West Bengal State Electricity Distribution Company Limited
(A Government of West Bengal Enterprise)
OFFICE OF THE CHIEF ENGINEER
Pumped Storage Project Department
5th Floor, Block-C, Vidyut Bhavan, Block DJ, Sector-II, Salt Lake,
Kolkata-700091,West Bengal, INDIA, Telephone No: +913323197746/+913323345855
Fax No. : +913323345855, Website : www.wbsedcl.in, e-mail : wbsedclpspd@gmail.com
CIN : U40109WB2007SGC113473

4 X 250 MW Turga Pumped Storage Project
Purulia, West Bengal

Construction of 02 (Two) nos. four storied Officers' Field Hostel Buildings for 4 X 250 MW Turga PSP at PPSP Township, Baghmundi, Purulia

NIeT No. : PSPD /2X1/TURGA FIELD HOSTEL/04/2020-21 Dated 04/02/2021

BID DOCUMENT

CHIEF ENGINEER
PUMPED STORAGE PROJECT DEPARTMENT
5TH FLOOR, BLOCK - C, VIDYUT BHAVAN,
KOLKATA - 700091
WEST BENGAL, INDIA
WBSEDCL

04.02.2021

PSPD
CHIEF ENGINEER
WBSEDCL

West Bengal State Electricity Distribution Company Limited
(A Government of West Bengal Enterprise)
OFFICE OF THE CHIEF ENGINEER
Pumped Storage Project Department
5th Floor, Block-C, Vidyut Bhavan, Block DJ, Sector-II, Salt Lake,
Kolkata-700091,West Bengal, INDIA, Telephone No: +913323197746/+913323345855
Fax No. : +913323345855, Website : www.wbsedcl.in, e-mail : wbsedclpspd@gmail.com
CIN : U40109WB2007SGC113473

4 X 250 MW Turga Pumped Storage Project
Purulia, West Bengal

Construction of 02 (Two) nos. four storied Officers' Field Hostel Buildings for 4 X 250 MW Turga PSP at PPSP Township, Baghmundi, Purulia

CONTENTS :

PSPD CHIEF ENGINEER WBSEDCL

SECTION 1

NOTICE INVITING e-TENDER (NIeT)

PSPD
CHIEF ENGINEER
WBSEDCL

West Bengal State Electricity Distribution Company Limited
(A Government of West Bengal Enterprise)
OFFICE OF THE CHIEF ENGINEER
Pumped Storage Project Department
5th Floor, Block-C, Vidyut Bhavan, Block DJ, Sector-II, Salt Lake,
Kolkata-700091,West Bengal, INDIA, Telephone No: +913323197746/+913323345855
Fax No. : +913323345855, Website : www.wbsedcl.in, e-mail : wbsedclpspd@gmail.com
CIN : U40109WB2007SGC113473

NOTICE INVITING e-TENDER (NIeT)

NIeT No. : PSPD / 2X1/TURGA FIELD HOSTEL/04/2020-21 **Date : 04.02. 2021**

The Chief Engineer, Pumped Storage Project Department (PSPD), WBSEDCL invites e-Tender only from the bonafide, experienced & resourceful contractors of State/Central Govt., Public Sector Undertakings (PSUs), Govt. Enterprises, Statutory Bodies and reputed Private Organizations who have fulfilled the conditions as detailed below for submission of online Bid.

Name of the Work : Construction of 02 (Two) nos. four storied Officers' Field Hostel Buildings for 4 X 250 MW Turga PSP at PPSP Township, Baghmundi, Purulia.

Estimated Cost : Rs. 4,66,14,603.00 (Rupees Four Crore Sixty Six Lakh Fourteen Thousand Six Hundred three Only)

Completion Time : 24 (Twenty Four) months from the Zero Date.

Earnest Money Deposit (EMD) : The bid must be accompanied by Earnest Money Deposit (EMD) as bid guarantee. The Bid guarantee shall be submitted in a separate envelope in the form of A/C Payee CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order or Bank Guarantee for Rs. 5,00,000.00 (Rupees Five Lakh Only) in favour of "West Bengal State Electricity Distribution Company Limited" drawn on any nationalized scheduled bank payable at Kolkata. Bid without Earnest Money Deposit shall be summarily rejected.

Cost of Tender Document : Bidder shall deposit Rs. 5,900.00 (Rupees Five Thousand Nine Hundred Only) (including GST) as the Cost of Tender Document (Non-refundable), through A/C Payee CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order in favour of "West Bengal State Electricity Distribution Company Limited" drawn on any nationalized scheduled bank payable at Kolkata.

1. Techno-commercial requirements of the Bidder (Must Conditions to be fulfilled) :

A) Experience of having successfully completed similar works during last 7 years (up to 31.03.2020) with fulfillment of any of the following criteria :

- 3 similar completed works, each costing not less than 40% of the estimated value or,
- 2 similar completed works, each costing not less than 50% of the estimated value or,
- One similar completed work, costing not less than 80% of the estimated value.

B) Valid PAN, GSTIN & current challan, Labour License, ESIC / Mediclaim (for non-ESI coverage area) & current challan, Professional Tax (PT) Registration & Current challan, PF Registration & current challan.

C) Average annual turnover during last 3 years not less than 30% of the estimated value.

D) Working capital in the year preceding the year of bid submission not less than 30% of the estimated value.

E) Net Worth for the each of the last 3 Financial Years should be positive.

F) Submission of annual audited financial report and IT returns for last 3 Financial Years.

For detailed requirements, please go through the Instructions to Bidders (ITB).

PSPD CHIEF ENGINEER WBSEDCL

2. Cost of Tender Document should be submitted through CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order and Earnest Money Deposit (EMD) should be submitted through Demand Draft / Banker's Cheque / Pay Order or Bank Guarantee issued on any nationalised scheduled Bank in favour of the **"West Bengal State Electricity Distribution Company Limited"** payable at Kolkata and should be documented through e-filling. The original Demand Draft / Banker's Cheque / Pay order against Cost of Tender Document and Demand Draft / Banker's Cheque / Pay Order or Bank Guarantee related to the Earnest Money Deposit (EMD) should be submitted physically by the Bidder to the Chief Engineer, PSPD, WBSEDCL at Vidyut Bhawan (5th floor Block C), Bidhannagar, Block-DJ, Sector-II, Kolkata-91 under sealed cover within the date as mentioned in Clause 17 of NIeT.

3. The interested Bidders shall download the Bid Documents from the website: <***https://www.wbsedcl.in***> or <***https://wbtenders.gov.in***>. Both Technical and Financial Proposals are to be submitted online through the website <***https://wbtenders.gov.in***>. All the documents uploaded by WBSEDCL form an integral part of the Bid. Bidders are required to upload all the Bid documents along with the other documents, as asked for, through the above website within the stipulated date and time as given in the NIeT. The Bidders shall carefully go through the documents and prepare the required documents and upload the scanned documents duly signed in blue ink and stamped in every page in Portable Document Format (PDF) to the portal. Submission of documents through any other means except uploading in e-tender portal (<***https://wbtenders.gov.in***>) shall not be accepted.

4. Bidders willing to take part in the process of e-tendering are required to obtain Class 2 or Class 3 Digital Signature Certificate (DSC) in the name of person who will sign the Bid Document, from any authorized Certifying Authority (CA) under the Controller of Certification Agencies (CCA), Govt. of India. The bidders are required to register the fact of possessing the Digital Signature Certificates through the Registration System available in the website. The documents uploaded shall be virus scanned and digitally signed using the Digital Signature Certificate (DSC). Applicants should take note of all the addenda/corrigenda related to the Bid and upload the latest documents as part of the Bid.

5. Clarification, if any, shall be addressed to the Chief Engineer, Pumped Storage Project Department, WBSEDCL, at the address mentioned in Clause 8 of NIeT by e-mail within the date as mentioned in Clause 17 of NIeT.

6. WBSEDCL reserves the right to modify, amend or supplement this Bid Document after giving notice duly uploaded in the e-tender portal <***https://www.wbsedcl.in***> or <***https://wbtenders.gov.in***>. The Bidders are therefore advised to follow the website regularly for such corrigendum, notification etc. Any such amendments shall be part of the Bid document.

7. All clarification and/amendments, if any, shall be uploaded in the e-tender portal <***https://wbtenders.gov.in***> 7 (seven) days prior to the deadline of submission of Bid.

8. Interested Bidders may obtain further information about the Project and the Service at the address below during office hour.

The Chief Engineer,
Pumped Storage Project Department, WBSEDCL,
Vidyut Bhavan, 5th Floor, Block - C,
Bidhannagar, Block - DJ, Sector - II, Kolkata - 700091
West Bengal, India
Ph. No. + 91 - 3323197746 / + 91 - 3323345855
E-mail : wbsedclpspd@gmail.com / cepspd@wbsedcl.in.

9. The Financial Proposal of the prospective Bidder will be considered only if the Technical Proposal of the Bidder is found qualified by the Tender Evaluating Authority, WBSEDCL. The decision of the Tender Evaluating Authority, WBSEDCL will be final and binding in this respect.

10. Bids shall remain valid for a period not less than **180 (One hundred eighty) days** from the date of opening of Financial Proposal. Bid with shorter validity period shall be rejected as non-responsive. If the Bidder withdraws / modifies the bid before the period of bid validity without giving any satisfactory explanation for such action, the Earnest Money as deposited by them will be forfeited forthwith without assigning any reason thereof. However, WBSEDCL may request extension of validity of the Proposal for a further period without any change in terms and conditions of the proposal.

11. At any stage during scrutiny and process towards placement of Letter of Award, if it is found that the credential or any other papers which the Bidder uploaded during Bidding process, found incorrect / manufactured / forged, that bid will be considered nonresponsive and outrightly rejected with the forfeiture of Earnest Money Deposit and action will be taken as per prevailing laws of the land.

12. WBSEDCL does not bind itself to accept the lowest bidder and reserve the right to reject any or all Bids or to split the whole work to more than one Bidder without assigning any reasons whatsoever.

13. WBSEDCL reserves the right to cancel the NIeT due to unavoidable circumstances without assigning any reason and no claim in this respect will be entertained.

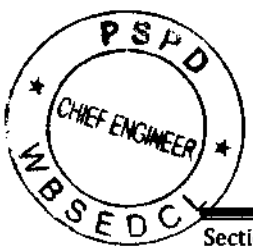
14. Conditional / Incomplete Bid will be summarily rejected. No Deviation from the Bid is accepted.

15. Exemption from deposition of Earnest Money Deposit (EMD) shall not be allowed under any circumstances.

16. Other information as well as terms and conditions, which are not covered above, is available in Instruction to Bidders, General Conditions of Contract, Additional Conditions of Contract and Technical Specification of this Tender.

17. **Date &Time schedule:-**

Sl. No.	Particulars	Date &Time
01	Date of uploading the NIeT and Tender Documents (Online). [Publishing Date]	10/02/2021 at 10:00 hrs
02	Documents sell / download start date (Online).	10/02/2021 at 11:00 hrs
03	Last date of submission of queries	18/02/2021 at 12:00 hrs
04	Last date of Uploading of Corrigendum / Addendum	25/02/2021 at 15:00 hrs
04	Bid Submission upload start date (Online)	01/03/2021 at 11:00 hrs
05	Bid Submission upload end / closing date (Online)	08/03/2021 at 15:00 hrs
06	Last date of submission of Cost of Tender Document and Earnest Money Deposit in original.	12/03/2021 at 15:00 hrs
07	Date for opening of Technical Proposal (Online) for the Bidders	15/03/2021 at 15:00 hrs
08	Date for opening of Financial Proposal (Online).	Will be intimated later



18. The Estimated Cost is inclusive of 1% BOCWW Cess but excluding GST as applicable in the provisions of the GST Act.

04.02.2021

Chief Engineer
Pumped Storage Project Department
WBSEDCL

PSPD
CHIEF ENGINEER
WBSEDCL

SECTION 2

INSTRUCTION TO BIDDERS (ITB)

PSPD
CHIEF ENGINEER
WBSEDCL

1. **General guidance for e-Tendering :**

Instructions / Guidelines to the participating bidder in e-Tendering :

i) **Registration of Bidder :**

Any Bidder 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 on to ***https://wbtenders.gov.in*** (the web portal). The Bidder is to click on the link for e-Tendering site as given on the web portal.

ii) **Digital Signature Certificate (DSC) :**

Each Bidder is required to obtain a class-2 or class-3 Digital Signature Certificate (DSC) in the name of person who will sign the Bid, from any authorized Certifying Authority (CA) under the Controller of Certification Agencies (CCA), Govt. of India. The bidders are required to register the fact of possessing the Digital Signature Certificates through the Registration System available in the website.

2. **Downloading of Bid Documents :**

The Bidder can search & download NIeT & Bid Documents electronically from <***https://www.wbsedcl.in***> or by logging in to the website <***https://wbtenders.gov.in***> using the Digital Signature Certificate. This is the only mode of collection of Bid Documents.

3. **Submission of Bids :**

All the documents of this NIeT uploaded by WBSEDCL shall form an integral part of the Contract. Bidders are required to upload all the tender documents along with the other documents, as asked for in the tender, through website. Bids comprising of Technical Proposal and Financial Proposal are to be submitted through online to the website <***https://wbtenders.gov.in***> in two folders concurrently within the prescribed date & time using the Digital Signature Certificate (DSC). The bidder shall carefully go through the documents and prepare the required documents and upload the scanned documents in Portable Document Format (PDF) to the web portal.

The bidder needs to download the Forms / Annexure, fill up the particulars in designated cell and upload the same in designated location. The bidder needs to fill up the rate in the designated cell and upload the same in the designated location.

The documents are to be uploaded (virus scanned copy) duly Digitally Signed. The uploaded documents will get encrypted (transformed into non readable formats). The Bidder shall take note of all the addendum / corrigendum related to the tender and upload the latest document as part of tender.

The original CTS 2010 compliant Demand Draft/ Banker's Cheque / Pay Order towards Cost of Tender Document and original Demand Draft / Banker's Cheque / Pay Order or Bank Guarantee towards Earnest Money Deposit (EMD) shall have to be submitted within the due date of submission.

PSPD CHIEF ENGINEER WBSEDCL

4. Eligibility Criteria for Participation in the Bidding :

4.1 General :

The Invitation of Bids, issued by WBSEDCL is open to the eligible Indian Proprietorship firm / Partnership Firm / Co-operative Society / Statutory Body / Registered Company incorporated in India under the Companies Act, 2013 and all other previous Companies Act barring those bidders, which have been placed under Holiday Listing and the term / duration of such listing has not yet expired.

A Bidder shall not have a conflict of interest.
Any Bidder found to be having a conflict of interest shall be disqualified.
Bidders may be considered to have conflict of interest in this bidding process if any of the following conditions / situations arises :

i. They have a controlling partner in common,
ii. They receive or have received any direct or indirect subsidy from any of them,
iii. They have the same legal representative for purpose of this bid,
iv. They have a relationship with each other, directly or through common third parties, that puts them in position to have access to information about or influence on the bid of another bidder, or influence the decisions of the employer regarding this bidding process,
v. A bidder submits more than one bid in the bidding process, either individually (including bid submitted as partner / authorised representative on behalf of one or more bidder, wherever permitted as per the provision of Qualification requirement for Bidders) or as partner in a joint venture, except for alternative Proposals permitted under Invitation to Bid. This results in disqualification of all such bids.

Or

vi. A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specification of the materials and services/works that are subject of the bid,
vii. The Bidder, directly or indirectly shall not be a dependent agency of the WBSEDCL.

The bidder must submit duly signed with stamp copy of Trade license, Certificate of Incorporation / Registration Certificate, GST Registration (GSTIN), PAN Card, PF Registration, ESI Registration / Mediclaim (for non-ESI coverage area), Profession Tax Registration as per the applicability. Submission of audit report for companies registered under the Companies Act and Tax Audit Report for partnership firm for the last 03 (three) Financial years (2019-20, 2018-19, 2017-18), Income Tax Return for the last 03 (three) Assessment Years (2020-21, 2019-20, 2018-19) and associated statutory clearances / certifications would be necessary.

A power of attorney, duly notarized, including that the person(s) signing the bid has(ve) the authority to sign the bid and thus that the bid is binding upon the Bidder during full period of its validity.

The above stated requirements are a minimum and WBSEDCL reserves the right to request for any additional information and also reserves the right to reject the Proposal of any Bidder, if in the opinion of the authority, the qualification data is incomplete or the Bidder is found not qualified to satisfactorily perform the Contract.

PSPD CHIEF ENGINEER WBSEDCL

4.2 Technical Eligibility Criteria :

a) Bonafide, experienced & resourceful contractors of State / Central Govt., Public Sector Undertakings (PSUs), Govt. Enterprises, Statutory Bodies and reputed Private Organization who have successfully completed similar work during the last 7 (seven) years (up to 31.03.2020) having value of

Three similar completed work costing not less than the amount equal to 40% of the estimated cost.

or

Two similar completed work costing not less than the amount equal to 50% of the estimated cost.

or

One similar completed work costing not less than the amount equal to 80% of the estimated cost.

The word 'similar' shall mean similar nature of work like Construction/renovation of residential/commercial buildings including the related electrical works.

The work shall have to be completed under the Authority of State / Central Government / Undertakings, Power Utilities, Statutory Bodies and reputed Private Organizations.

Copies of the Letter of Award and Completion Certificate indicating Contract value, value of work-done, tenure of completion, date of completion of the work and detail communicational address along with contact number of the Clients should be submitted by the Bidder.

Completion Certificate of the competent authority will be treated as valid credential. [Non-statutory Documents]

4.3 Financial Eligibility Criteria :

a) This Invitation for Bid, issued by WBSEDCL is open to bidders of a registered company incorporated in India under the Companies Act, 1956 or 2013 (with amendment from time to time) or Partnership Firm registered as per Partnership Act 1932 or Proprietorship Firm or Co-operative Society or Statutory Body and must submit the copy of Trade license, Certificate of Company Incorporation / Registration Certificate / Partnership Deed / Society Registration Certificate, PAN Card, PF Registration certificate and current challan, Employees' State Insurance Registration / Mediclaim (For non-ESI coverage area) and current challan, Profession Tax Registration and current challan, GST Registration (GSTIN) and current challan, Labour License, as per the applicability. Bidders who have been placed under Holiday Listing of any Department / Organization and the term / duration of such listing have not yet expired are barred from participating in the Bid.

b) The bidder should have a Minimum Average Annual Turnover @ 30% of the estimated cost of package(s) during last 03 (three) consecutive financial years (2019-20, 2018-19, 2017-18) for actual participation in the bidding process.

c) Submission of Annual Audit Report for companies registered under companies Act and Tax audit report for partnership firm and audit report of the participating organization for the last 03 (three) Financial Years (2019-20, 2018-19, 2017-18).

d) Accepted Income Tax Return for three Assessment Years (2020-21, 2019-20, 2018-19).

PSPD CHIEF ENGINEER WBSEDCL

e) The bidder shall submit reports on the financial standing i.r.o. solvency of Bidder Company / firm as certified by bankers.

f) The bidder should submit letter of undertaking issued by the bank for availability of credit facility as per enclosed format (**Annexure IX**).

g) Working Capital in the preceding year of bid submission (FY 2019-2020) will not be less than 30% of the estimated cost. In case working capital falls below the minimum level of 30%, the short fall shall be compensated with production of certified credit facility (fund based credit facility only) from a scheduled bank.

h) Net Worth for the each of the last three Financial Years (2019-20, 2018-19, 2017-18) should be positive.

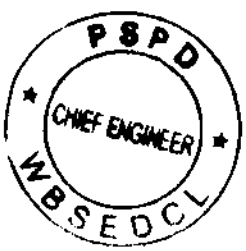
5. **Joint Venture (JV) / Consortium :**

Joint Ventures / Consortiums are allowed to participate in the bid.

a) Bid submitted by a Joint Venture/Consortium, having not more than 3 (three) partners with one partner as Lead Partner, shall comply with the following requirements as per the "Eligibility Criteria for Participation in the Bidding" stated in Clause no. 4 of ITB :

- One of the partners shall be authorized by the other partners of the JV / Consortium for performing the key role in execution of the contract and shall be designated as Lead Partner. The Lead Partner shall be authorized by submitting with the bid a Power of Attorney signed by legally authorized signatories of all the partners of the JV / Consortium as per **Annexure XI**.
- The bid shall be signed by the Lead Partner or its authorized representative.
- On behalf of the JV, the Lead Partner shall be authorized to incur liabilities, to receive instructions from WBSEDCL including payment and correspondence with WBSEDCL. The Lead Partner shall be held exclusively responsible for the entire execution of the contract.
- A Joint Venture / Consortium Agreement entered into by the partners shall be submitted with the bid as per **Annexure X**, including inter-alia delineation of responsibilities and obligations of each partner appended thereto, notwithstanding the joint and several liabilities.
- The Joint Venture / Consortium Agreement should indicate precisely the responsibilities of all partners of JV/Consortium in respect of this work and fulfilment of the contract.
- For JV / Consortium, the Lead Partner should fulfil at least 60% of the minimum criteria and combination of partners must fulfil 100% of the minimum criteria listed in the Technical Eligibility Criteria as stated in Clause No. 4.2 of ITB. Failure to comply with those requirements will result in rejection of the joint venture bid.
- A firm can be a partner in only one JV / Consortium; bids submitted by Joint Ventures/Consortiums including the same firm as partner will be rejected.

b) In case a bid is submitted by a JV / Consortium, all the partners of the JV / Consortium shall meet, individually, the qualification set forth at Clause 4.3(a), 4.3(c), 4.3(d), 4.3(e), 4.3(h) of ITB and collectively the requirement of Clause 4.3(b), 4.3(f), 4.3(g) of ITB. The figures for each of the partner of the JV shall be added together to determine the bidder's compliance with the minimum qualifying criteria set out in Clause 4.3(b), 4.3(f), 4.3(g) of ITB above.



6. **Technical proposal :**

The Technical proposal should contain scanned copies of the following in covers (folders).

6.1 <u>Statutory Cover containing four (04) covers (folders)</u> :

a) NIeT (b) Draft (c) Annexure (d) Forms

(a) To be submitted in "NIeT" folder

i) Tender Documents duly signed with stamp.
ii) Addenda / Corrigenda (if published) or response to query (if any) duly signed with stamp.

Note : Bidders are to keep track of all Addendum / Corrigendum / responses to queries (if any) issued / uploaded with a particular tender and upload all the above digitally signed alongwith the NIeT. Tenders submitted without the Addendum / Corrigendum will be liable to be rejected.

(b) To be submitted in "Draft" folder

i) CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order towards Cost of Tender Document as stated in the NIeT of the Bid
ii) CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order or Bank Guarantee towards Earnest Money Deposit (EMD) as stated in the NIeT of the Bid.

(c) To be submitted in "Annexure" folder

i) Letter of Bid (**Annexure II**),
ii) Pro-forma of Undertakings to be submitted by the bidder (**Annexure III**),
iii) Bid Proposal (**Annexure IV**)

(d) To be submitted in "Forms" folder

i) Check List (**Annexure I**).
ii) Summary statement of average Annual Turnover / Annual Audit report for a period of last three financial years, certified by Auditor appointed under Companies Act, 2013. In case the Bidder is not a company, certificate of Tax Auditor may be submitted.
iii) Statement of Orders executed during last 07 (seven) years.
(Downloaded forms of the bid document are to be filled up, digitally signed by the bidder, virus scanned and uploaded in the respective folders).

Note : Bids shall be summarily rejected if any item in the statutory cover is missing.

6.2 <u>Non-Statutory Cover containing five (05) covers (folders)</u> :

I. **<u>Company Details</u> :**
- Proof of Company Incorporation / Partnership Deed/ Society Registration Certificate and Trade Licence.
- Power of Attorney, duly notarized, indicating that the person(s) signing the bid has(ve) the authority to sign.

II. **<u>Certificates</u> :**
- PAN Card Details.
- GSTIN Registration Certificate and Current Challan.
- Professional Tax (PT) Registration and Current Challan.
- Labour License.

- PF Registration Certificate and current Challan.
- ESIC / Mediclaim (for non-ESI coverage area) & Current Challan.
- Joint Venture / Consortium Agreement, if any (**Annexure X**).

III. Financial Information :

- Income Tax Return for the last 03 (three) Assessment Years (2020-21, 2019-20, 2018-19).
- Banker's certificate in the specified format for Credit Facility as annexed (**Annexure IX**), if applicable.
- A certified copy from a practicing Chartered Accountant to be produced in support of 'Annual Turnover' and Working Capital for last three (03) years (2019-20, 2018-19, 2017-18).

IV. Credential :

- Copy of the Order(s) / Contract Agreement (s) for already executed work issued by the Owners / Purchasers.
- Completion Certificates duly authenticated by Beneficiary.
- Performance Certificates signed by the Owners / Purchasers for at least one year from the date of Bid Publication.

V. Declaration to be given by the Bidder :

- List of Work Order in hand. - (**Annexure XII**)
- List of Key personnel alongwith their experience and qualification, tools, plants, equipment and machineries to be engaged for the project. - (**Annexure XIII**)
- A self Declaration of the authorised signatory of the prospective Bidder or any of the constituent partners should be submitted confirming that they had not been barred to participate in any Tender by any Government Department / Govt. Undertakings / Enterprise / Reputed Private Organizations etc. during the last 5 (five) years prior to the date of this NIeT. - (**Annexure XIV**)
- A self Declaration of the authorised signatory of the prospective Bidder or any of the constituent partners should be submitted in respect of Historical Contract Non-Performance confirming that the prospective Bidders or any of their constituent partner have neither been abandoned from any entrusted work nor any of their contract have been rescinded during the last 5 (five) years. - (**Annexure XV**)
- A self Declaration of the authorised signatory of the prospective Bidder or any of the constituent partners should be submitted regarding any past and current litigation history with WBSEDCL / WBSETCL / Government / PSU in which Bidder is involved during the last 5 (five) years. - (**Annexure XVI**)
- Others: Any other documents if found necessary to be submitted by the Bidder.

Note :

- Failure of submission of any of the above mentioned document(s) will render the bid liable to be summarily rejected.
- The documents uploaded should be digitally signed using the Digital Signature Certificate (DSC)

Opening of Technical Proposal :

Technical proposals will be opened by the authorized representatives of WBSEDCL electronically from the web site stated using their Digital Signature Certificate (DSC).

a) Intending Bidders may remain present if they so desire.

b) Technical proposals for those tenders, whose original DD/ Pay Order towards Cost of Tender Document & DD/ Pay Order or Bank Guarantee towards EMD have been received, will only be opened. Proposals corresponding to which original DD/ Pay Order towards Cost of Tender Document & DD/ Pay Order or Bank Guarantee towards EMD has not been received, will not be opened and will be rejected.

c) Cover for Statutory Documents will be opened first and if found in order, cover for Non-Statutory Documents will be opened. If there is any deficiency in the Statutory Documents the bid will summarily be rejected and the Non-statutory cover shall not be opened.

d) Pursuant to scrutiny & decision of the Tender Evaluating Authority, WBSEDCL, the Financial Proposal will be opened.

8. **Financial proposal :**

a) The financial proposal should contain the following documents in one cover i.e. Bill of quantity (BOQ). The Bidder is to quote the rate (percentage above / below / at par) online in the space marked for quoting rate in the BOQ.

9. **Submission of Cost of Tender Document and Earnest Money Deposit :**

i) Cost of Tender Document & Earnest Money Deposit in original (Hard Copy) mentioning the Name of Work, NIeT No., Name of the Bidder on the envelope shall be submitted to the place of submission mentioned below.

ii) Only online mode of submission of document for Technical Bid & Price Bid is acceptable. No Hard Copy in this respect are required to be submitted.

iii) **Place of submission :** The Cost of Tender Document & Earnest Money Deposit as mentioned in Clause no. 9(i) (in original) shall be submitted at the following address :

Office of the Chief Engineer,
Pumped Storage Project Department (PSPD),
West Bengal State Electricity Distribution Company Limited (WBSEDCL),
Vidyut Bhavan, 5th Floor, C - Block,
Block - DJ, Sector - II, Bidhannagar, Kolkata - 700091

iv) **Time of Submission :** The Original CTS 2010 complaint Demand Draft / Banker's Cheque / Pay Order for Cost of Tender Document and Demand Draft / Pay Order/ Bank Guarantee for Earnest Money Deposit (EMD) must be submitted physically at the above mentioned address, under sealed cover within the date and time as specified in Sl.No.17 of the Notice Inviting e-Tender. If Bidder fails to submit the original documents within the due date and time, his Bid will not be opened and his bid will be rejected.

PSPD CHIEF ENGINEER WBSEDCL

10. **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 & documents will not be entertained by WBSEDCL. Neither any change in time schedule of contract nor any financial adjustments arising thereof shall be permitted by WBSEDCL, 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.

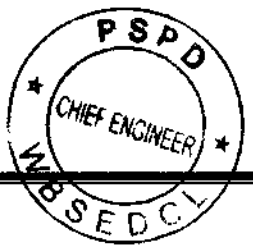
11. **Cost of Bidding :**

The bidder shall bear all cost associated with the preparation and submission of their bid and WBSEDCL in no case shall be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

12. **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 in the following address within the date specified in NIeT. The clarifications given in response to such queries shall be final and binding on the bidder.

Office of the Chief Engineer,
Pumped Storage Project Department (PSPD),
West Bengal State Electricity Distribution Company Limited (WBSEDCL),
Vidyut Bhavan, 5th Floor, C - Block,
Block - DJ, Sector - II, Bidhannagar, Kolkata - 700091
e-mail : wbsedclpspd@gmail.com / cepspd@wbsedcl.in.



13. Amendment to Bidding Document :

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 documents.

b) Any corrigendum, notification concerned to this NIeT will be published in the e-Tender portal <*https://wbtenders.gov.in*> and it will be treated as a part and parcel of the Tender. The Bidders are advised to follow the website regularly for such corrigendum, notification, etc. In order to afford prospective bidders reasonable time in which to take the amendment in to account in preparing their bids, WBSEDCL 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 enclose such documents as a part of the bids.

14. Bid Price :

a) The bidder shall quote their rate in the appropriate format in percentage above/below/ at par the estimated price for the entire scope of work covered under bidding document.
b) Price shall be quoted in Indian Rupee Only.
c) The quoted rate should be firm.
d) Rate include all the levies / duties / taxes / cess & all other incidentals payable but except GST as per statute. No Price adjustment is applicable under any circumstances.
e) GST shall be paid extra as per statute.

15. Signing of Bids :

The documents which are required to be scanned and uploaded shall have to be signed by a person / persons duly authorized by the bidder in blue ink and stamped in every page in Portable Document Format (PDF) to the portal.

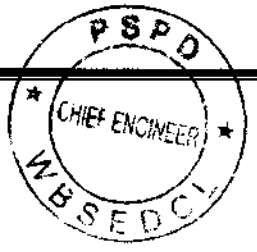
The proof of authorization shall also be uploaded in the form of a written power-of attorney which shall accompany the bid.

