry may be adopted. The tests so mentioned shall have to be carried out through reputed Central/State Government registered testing house/ laboratory and not from site testing facilities.
All tests , to carry out field as well as laboratory tests shall be borne by the Contractor .
3.4 Coarse Aggregate: Coarse aggregate shall be approved hard aggregate generally conforming to latest Indian Standards : IS - 383. The following tests should be carried out for every new lot of supply: ---
- Crushing value
- Impact value
- Sieve analysis
- Deleterious material
- Flakiness index

For every 150 CUM of concrete work of all kinds (apart from RMC) and part thereof one test shall be carried out.
All costs to carry out field as well as laboratory tests shall be borne by the Contractor .
3.5 Types of concrete, strengths etc.: The Bill of Quantities specifies M20 grade of reinforced cement concrete. The strength corresponding to this grade is given as under:-
TYPE OF CONCRETE

Sl. No.	Type of concrete	Characterize design strength N/mm2	Target design strength N/mm2
1.	M - 20	20	≥27

Even though the Bill of Quantities specified various types of concrete, it is possible that the type may be altered to suit the site conditions. The compressive strength indicated above pertains to pressure test on works test cubes 15 x 15 x 15 cm. after normal curing for 28 days. The strength of preliminary test cubes shall be as per IS :456(latest revision)
Sufficient number of cube mould should be kept ready at site . Relevant IS code of Specification and PWDSOR shall have to be followed.
The type of concrete for any particular situation or work shall be as per instructions given to the Contractor by WBSEDCL notwithstanding anything contained in the foregoing clauses.
3.6 Water: Water conforming to IS 456 - 2000 for all concrete work shall be clean, free from deleterious matter such as oils, acids, alkalis, sugar and vegetable matter. Every attempt shall be made to use potable water. Water storages facilities provided by the Contractor shall be maintained properly to preclude contamination of water by any of the harmful substances. WBSEDCL may instruct the Contractor to carry out test of water sample as per provision of relevant IS code , in Govt. laboratories and the Contractor shall comply the same at his risk and cost .
The quantity of water to be added to concrete for mixing shall be such as to afford workability consistent with strength. Water/cement ratio shall be recorded in every batch of concrete. Arrangement for slump cone test shall be kept at site to arrive workability whenever WBSEDCL wants to check at site. The periodicity of testing may be conducted as once in six weeks and part thereof or as specifically instructed by the Owner.
3.7 Tests for determination of strength of Reinforced concrete: As will be apparent from the Bill of Quantities, the strength of concrete specified is the criterion and the Contractor shall make every effort to obtain the specified strengths by good quality control. In case of concrete which does not obtain the specified strength at 28 days, such work shall be demolished and reconstructed to obtain the requisite strengths all as

directed by WBSEDCL. To determine whether concrete in any particular part of the work is of the requisite strength or not, test cubes (works test cubes) shall be made from samples collected from the concrete being poured for the particular part and determined as per acceptance criteria detailed hereinafter. The salient features for the collection of samples is as indicated below :

3.8 Testing of Concrete Cubes for determining Compression Strength for Reinforced Concrete Work at own cost

3.8.1. Quality as specified.

3.8.2. Compression Strength shall be as specified for the particular type of concrete.

3.8.3. Criteria for acceptance of work

The test and acceptance criteria shall comply to relevant IS codes including IS :456 Part or element of concrete work shall be deemed to be acceptable, provided the three cubes tested for 28 days strength conform to the following :

3.8.3.1 Average of the three cubes strengths shall not be less than the specified strength.

3.8.3.2 No individual cube strength shall be less than 90% of the specified strength.

3.8.3.3 If any individual cube strength exhibits more than 133% of the specified strength, such cube shall be classified as freak and criteria in 1.3.9.3.1 and 1.3.9.3.2 above, shall be applied for the remaining two cubes only and the acceptability determined.

3.8.4 Quantum of cubes and testing: The decision of WBSEDCL in this regard shall be final and binding. Cube testing shall be done at site regularly and at least 20% of this testing shall be carried out in the reputed laboratory (as approved by the Owner) as defined in the relevant clause of GCC.

Testing machine with valid calibration certificate to be kept at site for crushing of cubes . The testing shall be duly witnessed and approved by WBSEDCL.

All costs to carry out tests at field as well laboratory shall be borne by the Contractor .

3.9 Making of non-RMC concrete: All mixing of aggregates , cement and plasticizer shall be done by volume which is equivalent to design mix . All the necessary equipment such as measuring boxes, devices for determination of moisture and bulk in sand, slump cone etc. shall be provided by the Contractor. Concrete shall be machine mixed until there is a uniform distribution of materials and uniform colour and consistency is achieved and under no circumstances for less than two minutes.

A wooden board approximately 30 cms. x 40 cms. shall be put up at the concrete mixer on which shall have been legibly written in English and the local language, the quality of concrete that is being mixed, the proportions and other relevant data.

3.9.1 Cubes: The size of cubes to be prepared and tested shall be 15 x 15 x 15 cm.(6" x 6" x 6").

The minimum number of cubes to be collected from each samples as detailed below shall be six. Three cubes each are intended for testing at 7 and 28 days respectively and determining the strength.

Cubes tested at 7 days should give strength of not less than 70% of the corresponding strength at 28 days. It shall however be expressly understood that the test results at 28 days only shall govern and the 7 days tests are intended to obtain a fair idea only.

Relevant IS codes including IS: 456 (latest revision) shall be followed by the Contractor . All costs for sampling and field as well as laboratory testing shall be borne by the Contractor.

3.9.2 Number of tests: The number of cube tests in a work shall be entirely guided by the relevant IS Codes and/or at the discretion and as directed by the Controlling Officer of the work. Cubes shall generally be collected for various structural members and also for works at various levels. It shall also be collected whenever the usual quality for a particular strength is in suspect. The number of cubes may at most be twelve or even more as instructed by WBSEDCL and as per provisions of relevant IS code on any given day in a particular work. However, in case other important casting works are running in parallel with a major concreting work, additional cubes in the range of six or twelve shall be taken for each of them as well.

3.9.3 Preparation and Testing of Cubes: Casting of cubes, preparation of moulds for the same, processing and curing the cubes and pressure testing the same shall be as per detailed instructions which will be issued to the Contractor from WBSEDCL from time to time or as per relevant Indian Standard as amended upto date as directed. All costs including construction of vat for curing of cubes at site shall have to be borne by the Contractor.

3.9.4 Equipment modules, testing etc.: It is the entire responsibility of the Contractor to prepare and get the cubes tested and provide for all material, labour, modules, equipment, facility and charges for sampling, testing, curing etc. The Contractor's quoted rate work shall be deemed to include for these and no extra payment whatsoever is admissible on this account.

3.9.5 Slump: If in the opinion of WBSEDCL, slump cone tests are required to be performed to establish workability the same shall be carried out at free of cost. Slump tests are however, to serve as guide only.

3.10 Transporting and pouring of concrete: No mixing of concrete shall be started unless the situation where they are to be poured are prepared and kept ready. Concrete shall be poured immediately on preparation. Transporting of concrete shall be done as speedily as possible and also in a manner to prevent segregation of aggregates. No re-tempered concrete shall be allowed to be used on the works. No concrete shall be allowed fall through a height more than 1.20 M. where the concrete to be placed from more height it should be done through chute as per relevant IS specification and as directed by WBSEDCL.

Before fresh concrete is placed against an already cast and hardened section, such surfaces shall be roughened, swept clean, moistened with water and treated with cement slurry. Fresh concrete shall then be poured as required. Under no circumstances, concrete mixed more than stipulated initial setting time as per IS code shall be used . Dewatering of excavations for concreting where necessary shall be carried out by the Contractor as directed and the rates quoted by the Contractor are deemed to be inclusive of such dewatering. No concreting shall be done in adverse weather condition, except exigencies with proper precautions or prior approval from WBSEDCL.

3.11 Ready Mixed Concrete: If allowed and approved by WBSEDCL, the Contractor shall buy the RMC from a manufacturer approved by the Owner. The Contractor in association with the manufacturer will make a suggested trial mix with correct water cement ratio, slump and workability. To verify this, the test cubes from the concrete used should be made and tested. The tests results will determine the cement content and water cement ratio that produces the required strength. If the test result satisfies the WBSEDCL this mix design shall be followed throughout the work for RMC work, until and unless there is variation in shape and size of course aggregate, fineness of fine aggregate, cleanliness moisture content etc. The design mix as per stipulated strength of concrete mentioned in this technical specification shall be approved by the Consultant or any other designated authority as directed by WBSEDCL.

RMC will be supplied by manufacturer at site from a mixing area by transit mix trucks. The Contractor will get a assurance from manufacturer that initial setting will not start during the distance to be travelled from batching plant to job site. Again the Contractor will take a written statement from the manufacturer that within which time concrete should be delivered and discharged from transit truck mixer after the introduction of water to cement and aggregate and when the initial setting will start.

The manufacturer will also ensure that transit mix truck will discharge concrete with slump designated for the job. The time period between the discharge and placement in position should also be worked out and got approved.

The Contractor should arrange a material hoist to carry the wheelbarrow to the floors under construction for transferring of concrete and a smooth runways is to be provided for their travel to avoid any segregation or concrete mix may be carried by head load for placing of concrete as directed by WBSEDCL from the point of transfer of concrete at upper floors. During transferring of concrete to walls or deep beams baffle board, downspout or chute to be used for prevention of segregation. It is essential to closely supervise the discharging of concrete to prevent segregation at all points. The alternative approach can be to pump out the ready mixed concrete to the location. The method of pumping/placing, the W/C ratio and the plasticizer used need to be approved before commencing the operation as defined herein above in this clause.

Regular mandatory tests on the consistency and workability of the concrete after transferring from transit mix trucks at job site shall be done to achieve the specified compressive strength of concrete. The frequency of testing and the acceptability criteria will be according to I.S : 456 and I.S:516. A register of work test of concrete shall be maintained at site by the Contractor.

Cube testing register in standard CTE format is to be kept at site. WBSEDCL shall decide whether a particular set of cubes would be tested at site or at a reputed central/state government registered testing house/laboratory. In any case, at least 20% of the testing would be carried out at such laboratories. The Contractor shall undertake the entire cost of transporting of cubes to such testing facilities outside the site and testing charge therein.

In general payment for RMC shall be made on the basis of actual measurement or as per drawing whichever is less , of different reinforced concrete elements at site. If any deviation from the original drawing is required as per decision of the Controlling Officer , the Contractor shall comply to the same during execution . In such case, the payment will be made based on the actual measurement of different reinforced concrete elements or as per revised drawing issued subsequently whichever is less . No extra payment will be made for wastage during transfer of RMC at site or extra concreting done by the Contractor at his own . The rate includes the cost of materials and labour for carrying of RMC to upper floors, placing, consolidating, finishing, curing & testing etc.

The Contractor shall submit the design mix report and its further corroboration through trial cube tests (both 7 days and 28 days) from a reputed institute for approval by WBSEDCL and adoption at site. All related cost would be borne by the Contractor.

No RCC work shall be taken up till such time final test report of trial design mix is not available with WBSEDCL.

In case any admixture is used in RMC it shall conform to IS : 9103 latest edition and after obtaining necessary approval from WBSEDCL.

For RMC concreting, regular cube tests in the multiple of six (three for 7 days and three for 28 days respectively) are to be carried out as per IS :456 (latest revision) and the works to be carried out as per stipulations laid down in IS codes and clearance by WBSEDCL. The decision of WBSEDCL shall be deemed as final in this regard.

3.12 Formwork:

3.12.1 Materials and Design:

a) The method and design of form work to be adopted by the Contractors is to be produced for approval of the same by the WBSEDCL before any form work is taken up.

The form work shall be of approved 12 mm. thick water proof ply surface to be in contact with concrete, to be planed smooth. In every case joints of the shuttering are to be such as to prevent the loss of liquid / water from concrete. In ply shuttering the joints shall be perfectly close and lined. Steel shuttering using hydraulic jacks shall preferably be used in all possible cases and as directed by WBSEDCL.

If any particular materials or materials be specified in the schedule of quantities for form work such particularly specified material or materials shall be used in work. The form work shall be so constructed as to remain sufficiently rigid during placing of the concrete. All shuttering and forming must be adequately stayed and braced to the satisfaction of WBSEDCL for properly supporting the concrete during the period of hardening. The forms shall have sufficient strength and rigidity to hold concrete and withstand the pressure of remaining and vibration without excessive deflection from the prescribed lines and more so when the concrete is vibrated. The surface of all forms in contact with concrete shall be clean, rigid, watertight and smooth. Suitable devices shall be used to hold corners, adjacent ends and edges of panels of other forms together in accurate alignment.

b) The form work shall conform to the shape, lines and dimensions to suit the R.C.C. members as shown on drawings and be so constructed. Form work shall be adequately designed to support the full weight of workers, fresh placed concrete without yielding settlement or deflection, and to ensure good and truly aligned concrete finished in accordance with the construction drawings. A camber in all directions of 6mm for every 5 M span in all slab and beam centering shall be given to allow for unavoidable sagging due to compression or other causes , unless otherwise specifically instructed in writing by WBSEDCL .

c) The form work shall be as designed that the sides of the beams retain its position and does not get bulged these however should be so designed that the sides of the beams can be first struck leaving the soffit of beams and the supporting props in position. Props shall be designed to allow accurate adjustment and to permit of their being struck without jarring the concrete. No bamboo propping shall be used . Bulged section shall not be accepted and need to be rectified or rebuilt as per instruction of WBSEDCL . No extra claim , in any case shall be entertained by WBSEDCL .

d) Temporary openings shall be provided at the base of columns forms and at other points where necessary to facilitate cleaning and observation immediately before concrete in deposited.

e) Unused and new waterproof ply of 12 mm thickness is to be sited only and it shall be good enough to withstand a maximum of 5 (five) repetitions. In case in the opinion of WBSEDCL the formwork is seen to be no longer in order even before undergoing the maximum permissible 5 (five) repetitions, the same would be rejected and forthwith removed from site.

f) Vertical Shuttering

The vertical shuttering shall be carried down to such solid surface and is sufficiently strong to afford adequate support and shall remain in position until the newly constructed work is able to support itself. Props shall be securely braced against lateral deflection. Where timber props are used like bullies, they shall be a minimum diameter of 10cm. and shall be straight and adequately strong. The spacing of such struts shall be designed to carry to carry loads imposed on it without undue deflection of the members supported by the props. The spacing of props shall be approved by the WBSEDCL and any alterations suggested by him shall be carried out at Contractor's expense. Bracing shall be provided as directed without extra cost. Contractor shall allow in his rates for providing props and struts for any height shown in the working drawings issued to Contractor from time to time.

g) Curve & Circular shuttering

Unused and new waterproof ply of 6 mm thick supported by good quality wooden batten shall be used. Repetition of the material will be same as stated above for the other shuttering.

3.12.2 Water Tightness: It is the Contractor's responsibility to ensure that the forms are checked for water tightness just before concreting operation starts and to make good any deficiencies.

3.12.3 Cleaning and Treatment of Forms: All rubbish, particularly chippings, shavings and saw dust, shall be removed from the interior of the forms before the concrete is placed and the form work in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition. Care shall be taken that such approval composition is kept out of contact with the reinforcements. Interior of all moulds and boxes must be thoroughly washed out with a hose pipe or otherwise so as to be perfectly clean and free from all extraneous matter previous to the deposition of concrete.

Prior approval of the form work should be taken from the WBSEDCL before placing reinforcements on form work. No concrete shall be commenced until the WBSEDCL has inspected the form work and until his approval is obtained. A notice of at least 24 hours shall be given to the opinion of the WBSEDCL any materials is not accordance with the specification or the form work, is wrongly done or otherwise defective the Contractor shall immediately remove such materials from site and replace the same and rectify any other defects in accordance with the instruction of the WBSEDCL and to his entire satisfaction .

The lines , levels, form work, reinforcement etc shall be checked by the Contractor with subsequent approval / checking by WBSEDCL prior to allowing of concreting , by WBSEDCL . However, the cost, labour etc for such checking shall be borne by the Contractor and this will not relieve any of the obligations under this contract.

3.12.4 Stripping: Forms shall be left in place and removal shall be done as per norms laid down in IS codes and as instructed by the WBSEDCL and shall then be removed with care so as to avoid injury to concrete. In no circumstances shall forms be struck until the concrete reaches a strength of at least twice the strength as to which the concrete may be subjected at the time of striking. The strength referred to shall be that of concrete using the same cement and aggregates, with the same proportions, and cured under conditions of temperature and moisture similar to these existing on the work. Where possible, the form work should be left longer as it would assist the curing. Exposed surfaces of concrete which are indicated/ required to be plastered shall be roughened with wire brushes and hacked out closely immediately after removal of formwork by free of cost.

Any honeycomb , appeared after removal of form work shall be mended as per procedures laid down in IS codes including pressure grouting required , if any, as instructed by WBSEDCL with risk and cost of the Contractor without any further claim.

3.12.5 Stripping Time: In normal circumstances (generally where temperature are above 20oC) and where ordinary cement is used, forms shall be struck after expiry of the following periods and as per relevant IS code , CPWD manuals unless otherwise directed at site by WBSEDCL.

3.12.6 Form Work In Lift For Continuous Surfaces: Where forms for continuous surface are placed in successive units, (as for example in columns or walls) the forms shall fit tightly over the completed surface so as to prevent leakage of slurry from the concrete and to maintain accurate alignment of the surface.

3.12.7 Procedure While Removing The Form Work: All form work shall be removed without such shock or vibration as would damage the reinforced concrete. Before the soffit and strata are removed the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occur with all cements in the cold-weather.

3.12.8 Tolerances: The following shall be the maximum permissible tolerance:-

a) On general setting out dimensions upto 4 M. in length a tolerance upto 3mm will be allowed.

b) On lengths of more than 4 M. tolerance of not more than 5mm will be allowed.

c) On the cross sectional dimensions of columns, beams, slabs, faces, chajjas, mullions, grills, fins, louvers, and such other members tolerance more than 2mm will not be allowed.

d) The top surface of concrete floor slab will be within plus/minus 3mm of the level and line shown on the drawings.

e) Columns and walls and other vertical members shall not be more than 3mm out of plumb in their storey height and not more than 6 mm out of plumb in their full height.

f) If work is not carried out within the tolerance set out above (a) to (d) the cost of all rectification measures of dismantling and reconstructing as decided by the WBSEDCL shall be borne by the Contractor. In case of work dismantled, the same shall not be measured and no payment even for cement and reinforcement shall be allowed.

3.13 Consolidation and processing of concrete: Concrete for all works shall be compacted by means of suitable vibrating equipment. One or more spare vibrators which are in complete working condition shall always be kept ready at sites to be put into commission in case of failure of the vibrators under use. The vibrators shall be operated by skilled personnel, thoroughly instructed as regards the mode, frequency, duration etc. regarding vibration. Concrete of low volume/ quantum for a particular work may however, be permitted by WBSEDCL at their sole discretion to be consolidated by hand only after prior permission.

3.14 Finish to concrete surfaces: Finish to concrete surfaces at various situations shall be as per directions of WBSEDCL. Where form finish is specified, the final surface shall be smooth and even and no-undulations, ridges, spots etc. shall be permitted. They shall be laid to pattern as directed. In case surfaces intended and directed for form finish, exhibit any of the defects above mentioned, the surfaces shall be rubbed with carborundum or plastered and finished all as directed at the risk and cost of the Contractor. The decision as to the acceptability or otherwise of a surface will be notified by WBSEDCL and the Contractor will implement the instructions accordingly.

3.15 Concrete cover for reinforcement: Where not specifically indicated in the drawings, concrete cover for reinforcement shall be as per the latest Indian Standards IS 456 - 2000 and as per directions at site from time to time. Proper concrete cover blocks adequately cured to suit various covers as required shall be provided in adequate numbers sufficiently ahead of the work.

3.16 Construction joints: Construction joints in concrete work shall be provided as far as possible only at predetermined places as per direction and in consultation with WBSEDCL. Joints shall be provided as specified in latest Indian Standards or as directed by WBSEDCL.

3.17 Curing: It is very important that all cement concrete work shall be cured properly. All concrete work shall be kept continuously in a damp or wet condition by pouring or by covering with a layer of moist sack , canvas, hessian or similar material for a period as stipulated in the relevant IS codes and specifications from the date of concreting. Water used for curing

shall also be free from any deleterious substances and shall generally be fit for drinking. The work shall be adequately protected from drying, winds and direct sun rays. The Contractor should arrange at his own cost a temporary water supply line with provision of centrifugal pump, valves etc. for curing and constructional purpose at higher level. A sample sketch is enclosed for the reference purpose.

3.18 Openings and inserts: All openings and inserts which are designated in due time or as required for services, will be exactly provided by the Contractor. The Contractor should also fix the anchors or such items which may be supplied by the Proprietor in exact position and in perfect lines and levels. Inserts apply to such items as timber, dowels, bolts, loop, brackets, suspension irons, hooks, screws, plates, pipe of various types and diameter etc. etc. Openings in concrete or masonry must be provided in exact location to correct shape, size and depth or slightly bigger, if directed so, as shown in drawings or as instructed. It must be clearly understood that the provisions of inserts and openings as contemplated in this contract are to be carried out with "utmost precision" and any deviation of the same from that as shown in drawing or

instructed, have to be rectified by the Contractor at his own cost and responsibility. The Contractor should make provision of openings to deep beams and their members at bottom or at lower level as necessary for cleaning purpose prior to concreting.