The complete bid shall be without alterations, interlineations or erasures.

The bidder's name stated in the Bid proposal shall be exact legal name of the firm.

16. Period of validity of Bids :

The validity of the Bid shall be 180 (one hundred eighty) days from the date of opening of price bid or revised price bid, if any. Prior to the expiry of the original validity period WBSEDCL may request extension in the period of validity for a maximum period of 90 (Ninety) days. The bidder may refuse the request without forfeiting his bid security. Bidders agreeing to the request will not be required nor permitted to modify their respective bids, but will be required to extend the validity or their bid securities accordingly. The provisions of Clause no. 18 of ITB regarding forfeiture of bid security/guarantee shall continue to apply during the extended period of bid validity.



17. Bid Guarantee :

The Bids should be accompanied by requisite Earnest Money Deposit in the form of D.D. / B.C. / P.O. / Bank guarantee as Bid Guarantee. The CTS 2010 compliant Demand Draft (DD) or Banker's Cheque (BC) or Pay Order (PO) is to be purchased by Bidder only. The Bank Guarantee (as Bid Guarantee) shall be valid for 07 (seven) calendar months with a claim period further up to 03 (three) calendar months from the date of opening of Price bid.

Earnest Money Deposit (EMD) of Rs. 5.0 Lakhs (Rupees Five Lakhs) only should be submitted separately through CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order or Bank Guarantee (Annexure VIII) issued on any nationalised bank payable at Kolkata in favour of the "West Bengal State Electricity Distribution Company Limited", and the same should be documented and scanned copy of the aforesaid documents are to be uploaded through said website as per schedule stated in Notice Inviting e-Tender. Exemption from deposition of Earnest Money Deposit (EMD) shall not be allowed under any circumstances.

Unsuccessful bidder's bid guarantee will be released after finalization of tender but not later than 60 (Sixty) days after expiry of the period of bid validity prescribed by WBSEDCL on the basis of request initiated by the unsuccessful bidders to the Tender Inviting Authority.

In case of successful bidder, EMD will be refunded only after submission of Performance Bank Guarantee @ 10 % of the total value of the order / Letter of Award (LoA) placed on the bidder, which shall remain valid till expiry of defect liability period.

No interest shall be payable by WBSEDCL on the bid guarantee.

18. Forfeiture of Earnest Money / Bid Guarantee :

Earnest money / Bid guarantee shall be forfeited in case of following :

a) If during the period of validity, the bidder withdraws/modifies its bid as a whole or in part.
b) If the bidder deviates from any clarification / confirmation given by him subsequent to submission of his bid.
c) If the bidder submits / uploads any manufactured or forged documents / data.
d) In case of successful bidder, if the Bidder fails:
    i. To accept LoA / Order unconditionally and sign contract within specified time limit.
    ii. To furnish the Contract Performance bond as per enclosed pro forma.

19. Process to be Confidential :

i) 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.

ii) 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.

iii) Formation of any Cartel, may lead to the cancellation tenders with penal measures as necessary and WBSEDCL reserves the right to take such unilateral decisions without further notice to anyone.

PSP CHIEF ENGINEER WBSEDCL

20. Determination of Responsiveness :

i) Prior to the detailed evaluation of bids, WBSEDCL will determine whether the bid is substantially responsive to the requirement of the bidding document.

ii) For the purpose of this clause a substantially responsive bid is one which conforms to all terms, conditions and specification of the bidding document, without material deviation, or reservations. WBSEDCL's determination of bid's responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.

iii) If a bid is not substantially responsive to the requirements of the bidding document, it may be rejected by WBSEDCL and the same cannot subsequently be made responsive by the bidder by correction.

21. Time Schedule :

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

22. Evaluation and Comparison of Bids :

a) On examination of documents submitted under different covers, WBSEDCL will evaluate and compare the bid, determined to be substantially responsive at each step.
b) While evaluation, the Tender Evaluating Authority, WBSEDCL may summon the bidders and seek clarification / information or additional documents or original hardcopy of any of the document already submitted and if the same cannot be produced within the stipulated time frame, their proposal will be liable for rejection.
c) The summary list of bidders, whose bids will be found techno-commercially eligible, will be uploaded in the web portals.
d) Financial proposals of the Bidders declared techno-commercially eligible, will be opened electronically by Tender Evaluating Authority, WBSEDCL from the web portal on the prescribed date.
e) The Evaluation of bid will include and take into account :
   - Cost of construction / erection including taxes and duties etc., excluding GST.
   - WBSEDCL shall evaluate and compare only the bids determined to be substantially responsive and qualified.
   - Evaluated bid price of all bidders shall be compared and the lowest bid will be selected for award of contract.
   - Conditional rebate, if any, offered by any bidder shall not be considered in Bid evaluation.

f) Revision / withdrawal of Financial Proposal by the Bidder after opening of Technical Proposal of the Bid will not be allowed if it is not sought by WBSEDCL.

23. Taxes, Duties and Other Levies :

a) The Bidder shall be solely responsible for the taxes that may be levied on the Bidder's persons or on earnings of any office employee. WBSEDCL does not take any responsibility what-so-ever regarding taxes under Indian Income Tax Act or other applicable taxes on the contractor or on his personnel. It is obligatory under the provisions of Indian Income Tax Act, deduction of Tax at source shall be made by the WBSEDCL.

PSPD CHIEF ENGINEER WBSEDCL

b) All other taxes/duties/levies/cess payable (excluding GST) by the bidder shall be included in the bid price and no claim on this behalf will be entertained by WBSEDCL.

c) GST is applicable for this work as per prevailing laws.

24. Laws Governing Contract :

The contract shall be binding according to Acts / Laws in force in the country and shall be under the jurisdiction of Calcutta High Court.

25. 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.

26. Corrupt or Fraudulent Practice :

WBSEDCL expects that bidders observe the highest standard of ethics during the execution of the contract. In pursuance to this policy, WBSEDCL defines for the purpose of this provision, the terms set forth below as follows :

a) "Corrupt Practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the Contract execution

b) "Fraudulent Practice" means misrepresentation of facts in order to influence a procurement process of the execution of a contract to the detriment of WBSEDCL, and includes collusive practice among bidders (Prior to or after bid submission) designed to establish bid prices at artificial no competitive levels to deprive WBSEDCL of the benefits of free and open competition.

WBSEDCL will reject a proposal for award if WBSEDCL determines that the Bidder recommend for award has engaged in corrupt or fraudulent practice in competing for the contract in question.

WBSEDCL will declare a Bidder ineligible either indefinitely or for a stated period of time, if WBSEDCL any time determines that the Bidder has engaged in corrupt or fraudulent practices in competing for, or in executing the contract.

27. Site Visit :

The bidder may visit and examine the site of wok and their surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the bid submission of Proposal. The cost of visiting the sites shall be borne by the bidder. WBSEDCL may assist interested bidders to see and inspect the site of work whenever and wherever possible.

It must be understood and agreed that such factors have properly been investigated and considered while submitting the proposals. No claim for financial adjustment to the contract awarded under these specifications and documents will be entertained by the owner. Neither any change in the time schedule of the contract nor any financial adjustments, arising therefore shall be permitted by the owner, which is based on the lack of such clear information or its effect on the cost of the works to the bidder.

28. **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 reasonably 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 Contractor's liability. The premium for all insurance coverage at all times during the period of contract shall have to be borne by Contractor alone.

a) The Works - The contractor shall take all risk insurance cover for the full value of contract till the expiry of the defects liability period naming WBSEDCL as beneficiary.

29. **Correctness and Sufficiency of Rates quoted in the Bid :**

The bidder shall be deemed to have satisfied himself before Bidding as to the correctness and sufficiency of his Bid 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 including all materials, labour etc. necessary for proper completion and maintenance of the work.

30. **Penalty for suppression / distortion of facts :**

If any Bidder fails to produce the original hard copies of the document like Completion Certificate or / and any other documents on demand of the department within a specified time frame or if any deviation is detected in the original documents from the uploaded soft copies or if there is any suppression, it may be treated as submission of false documents by the Bidder. The Bid will be considered as non-responsive and the Bid will be rejected with forfeiture of Earnest Money Deposit.

At any stage during scrutiny and process towards placement of Letter of Award, if it is found that the credential or any other papers which the Bidder uploaded during Bidding process, found incorrect / manufactured / fabricated, that bid will be considered a nonresponsive and outright rejected with forfeiture of Earnest Money Deposit and action will be taken as per stipulation of the prevailing laws.

31. **Award of Contract :**

The Successful Bidder whose 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 General Conditions of Contract (GCC) will incorporate all documents and corresponding between WBSEDCL and the successful bidder. All the Bid documents including NIeT & BOQ will be the part of the contract documents.

The Successful Bidder within 7 (seven) days of receipt of Letter of Award (LOA), shall submit his unconditional acceptance in writing, failing which WBSEDCL shall have the right to terminate the LoA, and the Earnest Money Deposit submitted along with the Bid will be forfeited.

After acceptance of Letter of Award, the successful bidder shall have to submit requisite copies of contract documents stated in NIeT within time limit to be set in the letter of acceptance.

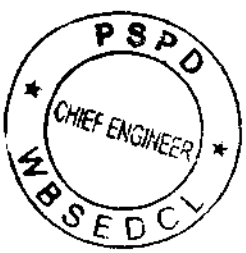
PSPD CHIEF ENGINEER WBSEDCL

32. **Holiday Listing :**

Holiday listing will be applicable according to the "Holiday Listing" policy of the Revised Purchase Policy, which is posted in the website of WBSEDCL (www.wbsedcl.in).

33. **Rejection of Bid :**

WBSEDCL reserves the right to accept or reject any Bid and to cancel the Bidding processes and rejects all Bids at any time prior to the Award of Contract without thereby incurring any liability to the Bidder or Bidders or any obligation to inform the Bidder or Bidders of the reason for WBSEDCL action.



SECTION 3

GENERAL CONDITIONS OF CONTRACT (GCC)

1. Any contractor willing to take part in the process of e-Tendering will have to be enrolled & registered with the Government e-Procurement system, through logging on to http://wbtenders.gov.in (the web portal). The contractor is to click on the link for e-Tendering site as given in the web portal.

2. **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.

i) The '***Company / Owner***' shall mean the WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED (WBSEDCL), having its office at Vidyut Bhavan, Block - DJ, Sector - II, Kolkata - 700091.

ii) The '**Engineer-in-Charge / Controlling Officer**' shall mean the Engineer deployed by the company for the purpose of this contract.

iii) 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, successor and permitted assignees.

iv) The '***Contract Price 'shall*** mean the lump-sum firm price with taxes and duties (excluding GST) quoted by the contractor in his bid with addition and /or deletions as may be agreed and incorporated in the letter of award, for the entire scope of the work.

v) '**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.

vi) '**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.

vii) The '**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.

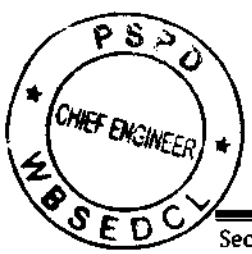
viii) The term '**Services**' shall mean all works to be undertaken by the Contractor as laid down under the head 'Scope of Work' or elsewhere in the specification enclosed. When the words 'approved', 'subject to approval', 'as directed', 'accepted', 'permitted' etc. are used, the approval, judgment, direction etc. are understood to be a function of company.

ix) '**Date of Commencement**' / '**Zero Date**' shall mean the date of actual handing over the site.

x) '**Date of Completion**' shall mean the date of completion of the project in all respect.

xi) '**Specifications**' shall mean collectively all the terms and stipulations contained in this document including the conditions of contract, technical provisions, drawings and attachments thereto and list of corrections and amendments.

xii) '**Drawings**' means collectively all the accompanying general drawings as well as detailed drawings, which may be used from time to time or as desired by WBSEDCL.



xiii) **'Approval'** shall mean the written approval of WBSEDCL and / the statutory authorities, wherever such authorities are specified by any codes or otherwise.

xiv) **'Labourer'** shall mean all categories of labour engaged by the Contractor and his piece workers for work in connection with the execution of the work covered by the specifications. All these labourers will be deemed to be employed primarily by the Contactor.

xv) **'Joint Venture (JV)'** shall refer to a group of Entities that has collectively submitted the Bid in accordance with the provisions of this Tender.

xvi) **'Lead Partner of the JV'** shall mean representative firm of the JV, with relation to the Contract.

3. Scope of Work :

The Scope of Work under this bid is intended to cover all the activities related to "Construction of 02 (Two) nos. four storied Officers' Field Hostel Buildings for 4 X 250 MW Turga PSP at PPSP Township, Baghmundi, Purulia". The major work activities are :

- Reinforced concrete framework with combined / isolated footings and subsequent superstructure work.
- Anti-termite treatment in foundation.
- Accessible roof & parapet wall, roof treatment, staircase.
- Fitting of doors & windows.
- Inside & outside plaster & painting, flooring.
- Sanitary & plumbing, overhead RCC tank.
- Plinth protection, drain.
- Water supply & sewerage system including its connection with the available local system.
- Fire-fighting arrangements.
- Electrical house wiring, transformer installation and connection from available supply.
- Supply and installation other electrical equipment.
- Supplying & fitting furniture and common kitchen setup.
- Supply of all materials, labour, equipment etc. and execution of any other works required for completion of the work in all respect as per the WBSEDCL's design, drawings, technical specification and schedule of works.

For execution of the contract as per scope of work detailed above, the contractor shall have to do the following ancillary work :

i. The Contractor shall develop the land profile as per approved design drawings as well as upto the acceptance of Engineer-in-Charge.

ii. The Contractor shall supply all materials, labours and equipment required for Construction of the field hostels. The Supply of materials shall include transportation, loading and unloading at the work site.

iii. Contractor shall arrange proper storage at site for the equipment and materials at his own cost and risk. The complete system shall be under the custody of the contractor till handing over the buildings to WBSEDCL. WBSEDCL in no case shall be responsible for any loss / damage / theft of materials / equipment; so long those shall continue to remain under the custody of the contractor.

PSPO CHIEF ENGINEER WBSEDCL

iv. The Contractor shall leave the site in clean, clear and tidy condition before handing over of the field hostel buildings after completion of the work.

v. Any item not specifically mentioned in technical specification and / or scope of work but which are required for successful completion of the work are deemed to be included in the scope of work / specification.

4. Performance Guarantee / Security Deposit :

As a Contract Security the successful Bidder shall have to furnish Performance Guarantee / Security Deposit alongwith his unconditional acceptance to the LoA within 7 (seven) days of receipt of Letter of Award (LOA), in the form of Bank Guarantee amounting to 10% of the Contract Value of Work plus GST as applicable to guarantee the faithful performance and security of the Contract in accordance with all the conditions and terms stipulated herein and relevant format attached (**Annexure VII**). Performance Guarantee will also have the Guarantee for successful and satisfactory performance of the materials supplied under the Contract till expiry of the Guarantee period as stated herein before.

5. Refund of Performance Guarantee / Security Deposit :

Refund of Performance Guarantee shall be subject to WBSEDCL's right to deduct / appropriate its dues against the Contractor or under this Contract. The Performance Guarantee for the Bid shall be released only after satisfactory expiry guarantee period (defect liability period), which shall be six months normally, (if not otherwise mentioned in the Letter of Award) and certified as such by the Controlling Officer of the Work upon request by the Contractor.

6. Refund of Earnest Money :

After opening of bid, Earnest Money shall be retained initially for all Bidders. Refund of Earnest Money of the unsuccessful bidders will be made within 30 days after placement of Letter of Award. Bidders shall collect D.C.R. from WBSEDCL for deposition of Earnest Money. The Earnest Money for all unsuccessful bidders shall be released on submission of original receipt duly pre-receipted along with an application. The Earnest Money for the Successful Bidder will be refunded only after submission of Performance Bank Guarantee as stated in Clause No 4 of GCC.

7. Defect Liability Period :

a) The term 'Defect Liability Period' shall mean the period of 6 (six) 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 material at their own cost and responsibility.

b) In case any defect work is detected by the Controlling Officer within the period of 6 (Six) months from the date of issue of Defect Liability Certificate, the defect liability period shall continue beyond 06 (Six) months or till the expiry of one full monsoon period i.e. June to September.

c) Defects / rectification work so notified shall have to be attended and completed satisfactorily within 15 (fifteen) days or as deemed justified by the Controlling Officer. For faithful & due fulfilment of all obligations, this defect liability period shall be covered by the Security Deposit already retained from the contractor.

PSPD CHIEF ENGINEER WBSEDCL

d) After completion of Defect liability period, and on completion of satisfactory rectification of defect, if any, reported within the defect liability period, and on receipt of the application from the contractor, Controlling Officer of the work shall recommend for refund of the Security Deposit.

8. Mode of Execution of Contract :

a) The successful bidder has to submit acceptance of the LoA within 7 (seven) days from the date of issue of the LOA.

b) The successful bidder shall be required to execute an Agreement (as per format enclosed as **Annexure - V**) at his expenses on a non-judicial stamp paper of Rs. 100.00 (Rupees One Hundred) only with WBSEDCL with all related documents for satisfactory execution of the work within 30 (thirty) days from the date of issue of LOA.

c) The Agreement shall be signed on a date and time to be mutually agreed upon at **Office of the Chief Engineer, PSPD, WBSEDCL, Vidyut Bhavan, 5th Floor, C - Block, Block - DJ, Sector - II, Bidhannagar, Kolkata - 700091** by both parties within 30 (thirty) days from the date of the acceptance of the LoA. Power of attorney of the authorized representative of the contractor who will sign the contract on behalf of the contractor is to be submitted before signing of the agreement.

d) The agreement shall be signed in original and five photo copies. The original agreement shall be retained by WBSEDCL and a copy will be handed over to the contractor.

9. General Requirement :

9.1. Contractor shall execute, complete and maintain the work as per direction of the **Engineer-in-Charge / Controlling Officer** of the work or his representatives.

9.2. **Contractor to submit program :** Within 14 (Fourteen) days from the date of issue of Letter of Award (LoA) the Contractor shall submit a program, procedure and method in which he proposes to carry out the work.

9.3. **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 particular person, if necessary).

9.4. **Setting out :** The Contractor shall be responsible for true and proper setting out of the work and for the correctness of the position, levels, dimensions and alignments of all parts of work. If at 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, shall at his own expense rectify such error to the satisfaction of the Controlling Officer / Engineer.

9.5. **Protection of works :** 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 or required by WBSEDCL or by any Competent Authority or Statutory or Other Authority for the protection of the work or for the safety and convenience of the public or others.

PSPD WBSEDCL CHIEF ENGINEER

9.6. **Care of work :** From the commencement to the completion of the work, the contractor shall take full responsibility for the care thereof and of all temporary work and in case of any damage, loss, or injury to work or to any part thereof or to any temporary work due to any cause whatsoever shall at his own cost repair and make good the same, so that at completion the work shall be in good order and conditions 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 adjoining or other properties or to any person. However even if any damage or injury occurs, the contractor shall be responsible in meeting the necessary claims and demands as may be required.

9.7. **Workmen's compensation for accident or injury to any workmen :** WBSEDCL shall not be liable for damage or compensation payable as per provision of law in respect of consequence of any accident or injury to any workmen or other person employed by the contractor. Contractor shall have to pay all claims, demands, proceedings costs, charges and expenses whatsoever in respect thereof or in relation thereto. Insurance Policy covering provision for workmen's compensation for all the workmen to be engaged by the contractor is to be made by him in terms of **Workmen Compensation Act, 1923.** This provision is not applicable for areas covered under ESIC.

9.8 **Facilities for other contractors :** The contractor shall afford all reasonable facilities for any other contractor employed by WBSEDCL in the execution on or near the site of any work not included in the contract.

9.9. **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 a good and tidy condition to the satisfaction of Engineer -in-Charge.

9.10 **Employee State Insurance (ESI) / Mediclaim Benefit (for non-ESI coverage area) for workmen :** Contractor shall have to pay for the Insurance Policy covering provision for ESI / Mediclaim premiums (for non-ESI Coverage area), charges and expenses whatsoever in respect thereof or in relation thereto for all the workmen to be engaged by the contractor. WBSEDCL shall not be liable for ESI / Mediclaim Benefit for medical treatment for any workmen or other person employed by the Contractor.

10. Change of Quantity :

The quantity mentioned in the schedule of work is provisional. WBSEDCL 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 actual execution on the basis of joint measurement signed by the Contractor or his authorized representative and WBSEDCL's representative.

11. GST :

Goods & Service Tax (GST) will be applicable as per prevailing GST Rules.

12. 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.

PSPD CHIEF ENGINEER WBSEDCL

Contractor shall furnish employment card to each worker with one copy of passport sized photograph of the worker working at site for the work.

13. 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 VI**) after placement of LOA.

14. 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.

15. Deductions of Provident Fund and remittance thereof in respect of Contract Labours :

In respect of causal workers or workers engaged for any job for a very short duration or sporadic nature having no employer-employee relationship (any related work 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 as per guidelines of the Provident Fund Commissioner.

16. Variation, Omission, Addition & Alteration :

The Contractor shall not modify the work except under direction in writing by the Controlling Officer. 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.

17. Paying Authority :

The **Assistant Manager (F&A) / Manager (F&A) / Sr. Manager (F&A), Turga Pumped Storage Project Department, WBSEDCL, Vidyut Bhavan, Kolkata - 700091** shall be the Paying authority.

18. Supplementary Works :

Whenever supplementary works become unavoidable for completion of the work in all respect, the Contractor shall bring the matter to the notice of the Controlling Officer / Engineer-in-Charge and submit the proposal prior to execute the work. However, the Controlling Officer / Engineer-in-Charge 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:

PSPD CHIEF ENGINEER WBSEDCL

18.1. The rates of supplementary items, if applicable shall be decided on pro-rata basis from the existing items in the contract.

18.2. When above clause (Cl. No. 18.1) shall not be applicable, the rate shall be taken from P.W.D. (W.B.) Schedule of Rates for Building works, P.W.D. (W.B) Schedule of rates for Sanitary & Plumbing Works, P.W.D. (W.B.) Schedule of Rates for Roads and Bridge Works and P.W.D. (W.B.) Schedule of Rates for Electrical works, including all addendum and corrigendum published till the date of publication of NIeT, plus / minus the contractual rate of quotation.

18.3. When Cl. No. 18.1 & 18.2 above shall not be applicable, the rate should be analysed to the mutual Acceptance of the prevailing market rates of different elements involved in the item, supporting documentary evidence, with 5% overhead, contractor's profit as 10% (ten percent) and 1% (one percent) as Cess (whenever applicable) towards BOCWWC Act, 1996. In that case contractual rate of quotation will not be applicable.

18.4 Controlling Officer's decision regarding finalization of rate of non-scheduled item(s) shall be final and binding upon the Contractor.

19. Measurement and Terms of Payment :

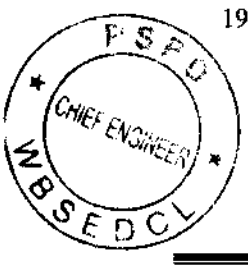
19.1 All items of work carried out by the contractor in accordance with the provision of the contract having a financial value shall be entered in the measurement book / log book etc. as prescribed by the company so that a complete record is obtained of all works performed under the contract and the value of work can be ascertained and determined there from.

19.2 Measurement shall be taken jointly by the WBSEDCL's representative authorized by the Engineer-in-Charge / Controlling Officer and by the contractor or his authorized representative. Every measurement thus taken shall be signed and dated by both the parties.

19.3 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.

19.4 Progressive R/A bills against the prayer of the contractor, for an amount of minimum 10% 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 normally be released within 30 (thirty) 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.

19.5 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 court of law 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 contractor's security



deposit or from the amount retained or the contractor shall pay the amount the overpayment on demand.

19.6 The Contractor shall submit the following documents for release of payments :

- Documents of payment of EPF against all workmen.
- Insurance coverage (Workmen's Compensation Insurance & ESI / Mediclaim Insurance) against all workmen.
- Payment pre-receipt.
- Guarantee / Warranty Certificate of the manufacturer for the required Electrical / Fire Fighting / Furniture items as directed by the Controlling Officer / Supervising Officer.

No bill shall be processed for payment without execution of contract agreement and indemnity bond and acceptance of contract performance guarantee by WBSEDCL.

Receipt for payment made on account of work when executed by a firm, must be signed by a person holding due power of attorney in this respect.

20. Completion of Contract :

All work under the contract must be completed by period of completion time mentioned in NIeT while portions of work as per program settled in consultation with the Controlling officer shall be completed by the date stipulated in the said program. 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 payment of liquidated damages, WBSEDCL shall have the right, without prejudice to any other clauses, to terminate contract forthwith and to take possession of the 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 WBSEDCL on that account. Any letter in writing by the Controlling Officer shall be treated as conclusive on behalf of the WBSEDCL.

21. Defective Materials :

If in the option of the Engineer-in-charge or his authorized representative, 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 the works, 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-in-Charge or his authorized representative 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.

22. Drawings :

The works shall be carried out as per the instructions and to the satisfaction of the Engineer-in-Charge in accordance with the approved drawings, the specifications and schedule of quantities and also as per any further drawings which may be supplied, all instructions which may be given by the Engineer-in-Charge from time to time. At least one set of approved Drawings should be kept at site.

23. Material and Workmanship :

All the works 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.

24. Extension of Time :

Due to Force Majeure activity the Extension of Time, if required, may be granted by the Controlling Officer without imposition of any Liquidated Damage. 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 Engineer-in-charge / Controlling Officer for each occasion. On receipt of such notice, the Engineer-in-charge / 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.

25. Liquidated Damage :

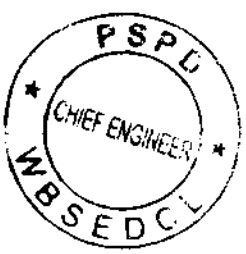
25.1 If the contractor fails to complete the work successfully within the time specified in the contract or any extension thereof, the company shall recover from the contractor as liquidated damages a sum of half percent (0.5%) of the contract value of work plus GST as per statute for each calendar week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

25.2 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.

26. Company's Right to Terminate Contract :

26.1 If the contractor fails to start the work within a month from the date of issue of Letter of Award (LOA), the WBSEDCL shall have the right to cancel the LOA with forfeiture of Earnest Money and /or invocation of Performance Guarantee without giving any notice to the contractor.

26.2 If the contractor neglects or fails to proceed with the work proportionate to the scheduled time of completion of the work or fails to complete the work within scheduled time for completion or within the extended time approved by WBSEDCL, WBSEDCL shall have right to terminate the LOA 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 matter notified, WBSEDCL shall terminate the contract and call the contractor to take joint measurement along with the Engineer-in-Charge or his representative for the finished portion of work. If the contractor does not appear for a joint measurement, ex-party measurement by the WBSEDCL will be taken as final. In that case WBSEDCL shall take possession of the work site and engage the 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 Money Deposit. If the contract is terminated as above, the contractor shall have no claim for compensation against the WBSEDCL for any loss or deterioration of any materials that he may have collected or engaged or entered into an account of the work.



27. Quality of Work / Material and Mode of Measurement :

As regards specification of materials, execution of work and the mode of measurement relevant stipulation of P.W.D. Schedule of rates, Govt. of West Bengal including all addendum and corrigendum prevailing at the time of submission of bids, (applicable at site of work) in this respect will be applicable. The contractor shall arrange and provide all necessary facilities along with necessary manpower for inspection, testing and measurement of work at his own cost.

28. Materials :

All materials including cement and steel and equipment, required for the job, are to be supplied by the contractor. WBSEDCL will have right to test any material(s) at any moment, if found necessary. In that case the contractor will be liable to take appropriate actions, which include the cost of testing and other incidental Charges. Authenticated document for confirmation of quality of material, purchased by the contractor, shall have to be submitted on demand by the Engineer-in-charge.

29. Deduction of Taxes and Cess :

If it is obligatory under the provision of Income Tax Act 1961 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 Worker's 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 the bills for all the items covered in the BOQ.

30. Force Majeure :

Force majeure is herein defined as any cause which is beyond the control of the contractor or WBSEDCL as the case may be, which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affects the performance of the Contract, such as :

- Pandemic situation including but not limited to diseases like COVID-19.
- Natural phenomena, including but not limited to floods, droughts, earthquakes and epidemics.
- Acts of any Government, domestic or foreign, including but not limited to war (declared or undeclared) aggression, internal emergency, mass upsurge, priorities, quarantines, strikes, hostilities or rebellion and embargoes etc.

Neither party shall be liable to the other for any loss and / or damage, occasioned by or arising out of "Force Majeure" cause as referred to or defined above. However, in case of "Force Majeure" incidents, the date of completion as referred shall be extended by a reasonable time. Each party shall intimate the other party in writing about the occurrence of such a "Force Majeure" cause within 15 (fifteen) days of such occurrence.

The contractor shall not be liable to pay any liquidated damage for delay / failure to perform the contract for reasons of force majeure. WBSEDCL shall verify the fact and grant such extension as found to be justified without imposing liquidated damage. 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.

PSPD CHIEF ENGINEER WBSEDCL

31. Controlling Officer's Decision :

Controlling Officer's decision is final and binding in respect of all matters related to the Contract, which are left to the decision of the Controlling Officer including the granting or with-holding of any certificate. If in the opinion of Contractor, any decision made by Controlling Officer is not in accordance with the meaning and intent of the contract, the Contractor may appeal to the Controlling Officer within 7 (seven) days after receipt of the decision. Failure to file an appeal within the allotted time will be considered as acceptance of the Controlling Officer's decision and the decision shall become final and binding.

32. Liability of Accidents and Damage :

The Contractor shall be responsible for the loss, damage or depreciation of the WBSEDCL's materials while in their custody and until the same was taken over by the company.

Until the completed work is taken over by WBSEDCL, the Contractor shall also be liable for and shall indemnify WBSEDCL in respect of all injury to person or damage to property resulting from negligence of the Contractor or his workman or for defective workmanship etc.

33. Completion of Work :

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

34. Controlling Officer / Engineer-in-Charge :

The **Chief Engineer, Turga Pumped Storage Department, WBSEDCL, Vidyut Bhavan, Kolkata - 700091** shall be the Controlling Officer/ Engineer-In-Charge. The controlling officer at his discretion may nominate his representative for proper execution of the job.

35. Idle Labour / Machinery :

Whatever the reason may be, no claim for idle labour and machinery, additional establishment cost, hire and labour charges of tools & plants would be entertained by WBSEDCL, under any circumstances.

36. Safety Rules :

In respect of all labour employed in the work, the Contractor shall, at their expense, arrange for all the safety provisions as per safety codes of W.B. PWD / CPWD, the Electricity Act and all such other Acts as applicable.

The Contractor shall observe and abide by all fire and safety regulations. Before commencement of work, the Contractor shall furnish all details of safety measures to the Controlling Officer that are to be adopted at site and must make good to the satisfaction of WBSEDCL any loss or damage due to fire to any portion of the work done or to be done under this contract or to any of the WBSEDCL's existing property.

PSPD CHIEF ENGINEER WBSEDCL

In cases of pandemic situations (such as COVID-19), the work shall only be continued following all the safety instructions, guidelines and protocol provided by the Govt. of India and Govt. of West Bengal.

The Contractor shall also provide necessary fencing and lights to protect the public from accident. Fire extinguishers shall be kept by the Contractor at the site 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 equipment 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 prominent place of the work spot. The persons responsible for compliance of code shall be named by the Contractor.

To ensure effective enforcement of the rules & regulations relating to safety precautions, the arrangement made by the Contractor shall be open inspection by WBSEDCL.

Notwithstanding the above clauses there is nothing in those to exempt the Contractor from the operations of any other Act or Rule in force in India.

All storage, handling and 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 Accidents :
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' forms as per appropriate Performa, 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.

- To provide first aid at his own First Aid Station.
- To take the injured person to the hospital along with the 'Injured on Work' form duly filled in.
- To report the accident to WBSEDCL

Fatal Accident :
Fatal accident must be reported immediately to WBSEDCL as well as to the local Police Station.

Penalty :
Failure to observe the Safety Rules will make the contract or 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.

37. Settlement of Disputes :

All disputes concerning question of act arising under the contract shall be decided by WBSEDCL on receipt of written appeal by the Contractor. Any dispute or differences arising out in connection with the contract shall to the extent possible be settled amicably and where settlement cannot be reached then such disputes shall be subjected to settlement under the jurisdiction of Calcutta High Court.

38. Equipment & machineries :

For timely completion of the work the contractor must have to deploy all necessary equipment, tools & tackles and machineries to execute the work at a time to perform all works simultaneously as per requirement of WBSEDCL.

39. 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., (A Govt. of West Bengal Enterprise) the 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.

40. Holiday Listing :

WBSEDCL's policy on 'Holiday Listing of Contractors' / Agencies / Firms / Companies where WBSEDCL may debar the agency from getting further tender papers for such time which shall be applicable as per the rules of owner's apart from other penal measures mentioned in the General Conditions of Contract (GCC), will be applicable.

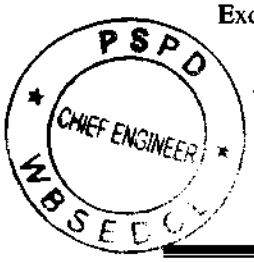
41. Sheds, Stores and Yards :

The Contractor shall at its own cost built up sheds, stores and yards in the specified area provided by WBSEDCL. The location, sizes and shapes of the proposed sheds, stores and yards are to be approved by the Engineer-in-Charge prior to actual execution. It shall keep sufficient quantity of materials and plant in stock at each such sheds, stores and yards so as to avoid any delay for carrying out of the work with due expedition and the Engineer-in-Charge and his representative shall have free access to the said sheds, stores and yards at any time for the purpose of inspecting the stock of materials or plant so kept in hand. Any materials or plant which the Engineer-in-Charge may object shall not be brought upon or used in the work, but shall be forthwith removed from the sheds, stores or yards by you at your own cost.

The Contractor shall take prior approval of the Engineer-in-Charge for all materials to be used in constructional work.

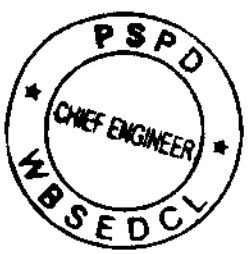
42. Limitation of Liability :

Except in cases of gross negligence or wilful misconduct,



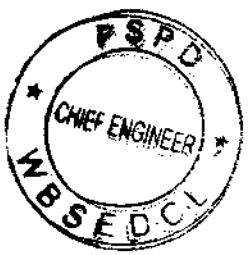
a) The **CONTRACTOR** and the **EMPLOYER** shall not be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the **CONTRACTOR** to pay liquidated damages to the **EMPLOYER**.

b) The aggregate liability of the **CONTRACTOR** to the **EMPLOYER**, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the **CONTRACTOR** to indemnify the **EMPLOYER** with respect to patent infringement.



SECTION 4

ADDITIONAL CONDITIONS OF CONTRACT (ACC)



1.0 The entire work shall be inspected by WBSEDCL representative from time to time at site as necessary. The Contractor shall provide all facilities for such inspection free of cost. Notwithstanding any inspection of the 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 office and store.

2.0 During the execution of the work, if any, problem arises which is not covered by the specifications, the contractor shall seek necessary clarification and instruction from WBSEDCL. Such instruction shall be binding on the contractor and shall be observed in full.

3.0 The Contractor shall make his own arrangement for the labour, construction equipment, tools and tackles and construction materials, construction water, office / labour accommodation, water supply, sanitation, etc. without affecting surrounding environment.

4.0 If the electricity for construction purpose is supplied by WBSEDCL, the charge shall be borne by the Contractor at the rate specified by 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 has to arrange the same at his own cost.

5.0 The Contractor shall strictly follow the construction / repairing safety rules, regulations and instructions issued from time to time. In absence of any particular reference the Contractor shall refer to the Indian Standard and also the State Government rules and regulations.

6.0 The contractor shall take all precautions during execution, especially while excavating underground works, such as cables, pipelines, drains etc. and provide all possible precautions to these works and in case they are damaged, rebuild / divert them at his own cost.

7.0 All guarantees and test certificates, royalty, road challans for all type of material obtained by the contractor during the execution of the work shall be transferred to the WBSEDCL time to time before issue of the final payment.

8.0 The Contractor shall provide all necessary storage at the site in specified areas for all materials such as all types of aggregates, bricks, timber, cement, electrical wires & materials and such other materials which are likely to deteriorate by the action of sun, wind, rain or other natural causes due to exposure in the open in such manner that all such material shall be duly protected from damage by weather or any other cause. All such stores shall be cleared after completion of work and the entire site shall be clean and free from debris. All material shall be stacked in such a manner as to facilitate rapid and easy checking of such materials.

9.0 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 on that area. All arrangements / program of work must be adjusted accordingly. All precautions must be taken to guard against chances of injury or accident to the occupants, users & workers. The Contractor must see that all damages to any property, which in the opinion of the Controlling Officer are due to the work of Contractor, are promptly rectified as per direction and to his satisfaction. The construction of work must be done in such a way as not to dislocate or disturb any sewerage system and other existing structures.

10.0 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 have to be made by WBSEDCL under order of appropriate authorities, the same shall be recovered from the Contractor.

11.0 Any services if affected by the work must be restored by the Contractor on emergency basis at his own cost.

12.0 After completion of work, the finishes shall be of high quality and approved standard.

PSPD CHIEF ENGINEER WBSEDCL

13.0 No omission or ambiguities in the drawing or in the specifications will relieve the contractor from responsibility for material or completeness of the work.

14.0 WBSEDCL's representative may during the 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.

15.0 All drawings as supplied with the Bid document are provisional.

16.0 The contractor shall provide sufficient strong and stable staging as to ensure safety of the labourers and structures.

17.0 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 as temporary facilities were built and restore the same to original condition.

18.0 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 WBSEDCL shall be removed by the Contractor from the site of work immediately.

19.0 All materials including reinforcing steel, cement for concrete work, bricks, wires, cables, electrical equipment shall be procured after approval of brand and make by WBSEDCL.

20.0 All bricks have to be submerged in vats before put to use. Carrying shall be done with proper care.

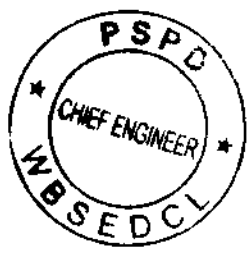
21.0 The contractor has to make arrangement for temporary cover to enable civil construction works to continue if interrupted due to rains during monsoon.

22.0 Technical specifications of any items of work in the Bid Documents shall be guided by the General Specifications & reference of IS code of practice as mentioned in P.W.D. (WB) schedule of rates for Buildings works, Sanitary & Plumbing works, Road & Bridge works and Electrical works with all corrigendum and addendum published till the date of publication of NIeT. Mode of measurement shall be followed as described in same PWD, S.O.R., unless otherwise stated.

23.0 All dismantled departmental materials shall have to be returned to store/ disposed and stacked in a place (within 200 m lead) provided by the purchaser without any extra cost to WBSEDCL.

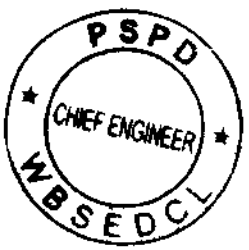
24.0 Valid Manufacturer's Test certificates of 11 KV XLPE cable, 1.1 KV PVC cable, 11 KV TPGO Isolator related to 315 KVA 11/0.433 KV DTR installation should be submitted by the Contractor to the Engineer-in-Charge before construction.

25.0 In relation to supply, delivery and installation of the specified model of Godrej make furniture and kitchen cubicles, the Contractor shall have to submit the Agreement executed between them and Godrej for ensuring the quality of the same as specified by the model number. Replacement of any item of the list if found damaged / defective within defect liability period has to be done with the same Godrej model at Contractor's total risk and responsibility.



SECTION 5

TECHNICAL SPECIFICATIONS (TS)



TECHNICAL SPECIFICATION FOR CIVIL WORKS

1. STANDARD :

The standard and quality of materials and workmanship shall be as per PWD SOR (WB) and CPWD Specifications. In case of non availability in PWD SOR (WB) and CPWD the same shall be followed as per relevant IS code.

2. APPROVAL OF TESTS :

All material to be used in permanent construction shall be subject to approval of the WBSEDCL. The Contractor shall apply sufficiently in advance with samples of the materials including the supporting test results free of cost if asked for from the approved laboratory and other documentary evidences from the manufacturer wherever applicable and indicating the type of materials and their respective sources. The delivery of materials at site shall commence only after the approval of the quality, grading and sources of the materials.

The quality of all materials once approved shall be maintained throughout the period of construction and periodical approved tests shall be carried out to ensure that it is maintained, if necessary.

The brands / makes of materials specified in the PWD SOR (WB), if not mentioned anywhere else in this document, shall only be used in work as decided by the WBSEDCL. Should it become necessary for any reason such as non-availability, to be verified and confirmed to use any material other than the specified "Brand" or "Make", the CONTRACTOR shall submit sample of the same to the WBSEDCL for approval together with test certificates and other documents necessary for examining and giving approval thereof.

Tests on Materials delivered at site shall be carried out as mentioned in PWD SOR (WB) or as per relevant IS code in case of non availability of the same in PWD SOR (WB), if not mentioned anywhere else in this document.

3. CODES :

Unless mentioned otherwise, current versions of all codes, specifications and standards issued by the Bureau of Indian Standards (BIS) and Indian Roads Congress (IRC) etc. shall be fully applicable to these specifications.

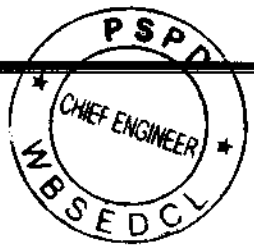
In case of any conflict in meaning between these specifications and those of BIS or IRC or similar, the provisions of these specifications shall prevail.

4. REJECTION OF MATERIALS :

Any material brought to site which, in the opinion of the WBSEDCL is damaged, contaminated, deteriorated or does not comply with the requirement of this specification, shall be rejected.

If the routine site tests or random site tests show that any of the materials, brought to site, do not comply in any way with the requirements of this specification, then that material shall be rejected.

The Contractor shall remove from site any and all such rejected material within the time specified by the WBSEDCL.



In case of any failure in test results of any permanent work beyond acceptable limit, as mentioned in PWD SOR (WB) and / or in relevant IS code, if not otherwise mentioned anywhere in this tender document, the work has to be dismantled and redone at the risk and cost of the contractor.

5. MATERIALS - IN GENERAL :

All materials should be as per specification of PWD SOR (WB), if not mentioned anywhere else in this document. In case of non availability of the same in PWD SOR (WB), relevant IS code should be followed. However, Cement, water and Steel will be as follows:

Cement :

Cement for the work shall either be of Ordinary Portland Cement conforming to the latest Indian Standards IS : 269 for 33 grade, 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 is "fly ash based".

Other types of cement, if found suitable by the Controlling Officer, may be used depending upon the requirements of certain jobs.

Testing of Samples :

The Contractor shall supply a copy of the manufacturer's test certificate for each consignment of cement supplied by him and consignments shall be used on work in the order of delivery. The CONTRACTOR shall supply samples of cement to the WBSEDCL as frequently as he may require for testing, if asked for, free of cost. The sampling of cement for testing shall be according to IS: 3535. All tests shall be in accordance with the relevant clauses of IS : 4031 & IS : 4032.

Contractor's Responsibility :

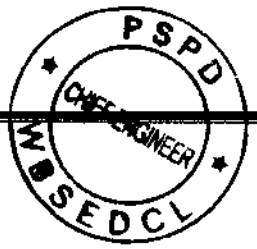
From the time that a consignment of cement is delivered at site and approved by the WBSEDCL until such time as the cement is used on the works. The CONTRACTOR shall be responsible for keeping the same in sound and acceptable condition. Any cement, which deteriorates while in the CONTRACTOR'S charge and is rejected as unsuitable by the WBSEDCL, shall be removed from the site and outside the limits of work within two days of ordering such removal by the WBSEDCL.

Stock of Cement :

In order to ensure due progress, the CONTRACTOR shall at all times maintain on the site at least such stock of cement as the WBSEDCL may from time to time consider necessary. No cement shall be used upon the works until it has been accepted as satisfactory by the WBSEDCL.

Storage of Cement :

The cement shall be stored in such manner as to permit easy access for proper inspection and in a suitable weather tight, well ventilated place to protect it from dampness caused by ingress of moisture from any source. Different types of cement shall be stored separately. Cement bags shall be stacked at least 15 to 20 cm clear of the floor bearing a space of 60 cm around the exterior walls. The cement shall not be stacked more than 10 bags high. Each consignment of cement shall be stacked separately to permit easy access for inspection.



Water :

Water used for mixing concrete and mortar and for curing shall be clean and free from injurious amounts of oil, acid, alkali, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel.

Steel for Reinforcement :

Reinforcing bars for concrete shall be round steel bars of the following types as may be shown on the drawing:

High Yield strength deformed bars conforming to IS : 1786 (Fe 500). "Specification for High Strength Deformed Steel Bars & Wires for Concrete Reinforcement".

All reinforcement bars shall be of uniform cross sectional area and be free from loose mill scales, dust, loose rust, coats of paint, oil or other coatings which may destroy or reduce bond.

6. EARTH WORK :

6.1 Excavation :

Excavation for footings, trenches, pits etc. shall be done to widths, lines and levels as shown in the drawings or to such lesser or greater widths lines and levels as directed by the Controlling Officer. The bottom and side of excavation shall be trimmed to required levels, profile, etc. watered and thoroughly rammed. 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 and causes any accident and hamper the progress of the work. They will take necessary step to prevent any damage to the adjacent structure or existing services. They shall repair and make good any such damage at their own expense to the satisfaction of the Controlling Officer.

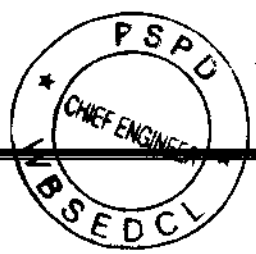
Excess Excavation :

All excavation done beyond the specified limits or directions of WBSEDCL shall be considered as excess excavation. They shall be made good as prescribed below by the CONTRACTOR at his cost:

i) Excess excavation in case of trenches shall be made good by filling and compacting with selected earth to the same compaction as the surrounding material. Degree of compaction shall be at least the same as the surrounding material.

ii) Excess excavation in case of trenches shall be made good by filling and compacting with selected earth to the same compaction as the surrounding material or as directed by WBSEDCL. This shall be done in layers not exceeding 150 mm thick, moistened and thoroughly compacted by trampling.

iii) Excess excavation in case of foundation beyond required depths shall be made good by filling with lean concrete of M-5 grade.



6.2 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 Controlling Officer 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 Controlling Officer.

6.3 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.

6.4 Silver sand filling :

Filling under floors or other places instructed by the Controlling Officer / Supervising Officer shall be done by silver sand brought from outside by the Contractor which is having silt content less than 5% by weight, and 150 mm thick (maximum) compacted layers will be spread, wetted & saturated to achieve the compaction. However, for any special case, Controlling Officer / Supervising Officer may instruct filling by sand other than silver sand which the Contractor shall comply. The specification etc shall be guided by relevant IS code.

6.5 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 (using all sorts of soils including mixed soil but excluding laterite or sand stone) 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 are 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.

6.6 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 the Controlling Officer 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 the Controlling Officer:

a) Removal of surplus material outside the plot for disposal.

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

7. PLAIN & REINFORCED CONCRETE :

7.1 General :

Concrete and reinforced concrete work shall be carried out generally in conformity with the latest Indian Standards IS : 456 - 2000 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.

7.2 Cement :

Cement for the work shall either be 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) 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 cement shall be used as per the list of manufactures provided in the bid document. Use of cement from any other manufacturer shall be strictly avoided unless prior approval has been granted by the Controlling Officer. 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.

7.3 Sand :

Sand, i.e. fine aggregate shall generally conform to the latest edition of the Indian Standards (IS : 383). Sand shall be natural sand, crushed gravel sand or crushed stone sand at the discretion of the Controlling Officer. 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 as specified in clause no. 3.1.3.4 of CPWD Specifications 2019 (Vol 1). Allowance for bulking of sand shall be made considering the moisture content during the use of sand. 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.

PSPD CHIEF ENGINEER WBSEDCL

7.4 Coarse Aggregate :

Coarse aggregate shall be approved hard aggregate generally conforming to latest Indian Standards: IS - 383. The following tests should be carried out as per the instructions of the Controlling Officer / Supervising Officer :-

- Crushing value
- Impact value
- Sieve analysis
- Deleterious material
- Flakiness index

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

7.5 Types of concrete, strengths etc. :

The Bill of Quantity specifies M20 (1:1.5:3) grade of reinforced cement concrete. The strength corresponding to this grade is given as under :-

- Grade of Concrete : M20.
- Characteristics strength : 20 N/mm^2
- Target strength : $\geq$ 27.6 N/mm^2

The concrete mix design shall conform to IS : 10262 - 2019 and IS : 456 - 2000. 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 - 2000. Sufficient number of cube moulds should be kept ready at site. 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.

7.6 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 Controlling Officer.

7.7 Tests for determination of strength of Reinforced concrete :

As will be apparent from the Bill of Quantity, 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

PSPD CHIEF ENGINEER WBSEDCL

made from samples collected from the concrete being poured for the particular part and determined as per acceptance criteria detailed hereinafter. Cube testing of RCC work is to be done as per the details provided in relevant IS codes and in Page 123 of CPWD Specifications 2019 (Vol 1). Testing of Concrete Cubes for determining the Compression Strength for Reinforced Concrete Work should be performed by the Contractor at own cost and upto the full satisfaction of the Controlling Officer/ Supervising Officer. The salient features for the collection of samples is as indicated below :

(a) Quality as specified.

(b) Compression Strength shall be as specified for the particular type of concrete.

(c) 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:

- Average of the three cubes strengths shall not be less than the specified strength.
- No individual cube strength shall be less than 90% of the specified strength.
- If any individual cube strength exhibits more than 133% of the target strength, such cube shall be classified as freak and criteria shall be applied for the remaining two cubes only and the acceptability determined.
- **Quantum of cubes and testing :**

The decision of the Controlling Officer 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 Controlling Officer).

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

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

7.8 Making of non-RMC concrete :

All mixing of aggregates, cement and plasticizer (if any) 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.

7.8.1 Cubes :

The size of cubes to be prepared and tested shall be 15 x 15 x 15 cm.

The minimum number of cubes to be collected from each sample 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 - 2000 shall be followed by the Contractor. All costs for sampling and field as well as laboratory testing shall be borne by the Contractor.

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 the Controlling Officer/Supervising Officer 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.

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.

7.8.2 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.

7.8.3 Slump :

If in the opinion of the Controlling Officer / Supervising Officer, 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.

7.9 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 1.2 metre. Where the concrete to be placed from more height it should be done through chute as per relevant IS specification and as directed by the Controlling Officer.

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 the Controlling Officer.

PSPD CHIEF ENGINEER WBSEDCL

7.10 Formwork :

7.10.1 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 Controlling Officer/ Supervising Officer 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 the Controlling Officer / Supervising Officer.

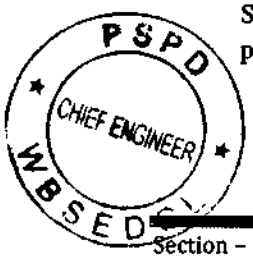
If any particular materials or materials be specified in the schedule of quantities for form work such particularly specified material or materials shall be used in work. The form work shall be so constructed as to remain sufficiently rigid during placing of the concrete. All shuttering and forming must 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 6 mm 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 the Controlling Officer.

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 the Controlling Officer/ Supervising Officer 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 10 cm and shall be straight and adequately strong. The spacing of such struts shall be designed 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.

7.10.2 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.

7.10.3 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 Controlling Officer / Supervising Officer before placing reinforcements on form work. No concrete shall be commenced until the Supervising Officer / or his representative 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 Controlling Officer / Supervising Officer 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 Controlling Officer / Supervising Officer and to his entire satisfaction.

The lines, levels, form work, reinforcement etc. shall be checked by the Contractor with subsequent approval / checking by Supervising Officer/ or his representative 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.

7.10.4 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 Supervising Officer/ or his representative 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

PSPD CHIEF ENGINEER WBSEDCL

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 the Controlling Officer/ Supervising Officer with risk and cost of the Contractor without any further claim.

7.10.5 Stripping Time :

In normal circumstances (generally where temperature are above 20°C) 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.

7.10.6 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.

7.10.7 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 occurs with all cements in the cold-weather.

7.10.8 Tolerances :

The following shall be the maximum permissible tolerance :-

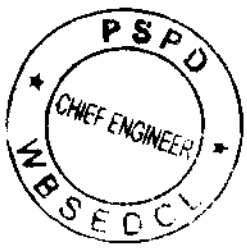
a) On general setting out dimensions upto 4 m in length a tolerance upto 3 mm will be allowed.

b) On lengths of more than 4 m tolerance of not more than 5 mm 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 2 mm will not be allowed.

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

e) Columns and walls and other vertical members shall not be more than 3 mm 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 Controlling Officer/ Supervising Officer 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.

7.11 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 the Controlling Officer / Supervising Officer at their sole discretion to be consolidated by hand only after prior permission.

7.12 Finish to concrete surfaces :

Finish to concrete surfaces at various situations shall be as per directions of Supervising Officer / or his representative. 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 the Supervising Officer/ or his representative and the Contractor will implement the instructions accordingly.

7.13 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.

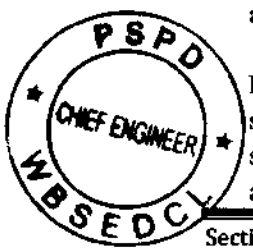
7.14 Curing :

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.

7.15 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 the Controlling Officer / Supervising Officer. 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 or as instructed in writing by the Controlling Officer.

All reinforcements 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 quantity for reinforcement will be measured and paid for according to bending lists without allowances for cutting, wastages, binding wire etc. Designed/Required laps, hooks, chairs, spacers etc. shall

however be accounted for. In case, the Contractor or the Controlling Officer/ Supervising Officer 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.

Reinforcements 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 directed by the Controlling Officer/ Supervising Officer, at the risk and cost of the Contractor.

8. MASONRY AND PLASTERING :

8.1 Materials :

8.1.1 Traditional 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 absorbing 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 criterion.

8.1.2 Autoclave Aerated Concrete (AAC) block :

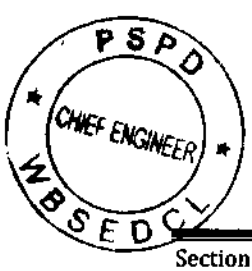
Grade - I autoclave aerated concrete (AAC) blocks of size 625 mm x 250 mm x 125 mm are to be used for superstructure masonry works. Any other size shall be used only after approval from the Controlling Officer. The drying Shrinkage is to be less than 0.05%. Use of fly ash should conform to IS : 3812-1981 with loss on ignition not more than 6%.

8.1.3 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 7 above and relevant IS code and schedule of specifications.

8.1.4 Additives :

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



8.2 Samples and testing :

When demanded by the Controlling Officer / Supervising Officer, the Contractor shall produce samples of out samples of work materials or carry for the 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 the Controlling Officer / Supervising Officer shall not relieve the Contractor's obligation of the Contract during entire period of Contract.

In case of traditional bricks, 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.

In case of AAC blocks, testing of blocks shall be carried out in respect of dimension, block density, compressive strength, thermal conductivity, drying shrinkage etc. as stated in cl. 6.14 of CPWD specifications, vol. I. In any consignment, all the blocks of the same size and from the same batch of manufacture shall be grouped together into a minimum number of groups of 10000 blocks or less. Each such group shall constitute a lot.

- For each lot, all the 24 Blocks shall be checked for dimensions and inspected for visual defects.
- Out of the 24 blocks, 12 blocks shall be subjected to the test for compressive strength, 3 blocks to the test for density, 3 blocks to the test for thermal conductivity and 3 blocks to the test for drying shrinkage. The remaining 3 blocks shall be reserved for re-test for drying shrinkage if a need arises.
- The samples of AAC blocks (each sample consisting of 6 specimen) shall be chosen randomly from the lot procured and tested for various parameters as stated above. One samples shall be tested for every 100 cum or part thereof. However, minimum one sample shall be tested from each lot received at site if the quantity procured in the lot is less than 100 cum. If required, Engineer-in-Charge or his authorized representative shall inspect the factory during production of the material for this work and also collect samples (of materials used for making AAC blocks and precast AAC blocks) from the factory itself. The contractor shall consider this contingency also while placing the order with one of the approved firms. Nothing extra shall be payable on this account.
- The criteria for conformity should follow cl. 6.14.9 of CPWD specifications, vol. 1.

8.3 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 m above another at any time, and the work shall be properly toothed and racked back.

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 10 mm. as the work proceeds. The surface of brick work shall be cleaned down and watered properly before the mortar sets.

PSPD CHIEF ENGINEER WBSEDC

8.4 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, if required, 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.

9. DOORS :

9.1 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 Quantity. The measurement, materials etc shall be guided by relevant IS code and relevant specification.

9.1.1 Materials :

Timber shall be best quality teak locally available or well seasoned Sal wood (as per BOQ) purchased from a Government licensed / approved supplier, 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 the Controlling Officer / Supervising Officer 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 the Controlling Officer/ Supervising Officer 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.

9.1.2 Fixing/erection in position of door frames :

Before the frames are fixed in position, these shall be inspected and passed by Supervising Officer / or his representative. The frames shall be placed in proper position and fixed to the walls with suitable holdfasts / clamps as per IS Code and relevant specification.

PSPD CHIEF ENGINEER WBSEDCL

9.1.3 Shutters (Block Board) :

Flush doors shall be solid core type with commercial or decorative faces. All flush doors shall be obtained from approved manufacturer. The specification generally should conform to IS: 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, if any, shall be removed from site within 48 hours.

9.1.4 Tolerance :

Tolerance on width and height shall be + 2 mm 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.

9.1.5 Adhesives :

Only synthetic resin adhesives conforming to IS : 851 latest version 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.

9.1.6 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 the Controlling Officer/ Supervising Officer 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.

10. FLOORING :

10.1 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 shall be perfect vertical and in right angled to each other. Minimum thickness of slabs shall be 20 mm (or as specified in the relevant items of BOQ and IS specification) 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 the Controlling Officer/ Supervising Officer. 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 the Controlling Officer/ Supervising Officer. 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,

PSPD WBSEDCL CHIEF ENGINEER

approval should be taken from WBSEDCL on the sample work and the approved sample(s) shall be kept at site for ready reference.

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.

10.2 Ceramic Wall Tiles :

10.2.1 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 fixing & workmanship shall be as per IS : 1443.

10.2.2 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 BOQ 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.

The back of the tile shall be covered with 15 mm thick layer of cement mortar 1:3 using fine sand and the edge of the tile smeared with neat white cement slurry. Fix 10 mm size stone chips at 4 corners of each tiles with adhesive viz., Araldite of equivalent for keying action or with approved chemical of reputed brand. A thin layer of cement paste (2 mm) 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. 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. 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. 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 mm in width and they shall be uniform. 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.

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.

PSPD CHIEF ENGINEER WBSEDCL

10.3 Marble Stone Flooring :

10.3.1 Dressing of Slabs :

Every stone shall be cut to the required size and shape, fine chisel dressed on all sides to the full depth so that a straight edge laid along the side of the stone shall be fully in contact with it. The top surface shall also be fine chisel dressed to remove all waviness. In case machine cut slabs are used, fine chiesel dressing of machine cut surface need not be done provided a straight edge laid anywhere along the machine cut surfaces is in contact with every point on it. The sides and top surface of slabs shall be machine rubbed or table rubbed with coarse sand before paving. All angles and edges of the marble slabs shall be true, square and free from chippings and the surface shall be true and plane. The thickness (from 15 to 18 mm) and size (from 0.3 to 0.6 sqm) of the slabs should be as per the description of the item in BOQ. Tolerance of + 3% shall be allowed for the thickness. In respect of length and breadth of slabs a tolerance of ± 2% shall be allowed.

10.3.2 Laying :

Base concrete or the RCC slab on which the slabs are to be laid shall be cleaned, wetted and mopped. The bedding for the slabs shall be prepared with 20 mm (avg.) thick base of Cement mortar (1:2) laid with white cement slurry @ 4.4 kg per sqm before placing marbles which are to be jointed with white cement slurry @ 2.0 kg per sqm with necessary pigments. The thickness of the bedding mortar at any place under the slab shall not be less than 12 mm.

The mortar (1:2) shall be spread under the area of each slab, roughly to the average thickness specified in the item. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped with wooden mallet and brought to level with the adjoining slabs. It shall be lifted and laid aside. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows. The mortar is allowed to harden a bit and cement slurry of honey like consistency shall be spread over the same at the rate of 4.4 kg of cement per sqm. The edges of the slab already paved shall be buttered with grey or white cement with or without admixture of pigment to match the shade of the marble slabs as given in the description of the item. The slab to be paved shall then be lowered gently back in position and tapped with wooden mallet till it is properly bedded in level with and close to the adjoining slabs with as fine a joint as possible. Subsequent slabs shall be laid in the same manner. After each slab has been laid, surplus cement on the surface of the slabs shall be cleaned off. The flooring shall be cured for a minimum period of seven days. The surface of the flooring as laid shall be true to levels, and, slopes as instructed by the Controlling Officer/Supervising Officer. Joint thickness shall not be more than 1 mm. Due care shall be taken to match the grains of slabs which shall be selected judiciously having uniform pattern of Veins/streaks or as directed by the Controlling Officer.