3.19 Tor Steel Reinforcement: TMT bar for reinforcement shall be of tested quality and shall conform to the relevant Indian Standards (IS:1786). Reinforcement shall be fabricated to shapes and dimensions shown on the drawing and shall be placed where indicated on the drawings or required to carry out the intent of drawing and specifications or as directed by WBSEDCL. Before placing, reinforcement shall be thoroughly cleaned of loose rust, coating etc. which would result in reducing or destroying the bend. Oiling the bars to clean them is strictly prohibited. Bending, straightening, cutting etc. operations shall be carried out in a manner not injurious to the material. List of manufacturers for reinforcement shall be as per BOQ and/or as per PWDSOR (Latest amendment) and/or list given in the technical specification of the "Bid Document" and finally, as instructed in writing by WBSEDCL.

All reinforcement shall be bent cold. Unless otherwise directed, reinforcement shall not be spliced at points of maximum stresses. WBSEDCL shall be informed well in advance before such splicing is taken up . Laps and splicing shall conform to the latest Indian Standards.

Reinforcement shall be accurately tied at all intersections and laps with 16 SWG soft drawn binding wire, such that the reinforcement will give a rigid structure. Binding wire will not be measured or accounted for separately. The Contractor's rate for reinforcement will be measured and paid for according to bending lists without allowances for cutting, wastages, binding wire etc. Authorised laps, hooks, chairs, spacers etc. shall, however be accounted for. In case, the Contractor or WBSEDCL desires to resort to welding, there shall however be made as if the laps have been provided and no extra claim whatsoever shall be admissible on this account. The relevant IS code and schedule of specification shall be followed and applicable for the case also.

Reinforcement shall be assembled in place with proper concrete cover blocks to suit various covers as required.

The Contractor has to ensure furnishing of manufacturer certificate with every lot of supply.

If felt necessary , WBSEDCL may ask for testing of reinforcement sample , over and above , submission of manufacturer's certificate , in Govt. laboratories/ testing houses as detailed in the relevant clause of GCC , at the risk and cost of the Contractor .

4. MASONRY AND PLASTERING

4.1 Materials

4.1.1 Bricks: All bricks shall be table moulded, burnt bricks of crushing strength not less than 75 kg/Sq cm. They shall be hard sound and well burnt with sharp edges and of uniform sizes and shapes. Bricks shall be neither under-burnt nor over-burnt and shall be free from cracks, stone floats, or other such defects as defined in relevant IS code and relevant schedule of specification.

When immersed in water for 24 hours, bricks shall not be absorb more water than 20% of its dry weight. All bricks shall be identical/ equal to samples submitted and approved by WBSEDCL before the commencement of the work. Metallic sound of brick is also a criteria.

4.1.2 Cement and Sand: Cement and sand used for masonry and under the heading plastering work shall conform to the specifications laid down under the heading "Plain and Reinforced Concrete" as per clause of 1.3 above and relevant IS code, PWDSOR and schedule of specifications.

4.1.3 Additives: Additives, like integral waterproofing compounds, shall be of the approved type from reputed manufacturers and as per instruction in writing by WBSEDCL. These shall be used strictly in accordance with the manufacturer's instructions/specification. The additives shall conform to IS: 9103.

4.2 Samples: When demanded by WBSEDCL, the Contractor shall produce samples of materials or carry out samples of work for WBSEDCL approval. All materials used as also works carried out shall conform to the quality of approved samples. Production of these samples shall be at Contractor's cost. However, approval of samples by WBSEDCL shall not relieve the Contractor's obligation of the Contract during entire period of Contract.

Testing of bricks shall be carried out in respect of dimension, crushing strength, water absorption and efflorescence in a standard sample size of six bricks. The periodicity of testing may be taken as once for every 50 CUM of brick masonry of nominal thickness not less than 250 mm and part thereof. Similarly for half brick masonry once for every 500 sqm and part thereof. These tests shall be guided as per relevant IS code and CPWD specifications at the risk and cost of the Contractor.

4.3 Brick masonry: Brick shall be soaked in clear water for at least six hours in a vat before use. Bricks shall be laid in English bond unless specified otherwise. No half or quarter brick shall be used except as closers. Brick shall be accurately raised to plumb.

Brick work shall be raised uniformly all round and no part shall be raised more than 1 metre above another at any time, and the work shall be properly toothed and racked back .In case of 125 mm. thick brick walls, wire mesh shall be provided in every third course as per relevant specification and as instructed by WBSEDCL. The wire mesh shall be properly bedded in mortar , as directed.

Joints in brick work shall not be more than 10 mm. thick. Brick work shall not be raised more than 10 courses a day. The work shall be kept watered thrice a day for 10 days and afterwards twice a day for 3 weeks. All joints shall be thoroughly flushed with mortar at every course. Care shall be taken to see that bricks are properly bedded and all vertical joints completely filled to the full depth. The jointed of brick work shall be raised out to a depth not less than 10mm. as the work proceeds. The surface of brick work shall be cleaned down and watered properly before the mortar sets.

4.4 Plastering: Plastering work in general shall proceed from top to bottom. An entire unobstructed area shall be plastered in one operation. The surface to be plastered shall be thoroughly cleaned, watered and roughened to provide key. Joints in brick work shall be raked out and cleaned. The surface shall be watered and well wetted for at least 24 hours before the commencement of work.

The entire plastered work shall be truly vertical and to proper lines and levels. All exposed angles shall be carefully flushed to provide neat and even surface. Any work that does not conform to approved samples or is not to the satisfaction of WBSEDCL shall be rejected and the Contractor shall be liable to redo the work at his own cost.

Cement sand plaster will be used. Sand will be coarse or fine (Zone-III) .

Where waterproofing compound is specified to be provided in mortar for plaster, approved integral waterproofing compounds shall be used. These shall be used and plastering work shall be carried out strictly as per manufacturer's recommendations.

4.5 Measurements

4.5.1 General: All the rates quoted by the Contractor shall be for a fully finished item of work and shall include for all material, labour, miscellaneous works like storage, loading/unloading, scaffolding, hoisting gear etc. as also all taxes, duties, overheads, profits, etc. complete. The measurement of all items shall be guided by relevant provisions of the GCC and specification, in general .

4.5.2 Masonry: Accounts on masonry shall be settled on the basis of cubic metres or square metres as indicated in the Bill of Quantities. Quantities will be decided on the basis of pertinent plans. Openings and recesses which exceed 0.10 sqm. will be deducted from quantities. Openings left initially on specific instructions or as required shall be closed at a later date, if so instructed by WBSEDCL, at no extra cost. Similarly, all openings, recesses, grooves etc. shall be provided at no extra cost.

4.5.3 Plastering: Accounts on plastering shall be settled on the basis of square metre, as arrived at from pertinent plans and for a particular type of plaster. Accounts shall be settled on the basis of dimensions of raw structure, Grooves, notches, drip notches etc. shall be provided in plaster free of cost, wherever indicated by WBSEDCL or shown in drawings. Similarly, no special compensation shall be paid for plastering in recesses, grooves, etc. shall be accounted for under relevant item of work. However, providing cleavage or similar miscellaneous works shall be deemed to have been include in the rates quoted by the Contractor and shall not be separately paid for.

5. DOORS

5.1 Wood Work: The work consists of supply of materials, fabrication, joinery, carpentry, delivery and erection at site on wooden door and window, flush doors as specified in Bill of Quantities . The measurements , materials etc shall be guided by relevant IS code and relevant specification .

5.1.1 Materials:Timber shall be best quality teak locally available or well seasoned Sal wood (as per BOQ)uniform in texture, free from large, loose dead or cluster knots, waves injurious open shakes, discoloration, soft or spongy spots. It shall have uniform colour, reasonably straight grains and shall be free from all defects.

All samples of wood work shall be got approved by WBSEDCL before bringing in bulk quantity at site and the samples shall be kept at site for future reference. Samples of wood may be sent for testing in Govt. laboratories / testing houses , if instructed by WBSEDCL at the risk and cost of the Contractor. The tests shall be governed by relevant IS codes and relevant specifications. Necessary test certificates shall have to be submitted, if asked for by WBSEDCL irrespective of further testing of samples as detailed above .

Wood work abutting against or embedded in masonry or concrete shall be painted with a coat of solignum paint before being placed in position. No wood work shall be painted prior to checking and subsequent approval by WBSEDCL.

5.1.2 Fixing/erection in position of door frames: Before the frames are fixed in position, these shall be inspected and passed by WBSEDCL. The frames shall be placed in proper position and fixed to the walls with suitable holdfasts/clamps as per IS Code and relevant specification as shown in drawing.

In case the door frames without sills the vertical members shall be buried in floor 50 mm. deep at least . `Sills shall be provided where so directed. The door frames without sills while being placed in position shall be provided with temporary wooden bracings well wedged between the styles at the sill level. The sills shall be retained to keep the frames from warping during construction. These frames shall also be protected from damages during construction.

5.1.3 Shutters (Block Board): Flush doors shall be solid core type with commercial or decorative faces. All flush door shall be obtained from approved manufacturer. This should be solid core with 1 mm thk. decorative laminates on both sides of approved shade & quality as desired by WBSEDCL and as mentioned in the approved list of materials with teak wood lipping all around and bonded with phenol formaldehyde synthetic resin as per IS specification. The specification generally should conform to I.S.2202/1966. Necessary test certificates shall have to be submitted by the Contractor , if asked for by WBSEDCL . Samples shall be approved well in advance prior to bringing in bulk quantities at site . Rejected materials shall be removed from site within 48 hours .

5.1.4 Tolerance: Tolerance on width and height shall be + 2mm and on thickness it will be + 1.2mm. The thickness of shutter shall be uniform throughout with a variation not exceeding 0.8 mm. when measured at any two points.

5.1.5 Adhesives: Only synthetic resin adhesives conforming to IS No.IS-851/1964 or latest amendment shall be used for bonding core members to one another including core frame and other exposed parts. The adhesive used for bounding cross band to core and face veneers to cross band shall conform to IS:848/1957 (Phenolic and Aminoplastic), or equivalent IS standards with latest amendment .

5.1.6 Fittings: Fitting shall be of Stainless Steel made of approved manufacturer.

The sample of fittings to be actually provided in a particular work shall however be approved by WBSEDCL prior to bringing in bulk quantities at site. Approved samples shall be kept at site for any reference .

Screws used for fittings shall be of the same metal.

The rate quoted for doors shall include all necessary hardware and screws as generally required to complete the job , as specified in the relevant items of BOQ and as per IS Code and relevant specifications.

5.2 Measurement: The rate quoted by the Contractor under for the entire work is applicable for a complete finished item and no claims by the Contractor in this regard shall be admissible. Supplying and fixing of all the fittings and iron mongery shall be deemed to have been covered by the relevant item of the S.O.W./B.O.Q and consequently, shall not be paid for separately.

6. FLOORING:

6.1 Kota Stone Flooring, Dado & Skirting

Kota Stone shall be of selected quality, hard, sound, dense and homogenous in texture free from cracks, decay, weathering and flaws. They shall be hand or machine cut and shall be of approved colour of even shade as far as permissible. The stones having yellowish strips, dent, black patch and broken edges shall not be used. The slabs shall conform to the sizes of 600 mm. x 600 mm. or as required and shall be laid to pattern as directed. The edges will be perfect vertical and in right angled to each other. Minimum thickness of slabs shall be 20 mm. and the minimum thickness of floor finish including bedding mortar shall be 40 mm or as specified in the relevant items of BOQ and IS specification. The floor surface to be tiled shall be closely picked or hacked and thoroughly watered and cleaned. Mortar for bedding shall be 1 part of cement, 4 parts of sand with a layer of neat cement slurry. The stone slabs shall be laid on this bedding immediately and as each stone is laid it shall be taped with a wooden mallet and set. Flush joints shall not exceed 1 mm thick and shall be as per pattern indicated by WBSEDCL. The joint shall be set close with white cement, stone dust, adhesive and admixture of pigment matching the shade of kota stone. After the work has set, the surface shall be machine polished to the satisfaction of WBSEDCL. The final polished surface shall then be washed of all dirt, mortar, etc. by using Oxalic Acid and handed over in a neat condition. Measurement will be taken on finished dimensions. Before the start of kota laying work, approval should be taken from WBSEDCL on the sample work and the approved sample(s) shall be kept at site for ready reference. For dado, 1200mm high, 300mm wide and 20mm thick Kota shall be fixed in wall, raised from the plastered surface matched with floor joints or as directed by WBSEDCL.

6.1.1 Rate quoted by the Contractor shall be deemed to include all labour, materials and equipments , cleaning the sub-base laying mortar bed and cement grout and fixing marble slabs and making the joints and polishing and shall also include:

a) Any cutting and waste if required.

b) Curing

c) Cleaning the floor and wall from all stains etc complete .

6.2 Ceramic Tile Flooring and Dado/Skirting:

6.2.1 General: This item relates to the furnishing of materials and installations of ceramic tiles in flooring ,dado, etc. Tiles shall conform to IS : 15622 and workmanship shall be per IS : 1443.
6.2.2 Materials: The ceramic tiles shall be of high quality of approved manufacturers as specified by WBSEDCL. The size of tiles shall be as specified or as directed in the drawing and shall be of appropriate minimum thickness as mentioned in the item of ceramic tile flooring & dado in BOQ. No chipped, cracked, crazed or warped tiles shall be used. Glazed rounded corners and cups (convex or concave) shall be provided at corner of walls , edge, junctions of floor and dado etc., if so specified. The mortar shall be in the proportion 1:4. (Cement: Sand)
6.2.3 Laying: The fixing shall generally conform to IS: 1443.
6.2.4 Workmanship: The surface to be covered shall be plastered rough to a thickness of 12 mm. Fix 12 mm size stone chips (5 nos. one in each corner and one in the middle of each tile with Adhesive viz., Araldite of equivalent for keying action) or with approved chemical of reputed brand and the tiles shall be soaked in water for at least 2 (two) hours prior to fixing at site. A thin layer of cement paste shall be buttered on the back of the tile and on the side after which the tile shall be pressed and tapped home taking care that the corner tiles are perfectly matching. After the backing coat has set the tile joints shall be grouted with neat, white cement slurry with necessary pigment. All surplus slurry that remains on the surface shall be carefully wiped off before it sets. Care shall be taken to ensure that the finished surface is absolutely plumb and to proper levels without any profusions, waviness or zigzag. Joints between tiles shall be uniform in straight level lines. After completion of the entire work or part of it , the surface shall be cleared of all stains , cement etc., by washing with oxalic acid (1:10) or any other approved compound.
6.2.5 Fixing tiles for Dado and Skirting /Facia: The dado work shall be done only after fixing the tiles / slabs on the floor. The approved glazed tiles before laying shall be soaked in water for at least 2 hours. Tiles shall be fixed when the cushioning mortar is still plastic and before it gets very stiff.
The back of the tile shall be covered with this layer of cement mortar 1:3 using fine sand (table III, zone IV, IS383-1963), and the edge of the tile smeared with neat white cement slurry. The tile shall then be pressed in the mortar and gently tapped against the wall with a wooden mallet. The fixing shall be done from bottom of wall upwards without any hollows in the bed of joints. Each tile shall be as close as possible to one adjoining. The tiles shall be jointed with white cement slurry. Any thickness difference in the thickness of the tiles shall be arranged out in cushioning mortar so that all tiles faces are in one vertical plane. The joints between the tiles shall not exceed 1.00 mm in width and they shall be uniform.
While fixing tiles in dado work, care shall be taken to break the joints vertically. The top of the dado shall be touched up neatly with the rest of the plaster above.
After fixing the dado / skirting etc. they shall be kept continuously wet for 7 days.
If doors, windows or other openings are located within the dado area, the corners, sills, jambs etc. shall be provided with true right angles without any specials. The Contractor will not be entitled to any extra claims on this account for cutting of tiles if required.
6.2.6 Cleaning: After the tiles have been laid in a room or the day fixing work is completed, the surplus cement grout that may have come out of the joints shall be cleaned off before it sets. After the complete curing, the dado or skirting over shall be washed thoroughly clean. In the case of flooring, once the floor has set, the floor shall be carefully washed clean and dried. When dry, the floor shall be covered with oil free dry sawdust. It shall be removed only after completion of the construction work and just before the floor is used.
6.2.7 Pointing and Finishing: The joints shall be cleaned off with wire brush to a depth of 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement and floor kept wet for 7 days and then cleaned. Finished floor shall not sound hollow when tapped with a wooden mallet.
6.2.8 Testing of the tiles: The tiles used for dado including border tiles are to be tested as per IS 13630 from Part I to Part 13 whichever is applicable In the periodicity of the testing shall be one set of tiles for every 300 Sqm of dado area and part thereof. The tiles used for the flooring are to be tested as per IS 13630 from Part I to Part 13 whichever is applicable and in case of it's periodicity of testing may be done as one set of tiles for every 100 sqm and part thereof. The Contractor shall submit the test certificates of the manufacturer (s) .Over and above, sample testing may have to be done, if so directed by WBSEDCL, at the risk and cost of the Contractor from Govt. laboratories / testing houses.
6.3 Ceramic Mosaic Tiles: Ceramic mosaic tiles of size 25 mm x 25 mm unglazed of reputed manufacturer as approved by WBSEDCL. Manufacturing company available in sheets of 300 mm x300 mm shall be used for external building cladding. At first , apply a coat of cement sand plaster on the external surface of 6 mm thick in a proportion of 1:3 (1 cement : 3 coarse sand) with proper leveling and alignment and check it to plumb. Then apply a coating of 4 mm thick pure cement slurry over the wet plastered surface and let the coating dry for 15-30 minutes and then use a wire brush to scratch the surface in zigzag pattern. On the un appeared side of shon mosaic tile sheet apply a thin layer of white cement in paste form and fix the sheet on the plastered wall in such a way that the papered side of the mosaic sheet faces the applicator. Let the tile fix for about 1 to 11/2 hours. Then wet the paper with water with a soft painting brush and peel off the paper starting from the top corner and moving down words. Clean the tile surface and apply cement paste putties with colour pigment , as required , to fill the cavities , if any and then wash the shon surface with dilute hydrochloric acid and water combined solution.
6.3.1 Testing of the tiles: The Contractor shall have to submit test certificates from the manufacturer (s) . Over and above , the tiles used for wall including border tiles are to be tested as per IS 13630 In the periodicity of the testing shall be one set of tiles for every 400 Sqm of wall area and part thereof or as directed by WBSEDCL and as per specification .
6.4 Granite Cladding:
6.4.1 Sampling:
6.4.1.1 Granite need for cladding work shall be sampled and criteria for selection shall conform to IS 3376-1974 and IS 14223 (Part-I):1995 and as per CPWD specification.
6.4.1.2 Variation efface dimensions on any granite shall not exceed 1 mm in 900 mm
6.4.1.3 Total variation of thickness on any granite shall not exceed □ 3 mm
6.4.1.4 Any bow or twist on finished faces of any stone shall not vary from the plane by a dimension exceeding 1 mm in 1200 mm.
6.4.1.5 All granite, unless otherwise designed , shall stand up square at all face corners so that any deviation in length or heights dimensions is reasonably uniform.
6.4.1.6 Water absorption shall be maximum 0.5 with a dry density of 2.60 to 2.68, as laid down in relevant IS Code and specification.
6.4.2 Cutting, Drilling and Fitting
6.4.2.1 Provide holes required for anchors , cramps , dowels and other devices requires to support stone and to accommodate other items that connect to or penetrate the stone.