The slabs shall be matched as shown in drawings or as instructed by the Controlling Officer/Supervising Officer. Slabs which are fixed in the floor adjoining the wall shall enter not less than 12 mm under the plaster skirting or dado. The junction between wall plaster and floor shall be finished neatly and without waviness.

10.3.3 Granite Polishing and Finishing :

Slight unevenness at the meeting edges of slabs shall then be removed by fine chiseling and finished in the same manner as specified in Clause 11.10.3 of CPWD Specifications 2019 (vol I) except that cement slurry with or without pigments shall not be applied on the surface before each polishing.

10.4 Marble Stone in Skirting :

Dressing of Slabs shall be as specified in Clause 10.3.1 above. A tolerance of ± 3% mm shall be allowed, unless otherwise specified in the description of the item. The wall surface shall be cut uniformly to the requisite depth so that the skirting face shall have the projection from the finished face of wall as shown in drawings or as required by the Controlling Officer. In no case the skirting should project by more than thickness of stone. The thickness (from 15 to 18 mm) and size (from 0.3 to 0.6 sqm) of the slabs should be as per the description of the item in BOQ.

10.4.1 Laying :

The skirting shall be in grey or white cement admixed with or without pigment to match the shade of the stone, with the line of the slab at such a distance from the wall that the average width of the gap shall be 12 mm and at no place the width shall be less than 10 mm, if necessary, the slabs shall be held in position by temporary M.S. hooks fixed into the wall at suitable intervals. The skirting face shall be checked for plane & plumb and corrected. The joints shall thus be left to harden then the rear of the skirting or riser slab shall be packed with 15 mm (avg) thick base of Cement mortar (1:2) laid with white cement slurry @ 4.4 kg per sqm and slabs are jointed with white cement slurry @ 2.2 kg per sqm with necessary pigments. The fixing hooks shall be removed after the mortar filling the gap has acquired sufficient strength. The joints shall be as fine as possible but not more than 1 mm. The top line of skirting and risers shall be truly horizontal and joints truly vertical, except where otherwise indicated. The skirting slab shall be matched as shown in drawings or as instructed by the Controlling Officer.

10.4.2 Curing, Polishing and Finishing :

It shall be as specified in Clause 11.11.4 of CPWD Specifications 2019 (vol I) as far as applicable, except that cement slurry with or without pigment shall not be applied on the surface and polishing shall be done only with hand. The face and top of skirting shall be polished.

11. PAINTING :

11.1 Materials :

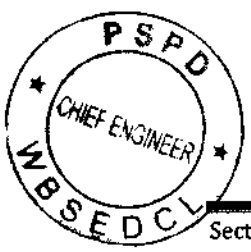
The primers and paints which to be used for this work shall be of first class quality (or as specified in BOQ) of reputed manufacturers and approved by the Controlling Officer/ Supervising Officer.

11.2 Preparation prior to painting :

The surfaces which are 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.

11.3 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 BOQ).



- Internal wall surfaces - Acrylic Emulsion Paint or as directed by the Controlling Officer / Supervising Officer in compliance to the BOQ.

- Doors, walls & roof in Kitchen, grill, collapsible gate etc. - Synthetic enamel paint or as directed by the Controlling Officer/ Supervising Officer in compliance to the BOQ.

- External wall surface - Cement based Protective and Decorative Acrylic exterior emulsion paint/ Textured exterior high class matt finish paint or as directed by the Controlling Officer / Supervising Officer in compliance to the BOQ.

11.4 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 m^2 in area) at the site for approval of the sample and shade as per the painting scheme instructed by the Controlling Officer/ Supervising Officer at his own risk and cost.

11.5 General :

The work shall be done as per best engineering practice. 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.

11.6 Wall Putty :

The plastered surfaces of walls and ceilings are to be properly prepared using sand papering etc. before applying the wall putty. The preparation, mixing, application are to be done while strictly following the manufacturer's guidelines and instructions of the Supervising Officer/ his representative. The putty should be of approved quality and brand and to be applied in layers (coats). The surface should be properly dried and finished before applying the new layer. The total thickness should not be less than 1.5 mm in thickness. The final layer/coat is to be applied and finished properly to suit the primer application.

11.7 Primer :

All surfaces for painting 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 the Controlling Officer/ Supervising Officer in compliance to the BOQ of ready mix primer.

11.7.1 Wood & Plaster Primer :

Wood & Plaster (for Kitchen) primer (oil bound) of approved brand and as per manufacturer's specification is to be applied on the surfaces which would be free from moisture and loose particles.

11.7.2 Steel Primer :

For steel surface, oil bound red oxide primer, zinc chromate primer of approved brand and is to be applied on the surface as per manufacturer's specification. The surface should be made free of grease, rust, moisture and loose particles before priming. All blistered surface should be made free by hammering, filling or otherwise so as to have smooth surface before priming.

PSPD CHIEF ENGINEER WBSEDC

11.7.3 Cement Primer Coat (Alkali Resisting Primer) :

Cement primer coat is to be used as base coat (for external walls) on wall finish before application of exterior paint. The cement primer is composed of a medium and pigments which are resistant to the alkalis present in the cement in wall finish and provides a barrier for the protection of subsequent coats of paints. Priming coat shall be preferably applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surface. The surface shall be thoroughly cleaned and made even 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 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.

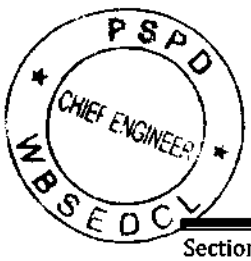
11.8 Paint :

11.8.1 Exterior painting :

The paint shall be (Cement based Protective and Decorative Acrylic exterior emulsion paint/ Textured exterior high class matt finish paint or as directed by the Controlling Officer/ Supervising Officer in compliance to the BOQ) of approved brand and manufacture. This paint shall be brought to the site of work by the contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the contractor and the Supervising Officer. The empty containers shall not be removed from the site of work till the relevant item of work has been completed and permission obtained from the Controlling Officer/ Supervising Officer.

The surface shall be thoroughly cleaned off all mortar dropping, dirt dust, algae, fungus or moth, grease and other foreign matter of brushing and washing, pitting in plaster shall make good, surface imperfections such as cracks, holes etc. should be repaired using white cement. The prepared surface shall have received the approval of the Controlling Officer/ Supervising Officer after inspection before painting is commenced.

Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its container, when applying also the paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform. Dilution ratio of paint with potable water can be altered taking into consideration the nature of surface climate and as per recommended dilution given by manufacturer. In all cases, the manufacturer's instructions & directions of the Engineer-in-charge shall be followed meticulously. The lids of paint drums shall be kept tightly closed when not in use as by exposure to atmosphere the paint may thicken and also be kept safe from dust.



Paint shall be applied with a brush on the cleaned and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.

11.8.2 Interior painting: Acrylic emulsion :

The plastic emulsion Paint is not suitable for application on external, wood and iron surface and surfaces which are liable to heavy condensation. These Paints are to be used on internal surfaces except wooden and steel. Plastic Emulsion Paint as per IS : 5411 of approved brand and manufacture and of the required shade shall be used as per the instruction of the Controlling Officer/ Supervising Officer. The wall surface shall be prepared as specified in Clause 13.23.3 of CPWD Specifications 2019 (Vol II). The number of coats shall be as stipulated in the Bill of Quantity (BOQ). The Paint will be applied in the usual manner with brush, spray or roller. The Paint dries by evaporation of the water content and as soon as the water has evaporated the film gets hard and the next coat can be applied. The time of drying varies from one hour on absorbent surfaces to 2 to 3 hours on nonabsorbent surfaces. The thinning of emulsion is to be done with water and not with turpentine. Thinning with water will be particularly required for the under coat which is applied on the absorbent surface. The quantity of water to be added shall be as per manufacturer's instructions. The surface on finishing shall present a flat velvety smooth finish. If necessary more coats should be applied till the surface presents a uniform appearance.

11.8.3 Interior painting: Synthetic enamel :

Synthetic Enamel Paint (conforming to IS : 2933) of approved brand and manufacture and of the required colour shall be used for 2 coats as per the instruction of the Controlling Officer / Supervising Officer. Preparation of surface shall be as specified in 13.24.2 of CPWD Specifications 2019 (Vol II). Additional finishing coats shall be applied if found necessary by the Controlling Officer/ Supervising Officer to ensure properly uniform glossy surface without any extra payment.

11.9 Precaution :

a) 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.

b) In the preparation of walls for plastic emulsion painting, an oil base putty shall be used in filling cracks, holes etc.

c) Splashes in floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.

d) Washing of surface treated with emulsion paints shall not be done within 3 to 4 weeks of application or the time specified by manufacturer.

12. ROLLING SHUTTERS :

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. 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 the Controlling Officer / Supervising Officer. 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. Rate

shall include for all materials, fabrication, transport, erection, maintaining in place till completion of the job. Priming and painting shall be done as specified in BOQ.

13. ALUMINIUM WINDOWS & LOUVERS :

13.1 Materials :

All sections shall be obtained from reputed manufacturers as instructed and approved by the Controlling Officer / Supervising Officer and shall be extruded from aluminium alloy conforming generally to IS : 733 - 1983 and IS : 1285 - 1975. The sections shall conform to IS : 1948-1961. They shall be coloured anodised. Anodising shall be done from reputed agencies as approved by the Controlling Officer / Supervising Officer 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 aluminium section shall be approved by WBSEDCL and kept at site by the Contractor for ready reference.

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

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.

The Contractor shall measure each opening before fabrication. WBSEDCL shall not be responsible for any variation in the widths and heights of openings. Frames shall be fabricated so that during fixing 6 mm clearance is obtained all rounds. The Contractor before fabrication shall submit shop drawings to the Controlling Officer/ Supervising Officer for prior approval.

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

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 (if found required by the Controlling Office / Supervising Officer) the rate should also be inclusive all materials labour and tools and plants.

14. WORKMANSHIP :

PSPD CHIEF ENGINEER WBSEDCL

Standard :

A high standard of workmanship in all trades will be required. The CONTRACTOR shall ensure that only skilled and experienced workmen are employed.

Supervision :

The Contractor's supervising staff shall be well qualified and experienced in the types of work being carried out under their supervision and shall be capable of ensuring that they are done well and efficiently.

Temporary Works :

Whenever asked, the Contractor shall furnish such details of his temporary works as may be called for by WBSEDCL and the CONTRACTOR shall satisfy WBSEDCL as to their safety and efficiency. WBSEDCL may direct that temporary works, which he considers unsafe or insufficient, shall be removed and replaced in a satisfactory manner.

Codes :

Unless mentioned otherwise, current versions of all codes, specifications, and standards issued by the Bureau of Indian Standards (BIS), shall be fully applicable to these specifications. In case of any conflict in meaning between these Specifications and those of BIS, the provision of these specifications shall prevail.

Base lines and bench marks :

The Contractor shall establish and maintain, to the satisfaction of WBSEDCL, the base lines and bench marks, based on which the works are set out. Where such base lines and bench marks are provided by the WBSEDCL, the CONTRACTOR shall maintain these throughout the period of construction without causing any disturbance to them.

Setting out :

The Contractor shall set out all the works to be executed by him, in line with the standard base lines, levels, positions and bench marks and truly as per drawings within the accepted tolerance limits at no extra cost to WBSEDCL. The Contractor shall be solely responsible for the setting out of all the works, to be executed by him and the approval of such setting out by the WBSEDCL shall in no way absolve the Contractor his responsibility for carrying the work to the true lines, levels and positions as per drawings.

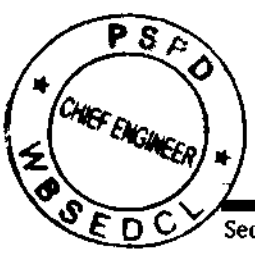
Dewatering :

The Contractor shall carry out all the works, in dry and workable condition and maintain the same in dry condition till the final handing over of works at no extra cost to the WBSEDCL. For this, the Contractor shall make all the necessary, to the entire satisfaction of the WBSEDCL.

Dimensional Tolerance :

A high standard of workmanship and accuracy shall be achieved in all sections and parts of the work. The workmanship shall be in accordance with the latest and the best civil engineering practice.

The Contractor shall ensure that all sections of the work are carried out with utmost care to achieve the dimensions shown in drawings or specifications. Where special and close tolerances are required in any particular section of work, these will be shown in the drawings and such tolerances shall be met. In the absence of such specific mention in drawings the dimensional deviations, as mentioned in PWD SOR (WB)/relevant BIS code may be tolerated, provided they do not impair the appearance or render the particular section of work unacceptable to the purpose for which it is intended.



Testing :

Testing of materials and all finished work shall be done as per PWD SOR (WB) / relevant BIS code, if not otherwise mentioned anywhere in this tender document.

Safety of existing work :

Before taking up construction adjoining, the Contractor shall take all steps necessary for the safety and protection of adjoining buildings / structures.

Protection of existing services :

The Contractor shall take all precautions necessary to prevent damage to or interference with underground or over ground services such as cables, drawings, piping or piles, whether shown on drawings or not. Equipment etc., mounted in position shall be protected against falling debris etc., by means of tarpaulin or such other material.

Clearing of worksite :

On completion of work, the CONTRACTOR shall remove all rubbish, debris, surplus materials, temporary work etc., from the site in a tidy and workmanship manner.

15. MODE OF MEASUREMENT :

Mode of Measurement will be as per PWD Schedule of Rates (WB) with effective from 01.11.2017, or relevant IS code, or CPWD Specifications 2019 in case of non availability of the same in the PWD SOR (WB), if not otherwise stated anywhere in the tender document.

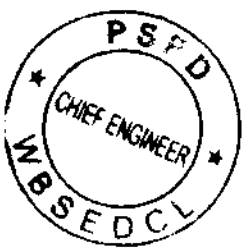
16. NOTES :

i) Selection of manufacturer / supplier shall be approved by the WBSEDCL prior to actual delivery of the material. The WBSEDCL reserve the right to choose any supplier. Without prior approval of the WBSEDCL no material and equipment shall be brought at site.

ii) Testing of material shall be done at the discretion of the WBSEDCL irrespective of the name of the suppliers / manufacturers / dealers.

iii) Naming of the approved manufacturers, dealers, and suppliers does not preclude the rights of the WBSEDCL to get the material tested at the cost of the CONTRACTOR as and when it is felt necessary.

iv) Depending on the quantum required, the order for supply of material may be distributed to the manufacturer / dealer as per the instruction of the WBSEDCL.



LIST OF PREFERRED MAKES :

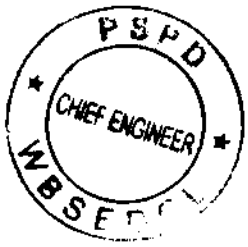
Sl. No.	ITEM	PREFERRED MAKE
1	Cement	ACC / Lafarge / Ultratech / Ambuja
2	Reinforcement bar	Tata / SAIL / RINL
3	Synthetic Enamel	Dulux Gloss / Luxol / Superlac High Gloss / Apcolite
4	Interior Acrylic Emulsion	
	(a) Standard Acrylic Emulsion	ICI Supreme 3 in 1 / Asian Paints Premium Emulsion
	(b) Luxury Acrylic Emulsion	ICI Velvet Touch / Berger Silk / Royal Luxury Emulsion
5	FRP Composite Door	Shree Fibroglass / AMCON / United Fibrecast / Nyflex
6	Aluminium Section	Hindalco
7	Protective and Decorative Textured exterior High Class Matt finish, composed of special Thermoplastic Resin containing Fine. Crystalline Additives Derived from Granite	Sandtex Matt / Weathercoat Textured / Weathershield Tex
8	Ceramic / Vitrified Tiles	Kajaria / Johnson / Euro / Somany / Nitco
9	Marble	As per the instruction of the Controlling Officer / Supervising Officer
10	Rust Removing Agent	PagelRustop / SIKA Rust off
11	Anticorrosive Paint (Polymer Based)	SikaRustop / Barcote
12	Bonding Agent	SikaRighbond / CICO Bond EPO / Pagel ERI
13	Waterproofing admixture with integrated waterproofing agent conforming to IS 2645 & 9103	SikaPlastocrete Super / RheoPlast IW / CICO Supaplast
14	Exterior Acrylic Emulsion Paint	
	(i) Normal acrylic	ICI Supercoat / Ace Walmasta
	(ii) 100% Premium Acrylic	Weathershield / Weathercoat / Snowcryl XT / Apex
	(iii) Super Protective 100% Acrylic	Weathershield Max / Apex Ultima
15	Mirror Finish Vitrified Tile	Marbonite / Kajaria Plus / Euro / Varmora / Somany
16	Title Fixing Polymerised Adhesieve	Title Fixing Polymerised Adhesieve
17	Epoxy Grout for filling Tile Joint	SikaTilogroutLatapoxy SP-100
18	White Cement Based Wall Putty	Birla White Wall Care / Sika Wall Door
19	W.C, Basin, Urinal	Cera / Hindware / Parryware / Neycer
20	Fire Clay kitchen Sink	SanfirePamini
21	PVC Pipes	Supreme / Oriplast / Longlast
22	PVC Cistern	Reliance Classic / Hindware / Parryware
23	Floor spring	Nitya / Garnish / Hardwyn
24	Glass	Saint Gobain / Modiguard / Indo Asahi
25	Aluminium Composite Panel	Aludecor / Alucoband / Alcopa
26	Other waterproofing compounds	Sika / Fosroc / Dr.Fixit
27	GI pipes	Tata
28	GI fittings	Zoloto / Unik / Kent
29	Down pipes	Supreme / Finolex
30	Valves	Leader / Zoloto
31	Rolling Shutter	Bengal Rolling Shutter
32	Flush door (Factory made)	Century Ply / Green Ply
33	Furniture	Godrej

PSPD CHIEF ENGINEER WBSEDCL

Notes :

1. Brand / make of any items not indicated above or elsewhere in the bid document shall be decided by the Controlling Officer, which shall be final and binding on the Contractor. If the preferred brands mentioned above are not available, equivalent make as may be approved by the Controlling Officer only is to be used for the work.

2. The makes / brands of all Sanitary & Plumbing items should be as per the BOQ and instruction of the Controlling Officer / Supervising Officer. The supply, storing, fitting & fixing of all these items should strictly follow the specifications mentioned in CPWD Specifications 2019 (Vol I & II), WB PWD SOR 2017 and relevant IS codes.



TECHNICAL SPECIFICATION FOR ELECTRICAL WORKS

1. INTERNAL ELECTRIFICATION :

1.1

All electrical work shall be carried out in accordance with this specification. These specifications shall be read in conjunction with the relevant Indian Standard, NEC, Indian Electricity Rules, DSR specification and Regulations.

(a) Relevant Indian Standards
(b) Indian Electricity Rules 1956
(c) National Electrical Code
(d) DSR specifications

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

1.2 Electrification for Dwelling Units

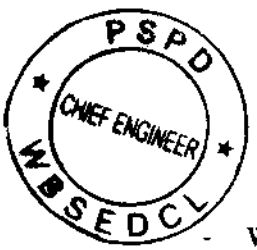
- The Power supply for the proposed buildings shall be taken from the dedicated 315 KVA, 11/0.433 KV Transformer through underground cable up to the LT Panel.
- Meter board shall house the main incoming MCCB, bus bars and outgoing MCB's and meters for various DU's of the block.
- For each floor, 3-Phase Power DB shall be connected through cable from the LT Panel. From the MLDB, MPDB, sub-main line shall be taken through cable to the Lighting, Power, Computer & AC Distribution Board of each unit.
- The point wiring for lights, fans and sockets shall be taken in the recessed conduits.
- Internal Electrical wiring shall be in concealed PVC conduits with 1.5 sq. mm. PVC insulated FRLS copper conductor for light point wiring, 2.5 sq. mm. PVC insulated FRLS copper conductor for 6A socket outlet wiring, and minimum 4 sq.mm PVC insulated FRLS copper conductor for 6/15A power point wiring and minimum 6 sq.mm PVC insulated FRLS copper conductor for AC point wiring if not otherwise mentioned in the drawings and BOQ.

- LT Panel shall be earthed to 2 nos. GI earthing pits.

- For each circuit, neutral and earth wire shall be separate.

- Wires shall conform to IS: 694 and comply with following features: -

  • PVC insulated stranded copper conductors.
  • 1100V grade wires for single phase and 3 phase circuits.
  • Colour coded as below:



Phase - R	- Red
Phase - Y	- Yellow
Phase - B	- Blue
Neutral	- Black
Earth	- Green

- Wiring inside the flat shall be with rigid PVC conduits.

- Load on each Lighting circuit shall not exceed 700 W for lighting and 2000W for Power sockets.

1.2.1 The general layout and wiring points and fittings are as shown in the drawings. The exact position of fittings, etc., may be altered by the Client (WBSEDCL) to suit local requirement. Cutting Chases / groove, wherever required, and making good is deemed to be included in the contractor's quoted rates and amount in BOQ.

1.2.2 "Loop in" system of wiring shall invariably be followed throughout the installation. Where it is absolutely necessary, junction boxes of approved make may be used as permitted by Client (WBSEDCL). Soldered or taped joints are not permitted for jointing under any circumstances. Porcelain connector with metal parts of brass shall be used.

1.3 Technical Specifications:-

1.3.1 General Requirements

1.3.1.1 Materials

All materials, fittings, appliances etc. used in electrical installation shall comply with the requirements of relevant Indian Standard specifications and shall be well finished. Materials for which Indian Standard specifications do not exist, shall conform in quality to the samples maintained by Client (WBSEDCL) or as approved by them.

The cable FRLS shall be of PVC of approved make / grade ISI marked. All materials for fittings / accessories, cable, etc., to be incorporated in this work shall strictly comply with latest appropriate Indian Standards. If Indian standards have not been issued relevant current British Standards may be used.

The contractor shall produce sample within one month from the date of acceptance of all such articles of fittings that he proposes to use and get them approved in writing by the Client (WBSEDCL). The samples shall be displayed in the Client (WBSEDCL) office as directed by Client (WBSEDCL). The articles so approved shall be labeled as such and signed by both the contractor and Client (WBSEDCL). These approved samples shall be kept in custody by Client (WBSEDCL) till the payment of final bill. The samples shall be fitted on a board as approved by the Client (WBSEDCL).

The rates for point wiring (power / light) in BOQ are with the provision of FRLS stranded copper conductor.

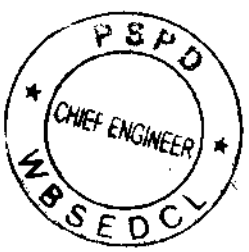
1.3.1.2 Execution of work

Unless otherwise exempted under the rule of the Indian Electricity Rules, the work of electrical installation shall be carried out under the supervision of a person holding a certificate of competency issued by the recognized authority. The workmen shall also hold certificate of competency. Good workmanship is an essential requirement for compliance with these specifications.

1.3.1.3 Testing of Installation

All electrical work executed shall be systematically tested by the Contractor in the presence of Client (WBSEDCL) to ensure compliance with the specifications laid down. Test results shall be recorded and signed by the Contractor and the Client (WBSEDCL), if the test results are not acceptable, all required repairs, replacement and extra work of removal and relaying or re-fixing shall be carried out by the Contractor at his expense and installation shall be re-tested until test results indicates compliance with the prescribed requirements.

The Contractor shall supply the necessary apparatus, labour and instruments or equipment required for testing.



1.3.1.4 Record of Installation:

On completion of the work, the Contractor shall submit to Client (WBSEDCL) complete wiring diagram for each of the installation in the case of internal electrical work, schematic diagram of equipment and connections for substations and switch gear works and the route layout plans in case of external overhead lines or underground cable work. Five sets of all plans along with soft copy in CD shall be submitted and it shall be ensured that the plans indicate complete site data of the installation.

All circuits shall be clearly indicated and numbered in the wiring diagram and all points shall be given the same number as the circuit to which they are electrically connected.

1.3.1.5 Electrical Tests:

The following tests as specified in IS-732, code of practice for electric wiring and fittings in building shall be complied with before the complete installation is taken over. The contractor shall carry out the tests in the presence of Client (WBSEDCL) and results recorded in triplicate on form IAFW-404. Electrical wiring test sheet shall be signed both by the contractor's representative and the Client (WBSEDCL). All testing equipment. shall be arranged by contractor without any extra cost of the department.

Insulation resistance shall be measured by 500 volts meggar. The insulation resistance in mega ohm of the installation shall not be less than 50 divided by the number of points on the circuit and the resistance of the whole installation shall not exceed one ohm and resistance including earth mass as 5 ohm.

Testing Polarity of Switches:

A test shall be made to verify that all non linked single pole switches have been fitted in the same conductor throughout and that such conductor has been connected to an other or phase conductor or to the non earthed conductor of the supply.

1.3.1.6 Safety procedures & Practices:

In all major electrical installations such as substations, industrial establishments, transmission & distribution lines and cable networks, safety procedure instructions for working on low, medium and high voltage mains and apparatus and safety practices listed in IS-5216: Guide for safety procedures and practices in electrical works shall be followed to the extent applicable. The Contractor shall provide all workmen with safety devices and appliances.

1.3.1.7 Fire safety:

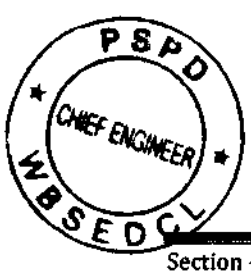
All electrical equipment shall satisfy the requirements laid down in IS-1646: Code of practice for fire safety of buildings (general) electrical installation and IS-3034: Code of practice for fire safety of industrial buildings, generating stations and distribution stations to the extent applicable.

1.4 Conduit Wiring:

1.4.1 Scope

The scope under this section covers rigid PVC recessed conduit wiring for the following:-

- Lighting circuits
- Power circuits
- Computer points
- AC points
- 3-Phase power points
- The wiring for circuit from DB to light/power/AC/computer shall be concealed in slab / wall beyond vertical run.



1.4.2 System of Wiring

1.4.2.1 All wiring shall be carried out with PVC insulated stranded FRLS copper wires of 1100 volts grade. The circuit wiring for points shall be carried out in looping in system and no joint shall be allowed in the length of the conductors. Circuit wiring shall be laid in separate conduit originating from distribution board to switch board for light / fan. A light / fan switch board may have more than on in same conduit as for point wiring. Looping circuit wiring shall be drawn in same conduit as for point wiring. Each circuit shall have a separate neutral boards. A separate earth wire shall be point wiring red colour wire shall be used with red, yellow or blur colour PVC insulated wire for RYB phase wire respectively and black colour PVC insulated wire for the neutral wires. Bare copper wire shall be used as dearth continuity conductor and shall be drawn along with other wires. No wire shall be drawn into any conduit until all work of any nature, that may cause injury to wire is complete. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire.
Before the wires are drawn into the conduit, the conduits shall be thoroughly cleaned of moisture, dust and dirt.

1.4.2.2 Joints:

All joints shall be made at main switches, distribution board socket and switch boxes only. No joint shall be made in conduits and junction boxes. Conductors shall be continuous from outlet to outlet.

1.4.2.3 Mains and Sub-mains:

Mains and sub main cable where called for shall be of the rated capacity and approved make. Every main and sub main shall be drawn into an independent adequate size conduit. Adequate size draw boxes shall be provided at convenient locations to facilitate easy drawings of the sub main and main cables. Cost of junction box / drawn box is deemed to be included in the rates of sub main wiring. Three phase sub main shall be provided with two earth wire.

Where mains and sub mains cables are connected to the switchgear, sufficient extra lengths of sub main and mains cable shall be provided to facilitate easy connections and maintenance. For termination of cables crimping type cable socket / lugs shall be provided. Same colour code as for circuit wiring shall be followed.

1.4.2.4 Load Balancing:

Balancing of circuits in three phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.

1.4.2.5 Colour Code for Circuit and Sub-main Wiring

Colour code for circuit and sub main wiring installation shall be Red, Yellow, Blue for three phases. Black for neutral and yellow / green or green insulated earth wire.

1.4.2.6 Conductor Size:

Wiring shall be carried out with following sizes of PVC insulated stranded single core copper conductor wire / cable.

i)	Light Point	1.5 sqmm
ii)	Ceiling / Cabin / Exhaust Fan Point	1.5 sqmm
iii)	Call bell point	1.5 sqmm
iv)	Plug point (5/6A Switch Socket outlet)	2.5 sqmm
v)	Circuit Wiring	2.5 sqmm
vi)	General power point	4.0 sqmm
vii)	Power Point for AC unit (for 1 & 1.5 Tr.)	4.0 sqmm
viii)	Power point for geyser	4.0 sqmm
ix)	Power Point for AC unit (for 3 Tr.)	6.0 sqmm

1.4.2.7 Not more than 8 (eight) light circuit points should run on one circuit and no more than two power points on one circuit.

1.4.2.8 Wiring is to be terminated in metal boxes in inner plate and cover suitable for mounting required nos. of modular switches / sockets as applicable with fixing hard wares.

1.4.3 Concealed Conduit Wiring:

For installations requiring concealed conduit wiring, the supply, routing and laying of PVC conduit of minimum size 20mm in walls/ceiling, from lighting panels up to fittings, receptacles, inspection/junction boxes etc. shall be in the Contractor's scope.

The Contractor shall closely co-ordinate his work with that of the Civil Contractor. The contractor shall prepare detailed shop drawing & submit for the approval of the Client (WBSEDCL) well before commencing the work. The shop drawings shall show setting out details for all components such as conduits and cable routes indicating the number and size of wires in each section of conduit.

The layout of conduits shall be such that any condensation or sweating inside the conduit is drained out. Suitable precaution shall be taken to prevent entry of insects inside the conduit. No cable or wire shall be installed until the inside of conduit has been cleaned.

Suitable junction/inspection boxes according to requirements shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. The boxes shall be mounted flush with the wall or ceiling. Junction boxes with minimum 75 mm depth shall be used in roof slabs and depth of boxes in other places shall be as per IS: 2667, 1976.

Pull boxes shall not be located in a conspicuous manner. Number and location of pull boxes shall be clearly indicated on shop drawings and shall be got approved by the Project Manager before commencing the work.

The chases in the wall shall be neatly made and with ample dimensions to permit the conduit to be fixed in the manner desired.

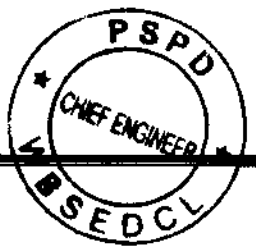
All the cuttings and chasings in the brick work RCC Work/Block work shall be carried out using electrically operated Hilti or' Fishcher make casing tool. Further all the drillings and cuttings in the RCC work shall be carried out using core-cutting machine. The rate shall include all these and no. separate rates towards the same shall be paid to the contractor.

Fixing of standard bends of elbows shall be avoided as far as practicable & all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing in of conductors. All threaded joints of conduits pipes shall be treated with some approved' preservative compound' to secure protection against rust. Open conduit ends shall be properly protected to prevent the ingress of dirt and rubbish.

Provisions shall be made at expansion joints, where they occur in the building structure, PVC pipe with coupling to be installed to prevent damage to structure/conduits and finishes. Continuity through all such joints shall be maintained.

All Conduits shall be kept clear of other services, except where intentionally earthed or bonded. Conduits shall be fixed to prevent contact with same at the following minimum spacing:

a) 150 mm away from hot water services
b) 50 mm away from all other services.



1.4.4 Standard

The following standards and rules shall be applicable :-

1) IS:732 : Code of practice for Electrical Wiring installation (System Voltage not exceeding 650V).
2) IS:1646 : Code of practice for fire safety of Buildings (General) Electrical Installation.
3) IS:1554 : PVC insulated cables
4) IS:3854 : Switches for Domestic and similar purposes
5) IS:1293 : 3 pin plugs and sockets.
6) IS:4648 : Guide for electrical layout in residential building
7) IS:3419 : Specification for fittings for rigid non metallic conduits. Conduit fittings shall be of unplasticised PVC.

1.4.5 Conduit Wiring

1.4.5.1 Type and size of Conduits

All rigid PVC conduits used shall conform to IS: 9537. The conduit may be threaded type and shall be used with the corresponding accessories. The conduits shall be designated by their nominal outside diameters.

1.4.5.2 Bunching of Cables

Conductors of different circuits / different phases / different voltages shall be bunched in separate conduits. Maximum number of PVC insulated cables conforming to IS: 732, 1989 that can be drawn in one conduit shall be as follows :

Nominal Cross Sectional Area of Conductor in Sq.mm	SIZE OF CONDUIT											
	20mm		25mm		32mm		40mm		50mm		63mm	
	S	B	S	B	S	B	S	B	S	B	S	B
1.5	7	5	12	10	20	14	-	-	-	-	-	-
2.5	6	5	10	8	18	12	-	-	-	-	-	-
4	4	3	7	6	12	10	-	-	-	-	-	-
6	3	2	6	5	10	8	-	-	-	-	-	-
10	2	-	5	4	8	7	8	6	-	-	-	-
16	-	-	2	-	4	3	7	6	-	-	-	-
25	-	-	-	-	3	2	5	4	8	6	9	7
35	-	-	-	-	2	-	4	3	7	5	8	6
50	-	-	-	-	-	-	2	-	5	4	6	5

Notes :
1. The above table shows the maximum capacity of conduits for a simultaneous drawing of cables.
2. The columns headed 'S' applies to runs of conduit which have distance not exceeding 4.25m between draw in boxes & which do not deflect from the straight by an angle of more than 15°. The columns headed 'B' apply to runs of conduit, which deflect from the straight by a angle of more than 15°.

PSPD CHIEF ENGINEER WBSEDCL

1.4.5.3 Conduit joints :

Conduits shall be joined by means of screwed couplers and screwed accessories only. Where there are long runs of straight conduit, inspection type couplers shall be provided at intervals. Threads on conduits in all cases shall be 13 mm to 19 mm long, sufficient to accommodate full threaded portion of couplers or accessories. For conduit fittings and accessories reference may be made to IS: 2667. Cut ends of conduits shall have neither sharp edges nor any burrs as otherwise these may damage the insulation of conductors while drawing them through such pipes.

1.4.5.4 Fixing of Conduits :

Conduit pipes shall be fixed by heavy gauge saddles and spacing plates secured to suitable wood plugs or other approved plugs with screws in an approved manner, at a distance of 300mm from the center of such fittings. The saddle shall comply with the requirements of IS: 3837.

Where conduit pipes are laid along the trusses, steel joists etc. the same shall be secured by means of ordinary clips or girder clips as required. Where it is not permitted to drill holes in the truss members, suitable clamps with bolts and nuts shall be used. The width and thickness of the ordinary clips or girder clips shall not be less than as given in following table:

Size of conduit (mm)	Width of clip (mm)	Thickness of clip (mm)
20	20	0.9
25	20	0.9
32 and above	25	1.25

For concealed conduit, above requirements shall be applicable and in addition, following clauses shall also be complied with.

Making of chases

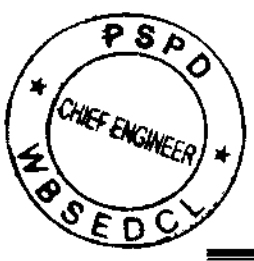
Chases in the wall shall be made neatly and shall be of ample dimensions to permit the conduit to be fixed in the desired manner. In the case of building under construction, conduits shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick / rubble masonry work, special care shall be taken to fix the conduit and accessories in the position along with the building work.

Fixing of conduit in chase

Conduit pipe shall be fixed by means of staples or by means of saddles not more than 600mm apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves shall be maintained by bending the conduits itself with a higher bending radius, which will permit easy drawing in of conductors. All threaded joints of conduit shall be treated with approved preservative compound to secure protection against rust.

Fixing of MS/cast iron conduit boxes in wall

Conduit boxes of mild steel or cast iron shall be fixed in the wall with cement and sand mortar 1:2. No screwing of conduit boxes shall be required when fixed in recessed conduit wiring system.



Inspection Boxes

Inspection boxes shall be provided to permit periodical inspection and to facilitate replacement of wires, when necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection cover box.

To facilitate drawing of wires in the conduit, galvanized iron fish wire of 3.25mm diameter shall be provided along with laying of recessed conduit.

1.4.5.5 Bends in conduit

All necessary bends in the system including diversion shall be done by bending conduit or by inserting suitable solid or inspection type normal bends, elbows or similar fittings or by fixing cast iron inspection boxes as approved by PM . Conduit fittings shall be avoided, as far as possible, in outdoor installations. Radius of bends in conduit shall not be less than 75mm.

1.4.5.6 Outlets

The switch or regulator box shall be made of metal on all sides, except on the front. In the case of cast boxes wall thickness shall be at least 3mm and in case of welded mild steel boxes, the wall thickness shall not be less than 1.22mm for boxes up to size of 200x300mm; and above this size, 1.63mm thick mild steel boxes shall be used. Except where otherwise mentioned, 3mm thick phenolic laminated sheets shall be fixed on the front with brass screws. Clear depth of the box shall not be less than 60mm and this shall be increased suitably to accommodate mounting of fan regulators in flush pattern. The metal box shall be effectively earthed with conduit.

In order to minimize condensation or sweating inside the conduit, all outlets of conduits system shall be properly drained and ventilated but in such a manner as to prevent the entry of insects, etc. as far as possible.

1.4.5.7 Heat may be used to soften the conduit for bending and forming joints in case of plain conduits. Caution should be exercised in the use of this conduit in locations where the ambient temperature is 40° C or above. Use of such conduits in places where ambient temperature is 45° C or above is prohibited.

1.4.5.8 Conduits to be rendered continuous before pulling the wires.

1.4.5.9 Conduits to be free from sharp edges and burrs and necessary check nuts & spring washers etc. to be provided for fixing of conduit at each junction box and out boxes.

1.4.6 Distribution Board inside the Flat :

1.4.6.1 MCB Distribution Boards of suitable outgoings shall be used. Supply and erection of triple / single pole and neutral distribution board (conforming to IS 13032 and IEC standard of IP-20) shall be surface / flush mounted as required. This shall be made from 18 gauge sheet steel / CRCA with stove enamel paint / powder coated, suitable for incorporating incoming MCB with required number of outgoing MCBs with electrolytic copper bus bar of 100A per phase and shall be erected on angle iron frame complete.

All the DBs / sub DBs in residential and non-residential buildings shall be MCB type.

All MCBs shall be as per IS: 8828 of 1996 with required wiring connections and lugs etc.

1.4.7 Point Wiring

Whenever asked for, if installation is to be carried out on point wiring basis, the supply of following shall be deemed to be included as part of the installation work.

a) 650/1100V lighting wires for conduit wiring, minimum size of 1.5 sq.mm PVC insulated copper conductor.

b) PVC conduit with all relevant accessories and junction/inspection boxes. Minimum size 20mm for exposed/concealed conduits respectively.

c) 650/1100V, PVC, copper-conductor, armoured cables (when wiring without conduits).

d) Ceiling rose or connector (in case of ceiling/exhaust fan points).
e) Back plate (in case of suspended light fixtures).
f) Wiring of each lighting fitting/receptacle unit/ceiling fan/bell point/exhaust fan, etc. shall be considered as one point.

1.4.7.1 Light /fan/bell point wiring shall be carried out with 1.5 sq.mm. copper PVC wires of 1100V grade along with neutral looping method in concealed conduits as specified in BOQ.

1.4.7.2 Earthing continuity conductor for Light /fan/bell point from DB shall be 1.5 sq.mm Copper conductors.

1.4.7.3 Three core flexible wires of required length shall be provided from ceiling JB/ ceiling rose to the fittings.

1.4.7.4 In case of group control point wiring for group of points up to 3 shall be controlled by 5/6A SP piano type switch and group of above 3 points shall be controlled by 15A SP piano type switch.

1.4.7.5 Point wiring shall start from switch board or from boards where circuit mains are provided.

1.4.7.6 Control switches to be connected to phase conductor only.

1.4.7.7 Point wiring for light / fan / bell in residential buildings shall be carried out with ISI mark 2 nos 1.5 sq.mm. FRLS stranded PVC insulated copper wire 1.1 kV grade with accessories conforming to IS complete erected with ISI mark modular type switch / bell push erected on MS box with base & cover plate including fixing accessories and ISI mark ceiling rose / circular JB with top of PVC cover as complete in all respect.

1.4.7.8 Point wiring for 6A socket on light or fan board in residential buildings shall be carried out with ISI mark 2nos. 1.5 sq.mm FRLS stranded PVC insulated copper wire 1.1 kV grade with 1.5 sq.mm FRLS stranded PVC insulated copper wire 1.1 kV grade in green colour used for earthing for plug both of ISI mark (earth wire shall be taken from DB or intermediate switch board).

1.4.7.9 Point wiring for independent plug shall be carried out with ISI mark 2 nos minimum 2.5 sq.mm. FRLS stranded PVC insulated copper wire 1.1 kV grade with 2.5 sq.mm ISI mark FRLS stranded PVC insulated copper wire 1.1 kV grade in green colour used as continuous earth wire end to end complete in all respects in an approved manner.

1.4.8 Fittings and accessories

1.4.8.1 Ceiling Rose and similar attachments.

1.4.8.1.1 A ceiling rose or any other similar attachment shall not be used on a circuit, the rated voltage of which exceeds 250 V AC.

1.4.8.1.2 Only one flexible cord shall be attached to a ceiling rose. Specially designed ceiling rose shall be used for multiple pendants.

1.4.8.1.3 A ceiling rose shall not embody fuse terminals as an integral part of it.

1.4.8.2 Control Switches, sockets and plugs (Modular type) :

1.4.8.2.1 The control switches and sockets shall be with ISI marking and of rated capacity. This shall comply with the following features:-

- Control switches
- Silver contacts with shrouded current carrying terminates.

- All switches and sockets shall be made of fire retardant, self extinguish poly carbonate plastic, able to withstand the glow wire test at 960 degree Celsius.

- The switches shall confirm IS 3854:1997. The internal design of terminals and contact shall make the switch capable of high overload conditions. The switch shall be of flush type with silver inlay contact on pure copper.

- All 5 and 15 Amp switches shall be modular type of 240 volts AC grade. All switches shall be fixed on modular plate.

- All socket shall fully comply with IS 1393:1988 specifications. The connector shall be of phosphor bronze for modular type.

- All 5 Amp socket shall be 3 pin type. All 15 Amp socket shall be 6 pin type suitable for 15/5 Amp.

- All switches, sockets or fans shall be connected to the phase wire of the circuit. Switch board shall be located at 1200 mm. above finished floor level unless otherwise indicated on drawings.

1.4.8.2.2 5/6A piano switch or bell push and other accessories shall be fixed on modular box with base & cover plate.

1.4.8.2.3 A Socket outlet shall not embody fuse terminals as an integral part of it, but the fuse may be embodied in the plug.

1.4.8.2.4 Every Socket outlet shall be controlled by a switch, which shall preferably be located immediately adjacent thereto or combined therewith.

1.4.8.2.5 The switch controlling the socket outlet shall be connected to the live side.

1.4.8.2.6 Ordinary socket outlet may be fixed at any convenient place about 230 mm. from the floor level, and shall be away from the danger of mechanical injury. In situations where the socket outlet is accessible to children, it is necessary to install an interlocked plug and socket.

1.4.8.2.7 In an earthed system of supply, a socket outlet with plug shall be of three pin type with the third terminal connected to earth. When such socket outlets with plug are connected to any current consuming device of metal or any non-insulating material or both, conductors connecting such current consuming devices shall be of flexible cord with an earthing core.

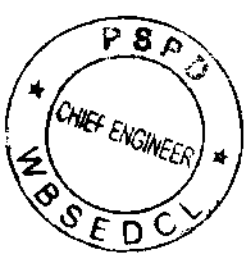
The earthing core shall be secured by connecting between the earth terminal of plug and the current consuming devices.

1.4.8.2.8 Every Plug containing a fuse shall be non-reversible and shall be so arranged and connected that the fuse controls a phase conductor or the non-earthed conductor of the circuit.

1.4.9 Porcelain Connectors :

Porcelain connectors shall be provided inside the box for fan and utility fittings. The wiring shall be done in such a way that wires from connectors to the fan are not visible. In situations where ceiling rose is proposed for fan and tube light fittings, the porcelain connector need not be provided.

All materials, fittings, appliances etc. used in electrical installation shall comply with the requirements of relevant Indian Standard specifications and shall be well finished. Materials for which Indian Standard specification do not exist, shall conform in quality to the samples.



1.4.10 Terminal Boxes :

In surface type wiring and concealed conduit wiring the terminal point for power /light sockets, outlets, switching, etc., shall terminate in recessed cast iron or galvanized mild steel boxes fitted flush with wall surface. The cover of boxes for surface type wiring shall be of Hylam Sheet 3mm thick. Rates for point wiring shall be deemed to be included for the above provision. All such terminal boxes shall be properly earthed and connected to earth dolly. Terminal blocks used in prewired DBs / panels shall be of polymide insulating material as per IEC / IS meeting V / V2 inflammability class. All metal parts shall be copper alloy and shall be suitable to mount on DIN / rail as per requirement for item in the schedule. The terminal block shall with stand vibrations / arcing effects and shall be shock proof. Makes of terminal blocks shall be as per list of makes as given in Appendix E1.

1.4.11 Earthing :

1.4.11.1 Earthing shall be done in accordance with IS-3043 of 1987.

1.4.11.2 For each building, earth stations shall be provided as, 2 nos. for electrical system and required number for lightning protection as per IS – 2307.

1.4.11.3 Distance between two earth pits shall be minimum 3 m

1.4.11.4 Equipment to be earthed.

Except for equipment provided with double insulation, all the non-current carrying metal parts of electrical installation are to be earthed properly. Specially body of table lamp, table fan, fan regulator and metallic parts of fluorescent fittings are to be earthed. In case of medium voltage installation, all metal conduits, trunking, cable sheaths, switchgear, distribution boards and all other parts made of metal shall be bonded together and connected by means of two separate and distinct connections with earth.

1.4.11.5 Structural metal work -

Earthing of the metallic parts shall not be effected through any structural metal work which houses the installation. Where metallic parts of the installation are not required to be earthed and are liable to become alive should the insulation of conductors become defective, such metallic parts shall be separated by durable non-conducting material from any structural work.

1.4.11.6 Systems of earthing -

Equipment and portions of installation shall be deemed to be earthed only if earthed in accordance with the direct earthing system. In all cases, the relevant provisions of Rules 33 and 61 of the Indian Electricity Rules. 1956 shall be complied with.

1.4.11.7 General Rules Applying to All Systems of Earthing

Method of earthing :

(a) Connections to earthing conductors :

1) Main earthing conductor - It shall be taken from the earth connection at the main switchboard to an electrode to which the connection is to be made or to an earthing terminal provided by the supplier near service cutouts.

2) Sub-main earthing conductor - It shall run from the main switch board to distribution board.

3) Circuit earthing conductor - It shall run from the exposed metal of equipment and shall be connected to any point on the main earthing conductor, sub-main earthing conductor, earth connection at it's distribution board or to an earth leakage circuit breaker.

PSPD CHIEF ENGINEER WBSEDCL

(b) Earthing of equipment (General)

Unless otherwise provided in (c) to (f) the exposed metal of equipment shall be earthed according to 1(a) (3) above.

(c) Conduits, cable sheathing and armouring -

They shall be earthed at the ends adjacent to switch boards at which they originate or otherwise at the commencement of the run by an earthing conductor connected to an earth clip, clamp or gland in effective electrical contact with the conduit or cable sheathing and armouring.

(d) Equipment mounted on metal frame work -

The exposed metal of equipment shall be deemed to be earthed if the metal framework on which it is mounted and is in effective electrical contact with which it is directly earthed.

(e) Exposed metal of equipment connected by flexible cord -

Where equipment is connected by flexible cord, all exposed metal parts of the equipment shall be earthed by means of an earthing conductor enclosed with the current carrying conductors within the flexible cords.

(f) Switches, accessories, lighting, fittings, etc. (use of screwed conduits for earthing)

Such fittings which rigidly secured effective electrical contact with a run of screwed conduit by screwing, lock-nuts or clamps may be considered as a part of the run of conduit for earthing purpose, provided that the run of conduit is earthed.

(g) Prohibited connections -

Sprinkler pipes or pipes conveying gas, water or flammable liquid conduit, metallic enclosures of cables and conductors and lightning protection system shall not be used as a means of earthing an installation or even as a link in an earthing system.

1.4.11.8 Metallic enclosures for wiring – continuity and resistance -

1.4.11.8.1 Continuity :

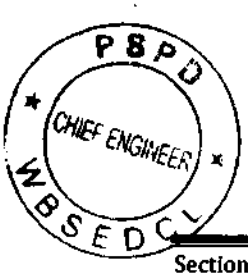
The metallic enclosures for wiring shall be mechanically and electrically continuous.

1.4.11.8.2 Resistance :

The electrical resistance of metallic enclosures for cables and conductors measured between earth connection at the main switch board and any other point on the completed installation shall be low enough to permit the passage of current necessary to operate fuse, circuit breaker or the earth leakage release of the circuit breaker protecting the circuit and shall not exceed 2 ohms.

1.4.11.9 Earthing Conductor -

Every earthing conductor shall be either stranded, flat strips or circular or rectangular bar. Protection against mechanical injury shall be provided where necessary. The earth conductor may be of high conductivity copper or aluminium or galvanized solid iron.



1.4.11.10 Installation of Earthing Conductor -

a) Position, fixing and protection of earth conductors: Earthing conductors shall be so placed and connected that it shall not be accidentally damaged or cut. It shall be fixed over its entire length by clamps, clips, saddles, staples, clouts etc. which in no way will damage the conductor. Aerial earthing conductor shall be supported on suitable insulators and shall be clearly identified.

b) Buried earthing conductor – It shall be protected against mechanical damage.

c) Earth connections – Any connection between an earthing conductor and electrode or the metallic sheathing of under ground supply cables shall be accessible, shall in no case be in a damp situation and shall be suitably protected where likely to be exposed to mechanical damage.

d) Joints – Joints in main earthing conductors shall be made by soldering, brazing or welding for conductors of size up to 7/1.70mm; for larger main earthing conductors, mechanical clamping may be used. Joints in either earthing conductors shall be made by soldering or by mechanical clamping.

1.4.11.11 Earth clips -

Paint, enamel compound, corrosion and other non-conducting material shall be removed from the surface of the metal section to which earth clip is attached.

1.4.11.12 Earth electrodes :

a) Type :
Earth plate electrodes shall be provided and they shall not be less than 60cm x 60cm x 6.3mm in case of galvanised plate or 60cm x 60cm x12mm in case of galvanised cast iron or 60cm x 60cm x 3.15mm in case of copper as per clause 9.2 of IS 3043.

b) Installation :
Electrodes shall as far as possible, be embedded below permanent moisture level. In addition, they shall be buried at a depth of not less than 1.5M. Complete installation shall be as per IS-3043 and as per section 19 of MES SSR specification.

c) Earth plate shall be 60cm x 60cm x 6.3mm in case of galvanised plate or 60cm x 60cm x12mm in case of galvanised cast iron or 60cm x 60cm x 3.15mm in case of copper buried in specifically prepared earth pit so as to keep top of earth plate 1.5M below ground with 40 kgs each charcoal and salt with alternate layers of charcoal and salt with 19mm dia. GI pipe with funnel with a wire mesh for watering and brick masonry block, CI cover complete as per para 9 of IS 3043 of 1987 with necessary length of double GI earth conductor bolted with lug to the plate and covered in 12mm dia. GI pipe 2.5M long complete connected to the nearest switch gear with end socket as per directions and duly tested by earth tester and recording results.

1.4.12 Lighting Fittings :

1.4.12.1 Every lighting fitting shall be controlled by a switch and where control at more than one point is necessary, by as many two-way and intermediate.

1.4.12.2 Where lighting fitting is supported by one or more flexible cords, the maximum weight to which the twin flexible cords may be subjected shall be as follows.

Nominal cross- sectional area of twin flexible cord (mm^2)	Number and diameter in mm of wires	Maximum permissible weight (kg)
0.4	12/0.200	1.4
0.65	22/0.200	2.3
1.00	32/0.200	3.5
1.2	38/0.200	4.5

PSPD CHIEF ENGINEER WBSEDC

1.4.12.3 No inflammable or low melting point material shade shall form a part of lighting fitting unless such shade is well protected against all risks of fire.

1.4.12.4 Where conductors are required to be threaded through tubes or channels formed in the metal work of fittings, such tubes and channels shall be of such size as will enable them to be wired with the conductors used for the final sub circuits without removing the braiding taping or outer covering. All tubes or channels shall be of sufficient size to permit 'looping back' wires. Where, with prior approval of the PM, 'Electrolier wire' is used for wiring fitting, the sub circuit leads shall terminate in a ceiling rose or connector from which this wire is carried to the fittings.

1.4.12.5 All nipples of the fittings shall not be less than 12mm (half inch).

1.4.12.6 Fittings and lamp holders for gas filled lamps shall be adequately ventilated.

1.4.12.7 Lamp Holders

1.4.12.7.1 Lamp holders shall be metal cased type or insulated type as indicated and shall comply with IS-1258:1979, specification for bayonet lamp holder. Lamp holder shall be suitable for fixing in pendent or to bracket or angular as required. Lamp holder for use on brackets etc. shall have not less than a half inch female nipple and all those for use with flexible pendants shall be provided with cord grips. All cases must be solid and substantial.

1.4.12.7.2 Edison Screw holders shall not be provided for lamps 100W and below.

1.4.12.7.3 All lamp holders shall be provided with shade carrier ring.

1.4.12.7.4 Where center contact Edison screw lamp holders are used, the outer or screw contact shall be connected to the 'middle wire', the neutral or the earthed conductor of the circuit.

1.4.12.8 Outdoor lamp holders

1.4.12.8.1 External and road lamp shall have weather proof fitting of approved design so as to effectively prevent the admission of moisture. An insulating distance piece of moisture proof material shall be inserted between the lamp holder nipple and the fitting. Flexible cord and cord grip lamp holder shall not be used where it is exposed to weather. In verandah and similar exposed situations where pendants are used, they shall be fixed by rod type.

1.4.12.8.2 Lamps
All incandescent lamps, unless otherwise specified in the special conditions of contract and suitably protected, shall be hung at a height of minimum 2.45M (8ft) above floor level.

1.4.12.9 Fans, Regulators and clamps

1.4.12.9.1 All ceiling fans shall be suspended from hooks or shackles with insulators between hooks and suspension rods. Supply and fixing fan hooks or shackles are part of the electrical works.

There shall be no joints in the suspension rod, but if joint is unavoidable then such joints shall be screwed to special couplers of 5cm minimum length and both ends of pipes shall touch together with couplers and shall in addition be screwed by means of split pins. Alternatively, the two pipes may be welded.

1.4.12.9.2 Fan clamps shall be of suitable design according to the nature of construction of ceiling on which these clamps are fitted. In all cases fan clamps shall be fabricated from tested mild steel of suitable sizes and they shall be as close to fitting as possible. Fan clamps for reinforced concrete roofs shall be buried in the concrete and due care shall be taken to tie them with the reinforcement properly. Fan clamps for wood beams shall be of suitable flat iron fixed on two

PSPD CHIEF ENGINEER WBSEDCL

sides of the beam and according to size and section of the beam, one or two MS bolts passing through the beam shall hold both flats irons together. Fan clamps for steel joints shall be fabricated from tested flat iron to fit rigidly to the bottom flange of the beam. Care shall be taken during fabrication that the metal does not crack while hammering to shape. Other fan clamps shall be made to suit the position, but in all cases care shall be taken to see that they are rigid and safe.

1.4.12.9.3 The canopy and wood block at the top of the suspension rod shall effectively hide the suspension. Canopies on bottom of suspension rod shall effectively hide connection to fan motor.

1.4.12.9.4 All ceiling fans shall be wired to ceiling roses or to special connector boxes. The leading in wire shall be of nominal cross sectional area not less than 1.5 sq.mm and shall be protected from abrasion.

1.4.12.9.5 All fans shall be hung 2.9M (9ft & 6 inches) above floor or as directed by the PM.

1.4.12.10 Exhaust Fans

1.4.12.10.1 For fixing of an exhaust fan, a circular hole shall be provided in the wall to suit the size of the frame, which shall be fixed by means of rag-bolts, embedded in the wall. The hole shall be neatly plastered with cement and brought to the original finish of the wall. The exhaust fan shall be connected to exhaust fan point by means of flexible cord, care being taken that the blades rotate in proper direction.

1.4.12.11 Attachment of fittings and accessories

1.4.12.11.1 All ceiling roses, brackets, pendants and accessories attached to wall or ceiling shall be mounted on substantial polished teak wood blocks except in case of conduit wiring for workshop type installation; after all fixing holes are made in them. Ceiling rose shall be surface type and shall comply with IS: 371-1979, specification for roses having two or three terminal plates and of outside diameter not less than 63.5mm. Ceiling roses shall be provided with means for gripping flexible cords which shall not damage the insulation and/or sheath of the cord and shall be such that the load on the cord is not transmitted to the terminals.

1.4.12.11.2 In case of installation in the premises like commercial complex, permanent indication should be made on or near each T. switch to indicate type of fittings its controls.

1.5 Distribution Boards :

1.5.1 Scope

The scope under this section covers distribution board.

1.5.2 Standards

The latest edition of following standards and rules shall be applicable: -

1) IS: 2675 : Enclosed Distribution Fuse Boards and cut-outs for voltages not exceeding 1000V.
2) IS: 2607 : Air break isolator for voltages not exceeding 1000V.
3) IS: 5578 : Marking and arrangement of switch gear bus bars, main connections and auxiliary wiring.
4) IS: 8828 : Miniature circuit breaker
5) IS: 12640 : Earth leakage circuit breaker
6) IS: 13947 : Moulded Case Circuit breaker
7) IS: 8623 : Low voltage switchgear and control gear assemblies.

PSPD CHIEF ENGINEER WBSEDCL

1.5.3 Construction :

The distribution boards shall be complete with :-

- Sheet steel enclosure suitable for recessed, semi-recessed or surface mounting on wall / structure as required and shall be of 16 SWG, sheet steel enclosure. Distribution feeder pillar shall be as per IS-5039. These shall be double pole and neutral link, triple pole or triple pole & neutral link type. it shall be fabricated out of MS sheet of 3.15mm thickness suitable for outdoor use. The top of the pillar shall be fitted with slopping canopy so that rainwater shall not accumulate on the top. Distribution pillar shall have a set of double hinged doors at the front. Similar door shall be provided at rear if indicated. The hinges shall be suitable for door opening of 150^{O} and shall permit doors to be removed completely when required. The doors shall be provided with suitable outdoor type lock. Pillar shall be provided with apron. They shall be easily removable. Thickness of sheet shall be 3.15mm. pillar shall be provided with anti-corrosive primer with epoxy based paint.
  - 2 nos. Earthing terminals for connection to external earthing conductor.
  - Circuit diagram indicating load distribution.
  - Phase barriers of insulating materials

1.5.4 Bus bars :

The bus bars shall be as follows :-

- The electrical high conductivity electrolytic grade insulated copper bus bars suitable for incoming feeder with minimum 100A.
  Neutral busbar – 50% of phase bus bar.
- Individual phase and neutral bars located in respective phase cubicle for.
- The Main Distribution Board / Sub Distribution Board shall be designed that the cables are not 1 directly terminated on the terminals of switch fuse / fuse switch etc. but are terminated on cable termination links.

1.5.5 Miniature Circuit Breakers :

The MCB's shall have the following features and shall comply with requirements of IS: 8828:-

- Short circuit capacity of 10 KA as mentioned in BOQ.
- Quick make quick break non welding silver alloy contacts suitable for manual and automatic operation.
- Inverse time over load and instantaneous short circuit tripping mechanism with trip free operation.
- Common operating handle and integral tripping for multiple MCB.
- Pressure clamp terminals for users' upto 4 mm2.
- Phenol formaldehyde moulded enclosure.

1.5.6 Moulded Case Circuit Breakers :

1.5.6.1 General :

Moulded case circuit breakers shall be incorporated in the Main Distribution Board and Sub Distribution Board wherever specified. MCCBs shall be suitable either for single phase AC 230 volts or three phase 415 volts.

The circuit breaker shall comply with IEC 60947-2 and IS 13947 Part 2.

The breaking capacity performance certificate shall be available for category A to the above mentioned standards. The test shall be carried out under the breaking performance during operation (Ics) equal to 100% of the ultimate breaking capacity (Icu), with following minimum services Breaking capacity requirement.

The MCCB shall be with Electronic trip unit or with thermal magnetic releases as specified in the BOO.

All circuit breakers shall have a rated operational voltage of 660AC *(50/60* Hz).

The rated insulation voltage shall be 600 V and 660 V at 50 *1* 60 Hz. For low breaking and high breaking capacity of MCCBs respectively.

Thermal overload release adjustment can be done from a single point. MCCB cover needs not to be opened for doing such adjustment.

The trip unit of MCCBs should be interchangeable.

There should be total discrimination *b/w* ACBs and MCCBs upto the breaking capacity level of downstream device. Total discrimination shall be supported by selection chart for various combinations along with recognized authority test certificates.

The electrical endurance of MCCBs shall be of minimum as follows:

- Upto 250 A - 8000 operations
- For 400 A and above - 4000 operations.

All MCCBs shall have spreaders and phase barriers on each terminal. The breaker shall be maintenance free and fully trivialized.