6.4.2.2 Include all cutting, drilling and fitting of stonework required to accommodate the work of other trades. In cutting and fitting, carefully cut and grind edges to a neat tight fit. Execute cutting in such a manner so as not to impair strength or appearance of stone. Use physical templates from the proper trade for all cutting and drilling of work.
6.4.3 Treatment of Granite:
6.4.3.1 Mortar mixes, setting beds, leveling screed and joint sealant shall be as specified and to approval.
6.4.3.2 Where required granite joints shall be sealed with joint sealant.
6.4.3.3 Where required shall be grouted with Elastiment Grout.
6.4.3.4 Fabric mesh reinforcement shall be incorporated in the leveling screed exceeding 75 mm thick.
6.4.3.5 Leveling screed shall be laid to the required thickness as indicated in the Contract Drawings or as required by the Architect.
6.4.4 Setting Generally:
6.4.4.1 When ready for setting, all stone units shall be clean and free from stains, dirt or dust. If necessary scrub face with mild soap and clean water applied with stiff fiber brushes. Rinse well with clean water.
6.4.4.2 Keep exposed faces of stone units free of mortar or joint sealant. And mortar or joint sealant that gets on exposed faces shall be immediately removed. To prevent marking of stone masking tape shall be applied to either side of the joint. The materials, labours etc deemed to have been included in the rate quoted by the Contractor and no claim in this regard shall be entertained by WBSEDCL

7. WATERPROOFING:
7.1 Waterproofing of underground reservoir: The waterproofing work shall be guided by relevant IS Code and relevant specifications and PWDSOR and as per BOQ also.
Proposed system (Given as guidance only):
SikaTop Seal 107 or equivalent of reputed manufacturer as approved by WBSEDCL, acrylic, cementitious waterproof coating
Intraplast EP or equivalent of reputed manufacturer as approved by WBSEDCL, Expanding grout admixture
A food grade epoxy coating Sikagard 67 or equivalent of reputed manufacturer as approved by WBSEDCL, on concrete
Surface Preparation:
Clean the PCC surface from dust, oil, grease, loosely adhering particles etc. Apply 12mm plaster (C:S::1:3) on the surface.
Application Methodology (Given as guidance):
Application methodology shall be as per manufacturer. However, as a guidance, the methodology is listed below:
Apply two coats of acrylic cementitious waterproof coating of Sika® Top Seal 107 or equivalent of reputed manufacturer as approved by WBSEDCL, on the prepared substrate.
A 12mm thick plaster (C:S::1:4) should be given on the waterproof coating before fixing of the reinforcements. The plaster should be prepared by mixing an integral waterproofing compound, Plastocrete Plus or equivalent of reputed manufacturer as approved by WBSEDCL, @ 100gms per bag of cement or as specified by the manufacturer.
Drill hole up to half of the depth of the concrete and fix nozzles min. 15mm dia, 100mm long GI nozzle 1.5 m C/C in a grid pattern in the interior surface of retaining wall with the help of quick setting compound Sika 2 or equivalent of reputed manufacturer as approved by WBSEDCL,.
Extra nozzle should be provided on the construction joint.
Inject Cement slurry enriched with Intraplast EP or equivalent of reputed manufacturer as approved by WBSEDCL - Non shrink grouting compound through the fixed nozzle in a pressure of 2.8 kg /cm2 or as specified by the manufacturer (s) with the help of hand operated grouting pump. Injection operation should be executed after 28 days of concreting.
7.2 Retaining Wall (Given as guidance): After the release of shuttering, repair all bug or pin hole with polymer modified mortar on the exterior surface of underground retaining wall
Make a 20X20 groove along with the construction joint and seal the same with polymer modified mortar, specially the starter joint of the retaining wall.
Prior to apply SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by WBSEDCL, the surface should be made SSD.
Apply first coat of SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by WBSEDCL over prepared surface. Coating should be continued over the projected portion of the raft and also 300mm above from the G.L. Allow the coated surface air cure for 4 hrs.
Before application of 2nd coat, surface should be wet again with the help of sprinkling water. Apply second coat of SikaTop Seal 107 or equivalent of reputed manufacturer as approved by WBSEDCL over the executed first coat.
The coating shall be covered with 12 mm thick plaster added with waterproofing admixture Plastocrete Plus or equivalent of reputed manufacturer as approved by WBSEDCL 0.2% by weight of cement with a cement - sand mortar (1:4) or as specified by the manufacturer.
Drill hole up to half of the depth of the concrete and fix nozzles min. 15mm dia, 100mm long GI nozzle 1.5 m C/C in a grid pattern in the interior surface of retaining wall with the help of quick setting compound Sika 2 or equivalent of reputed manufacturer as approved by WBSEDCL as per manufacturer specification complying to relevant IS Code and specification .
Extra nozzle should be provided on the construction joint.
Injection grouting shall be executed as mentioned above complying IS Code and specifications.
After necessary surface preparation, apply two coats of water based, epoxy coating Sikagard 67 or equivalent of reputed manufacturer as approved by WBSEDCL, on the RCC surface from inside. This is two component system, comp.A : comp.B:: 1:1 by weight and density is 1.2 kg/l or as specified by the manufacturer complying IS and CPWD specifications.
7.3 Terrace Waterproofing
7.3.1 Proposed system (Given as guidance):
SikaTop 77 or equivalent of reputed manufacturer as approved by WBSEDCL
Screed with panels
Surface Preparation (Given as guidance):
The substrate shall be rendered sound, free from contaminants such as fungus, algae, dust, etc., by removing all weak layers and cleaning with up to 5% solution of Sodium Hypochloride and using water jet.
The drainpipe openings shall be just above the prepared substrate and if they are not, either the substrate shall be repaired or the drain pipe relocated suitably.

Should any defect be present in the substrates, the Contractor or applicator shall carryout all the necessary rectification works and preparatory works before the installation of the specified waterproofing system at his risk and cost.
Cracks running through the sections shall be repaired using low viscosity, solvent free epoxy injection resin system, Sikadur 53 UF or equivalent compound of reputed manufacturer as approved by WBSEDCL.
Any surface cracks shall be chased open into a 'V' groove, and filled with Sika Latex or equivalent compound of reputed manufacturer as approved by WBSEDCL, modified cementitious mortar. In case the cracks are " Live " , it is recommended to seal the same with a flexible single component polyurethane sealant Sikaflex or equivalent compound of reputed manufacturer as approved by WBSEDCL, Construction after opening up the joint in a V groove at risk and cost of the Contractor ..
Special attention shall be given on substrate preparation on the internal surfaces of drain pipe openings to ensure it is carried out to properly.
The detailing at the penetrations of any pipes, cables, air-con mountings, etc., shall be carefully carried out as specified in the drawing or as directed by WBSEDCL .
Application Methodology (Given as guidance):
The prepared substrate shall be treated with SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by WBSEDCL, a two component acrylic polymer modified, cementitious, ready to use waterproofing slurry in two coats at right angles to each other and taking the coatings over the vertical parapet up to at least 300mm on the exterior surface of the parapet and as per manufacturer's specification or as directed by WBSEDCL.
Special care shall be taken to ensure proper coating of the inner surfaces of the drain openings in the parapet wall.
When the cementitous membrane is dried, an acrylic bond coat of SikaTop 77 or equivalent of reputed manufacturer as approved by WBSEDCL shall be applied. When the bond coat becomes tacky, the treated roof area shall be laid with avg. 75mm thick concrete screed admixed with the waterproofing admixture, Plastocrete Plus or equivalent compound of reputed manufacturer as approved by WBSEDCL, ensuring that the screed gently slopes towards the drain pipes. The concrete screed should be cast in panels of 2mx2m maintaining 10mmx10mm groove using solvent free polyurethane pavement sealant, or as directed by WBSEDCL.
Corners and joints such as those between the parapet wall and the roof slab, chimney and roof slab, etc shall be chamfered with 150mm X 150 mm fillet of mortar (Cement: sand – 1:4) admixed with SikaTop 77 or equivalent of reputed manufacturer as approved by WBSEDCL. Before chamfering a prime coat shall be given with the slurry of SikaTop 77 or equivalent compound of reputed manufacturer as approved by WBSEDCL.
7.4 Sunken slab waterproofing:
7.4.1 Proposed system (Given as guidance): SikaTop Seal 107 or equivalent of reputed manufacturer as approved by WBSEDCL, acrylic cementitious waterproof coating
Coving with acrylic emulsion and waterproof additive SikaTop 77 or equivalent of reputed manufacturer as approved by WBSEDCL
Sealing of pipe mouth with Sikagard 694 F (I) or equivalent of reputed manufacturer as approved by WBSEDCL, moisture insensitive epoxy putty
Surface Preparation:
Clean the RCC surface from dust, oil, grease, loosely adhering particles etc. and it should be rendered smooth with cement sand mortar.
Application Methodology (Given as guidance):
A 1:3 cement – sand mortar, mixed with SikaTop 77 or equivalent compound of reputed manufacturer as approved by WBSEDCL – the polymer modified high quality emulsion, shall be installed as a coving at the corners of floor and the vertical surface in the sunken area, and between floor and walls in the remaining area.
SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by WBSEDCL – the cementitious, flexible waterproof coating shall be applied onto the prepared surface in a continuous film on the floor of the sunken area, taking the coating over the vertical surfaces on to the floor and over the coving on to the wall (before tiling) to at least 300mm above the final finished floor level. The coating shall also be continued on to the inner surfaces of the pipe penetration holes. Two coats shall be applied. The coating shall be protected with 15mm plaster admixed with Plastocrete Plus or equivalent compound of reputed manufacturer as approved by WBSEDCL, an integral waterproofing compound @ 100gms per bag of cement. Application of compound should confirm to manufacturer's specification and as per IS and CPWD specifications .
Tiles are to be fixed with ready to use tile adhesive for vitrified tiles, Sika Ceram (Grey) or equivalent compound of reputed manufacturer as approved by WBSEDCL.
Pipe penetrations
Where the pipes are already installed:
Sikagard 694F(I) or equivalent compound of reputed manufacturer as approved by WBSEDCL, a moisture insensitive epoxy putty shall be installed in a continuous, 10mm thick gasket around the pipes to a width of approximately 15mm.

8. PAINTING
8.1 Scope of work: The scope of work as enumerated under this tender includes painting of external plastered and concrete surface, steel work, timber surfaces, pipes, as detailed in the Bill of Quantities. The work shall be carried out as per IS Code and PWDSOR and specification and finally, as directed by WBSEDCL .
8.2 Materials: The paints to be used for this work shall be of first class quality paint of reputed manufacturers and of approved type by WBSEDCL.
8.3 Preparation prior to painting: The surfaces to be painted shall be thoroughly cleaned of all dirt, cement slurry with coir or wire brush. The slight surface cracks shall be made good with hard stopping or filled with approved compound. Special care shall be taken in case of exposed concrete or shutter finish work.
8.4 Finishing Coats: All earlier coats of paints shall be thoroughly dry before subsequent coats are applied and shall be rubbed down with fine sand paper. The finishing coats are intended generally as follows: (The exact type of finish shall be as described in Bill of Quantities).
- External wall surface -Cement based waterproofing paint/Textured paint or as directed by WBSEDCL in compliance to the BOQ.
8.5 Samples: The Contractor shall be required to prepare the sample of painting at least three different samples or combinations(each sample not exceeding approx. 4 M2 in area) at the site for approval as per the painting scheme prepared by WBSEDCL at his own risk and cost.
8.6 Mode of Measurement: All measurement unless otherwise specified in these documents shall be as per latest Indian Standard and specifications for mode of measurement.
8.7. General: The rates shall include for all materials like putty, fillets ,rubbing compound primer, paint etc. as also labour for repertory works and painting all for a completed item of work..

The work shall be done as per best engineering practice. Samples and shades of paint should be approved by WBSEDCL prior to execution of work . Consumption of materials and the special precautions etc. shall be as per manufacturer's specifications. Necessary equipment for spray painting shall be supplied by the Contractor.
Guaranty /warranty for paint should be given by the manufacturer along with cross warranty for entire work by the Contractor.
8.8 Primer: All surface for painting , if they are new , should have a coat of priming
before application of the paint as per relevant item of BOQ.The primer should be of approved quality as directed by WBSEDCL of ready mix primer.
8.8.1 Wood Primer: Wood primer of approved brand (by WBSEDCL) and as per manufacturer's specification is to be applied on the wooden surface which would be free from moisture and loose particles.
8.8.2 Steel Primer: For steel surface red oxide primer , zinc chromate primer of approved brand (by WBSEDCL) and is to be applied on the surface as per manufacturer's specification and as approved by WBSEDCL. The surface should be made free of grease, rust, moisture and loose particles. All blistered surface should be made free by hammering , filling or otherwise so as to have smooth surface before priming.
8.8.3 Cement Primer Coat (Alkali Resisting Primer): Cement primer coat is to be used as base coat on wall finish of cement, lime or lime cement plaster or on asbestos cement surface before application of any wall coating e.g. oil bound distemper ,oil based paints, synthetic enamel, plastic emulsion etc. on them. The cement primer is composed of a medium and pigment which are resistant to the alkalis present in the cement, lime or lime cement in wall finish and provides a barrier for the protection of subsequent coats of oil bound distemper or paints. Priming coat shall be preferably applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surface. New plaster patches in old work before applying oil bound distemper paints etc. should also be treated with cement primer. The surface shall be thoroughly cleaned of dust ,all white or colour wash by washing and scrubbing. The surface shall then be allowed to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface. Any unevenness shall be made good by applying putty ,made of plaster of Paris with water on the entire surface including filling up the undulation and then sand papering the same after it is dry. The cement primer shall be applied with a brush on the clean dry and smooth surface. Horizontal stroke shall be given first. Vertical strokes are to be
applied after horizontal stroke is absorbed on wall/ ceiling surface immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush mark. It shall be allowed to dry for at least 48 hours before oil bound distemper or paint is applied. The entire process of application shall conform to manufacturer specification and as per IS Code and specification and as per decision of WBSEDCL.
8.8.4 Waterproofing Cement base paint: Waterproof cement based paint of approved manufacturer , and IS code 5410:1992 Part 2 : 1972 of desired shade/shads shall be applied over the Cement primer coat. Ensure that the surface is thoroughly dry before painting to avoid premature paint failure. When preparing the surface for painting ensure that all loose and flaking paint or foreign matter is removed and get an absolute smooth surface dried at ambient temperature outside. Wherever textured paint is applied it is to be ensured that the textured matt finish of smooth granular feeling is obtained after application of 2 coats of " Weather shield" or equivalent compound of reputed manufacturer as approved by WBSEDCL acrylic exterior textured paint. The entire process of application shall conform to manufacturer specification and as per IS Code and specification and as per decision of WBSEDCL.
8.9 Precaution
8.9.1 Brushes should be quickly washed in water, immediately after use and kept immersed in water during break periods to prevent the paint from hardening on the brush.
8.9.2 In the preparation of walls for plastic emulsion painting , an oil base putty shall be used in filling cracks , holes etc.
8.9.3 Splashes in floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.
8.9.4 Washing of surface treated with emulsion paints shall not be done within 3 to 4 weeks of application or the time specified by manufacturer.

9. STRUCTURAL GLAZING:
9.1 Scope of Works: The scope of works under this contract includes design, supply installation, protection guarantees, testing and maintenance upto the defects liability period of Structural glazing, openable panels, glass doors and fixed glazing.
The work under the section includes all labour, materials, equipment and services as required for the engineering, preparation of shop drawings, testing, fabrication, assembly, delivery anchorage, installation, installation, protection and waterproofing of the structural glazing openable panels, glass doors and fixed glazing system and all in accordance with the true intent and meaning of the specifications and drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings or described in the specification provided that the same can be reasonably inferred therefrom. Anchorage includes all primary and secondary anchor assemblies and supportive structural framing as required to secure Structural glazing system glass doors and fixed glazing. The materials , work etc shall be as per relevant IS codes and specification and overall direction of WBSEDCL .
The detailed scope of work is as outlined hereunder-
The Structural glazing system and openable panels described hereafter shall include but will not necessarily be limited to the following:
9.2 Frames: Openable panels where indicated, inclusive of all accessories, fittings, etc. All caulking, sealing and flashing including sealing at junctions with roof waterproofing and exterior wall, raised kerbs and in window surrounds. Sealant within and around the perimeter of all work under this section. Separators, neoprene / EPDM and silicon gaskets, trims, etc. Inserts in concrete, anchor fasteners etc. for the anchorage of all work under this section is subject to the approval of WBSEDCL. Isolation of all dissimilar metal surfaces as well as moving surfaces similar or dissimilar. Fire-stops, flashing, sealing of all interfaces with buildings etc. Protection during storage and construction unit handing over Engineering proposals, drawings and data . Shop drawings, engineering data and structural calculations of all systems including framing, fasteners. Scheduling and monitoring of the work All samples, mock-ups and test units Coordination with work of Main Civil Contractor and other agencies / Contractors employed on site. All final exterior and interior cleaning of the Structural glazing system, doors, etc. Hoisting, staging, scaffolding and temporary services Specified tests, inclusive of necessary reports , Maintenance manuals , Performance guarantees . Periodic inspection, supervision and advice by tenderer's Principal as well as a back-up guarantee in an acceptance format by the Principal for the quality and performance of works. Construction monitoring for regular quality control and technical inspection to ensure the work conforms to the shop drawing details (including any modification made during testing) and acceptable standards of quality.

9.3 Reference And Standards: Materials and workmanship shall comply with the latest edition of the following standards as follows (but not limited to this list of standards) :
ANSI Z97.1.84. Safety Glazing Materials used in Buildings
ASTM C1036-90 Specification for Float Glass

ASTM C1048-90	Specification for Heat Treated Float Glass
ASTM C864-90	Specification for Compression Seal Gaskets
ASTM C1115-89	Specification for Silicon Rubber Gaskets
ASTM C920-87	Specification for Sealants
ASTM C509-90	Specification for Sealing Material
GTA Specification	Specification for environment durability for heat strengthened
No. 89-1-6	Spandrel Glass with Applied Opacifiers
BSCP 118	Structural use of Aluminium

In general the Contractor may follow any international Standards subject to his satisfying WBSEDCL that these specifications are equivalent to latest specifications issued by ASTM, ISO, AAMA, BSS & SSIR or equivalent Indian standard as approved by WBSEDCL.

Copies of all codes proposed to be followed for design, materials, installation and testing shall be submitted to WBSEDCL within 2 weeks of issue of Works Order.

9.4 Building Regulations: Design of the Structural glazing system shall comply with all IS codes and regulations for wind design . All calculations shall comply with the requirements of the relevant National Building Code and Indian Standard Code, unless specified otherwise.
9.5 Guarantee/Warranty: The Contractor shall be fully responsible for and shall guarantee proper design safety and performance of this installed system for such a period as per manufacturer by providing guarantee/ warranty provided by the manufacturer along with the cross warranty by the Contractor and as directed by WBSEDCL as per terms of the contract from the date of taking over of works by the Owner.
In addition specific , guarantees/warrantees in approved formats shall be given for performance of glass, double-glazed units, anodizing and sealants. All the guarantees /warrantees shall be submitted before payment from the date of actual completion of work, and shall not in any way limit any other rights to correction which the WBSEDCL may have under the Contract.
9.6 Contractor's Responsibilities: The Contractor's responsibilities include but are not necessarily limited to the following items:
The Contractor shall provide and install all supplementary parts necessary to complete all items generally implied in the drawings and in the specifications though not specifically shown or mentioned.
This shall include providing, assembly & erection of all sections and anchor assemblies to meet the performance and furnishing and installation of all inserts, fasteners, clips bracing and framework as required for the proper anchorage of the structural glazing system elements to the structure, unless otherwise noted or specified to be furnish / installed by another agency. Alternate anchorage proposals will be considered , if in the opinion of WBSEDCL the general design and intent of the drawings and specifications are maintained.
The Contractor's system therefore must perform satisfactorily as a whole.
Drawings and specifications indicate the required basic dimensions, profiles and performance criteria. The Contractor shall have the option of modification and addition of details provided the visual concept and performance requirements are fulfilled. Proposed modification shall be clearly shown on shop drawings as "Design Modifications" and acceptance of the same will not relieve the Contractor from sole responsibility for performance of the structural glazing and other system. The Contractor shall be solely and fully responsible for due performance of his installation based on his own design and details. This should be done after approval of WBSEDCL, in writing , subject to the modified design and drawings with all necessary calculations etc and approved by WBSEDCL .
In-plant and job site inspection: The Contractor shall afford for WBSEDCL and / or their authorised agent full access to plants, shops and assembly points to view and inspect the processes and methods employed in the fabrication, assembly and finishing of the structural glazing and other system for this project at their own expense , whatsoever. This should be guided by the relevant clause of GCC of this contract.
WBSEDCL will have the right to reject any Structural glazing and other system, components, assemblies during assembly and erection if the workmanship and intent are not in strict conformity with the approved shop drawings, documentation, certifications, samples and mock-up and shall be binding on the Contractor. Replacement , modification , removal of rejected materials shall be done at the risk and cost of the Contractor.
All costs of shop drawings, documentations, maintenance manuals, certificates, sampling etc. including their resubmissions shall be borne by the Contractors without any extra claim.
Glass, sealants and other items or materials procured by purchase shall be back to back guaranteed by the manufacturer and cross guarantee/ warranty by the Contractor .
9.7 Shop Drawings: Within 15 days upon award of contract, the Contractor shall prepare shop drawings by necessary modifications , if any to the preliminary drawings and two (2) copies of all shop drawings along with the plan and method to execute the job mentioning the brand of materials , other accessories to be used for the work shall be submitted to WBSEDCL for review and approval. WBSEDCL's review of all shop drawings will be limited to their conformity to the concept & specifications. WBSEDCL's approval of the shop drawings will not relieve the Contractor from any of the responsibilities and requirements as stated in Contract documents. No work shall be fabricated until the shop drawings and all other relates submission, documentation, certifications, samples and the mock-up for that work have been reviewed and approved by WBSEDCL. On approval the Contractor shall submit 4 copies of drawings to WBSEDCL for release to site.
Shop drawings shall incorporate scaled and dimensioned plans, elevations, sections and full size details for all work in this section.
Shop drawings shall indicate the desired dimensional profiles and modules function, performance standards and, in general, delineate the scope of work. The Contractor shall verify and co-ordinate these items with all applicable and / or related trades, contract drawings and specifications. Since the dimensions and modular references shown on the drawings are for specific and / or typical detail, the shop drawings shall include a full complete layout of all modular and referenced dimensions for all the Structural glazing , openable panels, glass doors and fixed glazing and their related elements. All dimensions / modules, etc. shall be fixed and checked as required.
The full size details shall show and specify all metal sections, types of finishes; areas to be sealed and sealant materials, gaskets; direction and magnitude of thermal expansion, direction and magnitude of all applicable construction including fasteners and welds, all anchorage assemblies and components; the fabrication and erection tolerances for the work and applicable related works adjoining, attached to or in some way related to the work covered by these specifications. The location of all static and dynamic anchor assemblies, the direction of thermal and other applicable building movements, coordination with concrete works and the sequence of installation shall be designated on the applicable plans, elevations and / or sections. All details shall be subject to WBSEDCL's approval.
Shop drawings shall indicate the desired profiles, dimensions, details of metal finish and in general delineate the scope of the work. Profile adjustments in the interest of economy, fabrication, erection, weather-ability to satisfy the performance requirements may be made only with the written approval of WBSEDCL, provided that the general design and intent of the drawings and specifications are maintained.