1.5.6.2 Characteristics :

The protection unit shall have variable overload setting from 80 to 100% of line current. The setting 'knob should be centrally adjustable from front, MCCB cover need not be opened for carrying out adjustment.

1.5.6.3 Operation :

If required the breaker shall be provided with facility for padlocking and door interlocking.

The electrical and mechanical endurance of the MCCB should be as defined by IEC 60947-2 standard.

The circuit breaker rating, the "Push to trip" button, outgoing circuit identification and the contact position indication must be clearly visible and accessible from the front, through the front panel or the door of the switchboard.

1.6 LT PANEL / MAIN DISTRIBUTION BOARD :

The panels shall be of 600V grade suitable for the system short circuit capacity of 25 kA for 1 sec. and rated current carrying capacities and shall comprise of sheet steel enclosure, incoming & outgoing feeders, bus bars and feeders connections, meters, indicators and wiring. Panel fabrication drawings and control / wiring diagram should be got approved in writing before taking up the manufacturing.

CRCA Sheet steel enclosure shall be of 14 SWG (2mm thick) sheets for load bearing members and 3 mm thick for the frame. Panels shall be free standing, totally enclosed, extensible modular, dust and vermin proof, IP-52 for indoor installation, flush dead front, all components accessible from front for maintenance. Meter boxes shall have angle iron pedestal frame at bottom for adequate height for incoming cables and these shall also be adequately supported on the rear wall.

All metallic parts shall be given pretreatment for degreasing, phophatising etc. in seven-tank process. It shall be given two coats of red oxide followed by finish shade paint of synthetic enamel stove paint of approved shade of IS-5 Painting by powder coating shall also be acceptable.

PSPD CHIEF ENGINEER WBSEDCL

Cable entry for incoming cables shall be from bottom. Each feeder compartment shall be totally enclosed, self sufficient with MCCB/MCB unit, meters, interlocked door, pad locking facility, labeled terminal block, engraved anodized aluminium labels (white letters in black background) for each feeder. Name plate details shall indicate designation of feeder. Indicating lamps shall be LED type with fuses.

Noncurrent carrying metal parts shall be connected to earth bar which shall be run throughout the length of the panel and shall be provided with two independent earthing connections to external earthing leads.

Feeder connections shall be by solid copper wires/aluminium strips with bimetallic clamps wherever required, through lugs, nuts, bolts and spring washers. All doors and covers shall be folded type with gasket. Insulating covers / barriers shall be on live terminals for protection against accidental touch. Vitreous enameled danger board with skull and indication of voltage shall be provided on panels.

The panel shall be provided with hinged door for access to equipment. The hinged door shall be interlocked so as to prevent opening of the door when the MCCB is 'ON' & to prevent closing of the MCCB when the door is not fully closed. However, a device for by passing the door interlock shall be provided to enable operation of the MCCB during maintenance with the door open.

External lighting distribution board located in substation building shall be of construction and general features as above but shall be wall mounting type. External lighting distribution board located outside shall be of outdoor feeder pillar type as per requirements of clause 17.5 "Distribution Boards / Feeder Pillars" on page 242.

1.7 LIGHTNING PROTECTION SYSTEM

1.7.1 Scope

The scope of work covers supply, installation, connection, testing and commissioning of lightning protection system consisting of the following:

1) Air termination network.
2) Roof conductors.
3) Down conductors
4) Testing joints.
5) Earth termination network.

1.7.2 Standard

The lightning protection system shall comply with IS 2309 / 1989 and IEA rules.

1.7.3 System

a) The Lightning protection system shall be installed as indicated in the drawing or the contractor shall prepare one as per IS 2309 / 1989 and get the same approved by the consultant.

b) As the air terminal shall be installed on the highest roof of the building, so it should be joined to the horizontal roof conductor by means of rivets / clamps.

c) Roof conductor shall be laid horizontally on the roof.

d) Down conductor shall be installed on the vertical surface of the building. The down conductor shall be joined with roof conductors in the method as prescribed by the code. A test joint shall be provided in the down conductor 1000mm above the ground level at a place which is easily accessible for testing.

e) The down conductor shall be joined with earth termination network or to the earthing station as indicated on the drawing.

1.7.4 Component Part

Air terminal and roof conductors

a) An air termination shall consist of vertical conductor or a system of horizontal conductors and shall be installed along the outer perimeter of the roof.

b) No part of the roof shall be more than 9M from the nearest horizontal conductor.

c) All metallic projections, chimneys, ducts, vent pipe, railings, gutters etc. on or above the main surface of the roof shall be bonded to and form part of the air termination network.

d) The minimum dimension of the air termination network shall be :

	Above Ground (upto test link)	Below Ground (From test link)
Galvanised Iron Strip	-	32 x 6 mm
Aluminium Strip	25 X 3.15 mm	-

Down Conductor

a) A structure having a base area not exceeding 100 sqm shall have one down conductor.

b) For a structure with base area exceeding 100 sqm the no. of down conductors shall increase.

c) The down conductor shall be distributed around the outside wall of the structure.

d) Any external metal running vertically through the structure shall be bonded to the down conductor.

e) The size of the down conductor shall be similar to the roof conductor / Air termination network.

f) Each down conductor shall be provided with a testing joint in a convenient position (1000mm above G/L).

Joints and Bonds

a) The lightning protection system shall have as few as possible joints. Joints and bonds shall be mechanically and electrically effective. With overlapping joint the length of overlapping shall not be less than 25mm. Contact surfaces should be cleaned, inhibited from oxidation with non corrosive compound.

b) The Lightning conductor shall be secured at not more than 2 M apart for horizontal run and 1 M for vertical run by corrosion resisting fastener.

Earth resistance

The resistance from any part of the lightning protection system to the earth shall not exceed 10 ohms. If the value exceeds 10 ohms it shall be reduced by adding no. of earth electrode. The resistance from the earth electrode to the nearest test clamp shall not exceed 0.2 ohms.

Mode of measurement

The complete earth conductor shall be measured and paid per unit length including air termination network, down conductor, test joints and earthing termination network.

1.8 Electrical Drawings to be submitted by Contractor

For bidding

The bidder shall submit offer with the following documents in two sets.

- Schedule of deviations from technical specifications.
- List of proposed makes, for the items listed in the tender.
- Technical datasheets & Catalogues major items, highlighting the offered models.
- Other documents and comments, if any.

For approval before construction/erection

The Contractor shall submit the following documents:

a) For all the supplies, the contractor shall submit the following documents in 4 sets for approval.

- General arrangement drawings, with all dimensions, showing: space-requirements, weights (for transport and service conditions), requirements of civil works (compatible with the tendered specifications), fixing and mounting facilities, connection devices, etc.

- Electrical drawings, showing: power single line and functional/control multi line diagrams, terminal blocks, components' list with make, type, quantity, etc.

- Quality assurance plan and bar-chart showing manufacturing schedule.

The contractor shall incorporate all comments and submit revised drawings in stipulated time till all drawings are finally approved for manufacturing.

b) For installation work, the contractor shall submit the following documents in four sets for approval:

- Single line diagrams and substation/ electrical room layouts, based on working drawings of GEL / Contract specification, required for approval of Electrical Inspectorate and required for submission to other local authorities for approval.

- Detailed lighting layout drawings showing exact locations of lights and other fittings as per site conditions and instructions, conduit routes, phase wise distribution on each LDB, mounting details of each type etc. based on the tender documents.

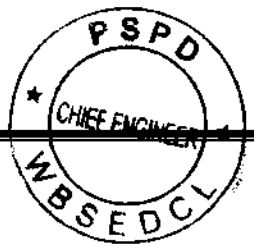
- Detailed cable and earthing layout drawings showing cable route, cable trays with number of trays and mounting heights, marking of cable numbers in each typical route of cable trays, mounting details of each type etc. based on the tender documents.

- Cable schedule showing cable number, cable sizes and cables route as per layout documents.

Final

The contractor shall submit the following documents, reflecting the true final as built situation, in 6 sets, and one soft copy in CD:

a) The drawings including wiring diagrams as revised and "as built".
b) Inspection and preliminary testing certificates and reports and shipping release.
c) Statutory certificates/approvals for materials and equipment.
d) Guarantee certificates.
e) Instruction & maintenance manuals, Cataloguers etc.
f) Any other certificate / report as called for by the Engineer.



Note: All wiring diagrams shall indicate clearly the main switch board, the runs of various mains & sub mains, position of all points and their control. All circuits shall be clearly indicated and numbered in the wiring diagrams and all points shall be given the electrical connections.

LIST OF APPROVED MANUFACTURER (Appendix E1)

Sl. No.	Description of Approved Material	Approved Brand / Manufacturer
1	Ammeter/Voltmeter selector switch	L&T/ KAYCEE / SALZER
2	Indicating Lamp	SIEMENS/VAISHNO/ L&T
3	L. T. Power, control and signal cable	HAVELLS / POLYCAB / MESCAB
4	Cu. Wires	MESCAB / HAVELLS / POLYCAB
5	MCB / RCCB / RCCBO	GE / L&T / SCHNEIDER
6	Lighting Fixture	PHILIPS / GE
7	Wall/ Ceiling / Exhaust Fans	HAVELLS / CROMPTON / KHAITAN
8	MCB Distribution Board	GE / L&T / SCHNEIDER
9	MCCB / Contactor	GE / L&T / SCHNEIDER
10	PVC conduit	PADAM
11	Change Over Switches	HAVELS / C&S
12	Industrial Power Socket Outlets	GE / L&T / SCHNEIDER
13	Switches and Sockets modular type	SCHNEIDER / CRABTREE
14	M.S. Conduit	BEC
15	LT Cable termination materials	DOWELL
16	Cable Tray	FABRICATED
17	CT	KAPPA

PSPD CHIEF ENGINEER WBSEDCL

TECHNICAL SPECIFICATION FOR FIRE-PROTECTION SYSTEM

1. Scope :

This specification covers the general requirements for Supply, site/shop fabrication, excavation and execution, testing, cleaning/flushing, back filling and mending good all the damages in walls / floors, etc. and painting with approved paints wherever necessary and supply, erection, joining, testing and commissioning of M.S.- Black, ERW, pipes (Conforming IS: 1239, Part-I, Medium Grade) with wall/ceiling suspended iron angle supports complete with fittings (conforming to IS: 1239, Part-II, Heavy Grade) bends, tees, flanges as per IS: 6392, table-17 and all necessary accessories complete with 2 coats of P.O. Red synthetic enamel paint followed by 2 coat of primer. Fire Fighting system shall be designed as per the National Building Code Of India, NFPA and latest Indian standards.

2. General :

i) All piping materials and testing shall conform to the relevant IS specifications of pipes, valves and other accessories unless otherwise specified.

ii) All pipe work shall be in conformity with the requirements of the applicable drawings and specifications.

iii) Piping shall also comply with applicable State, local or other Governmental laws and codes. In case of conflict with this specification the more rigid specification shall govern.

iv) All works shall be performed in accordance with the best modern practice for this type of work and shall be of the highest quality of workmanship.

v) Any deviation from this specification must have the written approval of the Employer.

3. Fabrication :

i) All M.S.-Black, ERW, Pipes shall conform to IS:1239, Part-I -including the necessary welding works / site fabrication of 'Long'/ 'short' radius bends, Tees, etc (as per ANSI B 16.11 class) as specified in the drawings and BOQ.

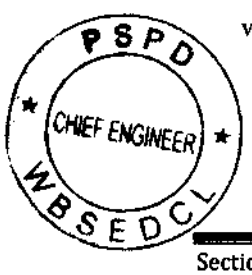
ii) All pipe fittings for required nominal diameters shall be of fabricated and welded fittings. No screwed fittings shall be used unless otherwise specified.

iii) Flat face or raised face flanges with full face or ring type CAF gaskets shall be used to mate with respective flange of same standard and dimension of the equipment.

iv) Welding elbows (either fabricated at site) shall be of long radius type unless otherwise specified.

v) All completed piping both bend and welded, shall conform to the fabrication dimensional tolerance specified in the IS / ASTM standards of the pipe fabrications and shall in no case deviate the tolerance limits mentioned therein.

vi) All butt welded pipe fittings are used/fabricated especially for 100mm nominal diameter pipe etc. and each fittings (i.e. butt weld able bends, Tees, etc .) shall have the inside diameter and wall thickness equal to as more than the pipe to which they are welded.



4. Pipe Fabrication :

i) Templates shall be used in laying out headers, laterals and other irregular details to ensure accurate cutting and proper fitting.

ii) Machine cut bevels to form the welding groove are preferred, but smooth, clean, Slag free flame cut bevels are acceptable but all flame cut bevels are to be properly machined before welding joint works to be taken up.

iii) In fitting up details preparatory to final welding, spacers shall be used while tack Welding the pipe and connections in position so that a proper gap is made for full penetration of welds. 1.5 mm weld gap is recommended.

iv) Only small tack welds which penetrate to the bottom of the welding groove shall be used and shall become a part of the finished weld. Tack welds having penetration are not acceptable and must be chipped out. Each weld shall be cleared of all scale, slag, flux and other foreign matters before additional welding beads are applied.

5. Pipe Joints :

i) In general all pipe joints shall be welded as specified in the applicable valve and piping specifications.

ii) Flange faces shall be in a plane perpendicular, true and square to the center line of the pipe to which they are welded.

iii) Bolts on flanged joints shall be drawn to provide even and adequate pressure on gaskets as required.

iv) Bolt holes shall straddle normal center lines in the vertical and horizontal planes unless otherwise specified.

v) All gaskets used in pipes and pipe fittings / valves etc. should be of CAF (compressed asbestos fibre) gaskets except joints, where rubber gaskets are to be used in some special cases; as per IS: 5382 of SBR quality are used. However, Neoprene rubber gaskets may be used only on some special requirements as per the direction of the Engineer in-charge.

vi) All pipe threads in case of pipes, fittings and valves shall conform to British Standard pipe threads BS: 21/IS unless otherwise specified.

vii) Jointing and lying:
For jointing Gaskets on joints, a suitable jointing tackle is preferred and the Gasket is pushed through inside through the pipe flange to flange joints until the compressed gasket sealed properly the gap between the two flanges. For pulling the pipes/fittings, if required suitable crow bar or a suitable pulling mechanism like TIRFOR may be used alternately a chain rope pulley also may be used. After jointing is completed the proper position of the gasket is confirmed by inserting a feeler gauge into the gap between the socket and the spigot to ensure that joint deflections if any are within the allowable tolerances.

viii)Jointing of Flanged joints of Pipes & fitting:
All flanged joints should be of (PN-16) rated. The faces of the flanges are cleaned and made free from dirt or particles of foreign matter. The gaskets to be used between the flanges of pipes and fittings should be of 3mm thick and of compressed asbestos fibre (IS: 2712) or 3mm thick neoprene rubber (as per IS: 638). Flanged joints should be bolted in correct sequence and to the appropriate torque.

ix) Jointing of pipes & pipe Fittings/ Valves, etc. with screwed ends:
All threaded pipes, fittings and valves etc. shall conform to British Standard pipe threaded BS: 21-male or female threaded unless otherwise specified. All threaded joints are jointed and tightened, after applying Teflon thread seal and after wrapping in correct sequence. Proper tightening of the threads are necessary but with caution to avoid any damages to the thread and thread seal.

PHPD CHIEF ENGINEER WBSEDCL

x) Pipes / fittings to HDPE water tank joining is done by G.I. jam nut (i.e. coupling nut with rubber / PVC washer) with washers.

6. Pipe Bends :

i) All M.S. Pipe bends of respective nominal sizes shall be of Butt weldable or fabricated bends suitable for Butt welding.

ii) Pipe bends of 25mm nominal dia or less can be of threaded type, only if required for connection for screwed ball valves of respective sizes.

iii) All hot fabricated pipe bends for 25 NB diameters shall be done with the pipe filled with sand. Following the bending operation, the bend shall be allowed to cool slowly in still air before the sand is removed. The minimum radius shall be 6 times the nominal pipe diameter.

iv) All cold bends be made to a radius of 6 times the nominal pipe diameter or greater may be made without subsequent stress relieving. No cold bending is allowed for 80 and 100 NB pipes.

7. Welding :

i) Welding procedures shall be qualified in accordance with the requirements of the codes and IS-817/1966. Welders should and must have valid welding certificates and should be of 6-G compatible. Horizontal and vertical welding qualifications shall be shown on qualification papers.

ii) All welding shall have full thickness penetration and shall be done by the Electric Arc process. The initial root run of all but welds shall be carried out with electrodes not exceeding 12 SWG.

iii) In multiple pass welding the slag shall be cleaned from each layer and any serious defects chipped out before the next layer is applied. Peening shall be done if necessary to prepare a bead for the next pass.

iv) The completed weld shall be cleaned off slag and spatter metal on all surfaces and when possible the inside bead shall be ground smooth.

v) No under cutting of pipe adjacent to the completed weld will be permitted.

vi) Finished welds shall project not less than 1.5mm but not more than 3mm from the outer surface of the pipe.

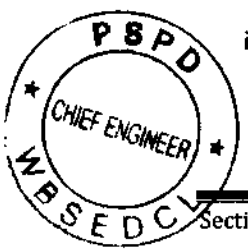
vii) Contractor may be requested to carry out any spot radiography test against the payment of the cost incurred for the same for any particular special reasons.

8. Installation & Erection :

i) Piping shall be grouped in banks wherever possible but must be at the same time have neat and economical layout with minimum number of fittings.

ii) All flanged joints shall be fitted up so that the gasket contact faces bear uniformly on the gasket and then made up with relatively uniform bolt stress. The gasket shall be properly compressed in accordance with the design principles applicable to the type of gasket used. All bolts shall extend completely through their nuts.

iii) Valved Air release points shall be provided as per the guidance of Engineer-in-Charge in the water supply line. Master Plan layout drawing to release trapped air inside the pipe line network, especially at all distant bends points or any other special locations as per approval of the Employer/Engineer in-charge.



iv) After piping is erected/installed in final position, it shall be tested, cleaned and flushed and dried out where required.

v) Necessary to be done to minimize as far as possible the number of butt welded joints and flanged / screw joints in case of pipes and to minimize the number of flanged gasket joints.

vi) All pipes and pipe fittings / valves shall be thoroughly cleaned off oil and grease using a solvent degreaser, which must then be allowed to dry. All rust, soil and other unwanted matter must be removed prior to solvent degreasing by chipping, manual scrapping and wire brushing.

vii) All external surfaces of pipes should be painted with 2 coats of synthetic enamel paint (colour- Red as per IS: 2379) of approved make as per IS codes after application of a ready mixed priming coat of red oxide paint only after the successful Hydrostatic Testing of pipes with the specified Test Pressure as per the Tender / direction of the Engineer in charge of the Client / Consultant with a minimum "Holding Time" of two hours.

viii)Care should be taken to avoid any damages scratches to the paint film thickness during lowering and installation of pipes.

9. Flanges :

Minimum number of flanges must be provided to facilitate servicing, inspection and maintenance. Particular attention must be paid to flanging of lines where there is possibility of blockage. All flanges to be fixed with MS-Black pipes should be of MS ASA#15O class flanges(slip-on type) as well as Blind flanges. All flanges to be painted with anti corrosive paint.

10. Valves :

Valves shall be provided on all mains entering the building or any small/medium scale plant areas as required and mentioned in the Hydrant Pipe – Master Plan (layout) drawing.

11. Inspection & Testing :

i) All metal welds shall be hammer tested and all welds shall be visually inspected for leaks while at test pressure. Carpenters blue chalk shall be used to detect any leakage through welds.

ii) All piping network should be hydrostatically tested either for a test pressure of 11 Kg/cm2 (gauge) or 1.5 times the working pressure whichever is higher, and the hold time should be at least 2 hours.

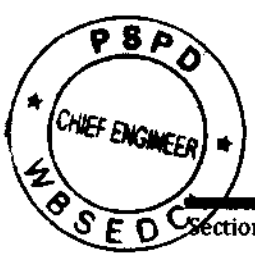
iii) All pipes shall be hydrostatically tested and found "OK" before taking up the painting work.

iv) Pipes shall be "Spot Radiographed" by the Contractor if being asked by the Client / Consultant.

v) Lines repairs by welding /screwing subsequent to a pressure test shall be tested in sections in order to permit completion of work in an area , however, a section found "OK" after testing shall be blanked and tagged accordingly and subsequently tested as a complete system prior to final acceptance.

vi) Test Reports shall in all cases be maintained on log sheets and duly certified by the Client / Consultant.

vii) All manufacturers' material test certificate must be submitted by the contractor to the employer with a copy to the consultant for pipes, valves and all other accessories below the execution of work, and has to obtain clearance from the employer and the engineer in-charge of the Consultant.



12. APPROVED MAKES FOR MAJOR ITEMS PRESENT IN THE B.O.Q.

Service: Fire Hydrant Piping Down-come
Working pressure: 7 Kg/cm^2(g)
Working temperature: Within 100°C
System Test Pressure: 10.5 Kg/cm^2(g)

Sl. No.	Description	Size mm NB From To	Material	Type	Standard/ Class/ Rating	Makes
1	MS-Black Main Pipes-Hydrant	100 80	M.S.-Black	ERW (IS-1239) Butt weldable /threaded	IS: - 1239 Part-I	Jindal/TATA or equivalent as approved by WBSEDCL
2	Ball valve	25	CI	Full Bore type	IS:- 9890	Sant /Zoloto/ Leader or equivalent as approved by WBSEDCL
3	Landing Valve	63 mm dia outlet		Single Head, Flanged type	IS: -5290	FireShield /Minimax, Surex (All ISI marked)
4	CP fire Hose with G.M. Hose-Coupling	63 mm dia	Attached with Rubber gasket coupling	IS-8423 for CP hose & IS-903 for GM hose coupling		FireShield /Minimax, Surex (All ISI marked)
5	G.M. short Branch-Pipe	63 mm dia		IS-903 for GM		FireShield /Minimax, Surex (All ISI marked)
6	Hose Box		16 SWG MS CRCA Sheet made, glass fronted	MS body, glass fronted, "Break-glass Open" type	ISI approved	FireShield /Minimax, Surex (All ISI marked)
7	'Swinging' type Hose Reel Drum with –MS 14 swg CRCA sheet along with 30 mtr. Long 20mm dia Rubber Hose Reels-'Swinging type with GM Nozzle		MS 14 swg CRCA sheet along with 30 mtr. Long 20mm dia Rubber Hose Reels-'Swinging type with GM Nozzle	MS body-'Swinging' type with 'Swing' Rubber Hose Reel	ISI approved	FireShield /Minimax, Surex (All ISI marked)

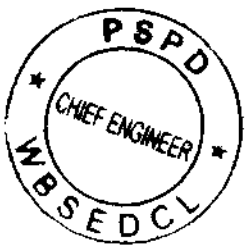
PSPO CHIEF ENGINEER WBSEDCL

8	Fire Extinguishers					
	CO2 - 4.5 Kg - including MS fastening Clamps for mounting on walls/columns	Cap. - 5 Kg. (ISI marked)		"ISI"- marked	IS: -2878	FireShield /Minimax, Surex (All ISI marked)
	ABC Type – 6 Kg including MS fastening Clamps for mounting on walls/columns	Cap. - 6 Kg. (ISI marked)		"ISI"- marked	IS: - 4308 or IS:- 14609	FireShield /Minimax, Surex (All ISI marked)

PSPD
CHIEF ENGINEER
WBSEDCL

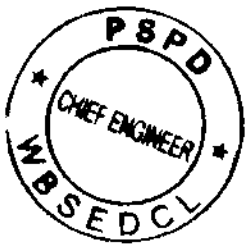
SECTION 6

SAMPLE FORMS (Bid Forms & Attachments)



List of Annexure

Number	Description
Annexure I	CHECK LIST
Annexure II	LETTER OF BID
Annexure III	PROFORMA OF LETTER OF UNDERTAKINGS
Annexure IV	BID PROPOSAL
Annexure V	PROFORMA OF AGREEMENT
Annexure VI	SPECIMEN COPY OF INDEMNITY BOND
Annexure VII	PROFORMA OF BANK GUARANTEE FOR CONTRACT PERFORMANCE
Annexure VIII	PROFORMA OF BANK GUARANTEE FOR BID GUARANTEE
Annexure IX	PROFORMA FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT FACILITIES
Annexure X	JOINT VENTURE / CONSORTIUM AGREEMENT
Annexure XI	POWER OF ATTORNEY FOR LEAD MEMBER OF JOINT VENTURE/ CONSORTIUM
Annexure XII	LIST OF WORK ORDER IN HAND
Annexure XIII	LIST OF KEY PERSONNEL, TOOLS, PLANTS, EQUIPMENT AND MACHINERIES
Annexure XIV	SELF DECLARATION OF DEBARRING BY ANY GOVERNMENT DEPARTMENT / GOVT. UNDERTAKINGS / ENTERPRISE / REPUTED PRIVATE ORGANIZATIONS ETC.
Annexure XV	HISTORICAL CONTRACT NON-PERFORMANCE
Annexure XVI	LITIGATION HISTORY



Annexure - I

CHECK LIST

Sl. No.	List of Documents (Scanned Copy of Documents to be uploaded by main bidder only)	Name of folder	To be submitted in cover	Submitted *(Y/N)*
1	Cost of Tender Document (Scanned copy)	Draft	Statutory cover (Technical proposal)	
2	Earnest Money Deposit (Scanned copy)	Draft	Statutory cover (Technical proposal)	
3	Bid proposal (**Annexure IV**)	Annexure	Statutory cover (Technical proposal)	
4	Notice Inviting Tender / Tender Documents	NIeT	Statutory cover (Technical proposal)	
5	Addenda / corrigenda (if published), response to query (if any)	NIeT	Statutory cover (Technical proposal)	
6	Check List (**Annexure I**)	Forms	Statutory cover (Technical proposal)	
7	Pro-forma for undertaking to be submitted by the Bidders (**Annexure III**)	Annexure	Statutory cover (Technical proposal)	
8	Format of Letter of Bid (**Annexure II**)	Annexure	Statutory cover (Technical proposal)	
9	Summary statement of average annual turnover / annual audit report	Forms	Statutory cover (Technical proposal)	
10	Statement of orders executed last seven years	Forms	Statutory cover (Technical proposal)	
11	Proof of Company Incorporation/ Trade Licence	Company Details	Non-Statutory cover (Technical proposal)	
12	PAN Card details	Certificates	Non-Statutory cover (Technical proposal)	
13	GST registration certificate and current challan	Certificates	Non-Statutory cover (Technical proposal)	
14	Professional Tax (PT) Registration and Current Challan	Certificates	Non-Statutory cover (Technical proposal)	
15	PF Registration Certificate and current challan	Certificates	Non-Statutory cover (Technical proposal)	
16	Labour License	Certificates	Non-Statutory cover (Technical proposal)	
17	ESIC / Mediclaim and current challan	Certificates	Non-Statutory cover (Technical proposal)	
18	Income Tax return for the last 03 (three) Assessment Years and Income Tax Clearance Certificate for the last Assessment year	Financial Information	Non-Statutory cover (Technical proposal)	

PSPD CHIEF ENGINEER WBSEDCL

Sl. No.	List of Documents (Scanned Copy of Documents to be uploaded by main bidder only)	Name of folder	To be submitted in cover	Submitted *(Y/N)*
19	Annual turnover and Working Capital for last three years	Financial Information	Non-Statutory cover (Technical proposal)	
20	Evidence of Access to or Availability of Credit/Facilities (**Annexure IX**)	Financial Information	Non-Statutory cover (Technical proposal)	
21	Order(s)/ Contract Agreement(s) issued by the purchaser, Completion Certificates, Commissioning Reports signed by the Purchaser/Ordering Authority to substantiate timely completion of the work and Satisfactory Performance Certificate issued by the Owner / Beneficiary.	Credential	Non-Statutory cover (Technical proposal)	
22	JV/Consortium Agreement (**Annexure X**) and Power of Attorney for Lead Partner (**Annexure XI**)	Declaration	Non-Statutory cover (Technical proposal)	
23	List Of Work Order In Hand (**Annexure XII**)	Declaration	Non-Statutory cover (Technical proposal)	
24	List of Key Personnel, Tools, Plants, Equipment and Machineries (**Annexure XII**)	Declaration	Non-Statutory cover (Technical proposal)	
25	Self Declaration of Debarring by any Government Department / Govt. Undertakings / Enterprise / Reputed Private Organizations etc. (**Annexure XIV**)	Declaration	Non-Statutory cover (Technical proposal)	
26	Historical Contract Non-Performance (**Annexure XV**)	Declaration	Non-Statutory cover (Technical proposal)	
27	Litigation History (**Annexure XVI**)	Declaration	Non-Statutory cover (Technical proposal)	
28	Declaration on Holiday Listing / Black Listing	Declaration	Non-Statutory cover (Technical proposal)	
29	Others : Any other documents found necessary	Declaration	Non-Statutory cover (Technical proposal)	

(Signature of the Bidder

with office seal and date)

PSPD
CHIEF ENGINEER
WBSEDCL

Annexure - II

LETTER OF BID

[TO BE PRINTED ON THE LETTER HEAD OF BIDDER (AS ENROLLED ONLINE ON e-TENDERING PORTAL OF NIC)]

To

The Chief Engineer,
Pumped Storage Project Department, WBSEDCL,
Vidyut Bhavan, 5th Floor, Block-C,
Bidhannagar, Block DJ, Sector-II, Kolkata 700091
West Bengal, India

Sub: Letter of Bid for the work

Ref: 1. NIeT 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 NIeT document as available in the website. The details of the Earnest Money Deposit, Cost of Tender Document, Power of Attorney & Undertaking being submitted by us both in on-line and hard copies.

This Bid and your subsequent Letter of Award shall constitute a binding contract between us.

We hereby confirm our acceptance of all the terms and conditions of the NIeT document unconditionally.

Thanking you,

Yours Faithfully

(Signature of the Bidder
with office seal and date)

PSPD
CHIEF ENGINEER
WBSEDCL

Annexure - III

PROFORMA OF LETTER OF UNDERTAKINGS
(To be submitted by the Bidder along with his Bid)
(To be executed on non-Judicial Stamp Paper of Rs. 100/-)

Ref: ..... Date:.....

To
The Chief Engineer,
Pumped Storage Project Department, WBSEDCL,
Vidyut Bhavan, 5th Floor, Block-C,
Bidhannagar, Block DJ, Sector-II, Kolkata 700091
West Bengal, India

Dear Sir,

1. I/We* have read and examined the following Bidding Documents relating to the ..... (full scope of work).

    a) Notice Inviting Tender
    b) "Invitation to Bid", "Instruction to Bidders (ITB)", "General Conditions of Contract (GCC)", and "Additional Conditions of Contract".