Six (6) copies plus two reproducible sepia print and one soft copy each of all final approved shop drawings shall be submitted to WBSEDCL.
9.8 Samples and Manuals: Within 2 weeks of issue of order, the following samples of actual job site materials together with detailed technical data / catalogues shall be submitted in duplicate , unless otherwise noted, and in the sizes noted, for WBSEDCL review alike for approval of all other samples to be used for the work at site and approval. Any omission of an item, or items which require the Contractor's compliance with these documents does not relieve him from such responsibility.
Aluminium Extrusions – one of each section, 300 mm long of specified thickness.
Glass; Each type and kind, 300 X 250 mm of specified thickness and including frame
Glazing gaskets, tapes, separators, glass setting blocks, etc. each section of unit, 300 mm long or unit.
Fasteners and connecting devices, each type and size
Finish samples: after approval of the final finish coating WBSEDCL is to be provided with six (6) approved samples.
Patch fitting door mongery and all accessories, as applicable.
Flashings and finish samples
Samples submitted should also include assembly of various components forming a typical fixing detail complete with glazing, extrusion, fastener, sealant, etc.
9.9 Maintenance Manual: The Contractor shall submit six (6) copies of maintenance manuals each along with one soft copy at no extra claim, if applicable of detailed procedures for the periodic inspection maintenance and cleaning of all the structural glazing, openable panels, glass doors, windows and fixed glazing, finishes, etc.
9.10.
9.10.1. Structural Properties: The design of structural glazing system / other fixing systems and all related components shall comply in general with the requirements of National Building Code IS-875 and Indian Standard Code IS-456 along with all relevant IS Code and specification .No structural glazing / other glazing system including sealants and sealed joint shall sustain permanent deformation or failure under loading equivalent to 1.5 times the design wind pressure herein specified.
9.10.2. Deflections: The specified deflections must be reduced if they are in any way detrimental to the Structural glazing and sealants.
The maximum deflection shall not exceed 1/300 of span of transom / sill/ head members.
Under 1.5 times design wind pressure there should be no permanent deflection of framing member exceeding 1/1000 of span length.
Maximum deflection of glass under design wind pressure at centre of any panel shall not exceed 15 mm or as recommended by the manufacturer whichever is less.
9.11 General: All braces, supports and connections for the structural glazing shall be designed, provided and installed complete as required.
Anchors for curtain wall sections shall be located with a maximum distance of 500 mm above or below the RCC floor slab unless specifically approved otherwise by the WBSEDCL.
Variations from Schematic layouts indicated on the drawings may be permitted at the risk , cost and responsibility of the Contractor but only if a proposed revision does not, in WBSEDCL's opinion, deviate from the design intent, cause excessive stress in the structure, cause excessive deflection, inhibit thermal and building movement or conflict with other requirements.
Member shapes and / or profiles if schematically shown on WBSEDCL's drawings are not necessarily the exact shapes required or best suited for the particular condition. Final shapes and locations shall be as designed by the Contractor and are subject to WBSEDCL's review and approval.
The horizontal or lateral load on such transom / railing (where not backed by an RCC concrete) shall be designed in accordance with the following criteria i.e. a horizontal UDL at 0.74 KN/m run, UDL supplied to the infill of 1.0 KN/m2 and a part load applied to part of the infill at 0.5 KN.
No holes shall be burned, filed or drilled in any structural steel members unless expressly approved by the WBSEDCL in writing.
The Contractor shall provide detailed layouts, alignments jigs etc. for the proper and exact placement of all welded anchor studs, anchorage components without any harmful effect to the structural glazing.
No field forming, cutting and / or alterations of primary wall elements will be allowed. All framing members shall be shop fabricated and finish coated. No furnished surfaces will be permitted on exposed surfaces.
9.12 Concrete Tolerances: The Contractor shall take into account tolerance in concrete and masonry surfaces to which the structural and glazing framework is fixed.
Fire stop and Interface with Building
Joints in the structural glazing system between successive floors shall have the required fire resistance of at least 2 hours and shall comply with requirements of CFO.
A fire-stop-cum-smoke seal shall be provided at each window head level. In addition the Contractor shall provide an aluminium flashing to approved design at the window sill level and on 2 sides of vision panels.
All interfaces with building structure, and other elements shall be sealed / flashed provided with expandable gaskets to WBSEDCL's approval.
9.13 Sound Control: Provisions shall be made (e.q. capping of all ends of mullions) to prevent sound transmission through the system. Provisions shall also be made to prevent metal to metal rubbing noise due to thermal changes and wind pressure.
9.14 System Description: The front seal structural glazing system is semi unitized system. In this specially designed extruded aluminium mullions are fixed to the building structure by means of SS brackets of angles 100 X 100 X 12 mm of minimum 300 mm long with necessary aluminium packing for true alignment, suitable chinch anchor bolts of minimum 150 X 10 mm shall be provided for fixing the brackets. On to these mullions, the transoms are fixed by means of pre-positioned angle cleats. After installing the grid work of mullion and transom, the entire frame work is aligned in perfect line, level and plumb. Drainage chamber, pressure equalization system and openable panel shall be provided.
Bonding of glass is not to be done on site. Panels are glazed in the factory under controlled conditions as per silicone manufacturer's recommendation to achieve required bonding result. These pre-glazed panels are brought to the site and fixed on to the preinstalled aluminium gird work. The gap between the adjacent glass panels are thereafter filled with silicone sealant to have complete homogenous surface of glass without any grooves and cavities and this shall depend upon the systems offered. The tenderer will indicate the details of systems offered along with the tender.
9.15 Frame Work: Frame work consists of specially designed mullion of minimum size of 101.6 mm X 57 mm X 3 mm (Alloy 6063-T-5/T-6 temper) B.S. 1474. Selection of mullion will depend upon the floor to floor height, distance between two. Mullions wind pressure and other required structural stabilities. Transoms of minimum 83 X 57 X 2.25 mm (E 91 WP(IS) 1285) are attached to this mullion by means of aluminium angle cleats. The material shall be of reputed manufacturer as approved by WBSEDCL . Extruded section sample before anodization shall be produced to WBSEDCL for approval .

All aluminium sections shall be black matt anodized to 15 microns minimum. Bolts for connections of frame work shall be high tensile steel minimum 100 mm length and pop rivets shall be used and two samples shall be submitted for approval. Test shall include, DFT, film hardness, dry, cross batch adhesion, boiling water adhesion, test & glass measurements & general appearance and shall meet the following performance requirements. Sample testing shall be done at Govt. laboratories / testing houses at the risk and cost of the Contractor , as directed by WBSEDCL .

Salt spray resistance 3000 hrs exposured to 5% salt solution at 95% RH, 37.50C□ □ 125 mm creepage or loss of adhesion from scribed lines or cut edges.

Humidity resistance

Abrasion resistance

Mortar resistance

Detergent resistance

Color retention

Guarantee for peeling, cracking, checking, blistering, fading, chalking, color change.

Cleats & spigots: 6351 alloy T6 temper and SS screws shall be used for fixing the panels.

9.16 Fasteners: The type, size, alloy and quantity and spacing of all fasteners and anchoring devices shall be as required for the specified performance standards. The material shall be of reputed manufacturer , as approved by WBSEDCL .

Bolts, anchors and fastening devices shall be self locking, suitable for conditions encountered and shall be torque tightened when required to achieve maximum Torque Tension relationship in fasteners, washers, nuts all ancillary items shall be same material as fasteners.

Fastening devices between aluminium and aluminium shall be AISC type 302 (18-8) stainless steel unless otherwise approved.

Fastening devices between aluminium and dissimilar material shall be 300 series non-magnetic stainless steel unless otherwise approved.

Exposed fasteners shall be of stainless steel.

Self locking fasteners shall be stainless steel with nylon inserts or patches.

Proper care shall be taken in anodizing process to proper adhesion of the structural silicone to the anodized aluminium substrate. The anodizer shall be apprised that the extrusion to be finished will be used for structural glazing application. Sample of fasteners shall be submitted to WBSEDCL before anodisation for approval .

After a long period of time, anodised surface may develop an aluminium hydroxide surface film. This film shall be removed by detergent free boiling hot water rinse. Random production samples of anodised extrusions must be tested by silicone sealant manufacturers and certified by them. The sample testing shall be done at Govt. laboratories / testing houses at the risk and cost of the Contractor , as directed by WBSEDCL .

9.17 Glazed Panels: These are factory made glazed panels of approved make (as of WBSEDCL) which are brought to site of work and are bolted on the pre-fixed gird work of mullions and transoms. The entire safety and principle of structural glazing depends on these panels, in which the glass is bonded to the aluminium frames by means of structural silicone sealant. This has to be done in perfectly controlled conditions and as per the procedure recommended by sealant manufacturer. The sealant manufacturer shall visit the place of application for on-site testing of bonding by deglazing few panels. Necessary certification by the sealant manufacturer shall be furnished indicating that the glazing has been carried out as per their recommended procedure , based on which the Contractor shall submit the warranty along with the certification of the manufacturer .

9.18 Sealants: All sealant applications must be clearly designated on the applicable shop drawing details and reference to a master sealant schedule specifying materials special instructions and application procedures.

The compatibility and sequence of installation for all sealants must be carefully considered in all proposals in order to ensure the required cure and optimum performance. Sealants must not degrade and / or fail under all design conditions including, but not limited to thermal movement, water, ultraviolet exposure and / or other adverse environmental conditions. The following sealant materials are specified for performance standards only. All proposals must be equal to or better than the materials herein specified. The designation of sealant types noted on the drawings is intended for general design guidance. Final selection by the Contractor for the sealant types shall be based on their conformity with the Performance Requirements herein specified and meet with WBSEDCL's approval. Maximum precautions shall be taken to prevent failure of sealant. Necessary warranty certificate by the manufacturer along with cross warranty by the Contractor shall have to be submitted.

9.19 Front Sealing: After glass panels are installed, leveled and aligned, the groove between two glasses on al the sides which depends upon the systems adopted shall be as minimum as possible. This groove is then filled with weather grade 789/79B black silicone sealant from outside to give one smooth surface. This silicone filled grooves shall allow for thermal movements in the glass. Sleek grooves are to be provided for esthetical requirement.

9.20 Structural Sealant: Dow Corning silicone sealant 995/GE ultra-glaze 4000. All exposed and concealed metal to metal (including tight or butt type metal to metal assembly prior to assembly), perimeter metal to concrete joints shall be silicone base sealant, preferably two component, in approved colour, conforming to the manufacturer's recommendations for the specific uses and performance criteria. The manufacturer shall conduct laboratory test for adhesion for each lot of aluminium sections and glass. Laboratory reports shall be submitted to WBSEDCL. Submission of warranty by the manufacturer and cross warranty by the Contractor is required .

9.21 Weather Sealant: Grade of sealants for concealed metal to metal and metal to concrete joints are to be installed or embedded in a full bed sealant and shall be of Dow Corning / GE. Joint fillers and back up materials shall be of neoprene and as per the written recommendation from sealant manufacturer. Shape, size hardness, compatibility and bond breaking requirements are to be considered. All sealants shall be non-staining as per norms.

All sealants shall be given guarantee/warranty for materials by the manufacturer along with cross warranty including , workmanship and performance from the date of taking over of the work by WBSEDCL.

9.22 Caulking compound: Dow Corning 790, one part gun grade consistency, colour to match adjacent material or approved by WBSEDCL for use around frame or between frame and floor slab.

9.23 Installation: The GI bracket having three way adjustments are first fixed to the building structure as per approved detailed drawings. On to these brackets, the mullions are bolted. The mullion to mullion joint on each floor is achieved by special aluminium sliding sleeve. There is an expansion gap between two mullions to allow thermal movements.

9.24 Smoke Seal: The gap between the building structure and the structural glazing frame is closed with perforated aluminium tubes. These smoke seals will stop t he smoke, travelling from one floor to other floor as well as will stop the noise, travelling from one floor to other floor and shall be two hour fire resistant. Necessary tests shall be conducted at the risk and cost of the Contractor to check the functioning of smoke seal as directed by WBSEDCL complying to IS code and specifications.

9.25 Glass: For structural glazing, minimum 6 mm thick grey, tinted heat strengthened glass shall be used for spandrel areas and 24 mm thick insulated glass with 6 mm thick reflective toughened glass +12 mm air gap +6 mm thick clear toughened glass for other areas. The colour of

the glass shall be as per the design of the WBSEDCL. Prior to bringing the materials in bulk, sample approval shall be done by WBSEDCL . Material shall be of reputed manufacturer and approved by WBSEDCL .
All glass and glazing materials shall be verified and co-ordinated with the applicable performance requirements.
Furnish and install glass and glazing work as indicated on the drawings and as specified herein. All glass shall be cut to required sizes and ready for glazing. Any pane which does not fit any section of the glazing and shop front will be rejected and a replacement made at the Contractor's expense. All glass shall be of accurate sizes with clear undamaged edges and surfaces which are not disfigured. Sample testing shall be done at the risk and cost of the Contractor as directed by WBSEDCL , over and above , the submission of test certificate from the manufacturer .
Heat strengthened glass shall not deviate in surface flatness by more than 0.23 mm within 260 mm of leading or trailing edge, or 0.076 mm in centre. Direction of ripples shall be consistent. Distortion of glass shall be controlled as much as possible during heat strengthening. Sag distortion shall be uni-directional as per WBSEDCL's option. Surface compression stress of heat strengthened glass shall be within 320-450 kg/cm2.
Permanent identification marking on glass shall be accomplished by a technique selected by the manufacturer. The location of the marking shall be proposed by the Manufacturer and approved by WBSEDCL. All glass shall be delivered to site with the manufacturer's label of identification attached along with the test certificate of the manufacturer .
Submit for WBSEDCL's approval a complete list of materials to be used , including the sealants proposed and such samples as WBSEDCL may require. All glass and glazing methods and materials including the design and profile dimensions of glazing pockets shall be as approved and recommended in writing by the applicable glass and sealant manufacturers. A sealant substrate test report shall be submitted for each type of sealant for adhesion and compatibility. If required , WBSEDCL may ask the Contractor for further sample testing of sealants in Govt. laboratories /testing houses at the risk and cost of the Contractor .
Warranty of the material by the manufacturer along with cross warranty including workmanship etc. shall be submitted by the Contractor.
Sealants in factory-glazed panels shall be fully cured prior to shipment to project site and installation.
All glass breakage caused by the Contractor or his sub-Contractor because of negligence or caused by the installation of faulty work by him shall be replaced by the Contractor at his own expense without delay to the project completion.
The Contractor shall be responsible for replacement of any unit of glass and glazing that fails within the guarantee/warranty period of the manufacturer without charge.
The glass glazed panels / structural glazing frames for the structural glazing system shall be designed to withstand lateral imposed loads and comply with requirements of local building codes.
Glass thickness should be selected in accordance with IS 875:1987(Part III) to satisfy design performance requirements and local design codes.
Glass shall be free from defects or impurities detrimental to its performance Defects such as bubbles, waves, spots, scratches, spalls, discoloration, visibly imperfect coating, chipping and bubbles or delamination of opacifier film shall be limited in accordance with the Manufacturer's / trader's guidelines. The glass is to be produced in such a way that the rollers will be parallel to what will be the horizontal position of the glass. Glass shall be consistent in colour.
Manufacturers' glazing instructions regarding installation, clearance, dimensional tolerance, bite edge clearance etc. shall be followed and shall also be guided by relevant IS codes and specifications.
All solar control glass panels shall be stored with particular care and protected against abrasion, sun and moisture prior to installation.
Precautions specified by glass manufacturers to minimise thermal stress must be followed. A thermal stress analysis shall be obtained from glass manufacturer prior to fabrication and their recommendations shall be followed. Allowances shall be made for thermal movements due to an air temperature range of 600C and a material temperature range of 1000 C.
Glass panels shall be selected / rejected on the basis of product quality standards specified by the manufacturer concerning scratches, pinholes, clusters, distortion, colour variations, flaws in coating and other defects. Decision of WBSEDCL in this regard shall be final and binding to the Contractor .
Each type of glass shall be obtained from only one manufacturer and in one lot. Adequate spare quantity shall be ordered to cover for breakage and for replacement during maintenance period.
Setting blocks for glass shall be extruded neoprene with minimum 80 durometer hardness.
9.26 Gaskets: Gaskets and seals shall be extruded EPDM of approved quality, compatible with substrates, finishes and other components they are in contact with. All gaskets exposed directly on the exterior face shall be silicon gaskets.
Extruded EPDM sections shall have the following properties :
Shore Hardness: 70 □ 5A
Tensile strength: Min. 70 kg / cm2
Elongation: 300%
Ozone Resistance: No crack at 50 +/-5pphm, test temp of 40 +/-2^{0}C, test duration of 96 hours and 20% strain

Extruded neoprene sections if specifically permitted shall have the following properties:

Physical Property	Test Method	Performance
Hardness, Durometer A	ASTM D 2240	601.5 points
Tensile strength	ASTM D 412	1800 psi, minimum
Elongation at break	ASTM D 412	25% min
Brittleness temperature	ASTM D 746	400 F
Resistance to heat	ASTM D 573	Change in original properties after 70 hrs. at 1000 C
Hardness	-	+ 10 points, max.
Elongation	-	40%, max.
Tensile strength	-	15% max.

Resistance to permanent set compression set after 70 hrs. at 1000 C	ASTM D 395	25% max.

Expansion joints
Expansion joints shall be with EPDM moulding.
Peripheral Flashing shall be done with aluminium anodized black with extruded 6101 alloy T6 tamper with DC multi seal.
Necessary test certificate from the manufacturer shall have to be submitted, if so instructed by WBSEDCL , the Contractor shall submit the test report of gasket sample tested through Govt. laboratories / testing houses at the risk and cost of the Contractor, over and above submission of the above test certificate .
9.27 Surface Preparation
9.27.1 Solvent cleaning
Dirty glass edges shall be cleaned with a solvent such as isopropyl alcohol (IPA), Oily metal surfaces shall be cleaned with degreasing solvent such as toulene, or xylene. Glass and metal finish manufacturers shall ensure compatibility of the solvent used for cleaning.
Primer shall be applied as per the manufacturer's recommendations. Silicon sealant shall be applied as soon as possible to prevent built up of dirt, moisture and other contaminants from affecting adhesion of silicone to substrates.
Silicone used shall be natural curing type. Acetoxy curing sealant which release acetic acid during the cure process are not recommended for use.
All adjacent surfaces shall be masked prior to sealant application. Backer rods shall be carefully positioned.
Sealant shall be applied in a continuous operation from a caulking gun or pump. Positive pressure, adequate to fill the entire joint cavity shall be applied by pushing the sealant bead ahead of application nozzle. The sealant must fill the entire joint and firmly contact with the glass and metal surfaces. Water, soaps or alcohol solutions shall not be used as tooling aids. After tooling, the masking shall be removed.
9.28 Separators: Separators between steel and aluminium members shall be of rigid type, high impact smooth both side Teflon with minimum thickness of 0.8 mm.
9.29 Quality & Certificates: All required certificates shall be furnished against each concerned supply.
Certificate of conformance for anodized finishes and thickness along with the test result.
Test certificates from sealant manufacturers issued at regular intervals during building process, conforming compatibility of materials and adhesion properties and workmanship of the system, testing of adhesion and chemical compatibility of all elements and design review in accordance with sealant manufacturer.
Physical and chemical properties of aluminium sections used.
Over and above the submission of test certificate from the manufacturer , WBSEDCL may instruct the Contractor for sample testing at Govt. laboratories / testing houses at risk and cost of the Contractor .
9.30 Leakage Test: The leakage test shall be conducted through hose pipes with water supplied at a pressure of 5 kg / sq.cm. at his own cost.
9.31 Accessories: All accessories shall conform to the relevant IS standard and shall meet all required functional aspects.
9.32 Warranty :The tenderer shall provide full warranty for structural glazing and other works carried out by them in this contract which shall include :
Against non-falling of glasses
Sturdiness of the system
Against water penetration
Against air infiltration
Smooth operation of the doors.
The structural glazing, door & fixed glazing systems shall be warranted for a period as stipulated in the bid documents or as provided by the manufacturer, whichever is later, and all repairs to the structural, sealant and other items if required shall be carried out without any additional cost. The warranty shall be furnished in stamped paper in the form to be provided after the award of work.
If breakage of glass / structural defects occurs due to faculty design and execution within the warranty period, the same shall be replaced without any additional cost and the same shall be replaced within 2 weeks. The decision of WBSEDCL shall be final.
Complete drainage system in the structural glazing panes. Water leakage and condensation shall be drained or discharged to exterior face of wall and shall be sealed off at every floor and water shall not be retained.
9.33 Drawings: On receipt of the order, the tenderer within 15 days shall submit detailed fabrication and erection drawings indicating all fixing details and panel arrangement, door details etc. for approval and fabrication to be taken up after approval of these drawings.
9.34 Packing: Packing shall be made with PVC adhesive tape for anti-scratch requirements.
Transport of glazed units shall be done only after the sealant is cured fully.
9.35 Payment :The opening area of structural glazing / door opening shall be measured for payment. The measurement shall be guided by the relevant specification and GCC . In case of any dispute , decision of WBSEDCL shall be final and binding on the Contractor . The rate quoted shall be deemed to include cost of all materials viz. Aluminium, sections, making frames, erection, glazing sealants, weather strips, fittings and fixtures, all fixing arrangements testing, fabrication at plants and erection at site including labour, machinery, scaffolding, staging, chipping of wall, beams, columns, tests , pre commissioning test, commissioning test , rectification of plaster, painting if required, for the complete job.
The GCC shall be read and applicable in conjunction with technical specification.

10. GYPSUM BOARD FALSE CEILING
G.I. perimeter channels of size 0.55mm thick having one flange 20mm and another flange30mm and a web of 27mm. Suspending G.I. intermediate channels of size 45mm, 0.9m thick with two flanges of 15mm each from the soffit at 1220mm. Centres with ceiling angle of width 25mm X 10mmX 0.55mm thk. fixed to soffit with GI cleat and steel expansion fasteners. Ceiling section of 0.55mm thk having knurled web of 51.5mm and two flanges of 26mm each with lips of 10.5mm are then fixed to the intermediately channel with help of connecting clip and in direction perpendicular to the intermediate channel at 457mm Centres. 12.5mm thick tapered edge Gypboard conforming to IS : 2095 (latest amendments) is then screw fixed to ceiling section with 25mm dry wall screw at 230mm centres.
Finally the boards are to be jointed and finished so as to have a flush look which includes filling and finishing the tapered and square edges of the board with jointing compound, paper tape and two coats of primer suitable for Gypboard (as per manufactures specification).

Test certificate from the manufacturer with warranty shall be submitted . The cross warranty attaching warranty of the manufacturer shall be submitted by the Contractor . WBSEDCL may also ask for further testing of sample of material at the risk and cost of the Contractor.

11. ROLLING SHUTTERS:

11.1 General : The rolling shutters shall be of approved make and the design and shall be suitable for fixing in the position shown in the drawing i.e. , inside, outside, or below lintel or below joists. The shutter shall be of the manually push and pull type upto 9 sq.m. If the area of the shutter is between 9 sq.m. and 12 sq.m. There ball bearing shall be provided for easy operation . When the area is more than 12 sq.m. mechanical gear arrangements shall be provided. The rolling shutters shall generally conform to IS : 6248. The shutter shall be complete with door suspension , shafts, locking arrangements, pulling handles and other accessories. The laths shall not be less than 1.25 mm. in thickness .and 80 mm wide. Guide channels shall be of minimum 75 mm depth and made of steel sheets of not less than 3.15 mm thick.

Material testing of samples shall be done at Govt. laboratories /testing houses at the risk and cost of the Contractor and submitted to WBSEDCL .

11.2 Mode of Measurement:

11.2.1 Measurements shall be guided by provisions of GCC and specifications.

11.2.2 Payment shall be made for the clear size of the opening only and the Contractor shall include in his rate for the side guide rails , pipe shaft , springs, hood/ cover and brackets.

11.2.3 Rate shall include for all materials, fabrication , transport , erection , maintaining in place till completion of the job. One coat of shop paint, all tools ,tackle , plant , equipment , scaffolding , testing etc., required for the completion of the job as per the specifications.

12. ALUMINIUM WINDOWS & VENTILATORS

12.1 Materials

12.1.1 All sections shall be obtained from approved , reputed , manufacturers such as Hindalco , Domal, as approved by WBSEDCL and shall be extruded from aluminum alloy conforming generally to IS : 733 - 1983 and IS : 1285 - 1975.

12.1.2 Sections shall conform to IS : 1948-1961.

12.1.3 All sections shall be coloured anodised. Anodising shall be done from reputed agencies as approved by WBSEDCL with the warranty by the anodizing agency. The thickness of anodising shall be a minimum of 15 microns and the Contractor shall furnish necessary evidence in proof of this to the satisfaction of the WBSEDCL.

Samples of extruded aluminum section shall be approved by WBSEDCL and kept at site by the Contractor for ready reference .

12.1.4The engineer at his discretion may send samples to an independent laboratory for testing at the cost of the Contractor and if the test report from the laboratory indicates any deficiency the materials shall be rejected. Warranty certificate from the manufacturer shall be submitted by the Contractor.

12.2 Workmanship:

12.2.1 All frames for windows, ventilators etc., shall be flat , with all corners at right angles and shall not be warped.

12.2.2 Frames shall be fabricated from sections machine cut to length, mitred and rivetted with clips at corners. Sub- dividing bars shall be tenoned and rivetted into the frame.

12.2.3 Hinged door shall be provided with approved quality floor springs , and aluminium push plates. Push plates shall extend the full width of the shutter , and shall be provided with tower bolts and approved quality lock.

All the members of all shutters have built -in grooves to take on snap on aluminium beading. Neoprene gaskets shall be provided to prevent direct contact between glass and aluminium and make the shutter completely weather seal.

12.2.4 The Contractor shall measure each opening before fabrication. The employer shall not be responsible for any variation in the widths and heights of openings.

1.12.2.5 Frames shall be fabricated so that during fixing 6 mm clearance is obtained all round.

1.12.2.6 The Contractor before fabrication shall submit shop drawings to the WBSEDCL for prior approval.

1.12.2.7 Before erecting, frames coming in contact with masonry, plaster, concrete care should be taken that a distinct gap as directed by WBSEDCL should be kept and the same to be sealed with colourless polysulphide sealant all round the frame on both sides. The Contractor shall provide necessary treated wooden spacer blocks or frame before erecting and finalizing the alignment of the aluminium frame with respect to the masonry opening.

12.2.8 Plain or tinted glass glazing, as specified shall be fixed.

12.3 Mode of Measurement and Payment:

12.3.1 Measurements shall be guided by provisions of GCC and specifications.

12.3.2 The rate for window and Glass partitions shall include for all materials including glazing , fabrication , transport to site, erection , cost of scaffolding , maintaining in position till completion of job and including all tools, tackle , plant and equipment , testing etc. and all other necessary works incidental to the completion of the work as per these specifications. For partitions with Bison panel in Aluminium frame the rate should also be inclusive all materials labour and tools and plants.

13. ALUMINIUM COMPOSITE PANEL CLADDING

13.1 Cladding shall be non-toxic composite aluminium panels of adequate strength with approved aluminium details. The panels shall be 4mm thick composite units finished with PVDF (Polyvinylidene difluoride) coating overall 35 micron thick of approved metallic colour. The resin content of the PVDF (Polyvinylidene difluoride) coating shall be 75% to 80%. The back of the panel shall be chromatised 3-4 micron thick, compatible with adhesives for stiffeners if any or given a polymer coating.

13.2 The fabrication and installation of the cladding systems shall be carried out as per manufacturer's instructions with invisible/concealed fastenings, aluminium sub-structure, silicon sealants properly tooled etc.

13.3 All cladding panels of one kind shall be obtained in one lot from the manufactures.

13.4 Each panel shall be guaranteed for a flatness of + 1mm from the true face after installation under no-wind conditions. Deviations from the true alignment of adjoining panels shall not be cumulative. Full load deflections shall be kept to the minimum possible. Each panel shall be capable of withstanding 300 Kg/Sq.m wind pressure without any permanent deformation.

13.5 The cladding system shall be adequately ventilated. The air-gap between the cladding panels and the concrete /block –wall shall be at least 50 mm to allow proper ventilation of the rain screen system. The cavity shall be closed by a perforated bird/vermin-proof closer at bottom and by a flashing at top or any other method as mentioned in the drawing. The wall behind should be treated with approved water proof paint applied over plastered surface as directed by the WBSEDCL.

13.6 The fabrication processes including cutting, grooving, benching, folding, root-in as well as installation shall be performed as per manufacturer's instructions. The panels shall be backed by approved aluminium support framework, fixed to wall with aluminium/galvanized steel brackets. Cross warranty attaching the warranty of the manufacturer shall be submitted by the Contractor to WBSEDCL in approved form and manner .

13.7 The composite Aluminium panels shall satisfy the following fire codes requirements:

BS476	part6	Class	0
ASTM E-84	Flame Spread Index		0
Smoke developed	Index	<15	

UBC 26-9 & NFPA for 30 minute Intermediate scale Multi-story Apparatus. Test to prove no flame spread beyond the area directly exposed to fire source.

Sample approval from WBSEDCL shall have to be got done by the Contractor prior to bringing the material in bulk at site . Necessary test certificate with warranty from the manufacturer shall have to be submitted by the Contractor. Over and above the submission of test certificate, WBSEDCL at its discretion may ask for sample testing further in Govt. laboratories / test house at the risk and cost of the Contractor.

14. INTERLOCKING PRE-CAST TILES FLOORING

Materials: Interlocking concrete pavers are composed of Portland cement, fine and coarse aggregate, color is often added .Admixtures are typically placed in the concrete mix to reduce efflorescence . Pavers are made in factory- controlled conditions with machines that apply pressure and vibration.

Application: Interlocking concrete pavements are typically constructed as flexible pavements on a compacted soil sub-grade and compacted aggregate base. Concrete pavers are then placed on a thin layer of bedding sand , compacted , sand swept into the joints , and the unit compacted again .

Do not use the sand to fill depressions in the base. These eventually will be reflected in the surface of the finished pavement . Fill any depressions with base materials and compact.

50 mm thick concrete mat finish factory made tiles of M25 grade shall be provided over 50 mm thick coarse sand over 100 mm thick PCC 1:2:4 in the location of road and other areas of the building as shown in drawing. The same will be measured in Sqm . The interlocking paving tile shall be factory made of makes as specified in the list of approved manufacturer '. The size, Shapes and pattern shall be as approved by WBSEDCL. The compressive strength shall be checked from reputed laboratory from each lot and shall be kept on record, over and above, the submission of test certificate from the manufacturer.

15 GLASS MOSAIC TILE

After checking the surface for leveling , spread the adhesive (GTA) of Pidilite/ Balendula/ laticrete or equivalent with 2mm notch trowel . Place the tile sheet available in 300 x 300 mm in size in perfect alignment vertically and horizontally. Soak the back paper of tile sheet with a sponge soaked in water . Peel off the water soaked back up paper starting from a corner. After removing the paper , the mosaic tile surface shall be washed with the water to remove any residual glue . Fill the joint grooves with Birla white cement mixed with colour pigment as approved and grouting admixture using a rubber trowel and clean the surface again with wet sponge and leave the surface for 8 hrs for curing . Lastly, clean the surface with diluted HCL in a ratio of acid to water as 5 : 95 .

16 APPLICABLE CODES AND SPECIFICATIONS:

List of major Indian Standards has been given in the list of IS Codes in "Special Conditions of Contract" of this bid document.

LIST OF APPROVED MANUFACTURERS

Sl. No	Description of Approved Material	Approved Brand / Manufacturer
1	Cement	ULTRATECH(L&T)/AMBUJA/ACC/LAFARZE
2	Reinforcement Steel	SAIL/TATA/RINL
3	Structural Steel	SAIL/TATA/RINL
4	Glazed Tile	JOHNSON /KAJARIA /SOMANI
5	Ceramic Floor Tile	JOHNSON /KAJARIA /SOMANI
6	Vitrified Ceramic Floor Tile	JOHNSON / KAJARIA/ RESTILES CERAMIC LTD
7	Cement Bonded Particle Board Conforming to IS 14276 – 1995	"BISON PANEL" – INDIA – NCL INDUSTRIES LTD. (Boards Division) / EVEREST INDUSTRIES LTD .
8	Ply Wood, Shuttering Ply Conforming to IS 303-1989 / IS 4990-1993	M/s. Century Plyboards (I) Ltd. / M/s. Green Ply Industries Ltd.
9	Wooden Frame	Siliguri Sal / Malayasian Sal
10	Fire Door	Shakti met-dor
11	Rolling Shutter	Bengal Rolling Shutter
12	Stainless Steel Section	SAIL/ TATA
13	Stainless steel hardware for doors	Dorma /Haffelle
14	Glazing	Saint Gobain / Asahi Float Glass Ltd / Hindusthan Safety Glass Works Ltd. / Modi.
15	Injection water proofing, waterproofing coating, water repellents Conc. Admixtures	Sika Qualcrete Ltd./ Structural Waterproofing Co. / Pidilite Industries Ltd. / 'Fosroc
16	Synthetic Enamel Paints, Distemper, Acrylic Emulsion Paints, Melamine Coating , Aliphatic Acrylate	I.C.I (I) Ltd. / Berger Paints (I) Ltd. / Jenson & Nicholson (I) Ltd. / Asian Paints (I) Ltd. / Goodlass & Nerolac , FOSROC Chemicals(I) Pvt Ltd .
17	Flush door (Factory made)	Century Ply / Green Ply
18	Aluminium Sections and Extrusion shall conform	INDAL / JINDAL

	IS:733-1983 and IS:1285-1975	
19	General Hardware	
	a) Latches, hinges etc.	GODREJ / DORMA / HAFFELLE
	b) GODREJ / DORMA / HAFFELLE	GODREJ / DORMA / HAFFELLE
	c) Handles	GODREJ / DORMA / HAFFELLE
	d) Screw	GKW / ND/ Nettlefold
	e) Door Closure	GODREJ / DORMA / HAFFELLE
	f) Floor Spring	GODREJ /EVERITE Gencies Pvt. Ltd. /Garnish
	g) Aldrop	ISI Marked
	h)Tower bolt	ISI Marked
	i) PVC Buffer block	ISI Marked
	j) Door Stopper	ISI Marked
	k) Patch fittings for toughened glass	Dorma Systems
20	Laminates	"DECOLAM" (Bakelite Hylam Ltd.) / "MERINO" (Century Laminating Co. Ltd.)./ GREENLAM (GREEN PLY)
21	Marble	
	White Variety (Indian) Green Variety (Indian) Italian Marble	Abu White Super Udaipur As per approved shade
	Granite	
a	Red	Ruby Red
b	Black/Grey	Premium
22	Kotah stone (Bluish grey)	Premium
23	Waterproof Adhesive for Tile / Slab fixing to wall or floor	SIKA/Fosroc/Pidilite/Roffe
24	Sealant	
25	Tile Jointing Materials	
26	Decorative Ply (Teak / Cedar / Mahegony / Walnut Veneer)	Century Ply/Green Ply
27	Cement Based Exterior Textured Paint	ICI/Asian Paints /Berger/ Snowcem India Ltd.
28	Glass Mosaic tiles	Shon/Kent/Bisazza
29	Glass for structural glazing & canopy (Coloured Reflective toughened glass)	Saint Gobain / Hindustan Pilkington/ Ashai float glass
30	Silicone Sealant	GE/Dow Corning
31	Aluminium composite panel	Aluco bond/Aludecor/Alstrong/Alupan
32	MS Conduit pipe	BEC /SUPREME/ AKG
33	PVC Conduit pipe	AKG /PLAZA/ PADAM
34	Pre-constructional Anti-termite (Chloropyriphos)	Pest Control India or approved by WBSEDCL
35	Cement Primer	ICI / BERGER / ASIAN
36	Textured Paint	ICI / BERGER / ASIAN PAINTS ,
37	Waterproofing acrylic emulsion exterior grade paint	ICI / BERGER / ASIAN PAINTS
38	Acrylic Polymer waterproofing coat	SIKA / FOSROC / PEDILITE / ROFFE
39	Expanding grout admixture	SIKA / FOSROC / PEDILITE / ROFFE
40	Integral waterproofing compound	SIKA / FOSROC / PEDILITE / ROFFE
41	Waterproofing admixture	SIKA / FOSROC / PEDILITE / ROFFE
42	Plasticizer	SIKA / FOSROC / PEDILITE / ROFFE
43	APP membran	SIKA / TEXSA / PEDILITE
44	PVC door	SINTEX OR AS APPROVED BY WBSEDCL
45	Aluminum anodized louver	HUNTER DOUGLAS
46	Structural glazing	JINDAL/HINDALCO
47	Stainless steel handrail with baluster	GODREJ / DLINE
48	False ceiling	GYPSUM/EVEREST/ARMSTRONG

Note:
If the approved brands mentioned above are not available, equivalent make as may be approved by WBSEDCL only is to be used for the work. The items for which brand name or name of the manufacturer have not been mentioned in the above list , shall be given by WBSEDCL to the contractor during the execution of work. The above list is not comprehensive and WBSEDCL reserve the right to ask the contractor for use of any alternate brand / manufacturer during execution of work, of equivalent quality.

TECHNICAL SPECIFICATION FOR WATER SUPPLY & SANITARY DRAINAGE SYSTEM (GENERAL)

I. GENERAL:

1. The Contractor shall arrange with local municipal authorities for getting the water and sewerage connections.

2. The Contractor shall arrange for submission of plans to the statutory authorities / local bodies etc. and obtaining sanction of the same.

3. The rates are of complete works/items as defined in the respective items of the B.O.Q. as fixed in position and overall costs- e.g. cutting of holes, chases, etc., and also for provision of fixing arrangement viz., clamps ,brackets, wooden blocks priming, painting etc. and include restoration to original condition of all damages to walls, floors etc., during the process of fixing sanitary installations , water supply and drainage . All debris of plumber's excavation, etc., shall be removed without any extra charge. The plumbing work/or the building work effected by the plumber work shall be left thoroughly cleaned to the satisfaction of WBSEDCL.

4. Unless specified to the contrary, all material should conform to ISI specification and be of best quality and make as approved by the WBSEDCL. Testing shall be undertaken for various materials samples, pipe lines etc. and as may be directed by the WBSEDCL at the risk & cost of the Contractor.

5. All G.I pipes (except concealed pipes and underground pipes) and brackets and fixtures and manhole covers shall be painted with 2 coats of synthetic enamel paints of approved brand over a coat of Red-oxide Primer/ Red lead primer, as directed.

6. All concealed and underground G.I pipes and specials shall be painted with 2 coats of bituminous paint & primer of approved brand as directed by WBSEDCL.

7. All priming and painting work shall be carried out to the satisfaction of the WBSEDCL and cost thereof shall be covered in the rates of all the respective items.

8. The Plumbers shall obtain the drainage completion certificate and the certificate of adequate water supply from the Local statutory body / Panchayat / Municipality and shall abide by the rules and regulations prescribed by them or other authorities concerned, wherever necessary.

9. In case of concealed G.I pipe work, the chases in floors and walls shall be made as approved by WBSEDCL. The pipes shall be secured tightly to the walls with clamps. The chases shall be filled with cement concrete 1:2:4 (1 cement: 2 coarse sand : 4 graded stone aggregate of 20mm nominal size). Payment shall be made for cutting chases and filling in the cement concrete and making them good as per relative item in the Bill of quantity for renewal items as per relevant specifications.

10. The cast iron pipes shall be laid exposed on wall with M.S. holder bat clamps made from 32mm thick. M.S. flats of approved design and required size. A clear minimum gap of 25mm between the wall and the pipe shall be left. All the clamps shall be embedded in cement concrete blocks sized 20cm x 20 x 10 cms. in 1:2: 4 mix (1 cement :2 coarse sand : 4 graded stone aggregate - 20mm. nominal size) . The holes in walls and RCC work shall be made at point approved by WBSEDCL, and shall be made by the Contractors. Payment shall be made as per respective item in the Bill of Quantities complying with relevant specifications.

11. All plumbing 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 for concealed at the time of casting of concrete and during the work shall be placed in position and embedded for concealed at the time of casting of concrete and during the work of construction. In case where chasing or cutting of concrete, masonry, or other structural or constructional work is unavoidable, the location of such fittings, pipe lines and traps etc., shall be chalked out at the various places and the cutting, chasing or disturbing of the construction work shall be proceeded only after the due approval of WBSEDCL.

12. All cuttings, chasing and fixing work shall be completed before commencement of any plastering, tiling or finishing work. Any rectification required shall be done at the risk & cost of the Contractor to the entire satisfaction of WBSEDCL.

13. Galvanized iron pipes of "TATA" make of "Medium" quality, E.R.W. as per IS – 1239, P-I; and Pipe Fittings shall be of "Heavy" quality, as per IS – 1239, P-II, of Galvanized Malleable Cast Iron, with Material code conforming to IS-1879 of "HB", or "NB" , "Zoloto", Leader, "JSI" or equivalent Brand.
Test certificates from the manufacturer shall be submitted by the Contractors. Over & above the submission of test certificates; WBSEDCL may also ask to the Contractor's for further testing of samples in Govt. laboratories/test houses at the risk & cost of the Contractor.

14. Samples:
In all cases samples of the materials proposed to be used shall be submitted for approval of the WBSEDCL, before taking up the work in hand and the samples shall be well preserved at site by Contractor at his own risk & cost.

15. Materials, Workmanship & Samples:
All the materials and workmanship are to be of the best possible description and to the entire satisfaction of WBSEDCL and the Contractors shall immediately remove from the site any materials and /or workmanship which, in the opinion of WBSEDCL, is defective or unsuitable and shall substitute proper materials and /or workmanship forthwith at Contractor's risk& cost.

16. The Contractors shall ,if required by WBSEDCL, arrange to test material and / or portions of the works at his own cost in order to prove their soundness and efficiency, physical & chemical properties from Govt. laboratories / test houses. If after any such test, the work or portion of works is found in the opinion of the WBSEDCL, to be defective or unsound , the Contractor shall pull down and re-execute the same at his

own cost. DEFECTIVE materials shall be removed from the site within 7 days from receipt of such order at his risk & cost. No extra claim whatsoever shall be entertained by WBSEDCL.
Wherever reference has been made to Indian Standard or relevant specifications or any other specifications, the same shall mean to refer to the latest specifications irrespective of any particular edition of such specifications being mentioned in the specifications or schedule of quantities. In case of any dispute, the decision of WBSEDCL shall be final & binding on the Contractor.
Bidders should note that the quantities in the Bill of quantities are approximate and are subject to variation to any extent.
This Technical specification shall be read in conjunction with other part / specification of the contract, viz. GCC SCC etc.
WBSEDCL shall have the right to modify / change the working drawing even after issue to the Contractor.

II. MATERIALS:

General:
a) All materials shall be of best of their kind and shall conform to the latest Indian Standard specifications.
b) A set of specification samples of all approved materials shall be kept well preserved at site, cost of which is to be borne by the Contractor.

1.0 SANITARY WARES:
All sanitary wares and fittings shall be of first class quality white vitreous China as manufactured by Hindware, or Parryware or Cera and sample brand approved by WBSEDCL prior to the procurement in bulk by the Contractor.
Stainless steel sinks and draining board shall be of best quality stainless steel of "Imagine" SS Sink from "Hindware"/ "Nirali" / "Parryware" with sample and brand approved by WBSEDCL prior to the procurement in bulk by the Contractor.