2. Technical Specification and Relevant Drawings.

3. I/We* hereby submit our Bid and undertake to keep our Bid Valid for a period of 180 days from the date of opening price bid. I/We* hereby further undertake that during said period I/We* shall not vary, alter or revoke my/our Bid.

    This undertaking is in consideration of WBSEDCL, agreeing to open my/our* Bid and consider and evaluate the same for the purpose of award of Work in terms of provisions of clause entitled "Award of Contract" under Section" Instruction to Bidders (ITB)" in the Bidding Documents. Should this Bid be accepted, I/We* also agree to abide by and fulfill all the terms and conditions of provisions of the above mentioned Bidding Documents.

    Signature along with Seal of Company.....
    (Duly authorized to sign the Tender on behalf of the Contractors)

    Name.....

    Designation.....

    Name of Company.....
    (IN BLOCK LETTERS)

PSPD CHIEF ENGINEER WBSEDCL

WITNESS

Signature.....

Date.....

Name & Address.....

.....

Telegraphic Address.....

.....

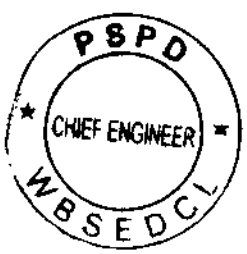
.....

Telephone No.....

Fax No.....

E-mail.....

***Strike out whichever is not applicable**



Annexure - IV

BID PROPOSAL

Bidder's Name and Address:

Bid Proposal Reference:

Person to be contacted:

Designation:

Telephone No.:

To
The Chief Engineer,
Pumped Storage Project Department, WBSEDCL,
Vidyut Bhavan, 5th Floor, Block-C,
Bidhannagar, Block DJ, Sector-II, Kolkata 700091
West Bengal, India

Sub: Proposal for .....
Ref: NIeT No.: .....

Dear Sirs,

1.0 We, the undersigned Bidder, have read and examined in detail the specifications and Bid documents of the above work and hereby propose to execute the work as detailed in specification and documents.

2.0 PRICES AND VALIDITY

2.1 Our prices stated in the bid are firm. Price adjustment is not applicable in line with the bidding document

2.2 All prices and other terms and conditions of this proposal are valid for a period of 180 days after the date of opening of Financial Bid.

2.3 We further declare that prices stated in our Proposal are in accordance with your "Instruction to Bidders" included in Condition of Contracts of Bid documents.

2.4 We confirm that our bid prices include all other taxes and duties and levies except GST and confirm that any such taxes, duties and levies additionally payable shall be to our account. We further confirm that no tax, duties in any form shall be payable by WBSEDCL except GST as per Rule.

2.5 We further declare that if any income-tax, surcharge/cess of income tax or any other corporate tax is attracted under the law, we agree to pay the same.

PSPD CHIEF ENGINEER WBSEDCL

3.0 COST OF TENDER DOCUMENT :

We have enclosed A/C Payee CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order as Cost of Tender Document in favour of West Bengal State Electricity Distribution Company Limited Of Rs.....payable at..... of..... vide DD / Pay Order No..... dated.....

4.0 EARNEST MONEY DEPOSIT :

We have enclosed A/C Payee CTS 2010 compliant Demand Draft / Banker's Cheque / Pay Order / Bank Guarantee as Earnest Money Deposit in favour of West Bengal State Electricity Distribution Company Limited of Rs.....payable at..... of..... vide DD / Banker's Cheque / Pay Order / Bank Guarantee No..... dated.....

5.0 Bid Price:- We further declare that total bid price inclusive of all taxes, duties, Cess etc (except GST) for the entire scope of work has been up-loaded through online system within due date.

6.0 Bid Pricing:- We further declare that the prices stated in our Proposal are firm and in accordance with your 'Instruction to Bidders' (ITB) included in Conditions of Contract of Bid documents.

7.0 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the technical specifications, scope of works and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices in price schedule quoted and uploaded in e-procurement web-portal.

8.0 Format of Undertaking - We have enclosed Undertaking as per **Annexure III.**

9.0 DEVIATIONS:

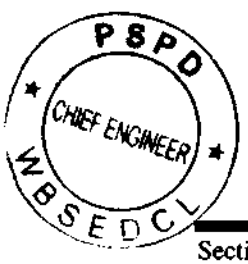
We declare that contract shall be executed strictly in accordance with the specifications and documents. We are aware that, our online price bid is liable to be rejected in case the same contains any deviation/omission from the contractual and commercial conditions and technical Specifications as per Bid documents.

10.0 WORK SCHEDULE:

If this proposal is accepted by you, we agree to provide services and complete the entire work, in accordance with schedule indicated in the proposal, we fully understand that the work completion schedule stipulated in the proposal is the essence of the Contract, if awarded. The completion schedule of the various major key phases of the work will be as per time Schedule submitted by us and approved by you in order to maintain the completion time schedule of bid documents.

11.0 CONTRACT PERFORMANCE GUARANTEE:

We further agree that if our proposal is accepted, we shall provide a Contract Performance Bank Guarantee in the form and value, as applicable and as stipulated in Bid document in the form of Bank Guarantee in your favour within stipulated time as mentioned in bid from the date of placement of Letter of Award and under take to enhance/extend the same, as required, as to be informed time to time.



12.0 QUALITY PLANS:

The Contractor is responsible for the proper execution of works as per drawings. The work beyond the Contractor's hold points will progress only with WBSEDCL's consent. WBSEDCL will also undertake quality surveillance and quality audit of the Contractor's, systems and procedures and quality control activities. The Contractor further agrees that any changes in Quality Plan will be made only with the Owner's approval. The Contractor shall also perform all quality control activities, inspection and tests agreed with the WBSEDCL (Owner) to demonstrate full compliance with contract requirement.

12.1 The Contractor also agrees to provide the Owner with the necessary facilities for carrying out inspection, quality audit and quality surveillance of Contractor's Quality Assurances System.

12.2 It is expressly agreed to by the contractor that the quality tests and inspection by the Owner shall not in any way relieve the Contractor of its responsibilities for quality standards, and performance guarantee and their other obligations under the Agreement.

12.3 It is further agreed by the Contractor that the contract performance guarantee shall in no way be constructed to limit or restrict the Owner's right to recover the damages/compensation due to poor workmanship or under any other clause of the Agreement. The amount of damages/compensation shall be recoverable either by way of deduction from the contract price, contract performance guarantee and or otherwise.

12.4 The contract performance guarantee furnished by the contractor is irrevocable and unconditional and the Owner shall have the powers to invoke it notwithstanding any dispute or difference between the owner and the contractor pending before any court, tribunal or any other authority.

12.5 This Agreement constitutes full and complete understanding between the parties and terms of the presents. It shall supersede and prior correspondence terms and conditions contained in the Agreement. Any modification of the Agreement shall be effected only by a written instrument signed by the authorized representative of both the parties.

13.0 CHECK LIST

We have included a Check List duly filled in.

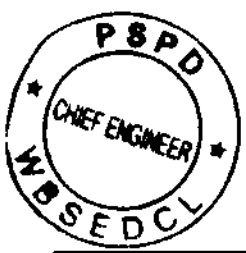
Dated this ..... day

of .....20....

Signature ..... in the capacity of ..... duly

authorized to sign for and on behalf of.....

(IN BLOCK CAPITALS)



Annexure - V

PROFORMA OF AGREEMENT

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

ARTICLES OF AGREEMENT made this .....day of .....in the year..... between West Bengal State Electricity Distribution Company Limited (WBSEDCL), a statutory body constituted by the Govt. of West Bengal having its Head Office at "Vidyut Bhavan", Block DJ. Sector II, Salt Lake City, Kolkata-700091, hereinafter referred to as the "Company" (which expression sball 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 its heirs, executors, administrators, representatives and permitted assigns) of the OTHER PART

WHEREAS the Company invited tenders vide Tender Notice No..... (annexed hereto) for "....."(Name of the work)

AND WHEREAS in pursuance of such invitation for tenders the contractor submitted a tender vide no. ..... dt..... the Techno-Commercial part of which was opened on .....and the Price Bid was opened on ..... (the tender offer is in the custody of the Company at present)

AND WHEREAS AFTER consideration of the tender submitted by the contractor with clarification(s), the Company accepted the said tender submitted by the contractor and placed Letter of Award no..... dt..... (annexed hereto)

NOW THEREFORE, the Company and the Contractor agree as follows:

1. The contractor agrees to undertake the work of "....." as per Letter of Award No. ..... dated ..... referred to above.

2. The Company agrees to pay the contractor as per the Letter of Award No.....dt..... referred to above.

3. Both the contractor and the Company agree that for the purpose of jurisdiction of court in regard to any dispute arising out of this agreement, this agreement shall be deemed to have been executed within the jurisdiction of the original side of the High Court, Kolkata.

IN WITNESS WHEREOF the parties have hereunder affixed their signature, on the day, the month and year written as above.

PSPD CHIEF ENGINEER WBSEDCL

SIGNED, SEALED AND DELIVERED

.....	.....
Contractor	Company
.....	.....
Witness	Witness
.....	.....
Witness	Witness

PSPD
CHIEF ENGINEER
WBSEDCL

Annexure - VI

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.....

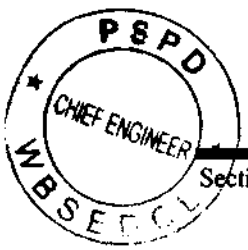
(herein after called "OBLIGOR/OBLIGORS" which expression shall mean and includes my/our successors legal representatives, assigns) do hereby binds myself/ourselves and also our Company/firm.....after having the power to bind so with the promise and undertaking in favor of the West Bengal State Electricity Distribution Company Limited, a Government Company within the meaning of sec.617 of the Company's Act 1956 having registered office at Vidyut Bhavan, Block-DJ, Sector-II, Salt Lake City, Kolkata-700091(herein after called as OBLIGEE, which expression shall mean and include it's legal representative, administrators assigns).

Whereas OBLIGOR/OBLIGAORS 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 here under as per letter mentioned herein-above and whereas the said job/works will be/likely to be done in places covered under Employees' State Insurance Act (ESI) / Mediclaim Policy (where applicable in case of Non-ESI zone) and/or the Employee Compensation Act, 1923 (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/are 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/undertake 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 Employees State Insurance Act., who does/do not has/have insurance coverage within the meaning of Employees' State Insurance Act,1948.
4. THAT the OBLIGOR/OBLIGORS further undertakes/undertake 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, 1948, who has life insurance / Mediclaim Policy 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/OBLIG\ORS shall keep harmless the OBLIGEE from all claims, compensation, damages, any proceedings in respect of any of its employee/workmen under the Employee 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 Employee 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/OBLIGORS.

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/OBLIGATORS 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/ OBLIGATORS.

SIGNED AND DELIVERED BY

THE OBLIGOR/ OBLIGORS

.....

.....

Signature

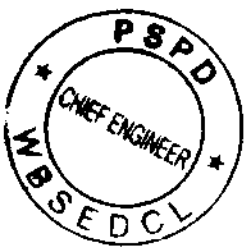
Witness:

1) Name, Designation .....

Signature .....

2) Name, Designation .....

Signature .....



Annexure - VII

PROFORMA OF BANK GUARANTEE FOR CONTRACT PERFORMANCE

(To be executed in non-judicial stamp paper of Rs. 100/-)

Ref.....
Bank Guarantee No..... **Date :.....**

To

.....

.....

West Bengal

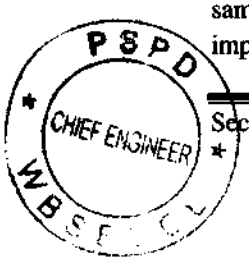
Dear Sirs,

In consideration of West Bengal State Electricity Distribution Company Ltd., (herein after referred to as the "Owner" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s.....with registered/Head office at.....(hereinafter referred to as "Contractor" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns), a Contract issued by Owner's Letter of Award No.....dated..... for.....(scope of work) and the same having been acknowledged by the Contractor, resulting in a Contract bearing No.....dated ..... Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to Rs..... being (10%) (Ten Percent) of the said value of the Contract to the Owner.

We.....(Name & Address) having its Head Office at .... (hereinafter referred to as the "Bank", which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Owner, on demand any or all monies payable by the Contractor to the extent of Rs.....as aforesaid at any time up to.....*(day/month/year) without any demur, reservation, contest, recourse or protest and/or without any reference to this Contractor.

Any such demand made by the Owner on the bank shall be conclusive and binding notwithstanding any difference between the Owner and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Owner and further agrees that the guarantee herein contained shall continue to be enforceable till the Owner discharges this guarantee.

The Owner shall have the fullest liberty without affecting in any way the liability of the Bank under the guarantee from time to time to extend the time for performance or the Contract by the Contractor. The Owner shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner and either to enforce or to for bear to enforce any covenants, contained or implied in the Contract between the Owner and the Contractor or any other course or remedy or security



available to the Owner. The Bank shall not be relieved of its obligations under these presents by any exercise by the Owner of its liberty with reference to the matters aforesaid or any of them or by reason of any other act of omission or commission on the part of the Owner or any other indulgences shown by the Owner or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Bank.

The bank also agrees that the Owner at its option shall be entitled to enforce this guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and not withstanding any security or other guarantee the Owner may have in relation to the Contractor's liabilities.

Notwithstanding anything contained herein above our liability under this guarantee is restricted to Rs.....and it shall remain in force upto and including .....**(day/month/year) and shall be extended from time to time for such period as may be desired M/s.....on whose behalf this guarantee has been given. Unless a demand or claim is lodged on us within and including .....*(day/month/year) we shall be discharged from all liabilities thereafter.

Dated this.....day of.....20.....at.....

WITNESS

.....	.....
(Signature)	(Signature)
.....	.....
(Name)	(Name)
(Official Address)	(Official Address)

Attorney as per Power of Attorney No.....

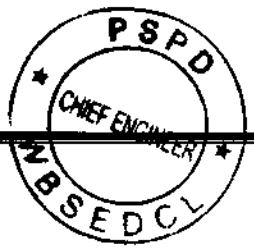
Date.....

*** Till 3 (three) months after the validity of the Bank Guarantee.**

**** Upto 3 (three) months after the expiry of warranty/guarantee period.**

Notes:

1. The stamp paper of appropriate value shall be purchased in the name of issuing bank.
2. The sum shall be 10% (ten percent) of the Contract Price. The performance Bank Guarantee/ Security Deposit Bank Guarantee shall be valid as per terms of contract. A period of three (3) months should be added as claimed period from the last date of validity of the Bank Guarantee.



Annexure - VIII

PROFORMA OF BANK GUARANTEE FOR BID GUARANTEE

The non-Judicial stamp paper of Rs 100/- should be in the name of issuing Bank

Ref..... **Bank Guarantee No.....**

Date.....

To

.....

.....

.....

West Bengal

Dear Sirs,

In accordance with Invitation to bid under your NIeT No.....M/s.....having its Registered / Head Office at.....(hereinafter called the 'Bidder") wish to participate in the said Bid of.....and you, as a special favour have agreed to accept an irrevocable and unconditional Bank Guarantee for an amount of .....valid upto..... on behalf of Bidder in lieu of the Bid deposit required to be made by the bidder, as a Condition precedent for participation in the said Bid.

We, the .....(Bank Name) at .....(address) having our Head Office at .....guarantee and undertake to pay immediately on demand by West Bengal State Electricity Distribution Company Ltd., the Amount of .....(in words & figures) without any reservation, protest, demur and recourse. Any such demand made by said 'Owner' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder.

This Guarantee shall be irrevocable and shall remain valid upto and including*..... If any further extension of this guarantee is required, the same shall be extended to such required period (not exceeding one year) on receiving instruction from M/s..... on whose behalf this guarantee is issued.

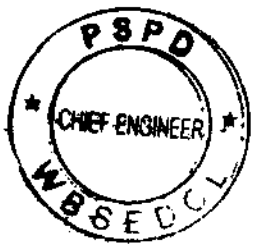
In Witness where of the Bank, through its authorized office, has set its hand and stamp on this.....day of.....,.....20.....at.....

PSPD
CHIEF ENGINEER
WBSEDCL

WITNESS

.....	.....
(Signature)	(Signature)
.....	.....
(Name)	(Name)
.....	.....
(Official Address)	(Official Address)

*This date shall be 30 (thirty) days after the last date for which the bid is valid.



Annexure - IX

PROFORMA FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT FACILITIES (TO BE GIVEN BY BANKER OF BIDDER)

BANK CERTIFICATE

This to certify that M/s ..... (FULL NAME AND ADDRESS) who are submitting their Bid to ..... against their tender specification vide Ref. No.....and date ..... is our customer for the past ..... years.

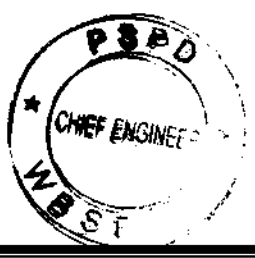
Their financial transactions with our bank have been satisfactory. They enjoy the following fund based and non fund based limits including guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

SL. No.	TYPE OF FACILITY	SANCTIONED LIMIT AS ON DATE	UTILIZATION AS ON DATE.....

This letter is issued at the request of
M/s .....

Name of Bank.....
Name of authorized Signatory.....
Designation.....
Phone No.....
Address.....

SEAL OF THE BANK



Annexure - X

JOINT VENTURE / CONSORTIUM AGREEMENT

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

THIS AGREEMENT executed on this.......... day of.......... Two Thousand .... BETWEEN .... a company incorporated under the laws of INDIA and having its Registered Office at ....(hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s...............a company incorporated under the laws of .... and having its Registered Office at .... (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns) and M/s.. .. .. a Company incorporated under the laws of .... and having its Registered Office at .... (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" (in case of award)] against the Specification No..................... for "..............................."(insert name of the work) of West Bengal State Electricity Distribution Company Limited, a Company incorporated under the Companies Act of 1956 having its Registered Office at Vidyut Bhavan, Block-DJ, Sector – II, Bidhannagar, Kolkata – 700 091 (hereinafter called the "Employer").

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated...............

AND WHEREAS the Employer invited bids as per the above mentioned Specification for the work ".." (insert name of the work) stipulated in the Bidding Documents.

AND WHEREAS Clause 4 & 5 (ITB) of NIeT (documents establishing the eligibility of Bidder) forming part of the Bidding Documents, inter-alia stipulates that an Undertaking of two or more qualified bidders as partners, meeting the requirements of Qualification Criteria in Clause 4 & 5 (ITB) of NIeT, as applicable may bid, provided, the Joint Venture/ Consortium fulfils all other requirements of NIT and Qualification Criteria in Clause 4 & 5 (ITB) of NIeT and in such a case, the Bid Forms shall be signed by all the parties so as to legally bind them and severally liable to perform the Contract and all obligations hereunder.

The above clause further states that the Contract performance guarantee will be as per the format enclosed with the Bidding Documents without any restrictions or liability for either party.

AND WHEREAS the bid is being submitted to the Employer vide proposal No.......................dated .... by Party/Parties in accordance with the requirements of Clause 4 & 5 (ITB) of NIeT (documents establishing the Qualification of Bidder) has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties do hereby declare and undertake:

1. In requirement of the award of the Contract by the Employer to the Joint Venture/Consortium, the Parties do hereby undertake that M/s......................... the Party No.1, shall act as Lead Partner and further declare and confirm that we the parties to the Joint Venture/Consortium shall jointly and

severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the work "....." (insert name of the work).

2. In case of any breach or default of the said Contract by any of the party or parties to the Joint Venture/ Consortium, the party(s) does hereby undertake to be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.

3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance or quality of the work in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of THESE PRESENTS undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to THESE PRESENTS before proceeding against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.

4. The financial liability of the Parties of this Deed of Undertaking to the Employer, with respect to any of the claims arising out of the performance or non-performance of the obligations set forth in this agreement, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of this agreement.

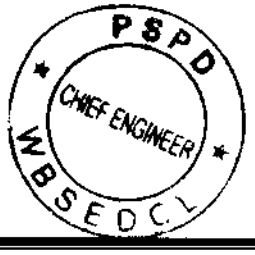
5. It is expressly understood and agreed between the Parties to this agreement that the responsibilities and obligations of each of the Parties shall be as delineated in the relevant Clauses of ITB & GCC to this agreement. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.

6. This agreement shall be construed and interpreted in accordance with the provisions of the Contract.

7. In case of an award of a Contract, the parties to this agreement do hereby agree that it shall be jointly and severally responsible for furnishing a Contract performance security in the form of Bank Guarantee from a nationalized bank in favour of the Employer in Indian currency.

8. It is further agreed that this Bank Guarantee shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Employer discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking have through their authorized representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.



Common Seal of ..... has been affixed in my/ our presence pursuant to Board of Director's Resolution dated .....
Name .....
Designation .....
Signature .....

For Lead Company / Lead Partner
(Party No.-1)
For and on behalf of M/s.....

(Signature of the authorized Representative)

WITNESS :
I. .....
II. .....

Common Seal of ..... has been affixed in my/ our presence pursuant to Board of Director's Resolution dated .....
Name .....
Designation .....
Signature .....

For Party No. - 2
For and on behalf of M/s.....

(Signature of the authorized Representative)

WITNESS :
I. .....
II. .....

Common Seal of ..... has been affixed in my/ our presence pursuant to Board of Director's Resolution dated .....
Name .....
Designation .....
Signature .....

For Party No. - 3
For and on behalf of M/s.....

(Signature of the authorized Representative)

WITNESS :
I. .....
II. .....

Note:

1. For the purpose of executing this agreement, the non-judicial stamp papers of Rs.100/- shall be purchased on behalf of Joint Venture / Consortium.

2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the parties.

3. The nomenclature of this agreement be treated as standardised format for parties being companies incorporated under Companies Act. 1956/2013.
   But other entities like partnership firm/ LLP may also eligible for participation in the bid as part of joint venture/ Consortium under relevant laws of India.

Annexure - XI

POWER OF ATTORNEY FOR LEAD MEMBER OF JOINT VENTURE / CONSORTIUM
(To be executed on Non-Judicial Stamp Paper of Rs. 100/- or above)

KNOW ALL MEN BY THESE PRESENTS THAT WE, the Partners whose details are given hereunder ..... have formed a Joint Venture under the laws of..... and having our Registered Office(s)/Head Office(s) at ..... (hereinafter called the 'Joint Venture' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s ..... being the Partner in-charge do hereby constitute, nominate and appoint M/s..... a Company incorporated under the laws of ..... and having its Registered/Head Office at ..... as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Authorised Representative" or "Partner In-charge") to exercise all or any of the powers for and on behalf of the Joint Venture in regard to Specification No..... Package ..... the bids for which have been invited by West Bengal State Electricity Distribution Company Limited, having its Registered Office at Vidyut Bhavan, Block-DJ, Sector – II, Bidhannagar, Kolkata – 700 091 (hereinafter called the 'Employer') to undertake the following acts :

i) To submit proposal and participate in the aforesaid Bid Specification of the Employer on behalf of the "Joint Venture".

ii) To negotiate with the Employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the "Joint Venture".

iii) To do any other act or submit any document related to the above.

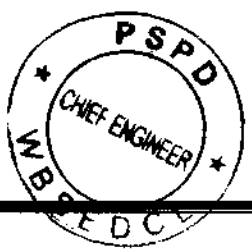
iv) To receive, accept and execute the Contract for and on behalf of the "Joint Venture".

It is clearly understood that the Partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The Joint Venture hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney/Authorized Representatives/Partner in-charge quotes in the bid, negotiates and signs the Contract with the Employer and/or proposes to act on behalf of the Joint Venture by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.

IN WITNESS THEREOF the Partners Constituting the Joint Venture as aforesaid have executed these presents on this..... day of ..... under the Common Seal(s) of their Companies.



for and on behalf of the
Partners of Joint Venture

.....
.....
.....
The Common Seal of the above Partners of the Joint Venture:
The Common Seal has been affixed there unto in the presence of:
WITNESS

1. Signature.....
   Name .....
   Designation .....
   Occupation .....

2. Signature.....
   Name .....
   Designation .....
   Occupation .....

Note:
1. For the purpose of executing the Agreement, the non-judicial stamp papers of appropriate value shall be purchased on behalf of Joint Venture/Consortium.

2. The Agreement shall be signed on all the pages by the authorized representatives of each of the partners and should invariably be witnessed.

Annexure – XII

LIST OF WORK ORDER IN HAND

A. For Bidders Other Than Joint Venture*

Sl. No.	Name of the Employer with Contact Address, Tel & Email	Name of the Work	Work Order Reference	Ordered Value (Rs.)	Contract Period	Schedule Date of Completion
1.						
2.						
3.						

B. For Joint Venture Bidders (Where Applicable)*

DETAILS OF WORK ORDERS IN HAND AS JOINT VENTURE	FIRM 'A' (Lead Member)	FIRM 'B'	FIRM 'C'
1. Name of the Employer with Contact Address, Tel & Email			
2. Name of the Work			
3. Work Order Reference			
4. Ordered Value (Rs.)			
5. Contract Period			
6. Schedule Date Completion			
7. Value of Outstanding Work (Rs.)			

- **The Joint Venture should indicate the details of participation (Give details on contribution of each) as above.**

*** Strike out whichever is not applicable**

(Signature of the Bidder

with office seal and date)

PSPD
CHIEF ENGINEER
WBSEDCL

Annexure - XIII

LIST OF KEY PERSONNEL, TOOLS, PLANTS, EQUIPMENT AND MACHINERIES

A. For Bidders Other Than Joint Venture*

I. List Of Key Personnel

Sl. No.	Name of the Personnel	Title of Position	Work Experience
1.			
2.			
3.			

II. List Of Tools, Plants, Equipment And Machineries

Sl. No.	Details of Construction Equipment
1.	
2.	
3.	

B. For Joint Venture Bidders (Where Applicable)*

PARTICIPATION DETAILS	FIRM 'A' (Lead Member)	FIRM 'B'	FIRM 'C'
1. Key Personnel with their Title of Position and Work Experience			
2. Construction Equipment			

❖ **The Joint Venture should indicate the details of participation as above.**

*** Strike out whichever is not applicable**

PSPD
CHIEF ENGINEER
WBSEDCL

(Signature of the Bidder
with office seal and date)

Annexure - XIV

SELF DECLARATION OF DEBARRING BY ANY GOVERNMENT DEPARTMENT / GOVT. UNDERTAKINGS / ENTERPRISE / REPUTED PRIVATE ORGANIZATIONS ETC.