2.0 CAST IRON SOIL & WASTE PIPE:
All cast iron soil pipes shall be of Sand cast with Socket & Spigot ends of standard make. The thickness and specification shall conform to Indian Standard specifications IS: 3989- "Centri" cast.
Pipes and fittings shall be true to shape smooth cylindrical, their inner and outer surfaces being as nearly as practicable concentric.
Pipe when tested for soundness by striking with a light hand- hammer shall emit a clear ringing sound. The pipes shall be free from cracks, laps, pinholes or other imperfection and shall be neatly dressed and carefully felted.
The fittings shall be of easy clean type. The access door fittings shall be designed so as to avoid dead spaces in which filth may accumulate. Door shall be provided with(3mm) rubber insertion packing and when closed and bolted ,these shall be water tight.
Pipes and fittings shall be supplied without ears. Each pipe fittings shall have the trade mark of the Manufacturer and nominal size suitably marked on it.
M.S. stays and clamps shall be made from minimum 1.6mm thick M.S. flat of minimum 30mm width bent to the required shape and size to fit tightly on the socket, when tightened with screw bolts. Lead to be used for the jointing of the pipes shall be refined lead of best quality.
Floor traps shall be of approved make, 'P' type with minimum of 2" (50mm) water seal. At the top of each of these Floor Traps there shall be provided with 5" dia.(125mm) CP brass circular Grating of approved make.
These shall be Sand Cast iron pipes (class 'SWR') conforming to Indian Standard specification IS: 3989- "Centri" cast.
Sample and brand / make approval shall be done by WBSEDCL prior to procurement in bulk quantities by the Contractor. WBSEDCL at its discretion may ask the Contractor for sample testing through Govt. test house / laboratories at the risk and cost of the Contractor.
2.1 Lead Caulked Joints: The annular space between the socket and spigot will be first well packed in with spun yarn leaving 25 mm.(1") from the lip of the socket for lead . the joint may be headed by using proper leading rings or if they are not available , by wrapping a ring of hemp rope covered with clay round the pipe. The lead shall be rendered thoroughly fluid and each joint filled in one pouring. Before caulking , the projecting lead shall be removed by flat chisel and the joint caulked round with proper caulking tools and a hammer of 1 to 1.1/2 kg (2 to 3 pounds) in weight in such a manner as to make the joint quite sound. After being well set, the joint is to be flush , neat and even the sockets. The specifications etc, shall comply to the relevant IS & CPWD specifications.
The approximate depth and weight of pig lead for various diameters of C.I pipes and specials shall be as given below (as a guide-line) :
LEAD FOR DIFFERENT SIZES OF PIPES

Nominal Size of Pipe (mm)	Lead/Joint (Kg.)	Depth of lead Joint (mm)
80	1.8	45
100	2.2	45
125	2.6	45
150	3.4	50
200	5.0	50
250	6.1	50
300	7.2	55
350	8.4	55
400	9.5	55
450	14.0	55
500	15.0	60
600	19.0	60
700	22.0	60
750	25.0	60

Note :
The quantity of lead given in the table are provisional and a variation of 20 percent is permissible, at the discretion of WBSEDCL.
The approximate depth and weight of pig lead for various diameters of C.I pipes and specials shall be as per relevant IS & CPWD specifications.

2.2 Smoke Testing: All CI Sewer & Waste pipes and fittings including joints will be tested by a smoke test and left in working order after completion. The smoke test shall be carried out as stated under. No extra payment will be made for the tests. Smoke shall be pumped into the brains at the lowest end from a smoke machine which consists of a blow and burner. The materials usually burnt are greasy cotton waste which form clear pungent smoke which is easily detectable by sight as well as smell if leaking at any point of drain. the Contractor will have to rectify all defects traced in such tests at his own expense to the complete satisfaction of the WBSEDCL. The test shall be carried out at the risk & cost of the Contractor at Site, in presence of WBSEDCL complying to the relevant IS code & relevant specifications.
2.3 Testing of Materials and works: As and when required by the WBSEDCL , the Contractor shall arrange to test materials and /or portions of works at his own cost to prove their soundness and efficiency. if after tests, any materials ,work or any portions of work are considered defective or unsound by the WBSEDCL, the Contractor shall remove the same from the site forthwith at his own risk & cost. No extra claim for this or for any rectification / modification shall be entertained by WBSEDCL. All testing shall be guided by relevant IS code & relevant specifications at the risk & cost of the Contractor.

3.0 G.I PIPES AND FITTINGS:
All G.I. pipes shall be of galvanized iron "Medium" quality (as per IS-1239, P-I) of "TATA" make unless otherwise specified or separately / specifically approved / allowed by WBSEDCL. All fittings shall be of 'HB', or 'NB', 'Zoloto', 'Leader' brand or other equivalent make bearing ISI certification mark. The pipes shall be seamless screwed of socketted conforming to the requirement of IS : 1239-1985. These shall be of the diameter (nominal bore) specified. The pipes and sockets shall be cleanly finished, well galvanized in and other defects. All screw threads shall be clean and well cut. the ends shall be cut cleanly and square with the axis of the tube. Sample tests for physical & chemical properties may be asked for by WBSEDCL at the risk & cost of the Contractor from Govt. laboratories / Test houses over & above submission of Manufacturer's Test certificates.

4.0 (FULL WAY) GATE VALVES:
These shall be of Bronze / Gun metal (PN-10) or (PN-16) quality of "ZOLOTO" or "SANT", 'Leader' conforming to the relevant IS specifications and tested to 21 kg. per sq. cm. for 2 minutes. Necessary Test certificates shall be submitted by the Contractor with warranty from the manufacturer as asked for by WBSEDCL.

5.0 C.P. TOILET FITTINGS:
5.1. C.P. Brass Bib Cocks, Two-way Bib Taps, Stop cocks, Angle Stop cocks, Pillar cocks : These shall be of Chromium plated Brass 'heavy' quality, threaded to BSPT (F) of Jaquar/Marc/Hindware/Essco make (as per B.O.Q) conforming to IS specification as per IS- 8931. Sample approval shall be taken by the Contractor from WBSEDCL prior to procurement in bulk quantities with samples well preserved at Site at the risk & cost of the Contractor.
5.2. C.P. Brass Pillar Cock (with control box) (for wash basins): This shall be of Jaquar/Marc/Hindware/Essco make with wall mounted Control Box below the Wsah Basins, threaded to BSPT (F) and conforming to IS-8931. Sample approval shall be taken by the Contractor from WBSEDCL prior to procurement in bulk quantities with samples well preserved at the risk & cost of the Contractor.
5.3 Health Faucets: This shall be of Jaquar/Marc/Essco model, to be fitted with the two-way bib cocks inside each W.C.s (except Driver's Toil), threaded to BSPT (F) and conforming to IS-8931. Sample approval shall be taken by the Contractor from WBSEDCL prior to procurement in bulk quantities with samples well preserved at Site at the risk & cost of the Contractor.

6.0 BALL FLOAT VALVE:
The ball float valves shall be of brass body of high pressure or of Pressure as specified. The Ball valve shall be of brass and the float of PVC of high pressure withstanding capacity. The minimum gauge of PVC Ball Float, the body of the ball valve shall be capable of withstanding a pressure of 200 lbs. per sqm.(14 kg. per sqm). The ball valve shall conform to IS specification No.
1708-1962. Necessary test certificates with warranty shall be submitted from manufacturers by the Contractor to WBSEDCL when asked for.

7.0 SUBMERSIBLE PUMP OF BORE WELL:
(To supply underground water from subsoil aquifer to the R.C.C underground tank.)
Supply, installation in bore well, testing & commissioning of submersible multistage pump motor set Capacity- 16.5 M3/Hr. max (i.e., 275 LPM) at 50 M head with 'Submersible' type suitable HP Rated Motor (min. 3.7 kw , 5HP) at 2900 / or 1450 RPM; including supplying of 35 Mtr. long suitably rated & suitable cross-sectioned 3 1/2 -core "Submersible" type PVC insulated Sheathed Armoured Cable with Cable Clamps (Cable size as per Manufacturer's standard) as required, and including 415 Volt, 3-phase, 50 Hz Star-delta Starter Panel suitable to withstand +/_ 10% voltage variation and +/_ 3% frequency variations with Switch Fuse unitsand Isolators etc, of approved Make/Brand, including all other necessary accessories complete as required.
(Make: - CALAMA / KSB / CRI).
Necessary test certificates with "warranty" from manufacturers as asked for by WBSEDCL shall have to be submitted by the Contractor with functional testing at site at the risk & cost of the Contractor in presence of WBSEDCL's representative.
7.1 Testing of Water Sample
Necessary chemical and bacteriological tests as per IS specifications for potable water shall have to be done by the Contractor at his risk & cost from Govt. laboratories / test houses as directed by WBSEDCL prior to commissioning of the Project.
7.2 Bleaching Dosing Tank
The bleaching dosing tank as shown in the drawing should be constructed and the dosing shall comply the specification & requirements of relevant IS code & specifications.

8.0 WATER LIFTING PUMP FROM UG TANK TO TERRACE TANK
It shall be of horizontal centrifugal type pumps for transfer of treated water from U/G Domestic Treated Water Reservoir to the Terrace Tanks of both Hostel Block and Training Centre to fill the Terrace Fire Tank first, which will re-circulates to the adjacent Terrace Domestic tank to store the treated water suitable to suit the drinkable water quality (as per IS-10500). The Treated Water from the individual Terrace Tank shall be distributed 'Down-Gravity' to respective individual Toilets.
(Treated water lifting pumps should be with C.I. Impeller, integrally coupled with submersible type 3 – phase 2900 R.P.M., 415 Volts, A.C. Motor, capable to withstand a voltage variation of (+/-) 10% and frequency variation of (+/-) 3%, including Pump Control Panel).
Pump of Capacity – 162.0 LPM @ 34.0 M head – with 2.2 KW (3 H.P) Motor input, 2900 rpm 3-phase integrally coupled Motor.

(To be located inside the Treated Water U/G Tank)
(Make- Kirloskar/KSB/Crompton Greaves).
Necessary test certificates with "warranty" from manufacturers as asked for by WBSEDCL shall have to be submitted by the Contractor with functional testing at site at the risk & cost of the Contractor in presence of WBSEDCL's representative.
GLOBE VALVE :
Bronze / Gun-metal Globe valve, rising / non-rising Spindle type (IS-778), screwed in Bonnet, provision of repacking under pressure, Teflon Gland packing, Class-I, with 'OPEN'/ 'SHUT' indicator and locking device, and also with C.I. Wheel of approved quality (screwed end).
(Make :- Zoloto / SBM / Leader)
It shall be of Bronze body Globe Valve with C.I. Wheel, screwed-in Bonnet, rising Spindle, Lubricated Gland Packing, conforming to IS-778, class-I, Bronze Disc & Disc nut, Brass Stem, with Asbestos Gland packing, and valve of approved quality (screwed end- female threaded).
Necessary test certificates with warranty from manufacturers as asked for by WBSEDCL shall have to be submitted by the Contractor with functional testing at site at the risk & cost of the Contractor in presence of WBSEDCL's representative.

10.0 PRESSURE REDUCING VALVE:
(At inlet main to every individual toilets and kitchen/canteen, except the top floor)
It shall be of 50mm and 32mm nominal diameter of Rubber Diaphragm type Pressure Reducing Valve of Bronze Body / Bottom Cover & Lock-nut (as per IS- 318 LTB 2), Spring loaded, screwed (female) end as per B.S.-21 class with reduced Set pressure range (Up-stream - to - Down-stream) of 3.5 Kg. / sq. cm. - to - 1.0 Kg. / sq. cm., with C.I. Camber & Bonnet, Seat Ring & Stem of S.S. (AISI 410), Bolt/nut & Tommy Bar of M.S., C.I. Spring Disc & Carbon Steel Spring, & EPDM Diaphragm, C.A.F. Gaskets (IS- 2712, Gr.-C), and the Valve with a Test Pressure (Hydraulic) of 35 Kg. / sq. cm. & with S.S. Screw / bolts / washers etc., and also with Teflon Thread Seal etc., all complete.
(Make - ZOLOTO- Product Catalogue no.-1040 / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by WBSEDCL. The functionality shall be tested at site in presence of WBSEDCL's representative at the risk & cost of the Contractor.

11.0 NON-RETURN VALVE (N.R.V.):
Bronze body "VERTICAL -LIFT" type Non-Return ("Check") valve with S.S. (AISI-410) body Seat Ring, two-piece design, S.S.(AISI-410) Disc, Screwed to BSPT-female (BS-21), with necessary 'Teflon' Thread Seal, including accessories.
(Make - ZOLOTO- Product Catalogue no.-1045 / Leader)
(At Submersible Raw water Supply Pump Discharge pipe at the U/G Reservoir).
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by WBSEDCL. The functionality shall be tested at site in presence of WBSEDCL's representative at the risk & cost of the Contractor.

12.0 GATE VALVE (BRONZE BODY):-
It shall be of 40mm nominal diameter of Gate Valve of Bronze Body, hand wheel operated, screwed (female) end as per B.S.-21 class with Non-Rising Spindle, Screwed in Bonnet, and Lubricated Gland packing, & with a provission of re-packing, Valve conforming to IS- 778, Class -I, outer body with Bronze conforming to IS-318 LTB 2, Bonnet, Stuffing Box & Gland of Bronze/ forged Brass conforming to IS-318 LTB 2 / or IS-6912 FLB, Brass Stem, Bronze or Brass Gland nut, with C.I. Hand wheel conforming to IS-210 Gr.- FG 200, & with S.S. Screw / bolts / washers etc., and Valve Test pressure of 1.0 M Pa, and also with Teflon Thread Seal etc., all complete.
(Make - ZOLOTO- Product Catalogue no.-1035 / Leader)
(At Submersible Pump Discharge pipe).
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by WBSEDCL. The functionality shall be tested at site in presence of WBSEDCL's representative at the risk & cost of the Contractor.

13.0 NON-RETURN VALVE (N.R.V): C.I. BODY:
(At Hydro-pneumatic Pump Discharge pipe)
These should be of C.I. Body, Check valve, Horizontal "Lift" – type with PN – 10 rating, with M.S. "Slip-on" type matching Flanges, along with CAF gaskets and appropriate M.S. Bolts, nuts, plain round Washers etc, all complete
(Make:- "Zoloto", code- 1067) / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by WBSEDCL. The functionality shall be tested at site in presence of WBSEDCL's representative at the risk & cost of the Contractor.

14.0 AIR-RELEASE VALVE : BRONZE/GUN METAL BODY:
(At Water Supply Lie top to different Blocks & to Kitchen pipe Riser top)
It shall be of Bronze / Gun metal body "Parallel Slide" – "Blow-off"valve with BS-10 Table-H / E Flanged ends, sliding action Discs, spring loaded, rack-pinion arragt., S.S Discs, Body Seat Ring of S.S., Grahite Asbestos packing, M.S. Key, with Hyd. Test pressure of 500 p.s.i.g, with adjustable 'OPEN' / 'SHUT' arragt. of approved quality (Flanged end)
(Make:- "Zoloto", Code- 1052 / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by WBSEDCL. The functionality shall be tested at site in presence of WBSEDCL's representative at the risk & cost of the Contractor

15.0 BLOW-OFF VALVE : BRONZE / GUN METAL BODY:
(At Water Supply delivery Main Line Hydro-pneumatic system for blow-off due extra pressure in main back to the U/G treated tank)
It shall be of Bronze / Gun metal body "Parallel Slide" – "Blow-off" valve with BS-10 Table-H / E Flanged ends, sliding action Discs, spring loaded, rack-pinion arragt., S.S Discs, Body Seat Ring of S.S., Grahite Asbestos packing, M.S. Key, with Hyd. Test pressure of 500 p.s.i.g, with adjustable 'OPEN' / 'SHUT' arrangement of approved quality (Flanged end).
(Make:- "Zoloto", Code- 1052 / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by WBSEDCL. The functionality shall be tested at site in presence of WBSEDCL's representative at the risk & cost of the Contractor.

16.0 DRAINAGE- STONE WARE PIPES:

All pipes shall be of best salt glazed variety conforming to IS specification. The pipes shall be free from visible defects such as fire cracks or hair cracks. The glaze of the pipe shall be free from blisters. The pipes shall conform to IS : 651-1965.

17.0 SANITARY INSTALLATION:
Sample approved shall be done prior to bringing in bulk quantities at site by the Contractor.
17.1 The W.C. Pans shall be of white vitreous China Wall mounted Pattern with C.I. Chair Bracket of fitted with 'P' or 'S' trap (with a conversion bend) of vitreous China with effective 2" seal and 2" vent as per IS : 771-1963 & IS:2556 (Part II & VII) , 1967.
17.2 Fixing: The W.C. Pan shall be laid in floor sloped towards the pan in a workman like manner, care being taken not to damage the pan in the process of fixing. It shall be fixed on a base of cement concrete 1: 3: 6 mix. (1 cement: 3 coarse sand: 6 stone ballast 40 mm and down gauge) taking care that the cushion is uniform and even without having any hollows between the concrete and pan. The joint between the W.C. pan and the trap shall be made with cement mixed with water proofing compound and made leak proof.
17.3 Flushing by PVC 'Low Level' Cistern (manually): The flushing of W.C. pan shall be done by "Hindware" / Parryware / Cera / Neycer make, PVC 'Low Level' Cistern- manually operated with push lever.
17.4 Brackets: (for Wall mounted W.C.- fixing): The fixing bracket of Wall mounted W.C.'s should be of C.I. 'Chair' Bracets to remain fully concealed & embedded in wall and partially in floor finish. The W.C. shall be fixed to the chair Bracket with proper galvanised fixing Bolts, Nuts, and Wahers etc, to the satisfaction of the Engineer- in charge.
17.5 Flush Pipe: The outlet of flush pipe from the cistern shall be of 32 mm (1.1/2") rigid P.V.C. (as per ASTM D 1785), schdl.-40 pipe to remain concealed inside the wall & finish upto the mouth of the Inlet port of the 'Wall hung' W.C.'s, and that shall be connected with the W.C. pan by means of an approved type of joint.
17.6 Seat & Lid: These shall be of black plastic or any approved matching colour hygienic seat and lid or as specified with rubber buffers, CP brass hinges and screws of standard 'Hindware' or 'Parryware' makes relative to the or equivalent approved Models & makes as in the schedule of Quantities.

18.0 URINALS:
The urinal basin shall be flat back of white vitreous China of specified size. It shall be fixed in position by using wooden plugs and screws at a height such that the outside bottom of Urinal Basin remains at 600 mm. from the finished floor level. The Urinal Basin shall be of "Flat-back-Large" type. Standard height of the Urinal Basins shall be as per the respective Manufacturer's standard. At least 200mm is to be given for fixing the "Jaquar" Sensor Installation Box from the top of the urinal (where the CP Spreader inlet Hole), if such installation is directed by WBSEDCL. Each urinal shall have 32 mm. dia. CP Bottle Trap with connected CP Waste Pipes, CP Waste Couplings etc, (as per the drawings).
18.1 Waste Pipes-concealed & Traps: Each concealed Waste pipes (in proper slope) from the Urinals shall have 32 mm. dia. Rigid PVC (ASTM D 1785), schdl.-40) and this shall be further connected to 40 mm. lead of PVC waste pipe conforming to ASTM D 1785, complete with G.I. unions, elbows, tees (equal or unequal) (as per IS-1879) of approved make as specified in the schedule of quantities, including wiped plumber joint complete with unions shall be terminated upto the mouth of respective extension pieces of the 100mm dia C.I. 'P' traps (below floor finish).
The main and distribution pipes fittings and clamps shall be of C.P brass unless otherwise specified in the schedule of quantities, distribution pipes shall feed the urinals with C.P. brass spreaders of approved make.
18.2 Painting: In case of cast iron flushing cisterns, painting shall be done as specified in the Bill of quantity.

19.0 KITCHEN SINK:
The above item shall be of Salem Stainless Steel Kitchen Sink - (AISI-304, conforming to IS-13983), Single Bowl, built with superior steel, with Bowl size not less than- 560 x 410mm and with Bowl depth of 205mm to 215mm; and total overall size - 1145 x 510mm, with a provision of a Drain-board, also including with 40mm Salem Stainless Steel Unique Waste Coupler and Coupler knob with C.I. / MS fixing Brackets, and C.P. screws/washers etc.(Make - Hindware / Parryware / Nirali)
19.1 Fittings: Each Sink shall have single pillar tap (Sink Cock with swinging lever of "Jaquar", model-Clarion). It's a special tap for the type of the sink specified and other fittings as specified , of Jaquar/ Marc / Essco make 40 mm (1.1/2") C.P. brass waste (CP) . C.P. brass angle valve with inlet connection of C.P. brass chain and rubber plug.
19.2 Waste Connection: Waste pipe shall be of 1.1/2" dia. (32 mm.) rigid P.V.C. (concealed) pipe of approved make (as per ASTM D 1785), complete with unions. This shall discharge into a Floor trap.
19.3 Fitting: Sinks shall be provided with 1/2"(15 mm C.P. brass valve) mixing fitting of 'Jaquar', or 'ESSCO' make complete with swinging spout.
19.4 Waste Connection: The waste pipe shall be of PVC 1.1/2" (32 mm.) dia. As per ASTM D 1785, discharging upto the Floor trap. The rates shall include the cost of all materials and labour involved in all the operations described above.

20.0 TOILET REQUISITES:
Sample approved shall be done prior to bringing in bulk quantities at site by the Contractor.
20.1 Mirror: Mirrors shall be of 6.0 mm. thick plate glass Saint Gobain / Modi-guard / Ashai make or approved equivalent make. The glass shall be uniformly silver plated at the back. Silvering shall have a uniform protective coating of red lead paint. The mirror shall have Plastic moulded frame of approved quality and colour. The mirror and its 6mm thick hard backing shall be fixed on the wall face to wooden cleats with C.P. brass screws and washers.
Toilet paper holder shall be of chromium plated as specified in the B.O.Q.
20.2 CP Robe Hooks (with double/ single Forks): Theses should be of CP Robe Hooks with double / or single forks, of Hindware / Jaquar / Essco supported on anodized chromium plated base, fixed with 40mm long screws, rawl plugs etc., all complete.

21. WATER CLOSETS:
Samples shall have to be got approval from WBSEDCL prior to bringing in bulk quantities at site by the Contractor.
21.1 European type water Closets (EWC) : "Floor mounted type"(Make - Hindware / Parryware / Neycer)
The W.C. Pans shall be of white Vitreous China Wall mounted Pattern with C.I. Chair Bracket of fitted with 'P' or 'S' trap (with a conversion bend) of vitreous China with effective 2" seal and 2" vent as per IS : 771-1963 & IS:2556 (Part II & VII) , 1967.
Fixing:

The W.C. Pan shall be laid in floor sloped towards the pan in a workman like manner, care being taken not to damage the pan in the process of fixing. It shall be fixed on a base of cement concrete 1: 3: 6 mix. (1 cement: 3 coarse sand: 6 stone ballast 40 mm and down gauge) taking care that the cushion is uniform and even without having any hollows between the concrete and pan. The joint between the W.C. pan and the trap shall be made with cement mixed with water proofing compound and made leak proof.

22.0 FLUSHING BY PVC FLUSHING CISTERN: (MANUALLY)

22.1 Brackets (for wall mounted W.C. fixing): The fixing bracket of Wall mounted W.C.'s should be of C.I. 'Chair' brackets to remain fully concealed & embedded in wall and partially in floor finish. The W.C. shall be fixed to the chair Bracket with proper galvanized fixing Bolts, Nuts, and Washers etc, to the satisfaction of WBSEDCL.

22.2 Flush Pipe: The outlet of flush pipe from the cistern shall be of 32 mm (1.1/2") rigid P.V.C. (as per ASTM D 1785), schdl.-40 pipe to remain concealed inside the wall & finish upto the mouth of the Inlet port of the 'Wall hung' W.C.'s, and that shall be connected with the W.C. pan by means of an approved type of joint.

22.3 Seat & Lid: These shall be of black plastic or any approved matching colour hygienic seat and lid or as specified with rubber buffers, CP brass hinges and screws of standard 'Hindware' / 'Parryware' / 'Neycer' makes relative to the or equivalent approved Models & makes as in the schedule of Quantities.

22.4 W.C. Pan:

22.4.1 The W.C. Pans shall be of white vitreous china wall mounted pattern with C.I. chair bracket fitted with 'P' or 'S' trap (with a conversion bend) of vitreous China with effective 2" seal and 2" vent as per IS : 771-1963 & IS:2556.

22.4.2 Fixing: The W.C. Pan shall be laid in floor sloped towards the pan in a workman like manner, care being taken not to damage the pan in the process of fixing. It shall be fixed on a base of cement concrete 1: 3: 6 mix. (1 cement: 3 coarse sand: 6 stone ballast 40 mm and down gauge) taking care that the cushion is uniform and even without having any hollows between the concrete and pan. The joint between the W.C. pan and the trap shall be made with cement mixed with water proofing compound and made leak proof.

22.5 Flushing by Flush valve: (manually): The flushing of W.C. pan shall be done by Jaquar / Essco / Hindware make, CP Flush valve with 32mm dia CP Control cock (Wall mounted), with push lever.

22.6 Brackets: (for Wall mounted W.C.- fixing): The fixing bracket of Wall mounted W.C.'s should be of C.I. 'Chair' Bracets to remain fully concealed & embedded in wall and partialy in floor finish. The W.C. shall be fixed to the chair Bracket with proper galvanised fixing Bolts, Nuts, and Washers etc, to the satisfaction of WBSEDCL.

22.7 Flush Pipe: The outlet of flush pipe from the cistern shall be of 32 mm (1.1/2") rigid P.V.C. (as per ASTM D 1785), schdl.-40 pipe to remain concealed inside the wall & finish upto the mouth of the Inlet port of the 'Wall hung' W.C.'s, and that shall be connected with the W.C. pan by means of an approved type of joint.

22.8 Seat & Lid: These shall be of black plastic or any approved matching colour hygienic seat and lid or as specified with rubber buffers, CP brass hinges and screws of standard 'Hindware' or 'Parryware' makes relative to the or equivalent approved Models & makes as in the schedule of Quantities.

23.0 RAIN WATER PIPES OF PVC (IS-13592) & PVC/CI PIPE FITTINGS & SPECIALS AS PAR IS: 1729

All Rain Water pipes and fittings shall be of PVC, conforming to the latest Indian standard specifications for rain pipes. CI pipe clips or CI holder bat clamps are to be used for proper clamping on the wall.

These shall be free from cracks and other flaws. The interior of pipes and fittings shall be clean and smooth and the pipes are to be painted outside with paints matching with the colour of the building outside wall paints.

The access door fittings shall be of proper locations and in no circumstances less than as shown in the drawings. Doors shall be provided with 3 mm. (1/8") rubber insertions packing and when closed and bolted they shall be fully water tight.

23.1 Fixing: The pipes and fittings shall be fixed to walls by using proper holder UPVC Pipe Clips (at every 2.0 metres intervals on the outside Building exterior wall pipes, i,e., Stacks or Pipes in slopes). The pipes shall be fixed perfectly vertical or in a line as directed. The spigot end and the shoulder of the socket leave no annular space in between. All Rain water pipes shall be carried up above the roof and shall have proper UPVC Bends of required degree near the roof and at the bottom of Rain water pipes. Connections between main pipe and the branch pipes shall be made by using proper branches and bends invariable with access-doors for cleaning. All vertical pipes should be covered on top with a wire down. The pipes and fittings should be firmly attached to the wall at least 5 mm. clear of the wall & should be strongly supported at the foot upon a bed of concrete.

23.2 Joints of Pipes & Fittings (by jointed by solvent cement joints / joints with Rubber gasket insertion) for CI pipes etc: The annular space between the socket and spigot will be jointed by solvent cement joints / joints with Rubber gasket insertion between the pipes & Pipe Fittings. This shall be done with 100% Leak-proof under Hydro-static Pressure Test under 4.0 Kg-f / cm2 (g) pressure with a minimum Holding time of 1.0 hour and those joints after found tested OK shall be preserved and care is to be taken in such a manner so that there should be no undue load / impact / hammerrage on those tested joints so as to make the joint quite sound. After being well set, the joint is to be flushed, neat and even the sockets.

The Pipes shall be of "SWR" class.

Under some extreme conditions and with the approval of WBSEDCL, the joints in a few locations may be considered by Solvent cement joints.

23.3 Testing: All PVC Rain water pipes/CI pipes and fittings including joints will be tested by Hydro-static Pressure Test under 4.0 Kg-f / cm2 (g) pressure with a minimum Holding time of 1.0 hour and those joints after found tested OK shall be tagged "Tested OK" for those portion of the tested pipe and shall be preserved and care is to be taken in such a manner so that there should be no undue load / impact / hammerrage on those tested joints so as to make the joint quite sound.

Smoke test can also may be allowed and left in working order after completion. The smoke test shall be carried out as stated under.

Smoke shall be pumped into the brains at the lowest end from a smoke machine which consists of a blow and burner. The materials usually burnt are greasy cotton waste which form clear pungent smoke which is easily detectable by sight as well as smell if leaking at any point of drain. the Contractor will have to rectify all defects traced in such tests at his own expense to the complete satisfaction of the WBSEDCL. The test shall comply to relevant IS code & specifications and shall be done in presence of WBSEDCL's representative at site.

No extra payment will be made for the tests.

23.4 C.I. Floor Traps: The traps shall be of self cleaning design provided with a minimum 50 mm (2") Water seal at the Trap to arrest Foul smell there stopping it to enter into the building inside from the respective Stacks. Furthermore every Floor Trap will associated with a S.S. "Chilly" make cockroach arrestor trap with SS Circular Grating.

23.5 Waste Connections: Waste from Wash Basins, floor traps , Sinks, Ablution Traps inside wc's etc, shall separately discharged into the Waste Stacks that terminated & fed to the Gully Traps on the building outside ground level / Plinth protection level and shall be separately connected to (IP) Inspection Pits that leads to the Septic tank.
23.6 Anti- Syphonage (Vent) Pipes: 50mm dia C.I (sand cast as per IS-1729)
Anti-syphonage Vent pipe shall be HCI pipes of sand cast (as per IS-1729) with lead caulked joints and tob remained connected at a point with the Sewer Stack above every Junction Branches (keeping a gap of at least 450mm above the top-most Junction Branches per floor from the Stack and finally that 50mm dia Vent Stack after running parallelly with Sewer Stack joined again with the Sewer Stack by 100 x 100x 50 mm dia Inverted unequal junction (IS-1729) above the top most finish floor level at a point above all the other horizontal junction points.
In every floor with the main anti-syphonage pipe junction Tees shall be 50 mm. (2") internal diameter or as specified.
23.7 Painting: All the exposed CI Stacks / Pipes and fittings shall be painted with two coats of synthetic enamel paint over one coat of primer of approved quality, manufacture, colour and shade to match the surroundings. The cost of such painting should be included in the Contractor's rates for pipe work.
The surface of pipes and fittings to be painted shall be cleaned thoroughly , Red lead or other primer shall be painted as specified and allowed to dry. the finishing shall be done by painting 2 or more coats with paint in an approved colour and shade.

24.0 WATER SUPPLY:
Sample and brand / make shall be got approved by WBSEDCL prior to bringing in bulk quantities at site by the Contractor. Necessary test certificates shall have to be submitted from the manufacturer. Over & above the submission of test certificates, WBSEDCL may ask the Contractor for further test from Govt. test house / laboratories at the risk & cost of the Contractor.
24.1 G.I. Pipes and Fittings: The pipes shall be of galvanized steel, ERW, (IS-1239, P-I) 'Medium', screwed and socketed and shall conform to latest Indian Standard specifications for medium quality.
The pipes shall be tested to a pressure of 50 kg/sqm. (700 lbs. per sq. inch). these shall have threads and the sockets, paralleled threads complying to the relevant IS code & specifications.
24.2 Laying & Fixing: Where pipes have to be cut or re-threaded ,ends shall be care-fully filled out so that no obstruction to bore is offered.
In jointing the pipes , the inside of the sockets and the screwed end of the pipe shall rubbed over with white lead and few turns of hemp yarn wrapped round the screwed end of the pipe which shall then be screwed home in the socket with a pipe wrench. Care must be taken that all pipes and fittings are kept at all times free from dust and dirt during fixing.
24.3 Internal Work: For internal work, G.I pipes and fittings inside and outside the walls shall be fixed either visible (not in chase) by means of standard pattern holder bat clamps keeping the pipe 12 mm (1/2") clear of the wall everywhere or concealed as specified in Bill of Quantity .
When it is imperative to fix the pipe in front of house or in any conspicuous position where it looks unsightly chasing may be adopted.
All pipes and fittings shall be fixed truly vertical and horizontals or as directed by the WBSEDCL.
24.4 External Work: For external work G.I pipes and fittings shall be laid in trenches. the width of the trench shall be the minimum width required for working the pipes laid underground level . they shall not be less than 60 CMS (2 feet) from the ground level, and wrapped with gunny cloth dipped in hot bitumen. The work of excavation and refilling shall be done in accordance with the instruction of the WBSEDCL.
24.5 Painting: All internal G.I pipes and fittings shall be painted with two coats of synthetic enamel paint over one coat of red lead primer of approved quality manufacture, colour and shade as directed by WBSEDCL. The cost of such painting shall be deemed to have been included in the rates of respective items of the B.O.Q.
24.6 Testing: All G.I pipes and fittings shall be tested to a pressure of 7 kg. per sqm. (100 lbs. per sq. inch) as specified in the relevant IS code & specifications to ensure that pipes have proper threads and that proper materials (such as white lead and hemp) have been in jointing . All leaky joints must be made leak-proof by tightening at Contractor's expense. WBSEDCL may ask the Contractor to submit the necessary test certificates in this regard.

25.0 BRASS WATER FITTINGS:
All water fittings shall be of standard manufacture as approved by WBSEDCL and shall be in all respects comply with the latest Indian Standard Specifications. the brass fittings shall be fixed in the pipe line in a workmanship like manner. Care shall betaken to see that joints between fittings and pipes are made leakproof . The fittings and joints shall be tested to pressure of 21 kg per sqm. (300lbs. per sq. inch) unless otherwise specified. The defective fittings and the joints shall be repaired or replaced.

26.0 SPECIFICATION OF WATER SUPPLY MATERIALS:
General:
a) All materials shall be of best of their kind and shall conform to the latest Indian Standard specification.
b) A set of specification samples of all approved materials shall be kept & well preserved at site by the Contractor for ready reference, cost of which is to be borne by the Contractor.
c) Over & above the list of specifications, WBSEDCL reserves the right to ask the Contractor for fixing of materials / fittings of equivalent quality other than mentioned in the list.

27.0 DRAINAGE:
27.1 Stone Ware Pipe: All pipes must be new and perfectly sound, free from fire cracks and imperfection of glazing, cylindrical straight and of standard nominal diameter, length and depth of socket. They shall be hard burnt stoneware of dark grey colour and thoroughly salt glazed inside and outside. They should conform IS: 651-1965.
27.2 Trenches for S.W. Pipe Drains Excavation: The trenches for the pipes shall be excavated to lines and levels as directed. The bed of the trench shall be truly and evenly dressed throughout from one change of grade to the next.
The gradient is to be set out by means of bending rods and should the required depth be exceeded at any point the trench shall be refilled by means of cement concrete of the specification of the bed concrete, at the Contractor's own expense. the bed of the trench if in soft or made up earth shall be well watered and rammed and depressions thus formed filled with sand or other suitable materials as directed by WBSEDCL before laying the bed concrete.
If rock is met with, it shall be removed to 15 cms. (6") below the level of the pipe and the trench will be refilled with concrete, sand or other suitable material as directed by WBSEDCL to bring it to required bed level. the excavated materials shall be kept away from the edge of the trench at a distance equal to 1 Metre (3 ft.) or equal to half the depth of the trench which -ever is greater.
The trench shall be kept free from water. Shoring and timbering shall be provided wherever required.

The trench width shall be the nominal diameter of the pipe plus 36 cms. (15") but it shall not be less than 52 cms. (21") in case of all kinds of soils excluding rock and not less than 92 cms.(3 feet) in case of rock.
Wherever the drain runs deeper, the width of the trench in the upper reaches may be increased as per the directions of the WBSEDCL.

28.0 ROAD CROSSINGS:
All road crossings shall be excavated half at a time , the second half being commenced ,after the pipes have been laid in the first half and the trench refilled. The trench at the existing road crossings shall be filled in with mud concrete for the full depth except for the 15 cms (6") layer ,which shall be filled with cement concrete 1:2: 4 or as directed.

29.0 PROTECTION OF EXISTING SERVICES:
All pipes, water mains, cables etc., met within the course of excavation shall be carefully protected and supported. Such mains will be hung from timbers placed across the trench. Care shall be taken not to disturb the electrical and communication cables. WBSEDCL may, solely at their discretion, arrange for removal of such services, at the Contractor's cost.

30.0 LIGHTING AND WATCH:
The open trenches shall be provided with requisite fencing and watchman to guard against accidents. Red flags during day and red light during night shall be provided at the ends and at intervals along the sides of the trenches.
Sign boards with necessary wording such as "SLOW, ROAD CLOSED" etc. shall be provided at least 30 metres ahead of road crossing where the work is in progress. The precautions will be continued till the surface is restored.
Temporary bridges or planks shall be provided over the trenches for keeping open the access to private or public property.

31.0 REFILLING:
Refilling in trenches for pipes shall be commenced as soon as the joints and concrete have been passed. The refilling on the top and around the drain shall be done with great care and in such a manner as will obtain the greatest amount of compactness and solidity possible. For this purpose the earth shall be laid in regular layers of 15 cms (6") watered and rammed at each layers. All surplus earth shall be disposed off as directed by WBSEDCL at the Contractor's cost.

32.0 CONCRETING:
All S.W. pipes shall be laid on a bed of 15 cms. (6 ") thick cement concrete as specified with projection on each side of the pipe to the full width of the trench and surrounding the pipes all-round with 1:4:8 concrete mix.
All NP-3 RCC pipes below Road crossing / Car Parking areas shall be laid on a bed of 15 cms. (6 ") thick cement concrete as specified with projection on each side of the pipe to the full width of the trench with 1:4:8 concrete mix.
The pipes with their crown level at 1.22 Metre (4 ft.) depth and less from ground shall be covered with 15 Cms. (6") thick concrete above the crown of the pipe and slipped off to give a minimum thickness of 15 Cms. (6 ") all-round the pipe or as per construction drawing.
Pipes deeper than these shall be concreted upto haunches level with the top of the pipe.

33.0 LAYING AND JOINTING S.W. PIPES:
33.1 Laying: The pipes shall be carefully laid to the levels and gradients shown on the plans and sections. Great care shall be taken to prevent sand etc., from entering the pipes. The pipes between two manholes shall be laid in straight line without vertical or horizontal undulations.
The pipes will be laid "socket up" the gradient. The body of the pipe shall for its entire length rest on an even bed.
33.2 Jointing: The cement mortar joints shall be cured at least for seven days.
33.3 Testing: All joints shall be tested to a head of 61 Cms. (2') of water above the top of the highest pipe between two manholes.
The lowest end of the pipe shall be plugged watertight. Water shall then be filled in manhole at the upper end of the line. The depth of water in the manhole shall be 61 cms. (2) plus the diameter of the pipe. The joints shall then be examined. Any joint found leaking or sweating shall be remade or embedded into 15 Cms. (6") layer of cement concrete (1:2:4) in length and section re -tested, at the Contractor's expense until satisfactory results are obtained.

34.0 GENERAL:
34.1 Under-ground Storm Water Drain Pipes: NP-3 R.C.C. pipes are used for storm water drainage, on a concreting at pipe bed with 1:4:8 mix. The cement mortar for jointing with the Pipes and Collars will be 1:2 or that as specified in the Schedule of Quantities. Testing of joints also. will be required under a Hydro-static Pressure Test under 1.5 Kg-f I cm2 (g) pressure with a minimum Holding time of 1.0 hour and those joints after found tested OK shall be tagged "Tested OK" for those portion of the tested pipe and shall be preserved and care is to be taken during back-filling in such a manner so that there should be no undue load I impact I hammerrage on those tested joints so as to make the joint quite sound.
34.2 Precaution: To avoid logging of drains, both ends shall be kept plugged until the construction of manholes is completed in every respect. On completion, care shall be taken that each plug is removed and the face of the drain made smooth.
34.3 Measurements: The measurements for providing, laying and jointing R.C.C. pipes shall be recorded for the finished length of the pipe line i.e., from inside of one manhole to the inside of other manhole.

35.0 S.W. GULLY TRAPS:
This must be new, perfectly sound free from fire cracks and other imperfections of glazing of standard nominal diameter and other dimensions. It shall be made of hard burnt stoneware of dark grey colour and thoroughly salt glazed inside and outside.
Each gully traps shall have a C.I. piping 15 x 15 Cms. (6" x 6") and one water tight C.I. cover with frame 30 x 30 Cms. (12" x 12") (inside dimensions) with machine seating faces or as specified.
35.1 Excavation: The excavation for gully traps shall be done true to dimensions and levels as indicated on plans or as directed by the Engineer-in- Charge.
35.2 Fixing: The gully trap shall be fixed on cement concrete foundation 70 Cms. (2'3") square and not less than 10 Cms. (4") thick.
The mix for the concrete will be 1 :3 : 6 (1 Cement : 3 Sand : 6 Stone ballast) 40 mm (1.1/2" gauge) or as specified. The jointing of gully outlet to the branch drain shall be done similar to jointing of S.W. pipes.

35.3 Masonry Chamber: After fixing and testing the gully and branch drain , a brick masonry Chamber 30 x 23 Cms (12" x 9") (inside in first class brick in cement mortar 1:5 shall be built with 11 Cms. (4.1/2") thick around the gully trap from the top of the bed concrete upto ground level. The space between the Chamber walls and the trap being filled in with cement concrete of the specifications of bed concrete. The upper portion of the Chamber i.e. above the top level of the trap shall be plastered inside with cement mortar 1:3 (1 cement: 3 sand) finished with floating coat of neat cement. The corners and bottom of the Chamber shall be rounded off so as to slope towards the grating.
35.4 C.I. Cover: C.I. cover with frame 30 x 23 Cms. (12" x9") or as specified with mechanical seating faces shall then be fixed on the top of the brick masonry with cement concrete 1 : 2 : 4 and rendered smooth. The finished top of cover shall be left 15 Cms. (6") above the adjoining ground level so as to exclude the surface water from entering the gully trap.

36.0 MANHOLES, INSPECTION PITS, GULLY CHAMBER ETC:
36.1 Manholes: (The size of Manholes) : The size specified shall be in the internal size of the manhole. The work shall be done strictly as per drawings and specifications. The following specifications shall be adopted.
36.2 Excavation: The manhole shall be excavated true to dimensions and levels, shown on the plan or as directed by WBSEDCL.
36.3 Brick Work: The brick work shall be with best quality brick in cement mortar 1:4 , brick work in arches shall be with 1st class brick in cement mortar 1:4 , brick masonry round the pipes shall also be with 1st class brick in cement mortar 1:4 , the joints shall be made thoroughly leak proof.
36.4 Bed Concrete: The manhole shall be built on a bed of 15 Cms. (6") thick cement concrete (1 : 3 : 6) over a layer of brick flat soling.
36.5 Plaster:
Inside of the walls be plastered with 12 mm. (1/2") thick cement plaster 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement.
In wet ground, 12 mm. (1/2") thick cement plaster of the above specifications shall be done on the outside surface of the walls also. This plaster shall be done with waterproofing admixture as approved by WBSEDCL. The plastering shall be done upto 30 cms.(1 foot) above the wet soil line. Extra shall be paid for plastering the outside surface wherever directed.
36.6 Pointing:
Pointing shall be done with cement mortar 1:2.
36.7 Benching:
The channels is and benching shall be done in cement concrete 1:2:4 and rendered smooth with neat cement.
The following sizes of the channels shall be adopted for the benching:-

Size of the Drain	Depth at the Centre	Depth at sides i.e., at walls
100 mm. (4")	15 Cms (6")	20 Cms
150 mm. (6")	20Cms (8")	25 Cms
250 mm. (9")	28 Cms(11")	38 Cms
300 mm. (12")	35 Cms(14")	45 Cms

36.8 R.C.C. WORK: R.C.C. work for slabs or lintels shall be in cement concrete 1:11/2:3 with steel reinforcement as per details. Plain concrete, if used for fixing manhole covers, shall be of (1:2:4) proportion, unless otherwise mentioned specifically in the BOQ / drawings etc.
36.9 FOOT RESTS: These shall be of C.I. standard / or by M. S square rod 22 mm. (7/8") or as specified and shall be galvanized or painted with coal tar. These shall be embedded in masonry in cement mortar at least 23 Cms. (9") while the brick work is in progress. These shall be fixed 30 Cms. (1foot) apart vertically and staggered laterally and shall not project more than 11 Cms., (4.1?2") from the wall.
36.10 C.I. MANHOLE COVERS: The C.I covers shall be of tough homogeneous cast iron of 'heavy' or 'Medium' type as specified in the Bill of quantities, are the clear internal dimensions. The approximate weights of the various types of manhole covers with frames and their internal size will be as per specification in schedule of quantities & conform to IS : 1726-1966. Variations in weight ton the extent of 6 percent on either sides shall be permissible. the covers used in manhole on sewer lines shall invariably bear the work 'SEWER' on the top and those used for storm water drains shall bear the word 'S.W.D.' .These markings shall be done during casting of the covers.
The frame of manhole cover shall be embedded firmly in the R.C.C slab or plain concrete as the case may be on the top of the masonry.
After the completion of the work , manhole covers shall be sealed by means of thick mortar greased. All exposed surfaces of the frames and covers shall be painted with coal tar. The cost of such paintings should be included in the Contractor's rates for the manhole cover.

37.0 PLAIN MANHOLE (INTERNAL WORKS):
As per drawing or 60 cms. x 45 cms. (3' x 1'-6") when not mentioned / shown specifically. This type of manhole is minimum generally constructed within compounds for house drainage only. Due to shallowness and narrowness the manhole is provided with cover with bigger opening to facilitate cleaning and repairs. Cover of size 90 Cms. x 45 Cms. (3' x 1"-6") shall be used.

38.0 PLAIN MANHOLE (EXTERNAL WORKS):
As per drawing or 1.2 X 0.9 M (4" x 3") when not mentioned / shown specifically. This type of manhole is constructed for main drainage work for depth less than 2.4 Meters (8").
When the manhole is built on the footpath ,this shall be provided with 45 Cms. (18") internal diameter light type C.I cover , when it is built within the width of the road under traffic, it shall be provided with 53 Cms. (21") internal diameter heavy type C.I cover.

39.0 LEVELS OF INVERT OF INSPECTION PITS AND STORM WATER MANHOLES:
All Invert levels as specified in the drawing to be maintained strictly as minimum requirement. All Invert levels (I.L.) given in the drawings are with respect to the (±) 0.00 level as specified in the drawings.
Unless some acute problem as per the Site conditions the Invert levels as mentioned in the drawing shall have to be maintained.
For any alterations in Invert levels as per the Site conditions (if any) shall have to be approved by WBSEDCL before executing the job.
The invert of the smaller sewer at its junction with main shall be at least 2/3rd dia. of the main above the invert of the main . The branch sewer should deliver sewage in the manhole in the direction of main flow and the junction must be made with ease so that flow in the main is not impeded.

40.0 MEASUREMENTS:

The depth of the manhole wall be reckoned from the invert level of the channel to the top level as to the C.I cover . The depth shall be measured correct to nearest 25 mm.

41.0 HOUSE CONNECTIONS: No drain from house fittings e.g. gully trap or soil pipe etc., to manhole shall exceed a length of 6 Meters (20 feet) unless it is unavoidable.

42.0 DROP CONNECTIONS (DROP MANHOLES) – IF ANY: In case where branch pipe sewer enters the manholes on main pipe sewer at a higher level than the main sewer, a drop connection should be provided.
C.I. Inspection bend shall be fixed in position at right angle to the drop pipe at the level of the inlet branch drain. The plain C.I. shoe at the bottom shall be fixed in the benching cement concrete 1:2:4 (1 cement : 2 sand : 4 stone ballast ¾" size) so as to discharge into the channel (the joints be lead caulked as per specification for the cast iron pipes for water supply).

43.0 C.I. PIPE DRAINAGE:
43.1 C.I. Drainage: C.I. pipe drainage shall be adopted (IS-3989 or IS-1729) in the case mentioned below:-
a) When the drain passes under a structure.
b) When the drain passes under a road which is subject top heavy traffic and where the covering cushion is not considered sufficient.
c) When the drain passes through a place where it is subjected to vibrations.
d) In hilly places where the slopes are very steep.
e) When drainage lines run on the surface or above ground.
43.2 Trenches: Specifications for trenches for stoneware pipe drains will apply in this case.
43.3 Pipes: The pipes used shall conform to the Indian Standard specifications for class "A" pipes.
43.4 Fittings: C.I. trap with hopper, C.I inspection bends C.I. inspection Chambers etc., shall conform to Indian Standard specifications for C.I fittings.
43.5 Laying: For laying C.I pipes and fittings, specifications for C.I water mains will apply .
The joints for pipes and fittings shall be lead caulked joints under water supply. the joints shall be leak proof.
All inspection doors etc., shall be provided with felt washers and strong brass bolts and nuts.
43.6 Testing: Testing of joints for C.I pipes and fittings shall be done by smoke test as specified under C.I pipes and fittings.
43.7 Masonry Chamber: C.I inspection chambers and bends for underground shall be enclosed in masonry chambers.
Note:
In case of non- availability of any particular brand of material as specified in the Bill of Quantities bidder may propose any other equivalent approved brand or material or equipment conforming to the latest I.S specifications subject to the approval of WBSEDCL.
LIST OF APPROVED MANUFACTURER

Sl. No.	Description of Approved Material	Approved Brand / Manufacturer
1	G.I. Pipes - medium class (As per 15-1239, P - I)	TATA
2	G.I. Pipe fittings (As per IS-1239, P - II); of material with Galvanized Cast Iron Fillings, with material code conforming to IS- 1879	HB'/ "NB' I "ZOLOTO"/Leader or as approved by WBSEDCL
3.0	C.P. on brass fittings	CP Bib cock
3.1	ESSCO 'Delux' or equivalent as approved by WBSEDCL	Do -
3.2	CP 'Long Nose' / or' Long Body' Bib cock	Do -
3.3	CP Angle valve	Do -
3.4	CP 'Concealed' Stop cock 'Heavy' type with adjustable CP wall Flange	Do -
3.5	CP Shower Rose	
4	Gun metal body Ball Float valve with PVC (High pressure) Ball Float	Zoloto" / Leader"/ "Sant" or as approved by WBSEDCL
5	15 mm dia. PVC Connector pipe with Symet nuts at both ends. - (for Wash Basin Pillar tap & W.C. & Urinal - Cistern connections)	PRAYAG or equivalent as approved by WBSEDCL
6	Wall Outlet Connection Flexible Pipe - 15mm dia	"Jaquar" or equivalent as approved by WBSEDCL
7	Bronze / Gun metal-body Gate valve with threaded screwed ends, "Non-rising Spindle" type (PN-1.0) / or (PN-1.6) class	Sant / "Leader" / "Zoloto"-for Bronze body or equivalent as approved by WBSEDCL
8	Bronze -body Globe valve with 'BSPT(F), threaded screwed ends, "Non-rising Spindle" type (PN-1.0) (PN-1.6) class	'Zoloto' / 'Leader' or equivalent as approved by WBSEDCL
9	CI body Gate / Sluice valve with flanged ends rising Spindle" type IPN-1.0\ 1 or IPN-1.6) class	Zoloto / Leader / Sant or equivalent as approved by WBSEDCL
10	CP Urinal Spreader-15mm (for Urinals only)	Hindware / Parryware / Neycer or equivalent as approved by WBSEDCL
11	Soil, waste & vent pipes I and Pipe Fittings & Specials :- C.I. Centri cast (as per 15-3989)	'NECO'I 'HEPCO' 1 'KAPILANSH DHATU UDYOG (P) L TD.'
12	Sanitary wares (Vitreous chinaware) :- W.C. - (European type) – with 'S' I 'P' -Trap - Floor mounted type, without PVC Flushing Cistern, ii) Wash Basins - "Oval" pattern "Under Counter" type -	'Hindware- /'Parryware' / 'Cera' /'Neycer' or equivalent as approved by WBSEDCL Wash Basin :- 'Hindware' - /Parryware / Neycer or equivalent as approved by WBSEDCL

	with Jaquar Sensor Pillar Tap, iii) Urinal - Flat back "Large" with CP Spreader, CP Waste coupling, CP Bottle Traps with waste pipes & also with "Jaquar' Sensors with installation box.	WC flushing :- PVC 'Low-level' "Dual- Flush" Cistern of 'Hindware' / Parryware / Neycer Urinals :- Hindware / Parryware /Neycer Urinal Partitions 'Division Plate' :- 'Hindwarwe'/Parryware/Neycer or equivalent as approved by WBSEDCL
13	Wall Mirror	6mm thick 'Saint Gobain' /'Modiguard' / 'Ashai' or equivalent as approved by WBSEDCL, with 12mm thick hard-board backing
14	C.P. on brass fittings	
14.1	C.P. on brass fittings C.P. Waste Coupling, ii) C.P. Bottle Trap, iii) C.P Robe Hook, iv) C.P. Towel Rail. v) CP Two way Bib Tap	ESSCO 'Delux' or equivalent as approved by WBSEDCL 14.2
14.2	CP Toil. Paper Holder	-Do -
14.3	CP Towel Ring	-Do -
14.4	CP Soap Dish Holder	-Do -
14.5	CP Bottle Trap with CP wall connection Pipe	-Do -
14.6	CP Robe Hooks	-Do -
14.7	CP "Two-way" Bib cock	-Do -
14.8	CP Shower Rose	-Do
15	Rigid PVC (Concealed) Waste pipe, [Schdl.-40], (as per ASTM D .1785)- (concealed or exposed)	Supreme/ Oriplast or equivalent as approved by WBSEDCL
16	Rain Water Pipes :- PVC' - "SWR" class, ' as per (IS: 13592)	NECO'/'HEPCO'/'KAPILANSH DHATU UDYOG (P) Ltd. or equivalent as approved by WBSEDCL
17	Rain Water Pipe Fittings :- 'Sand cast Iron' - "SWR" class, as per (IS: 13592)	-DO-
18	Salem Stainless Steel Sink as per AISI 304 (18/8) conforming to I.S.- 13983	"Hindware" / "Hafele" / '"Nirali' / 'Parryware' or equivalent as approved by WBSEDCL
19	Stainless Steel Kitchen Chimneys	Kutchina / Hindware or equivalent quality as approved by WBSEDCL
20	Stone- Ware Pipes, and S.W. Pipe Fittings	Sonali / GINNI / NIRALI or equivalent as approved by WBSEDCL
21	C. I. Manhole Cover (I.S. - 1726) - "Medium" or "Heavy" Grade' (Light duty only on Oil/Grease Trap Chamber)	NECO' / 'HEPCO'/ Swastika / 'BPL' or equivalent as approved by WBSEDCL
22	NP-2 class R.C.C. Pipes and Pipe Fittings (i.e., RCC Collars etc. ,)	Eastern Spuncrete / 'West Bengal Concrete Industries (P) Ltd. / 'HINDUSTAN' / 'SUR' or equivalent as approved by WBSEDCL
23	Stone- Ware Gully Trap	Sonali / GINNI / NIRALI / Hind or equivalent as approved by WBSEDCL
24	C. I. Grating- (Over Catch Pit I Yard Gully Chamber), (I.S. - 1726) - "Medium" or "Heavy" Grade	NECO' / 'HEPCO' / 'BPL' or equivalent as approved by WBSEDCL
25	"Enclosed" type Analogue type Water Meter ("Bulk" Type), conforming to IS- 2373 with Calibration Certificate, including all necessary accessories	"Dashmesh" / 'Kaycee" / "Capstan" or equivalent as approved by WBSEDCL
26	Bronze body "Parallel Slide" 'Blow-off valve ("Spring loaded, blow-off pressure sellable" type), with flanged ends, also with matching Flanges (PN-1.0) / or (PN-1.6) class	'Zoloto' / Sant / Leader or equivalent as approved by WBSEDCL
27	Air-Release Valve	
	Bronze body "Parallel Slide" 'Blow-off valve ("Spring loaded, blow-off pressure sellable" type), with flanged ends, also with matching Flanges (PN-1.0) / or (PN- 1.6) class	Zoloto' / Sant / Leader or equivalent as approved by WBSEDCL
28	Bronze I Gun metal -body Ball valve with 'BSPT(F), threaded screwed ends, "quarter turn Lever operated" type IPN-1.m / or (pN-1.6) class	'Leader' / 'Zoloto' / Sant or equivalent as approved by WBSEDCL
29	Gaskets-CAF 'Full face' conforming to IS-2712, Gr.- C; (3mm thick)	"Klinger" / "Permanite" / "Champion" or equivalent as approved by WBSEDCL

Pro-forma for Contract Agreement

(To be executed on Non-Judicial Stamp Paper of Rs. 100/-)

Articles of agreement made on this ----------day of ---------- in the year ------ ----------between West Bengal State Electricity Distribution Company Limited (A Government of West Bengal Enterprise) having its head office at Vidyut Bhaban, Block-DJ, Sector-II, Kolkata-700091 hereinafter referred as ' WBSEDCL ' (which expression shall unless excluded by or repugnant to the context be deemed to include its successors and assigns) of the ONE PART , AND ---------- ---------- hereinafter referred to as the 'CONTRACTOR' (Which expression shall unless excluded by or repugnant to the context be deemed to include his heirs, executors, administrators, representatives and assigns) of the OTHER PART.

WHEREAS the WBSEDCL invited tenders vide Tender Notice No ----------dated---------- ---------- (annexed hereto) for construction of ---------- ---------- .

AND WHEREAS in pursuance of such invitation for tenders, the contractor submitted a tender vide no ----------dated ---------- (annexed hereto).

AND WHEREAS AFTER consideration of the tender submitted by the contractor with clarification(s), if any, the WBSEDCL accepted the said tender submitted by the contractor and placed order no ---------- dated ---------- (annexed hereto).

NOW, THEREFORE, the WBSEDCL and the contractor agree as follows:

1. The Contractor agrees to undertake the work of ----------as per order no ---------- dated ---------- referred to above.

2. The WBSEDCL agrees to pay the Contractor as per order no ---------- dated ---------- referred to above.

In witness whereof the parties have hereunder affixed their signature on the day, the month and year written as above.

SIGNED, SEALED AND DELIVERED

---------- ----------

Contractor WBSEDCL

1) ---------- 1)----------

Witness Witness

2) ---------- 2)----------

Witness Witness

ANNEXURE-B

SPECIMEN COPY OF INDEMNITY BOND
(To be executed on Non-Judicial Stamp Paper of Rs. 100/-)

BY THE PRESENT INDEMINITY BOND EXCUTED by me / us on this _____Day of _____, 20_____. I/We having Registered Office/ residing at _____ (hereinafter called "OBLIGOR/OBLIGORS" which expression shall mean and includes my/our Successors legal representatives, assigns) do hereby binds myself / ourselves and also our Company /firm _____ after having the power to bind so with the promise and undertaking in favour of the West Bengal State Electricity Distribution Company Limited., a government Company within the meaning of sec.617 of the Indian Company ¨s act having registered office at Bidyut Bhavan, Block-DJ ,Sector-II, Salt Lake City, Kolkata-700091(hereinafter called as OBLIGEE, which expression shall mean and include it's legal representative, administrators assigns.
WHEREAS OBLIGOR/OBLIGORS has /have been awarded to execute the job/works under letter no_____ Dated_____ issued by the OBLIGEE after having observing necessary formalities the details of which is described in the schedule given hereunder as per letter mentioned hereinabove and whereas the said job/works will be/likely to be done in places covered under Employees¨ State Insurance Act(ESI) and /or the Workmen Compensation Act(W.C. Act) and /or other laws relating to the Labour Management and Welfare.

AND WHEREAS according to the condition of the contract the OBLIGOR/OBLIGORS is under obligation to execute this Indemnity Bond before the commencement of actual execution and OBLIGOR/OBLIGORS is/are aware that unless this Indemnity Bond is executed in accordance with the condition of contract before the actual execution in accordance with law the OBLIGEE shall have the power to deem that actual work has been started within the meaning of the contract before the execution of this Indemnity Bond NOW THIS INDENTURE WITNESS THAT I / We the OBLIGOR/OBLIGORS do hereby undertake.

1. THAT the OBLIGEE shall not be held responsible for any type of accident which may take place during the course of work undertaken by the OBLIGOR/OBLIGORS.
2. THAT the OBLIGOR/OBLIGORS will take adopt all safety norms in respect of each and every Workmen labour personnel according to the rules or to the satisfaction of the OBLIGEE in all cases.
3. THAT the OBLIGOR/OBLIGORS undertakes to engage only those labour worker or any other personnel whether skilled or unskilled or any other person whether in technical management or non-managerial or any other capacity in the area covered under Employees¨ State Insurance Act, 1948 who has/have insurance coverage within the meaning of Employees State Insurance Act and further undertakes NOT to engage any person in the area covered under the Employees State Insurance Act, who does / do not has/have insurance coverage within the meaning of Employees State Insurance Act.
4. THAT the OBLIGOR/OBLIGORS further undertakes to engage only those labour worker, or any other personnel, whether skilled or unskilled, whether in technical, managerial or non- managerial or any other capacity in the area NOT covered under Employees¨ State Insurance Act who has life insurance for the sum assured equivalent to the amount of Compensation under the Employees¨ Compensation Act in case of accidental death or inquiry and such insurance has been effected by the OBLIGOR/OBLIGORS.
5. THAT the OBLIGOR/OBLIGORS undertakes / undertake to indemnify and keep harmless the OBLIGEE from all claims action proceedings and of risk damage danger to any person whether belonging to/or not belonging to OBLIGOR/OBLIGORS.
6. THAT the OBLIGOR/OBLIGORS shall keep harmless the OBLIGEE from all claims compensation damages any proceedings in respect of any of its employee/workmen under the Workmen Compensation Act. or any other laws for the time being in force.
7. THAT if during the course of execution of work as stated in the letter mentioned hereinabove issued by the OBLIGEE, it is found that the OBLIGOR/OBLIGORS has/have not complied with guidelines/formalities within the meaning of Employees¨ State Insurance Act or Workmen Compensation Act or any other laws relating to the Labour Welfare for the time being in force, and also has not observed the safety norms in accordance with the law to the satisfaction of the OBLIGEE, the OBLIGEE shall have the right to stop the execution of work/job and the period of such stoppage shall continue till adequate safety and other compliance mentioned hereinabove under the labour welfare legislation have been observed and such period of stoppage shall not be taken into account for the calculation of the total period of completion of work for which the OBLIGOR/OBLIGORS is responsible to complete the work/job and it will be deemed that discontinuance was due to default of OBLIGOR/OBLIGATOR.
8. THAT, if at any time due to exigency, the OBLIGEE i.e. the West Bengal State Electricity Distribution Company Limited as the Principal Employer, becomes liable to pay any such compensation mentioned hereinabove, whether on failure of the OBLIGOR/OBLIGORS or for any other reason, the OBLIGEE shall have the right to recover the said amount from any amount receivable by OBLIGOR/OBLIGORS or any bank guarantee deposited or anything payable whether in connection with this contract or other contract by the OBLIGEE to the OBLIGOR/OBLIGORS
9. THAT the OBLIGOR/OBLIGORS is/are aware and accept that for the persistent or repeated violation of any condition mentioned in this Indemnity Bond, the OBLIGEE shall have right to terminate the contract of work issued by the OBLIGEE to OBLIGOR/OBLIGORS.

SIGNED AND DELIVERED BY
THE OBLIGOR/OBLIGORS

_____
(Signature)

WITNESS
1 Name, Designation _____

Signature _____.

2. Name, Designation _____

Signature _____

Proforma for Goods & Services Tax Declaration

I/We do hereby declare that, our firm is a Small Service Provider in terms of the Finance Act 1994 & we need not be registered with the Central Goods & Services Tax Act'2017.

_____

Signature and seal of the Contractor