[The following table shall be filled in for the Bidder and for each member of a Joint Venture where permitted]

Bidder's Legal Name : _____ **Date :** _____

JV Member Legal Name : _____

Debarring of Award of Contracts in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria :			
☐ **Debarring of Award of Contracts did not occur since last five (5) years from the publication of this NIeT [insert year] in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria.** ☐ **Debarring of Award of Contracts since last five (5) years from the publication of this NIeT [insert year] in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria.**			
Year	**Non- performed portion of contract**	**Contract Identification**	**Total Contract Amount (Rs.)**
[Insert year]	[Insert amount and percentage]	Contract Identification : [indicate complete contract name / number, and any other identification] Name of Employer : [insert full name] Address of Employer : [insert street / city / country] Reason(s) for non performance : [indicate main reason(s)]	[Insert amount]

PSPD CHIEF ENGINEER WBSEDCL

(Signature of the Bidder with office seal and date)

Annexure - XV

HISTORICAL CONTRACT NON-PERFORMANCE

[The following table shall be filled in for the Bidder and for each member of a Joint Venture where permitted]

Bidder's Legal Name : _____ **Date** : _____

JV Member Legal Name : _____

Non-Performed Contracts in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria :			
☐ **Contract non-performance did not occur since last five (5) years from the publication of this NIeT [insert year] in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria.** ☐ **Contract(s) not performed since last five (5) years from the publication of this NIeT [insert year] in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria.**			
Year	**Non- performed portion of contract**	**Contract Identification**	**Total Contract Amount (Rs.)**
[Insert year]	[Insert amount and percentage]	Contract Identification : [indicate complete contract name / number, and any other identification] Name of Employer : [insert full name] Address of Employer : [insert street / city / country] Reason(s) for non-performance : [indicate main reason(s)]	[Insert amount]

(Signature of the Bidder

with office seal and date)

PSPD CHIEF ENGINEER WBSEDCL

Annexure - XVI

LITIGATION HISTORY

[The following table shall be filled in for the Bidder and for each member of a Joint Venture where permitted]

Bidder's Legal Name : _____ **Date :** _____

JV Member Legal Name : _____

Year	Non- performed portion of contract	Contract Identification	Total Contract Amount (Rs.)
Pending Litigation, in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria:			
☐ **No pending litigation in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria.**			
☐ **Pending litigation in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria as indicated below.**			
Litigation History in accordance with Section 6.2 (v) of ITB, Evaluation and Qualification Criteria			
[Insert year]	[Insert **Contract Value of Work]**	Contract Identification: [indicate complete contract name, number, and any other identification] Name of Employer: [insert full name] Address of Employer: [insert street / city / country] Matter in dispute: [indicate main issues in dispute] Party who initiated the dispute: [indicate "Employer" or "Contractor"] Reason(s) for Litigation and award decision [indicate main reason(s)]	[Insert percentage of work done]

04.02.2021

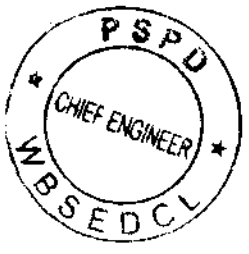
PSPD CHIEF ENGINEER WBSEDCL

(Signature of the Bidder with office seal and date)

SECTION 7

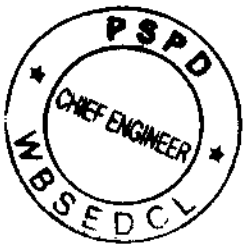
BILL OF QUANTITY (BOQ)

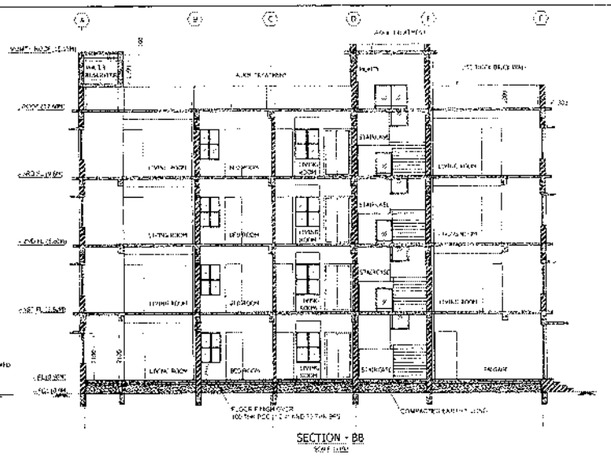
(To be completed and submitted in the Finance Folder of www.wbtenders.gov.in)

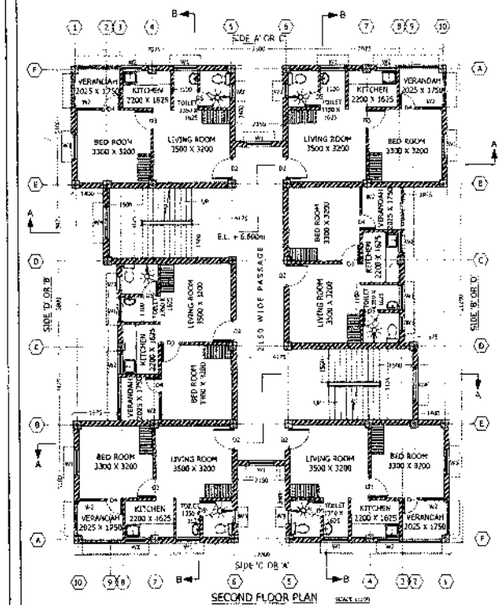


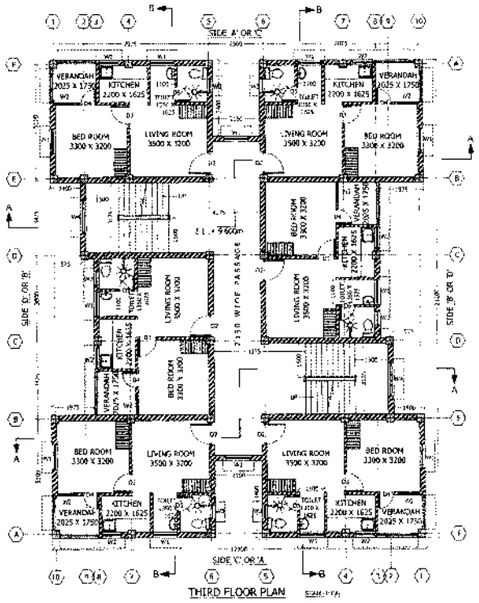
SECTION 8

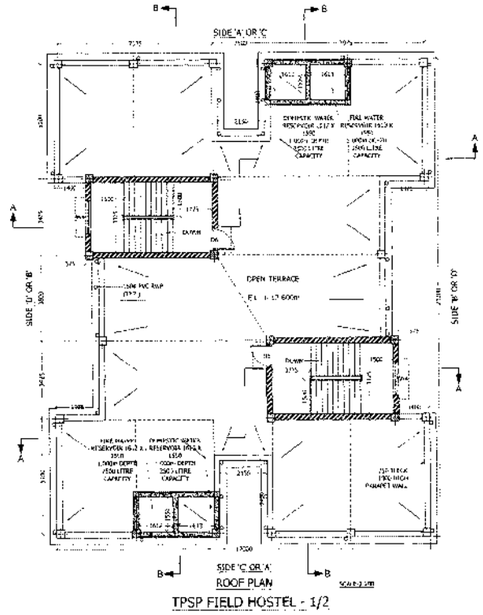
DRAWINGS

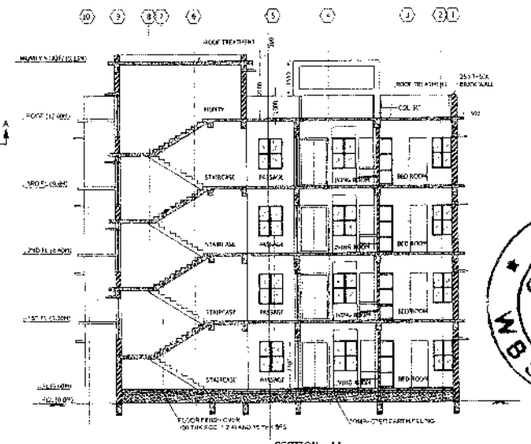


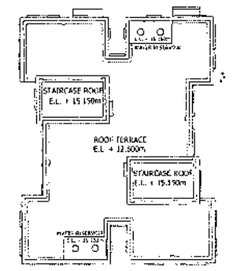












ELEVATION - SIDE 'B'

SCALE 1:100

ELEVATION - SIDE 'A'

SCALE 1:100

SECTION - BB

SCALE 1:100

FINISHING SCHEDULE

LOCATION	FLOORING	SKIRTING	INTERNAL WALL AND CEILING
BED ROOM, LIVING ROOM, KITCHEN, VERANDAH	25 TO 30 mm THICK FLOOR MARBLE SLAB	15 TO 18 mm THICK MARBLE SLAB 100mm HIGH	[illegible] ACRYLIC EMULSION PAINT OVER [illegible] PRIMER OVER PLASTER OF PARIS / WALL PUTTY
TOILET		CERAMIC TILES 2.1 M HIGH IN WALL	
CORRIDOR, PASSAGE, LOBBY, OFFICE ROOM, STORE ROOM, STAIRCASE, DINING & KITCHEN, RECREATION CLUB, GAMES ROOM, STAFF ROOM, STAIRS	15 TO 20 mm THICK KOTA STONE SLAB	15 TO 20 mm THICK KOTA STONE SLAB SKIRTING 100 mm HIGH	

KITCHEN COOKING PLATFORM 600mm WIDE & 800mm HIGH FINISHED WITH 15 TO 18 mm THICK GRANITE/MARBLE SLAB WITH SUITABLE STORAGE PARTITIONS BELOW PLATFORM BY 75mm THICK BRICK WALLS & 40mm THICK R.C.C. SLABS

EXTERNAL WALLS SHOULD BE PAINTED WITH PROTECTIVE AND DECORATIVE ACRYLIC EXTERIOR EMULSION PAINT OF RENOWNED MAKE AND SHADE COMBINATIONS INCLUDING TEXTURE [illegible] OVER SELECTED AREA APPLIED OVER A COAT OF ACRYLIC PRIMER AS PER DIRECTION.

ALL WOODEN DOORS, COLLAPSIBLE GATE, ROLLING SHUTTER, WINDOW GRILLS, RAILINGS, M.S. STAIR BALUSTER ETC. SHOULD BE PAINTED WITH SYNTHETIC ENAMEL PAINT OF RENOWNED MAKE AND SHADE OVER A COAT OF PRIMER.

DOOR WINDOW SCHEDULE

NUMBER	WIDTH (in mm)	HEIGHT (in mm)	DESCRIPTION
D1	2500	2550	ALUMINIUM FRAMED GLAZED DOOR, TOP 600 FIXED GLAZED, MIDDLE 1950 SLIDING OPENABLE DOUBLE SHUTTER, TWO SIDES UPPER HALF FIXED GLAZED
D2	1200	2100	WOODEN FLUSH DOOR, SINGLE SHUTTER
D3	900		
D4	750		
D5	750		PVC FLUSH DOOR, SINGLE SHUTTER
D6	1000		WOODEN PANELLED DOOR, SINGLE SHUTTER
RS	2500	2550	STEEL ROLLING SHUTTER
CG	2550	2550	COLLAPSIBLE GATE
W1	1500	1500	ALUMINIUM FRAMED 2 TRACK SLIDING FULLY GLAZED WINDOW
W2	900		
W3	600	600	ALUMINIUM FRAMED CENTRE HUNG FULLY GLAZED WINDOWS
[illegible]	1500	850	STEEL WINDOW, [illegible] OPENABLE

ALL WINDOWS SHOULD BE PROVIDED WITH GRILLS

ALL BALCONIES SHOULD BE PROVIDED WITH STEEL RAILINGS, [illegible] HIGH

SECOND FLOOR PLAN

SCALE 1:100

TPSP FIELD HOSTEL - 1/2

THIRD FLOOR PLAN

SCALE 1:100

TPSP FIELD HOSTEL - 1/2

ROOF PLAN

SCALE 1:100

TPSP FIELD HOSTEL - 1/2

SECTION - AA

SCALE 1:100

PSPD CHIEF ENGINEER WBSEDCL

ABOVE ROOF PLAN

SCALE 1:100

SCHEDULE OF FIXTURES

SYMBOL	DESCRIPTION
	WC INDIAN PATTERN
	WC WESTERN PATTERN
	FLAT BACK URINAL
	WASH BASIN
	SINK FOR DRINKING WATER
	SHOWER
	KITCHEN SINK

ABBREVIATIONS

WC - WATER CLOSET
EGL - EXISTING GROUND LEVEL
FGL - FINISHED GROUND LEVEL
PL - PLINTH LEVEL
EL - ELEVATION LEVEL
TOC - TOP OF CONCRETE LEVEL
PCC - PLAIN CEMENT CONCRETE
RCC - REINFORCED CEMENT CONCRETE
UNO - UNLESS NOTED OTHERWISE
SC - STEEL COLUMN
RWP - RAIN WATER PIPE

ADDITIONAL NOTE ON FINISHING SCHEDULE :

1. COLOUR OF ALL CEILING SHALL BE WHITE.
2. ALL STEEL WINDOWS, VENTILATORS, COLLAPSIBLE GATE, ROLLING SHUTTER, BALUSTER ETC. SHOULD BE PAINTED WITH SYNTHETIC ENAMEL PAINT OF APPROVED MAKE AND SHADE OVER A COAT OF PRIMER.
3. ALL WOODEN DOORS SHOULD BE PAINTED WITH SYNTHETIC ENAMEL PAINT OF APPROVED MAKE AND SHADE OVER A COAT OF SYNTHETIC PRIMER.
4. INTERNAL WALLS AND CEILING SHOULD BE RENDERED WITH PLASTER OF PARIS / WALL PUTTY (MIN. 1.5 MM THICK) OVER CEMENT PLASTER.
5. EXHAUST FANS SHOULD BE PROVIDED IN TOILETS.
6. DOOR STOPS SHOULD BE PROVIDED IN ENTRANCE DOOR, TOILET DOOR & VERANDAH DOOR.
7. ELECTRICAL WIRING SHOULD PREFERABLY BE CONCEALED.
8. ROOF TREATMENT SHOULD BE EITHER ROOF TILES OR SCREED CONCRETE [illegible] LAID OVER APPLICATION OF CEMENT SLURRY PREPARED WITH LATEX OF REPUTED BRAND AND CEMENT MORTAR ADMIXED WITH WATER RESISTANT BONDING AGENT AS PER MANUFACTURER'S SPECIFICATION.

AREA STATEMENT

COVERED AREA OF EACH SINGLE UNIT = 40.466 SqM
TOTAL COVERED AREA OF BUILDING = 309.11 SqM

TPSP FIELD HOSTEL - 1

TPSP FIELD HOSTEL - 2

GRID ORIENTATION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE STATED.
2. ONLY FIGURED DIMENSIONS ARE TO BE FOLLOWED AND SHOULD NOT BE SCALED.
3. GRID LINES ARE DRAWN ON COLUMN CENTRES.
4. FGL SHOULD MEAN FINISHED GROUND LEVEL AFTER NECESSARY LAND DEVELOPMENT BY FILLING AND/OR CUTTING, AS THE CASE MAY BE, IF ANY.
5. CONCRETE FOR ALL RCC WORKS SHOULD BE OF M-20 (NOMINAL MIX 1:1.5:3).
6. REINFORCEMENT SHOULD CONFORM TO Fe-500 AS PER IS 1786-2008.
7. ALL EXTERNAL BRICK WALLS SHOULD BE 250mm THICK AND INTERNAL BRICK WALLS ARE 125mm THICK.
8. FLOOR FINISH SHOULD BE PLACED OVER 100mm THICK M15 GRADE CONCRETE (1:2:4). PLINTH FILLING SHOULD BE MADE WITH COMPACTED EARTH BY PROPERLY RAMMING IN LAYERS.
9. SUITABLE ROOF TREATMENT SHOULD BE PROVIDED OVER STRUCTURAL ROOF SLABS. ADEQUATE SLOPES IN ROOF SLAB AND RAIN WATER PIPES SHOULD BE PROVIDED FOR PROPER DISPERSAL OF RAIN WATER FROM ROOF.
10. PLINTH PROTECTION AND SIDE DRAIN SHOULD BE PROVIDED AROUND THE BUILDING AS PER DETAIL PROVIDED.
11. THERE IS NO PROVISION OF ANY EXTENSION IN UPPER STOREY.
12. INTERNAL FLOOR PARTITIONS IN ALL FLOOR SLABS IF PROVIDED ADDITIONALLY OR DUE TO REVISION OF FLOOR PLAN(S) IF FELT NECESSARY AND UNAVOIDABLE, MUST BE MADE BY ERECTING ONLY LIGHT-WEIGHT PARTITIONS AS PER REQUIREMENT AND NO BRICK WALLS SHOULD BE CONSTRUCTED ANYWHERE EXCEPT IN LOCATIONS AS SHOWN IN FLOOR PLANS.

THIS DRAWING SUPERSEDES EARLIER DRAWING NO. PLN(D)/BLDG/[illegible], [illegible]

IN CASE OF ANY CONFUSION PLEASE CONSULT P. & E. Dist. DEPT.

AS PER NOTE RECEIVED NO. [illegible] DATED [illegible]

GROUND FLOOR PLAN

SCALE 1:100

TPSP FIELD HOSTEL - 2

GROUND FLOOR PLAN

SCALE 1:100

TPSP FIELD HOSTEL - 1

FIRST FLOOR PLAN

SCALE 1:100

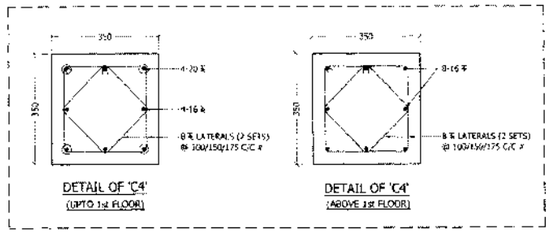
TPSP FIELD HOSTEL - 1/2

REVISIONS	WBSEDCL	DISTRIBUTION HQ.
		PLANNING AND ENGINEERING DEPARTMENT

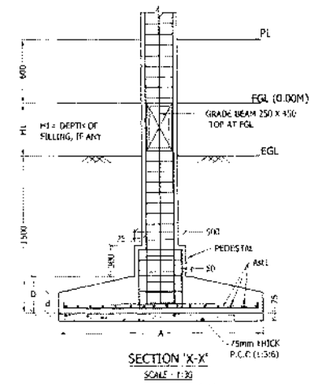
TWO NOS. NEW FOUR STORIED OFFICERS FIELD HOSTEL BUILDINGS AT PURULIA PUMPED STORAGE PROJECT TOWNSHIP PREMISES. DIST.- PURULIA

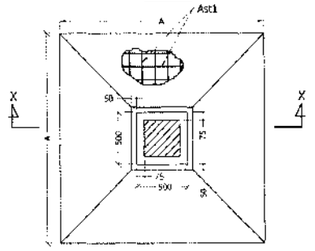
FLOOR PLANS, ROOF PLAN, ABOVE ROOF PLAN, ELEVATIONS, SECTIONS AND SCHEDULES

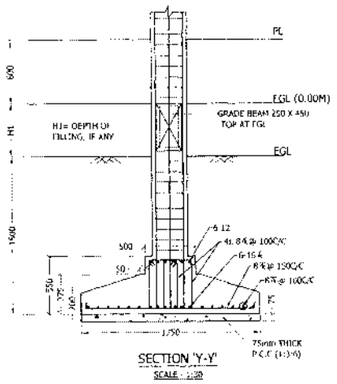
DRAWN BY :	J.E.(C) GR.I		
DESIGNED BY.	A.E.(C)		
CHECKED BY	D.E.(C)	DRAWING NO. PLN(D)/BLDG/511	
RECOMMENDED BY	A.C.E.-I (P. & E. - Dist.)	SCALE. AS STATED	SHEET NO 1 OF 7
APPROVED BY	C.E. (P & E - Dist.)	DATE. 06.02.2020	REV. NO 0



SEE TYPICAL DETAILS OF COLUMN TIES AND BEAM-COLUMN JUNCTION







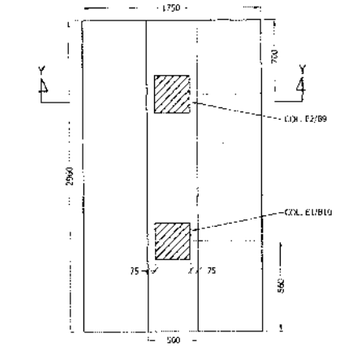


TABLE FOR CLEAR COVER

DESCRIPTION	CLEAR COVER IN mm
FOUNDATION BOTTOM AND SIDES	50
COLUMN SIDES	40
GRADE BEAM	30
FLOOR BEAM / ROOF BEAM	25
RCC SLAB & WALL	20

TABLE FOR REINFORCEMENT LENGTH 'E' & 'Ld' IN MM

DIA OF BAR (MM)	EMBEDDED LENGTH 'E'	DEVELOPMENT LENGTH 'Ld'
12	800	750
16	1100	925
20	1350	1150

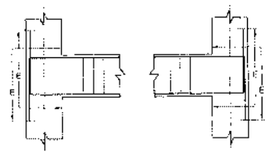
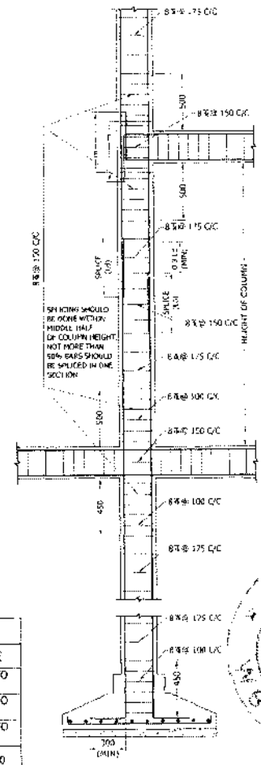
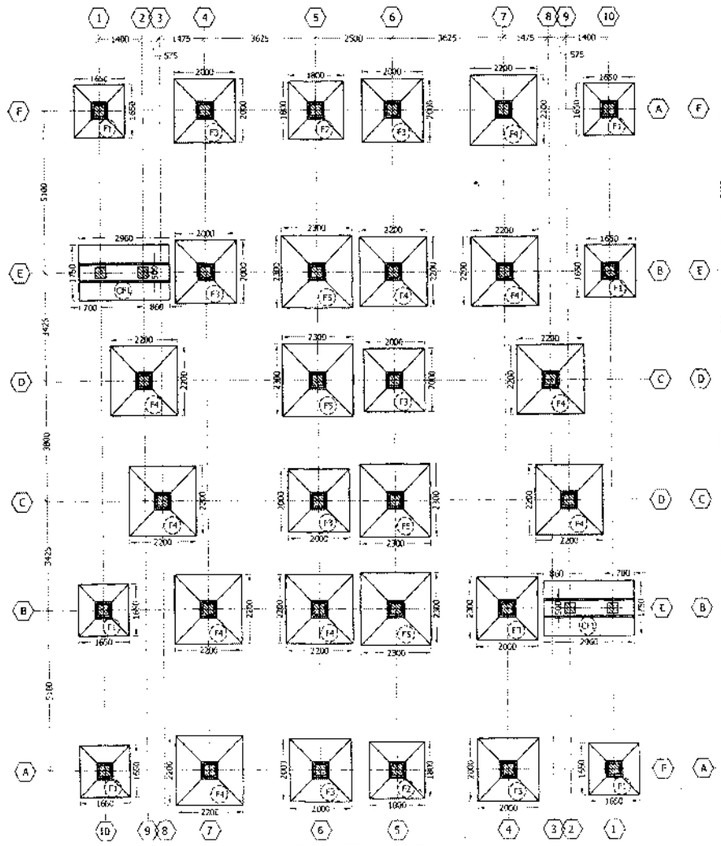
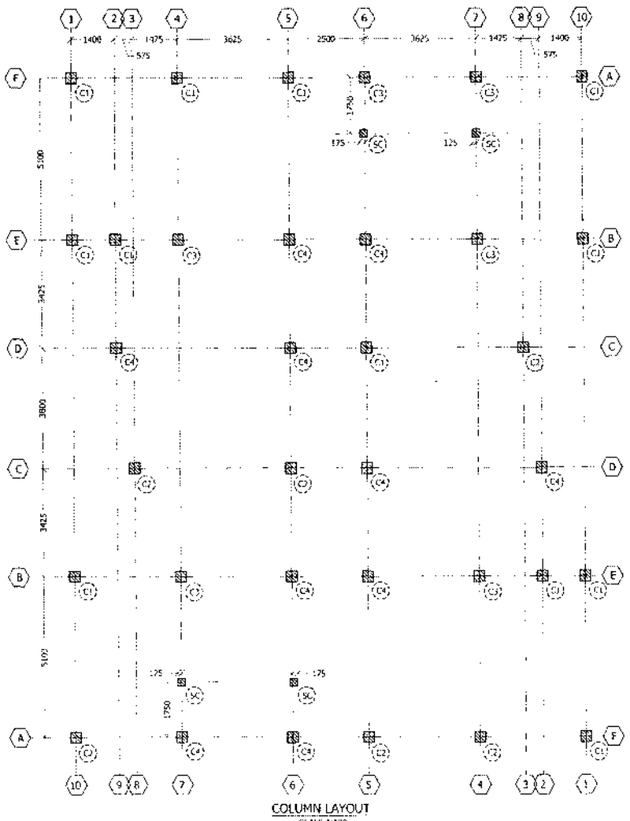


TABLE FOR COLUMN TERMINATION

	COLUMN MARKED W.R.T GRID	LEVEL IN METRE
FIELD HOSTEL 1/2	B4, B5, B7, C5, D6, E4, E6, E7	-1.500 FROM E.G.L TO +12.600
	A1, A6, A7, A10, B1, B10, C3, D8, E1, E10, F1, F4, F5, F10	-1.500 FROM E.G.L TO +13.600
	A4, A5, B6, B9, C6, C9, D2, D5, E2, E5, F6, F7	-1.500 FROM E.G.L TO +15.150
	COL. MKD. 'SC'	-12.600 TO +15.150

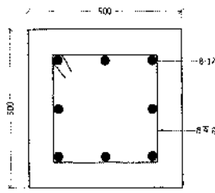


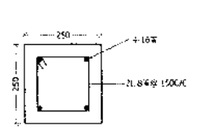




SCHEDULE OF ISOLATED COLUMN FOOTING

FOUNDATION MARKED	SIZE IN mm (A X A)	DEPTH OF FOOTING ('D')	END DEPTH OF FOOTING ('d')	REINFORCEMENT IN FOOTING ('AstI')
F1	1650 X 1650	375	150	10 ϕ @ 125 C/C BOTHWAYS
F2	1800 X 1800	400	175	10 ϕ @ 100 C/C BOTHWAYS
F3	2000 X 2000	450	200	12 ϕ @ 125 C/C BOTHWAYS
F4	2200 X 2200	525	225	12 ϕ @ 125 C/C BOTHWAYS
F5	2300 X 2300	550	225	12 ϕ @ 100 C/C BOTHWAYS





NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRE UNLESS SPECIFIED OTHERWISE
2. FIGURED DIMENSIONS ARE TO BE FOLLOWED AND DRAWING SHOULD NOT BE SCALED.
3. GRID LINES ARE DRAWN ON COLUMN CENTRES.
4. CONCRETE FOR ALL R.C.C. WORKSS SHOULD BE OF GRADE M-20, NOMINAL MIX (1:1½:3) AND REINFORCEMENT SHOULD CONFORM TO Fe-500 AS PER IS:1786-2008.
5. FINISHED GROUND LEVEL (F.G.L.) SHOULD MEAN THE GROUND LEVEL AROUND THE BUILDING AFTER NECESSARY LAND DEVELOPMENT BY EARTH FILLING AND/OR CUTTING AS THE CASE MAY BE, IF ANY.
6. CROSS SECTIONS OF TYPE COLUMNS SHOWN ARE TYPICAL FOR BETWEEN LEVELS MENTIONED IN SECTION DRAWINGS AND NO VARIATION SHOULD BE MADE
7. FOUNDATION BED SHOULD BE WELL COMPACTED BEFORE LAYING THE FOUNDATION.
8. DEPTH OF FOUNDATION FOR ALL SQUARE FOOTINGS IS 1.5M FROM THE EXISTING GROUND LEVEL (E.G.L.).
9. NECESSARY PRECAUTION SHOULD BE TAKEN TO RETAIN EARTH AND PREVENT SLIPPAGE OF EARTH BELOW FOUNDATION TOWARDS ADJACENT LOW LAND OR STRUCTURE, IF ANY, PRIOR TO COMMENCEMENT OF FOUNDATION WORKS.
10. LAP LENGTH FOR REINFORCEMENT SHOULD BE 50 X DIA. OF THE BAR, PLACED STAGGERED. REINFORCEMENTS SHOULD BE PROVIDED ALTHROUGH WITHOUT CURTAILMENT UNLESS OTHERWISE SPECIFIED.
11. LONGITUDINAL MAIN REINFORCEMENT IN BEAMS (TOP AND BOTTOM) SHOULD BE ENDBENT TO A MINIMUM LENGTH OF 'E' SPECIFIED IN TABLE IN END COLUMNS FROM FACE OF COLUMNS
12. THE FOUNDATION HAS BEEN DESIGNED AS PER FINDINGS AND RECOMMENDATION OF SOIL INVESTIGATION WORKS BY M/S CONSULTING ENGINEERING SERVICES (I) PVT LTD., JOB NO. CONS/0052/14 DATED ANGUST 1995 FORWARDED BY THE C.E., PSPD T-HROUGH U/O NOTE RECEIVED VIDE NO. P & C (Dist)/WBSEDCL/D1 DATED 02.01.18.
13. THE BUILDING FRAME AND FOUNDATION HAS BEEN DESIGNED CONSIDERING SEISMIC LOADING 'ZONE-III' CONFORMING TO IS 1893:2002 WITHOUT ANY PROVISION OF ADDITIONAL UPPER STOREY

REF. U/O NOTE RECEIVE NO. P & E (Dist)/WBSEDCL/01 DATED 02.01.2018

THIS DRAWING SUPERSEDES EARLIER DRAWING NO. PLN(D)/BLDG/498, SHEET NO. 02, DATED 29.10.2018

IN CASE OF ANY CONFUSION PLEASE CONSULT P. & E. - Dist. DEPT.

TPSP
FIELD HOSTEL - 1

TPSP
FIELD HOSTEL - 2

GRID ORIENTATION

REVISIONS	WBSEDCL	DISTRIBUTION HQ.
		PLANNING AND ENGINEERING DEPARTMENT
		TWO NOS. NEW FOUR STORIED OFFICERS FIELD HOSTEL BUILDINGS AT PURULIA PUMPED STORAGE PROJECT TOWNSHIP PREMISES, DIST.- PURULIA
		LAYOUTS AND DETAILS OF FOUNDATION AND COLUMN
	DRAWN BY : J.E.(C)-GR.1 05.02.20	
	DESIGNED BY: A.E.(C) 05.02.2020	
	CHECKED BY: D.E.(C) 05.02.2020	DRAWING NO. PLN(D)/BLDG/511
	RECOMMENDED BY: A.C.E.-I (P & E - Dist.) 05.02.2020	SCALE: AS STATED / SHEET NO. 2 OF 7
	APPROVED BY: C.E. (P & E - Dist.) 05.02.20	DATE: 05.02.2020 / REV. NO. 0

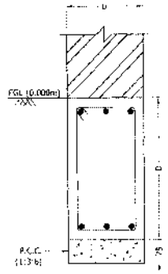
CHIEF ENGINEER
PSPD
WBSEDCL

SCHEDULE OF GRADE BEAMS (T.O.C 0.0m)

BEAM MARKED	SPAN 'L' (m)	SIZE (mm) WIDTH 'b'	SIZE (mm) DEPTH 'D'	TOP REINFORCEMENT LEFT SUPPORT (ϗ)	TOP REINFORCEMENT SPAN (ϗ)	TOP REINFORCEMENT RIGHT SUPPORT (ϗ)	BOTTOM REINFORCEMENT LEFT SUPPORT (ϗ)	BOTTOM REINFORCEMENT SPAN (ϗ)	BOTTOM REINFORCEMENT RIGHT SUPPORT (ϗ)	STIRRUPS '0.25L' OR '2D' FROM FACE OF COLUMNS #	STIRRUPS BALANCE MIDDLE SPAN
GB1	3.450	250	450	2-12 + 1-16	2-12	2-12 + 1-16	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-12 + 1-16	2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	2.500			2-12 + 1-12	2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-12 + 1-12	2-12	2-12 + 1-16	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.450			2-12 + 1-16	2-12	2-12 + 1-16	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB2	3.450	250	450	2-12 + 2-12	2-12	2-12 + 2-12	2-12	2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-12 + 2-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	2.500			2-12 + 1-12	2-12	2-12 + 2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-12 + 2-12	2-12	2-12 + 2-12	2-12	2-12 + 2-12	2-12 + 2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	2.050			2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	1.400			2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-12 + 2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 100 C/C
GB3	5.100	300	450	2-16 + 2-12	2-16	2-16 + 1-12	2-16	2-16 + 1-12	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	2.500			2-16 + 1-12	2-16	2-16 + 2-16	2-16	2-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	5.675			2-16 + 2-16	2-16	2-16 + 2-16	2-16	2-16 + 2-12	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB4	5.675	300	450	2-20 + 1-16	2-20	2-20 + 1-12	2-16	2-16 + 2-12	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	2.500			2-20 + 1-12	2-20	2-20	2-16	2-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	5.100			2-20	2-20	2-20 + 1-12	2-16	2-16 + 1-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB5	1.400	250	450	2-16	2-16	2-16	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 100 C/C
	2.050			2-16	2-16	2-16 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-16 + 1-12	2-16	2-16 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	2.500			2-16 + 1-12	2-16	2-16	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-16	2-16	2-16 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.450			2-16 + 1-12	2-16	2-16 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB6	3.450	250	450	2-12 + 2-12	2-12	2-12 + 2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-12 + 2-12	2-12	2-12 + 2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	2.500			2-12 + 2-12	2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-12 + 1-12	2-12	2-12 + 2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.450			2-12 + 2-12	2-12	2-12 + 2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C

ADDITIONAL NOTES FOR BEAM DETAILING:-

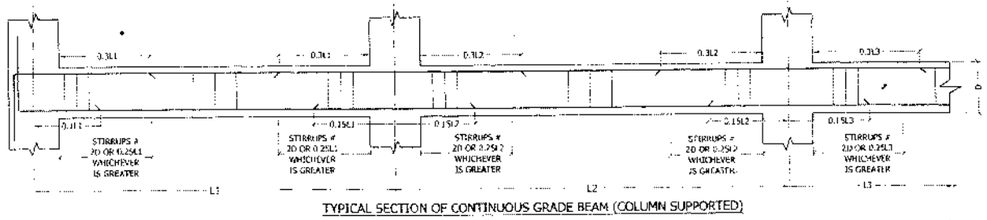
1. THE TABLE FOR REINFORCEMENT DETAIL SHOULD BE READ IN THE DIRECTION GRID Ⓐ TO Ⓕ OR Ⓕ TO Ⓐ AS THE CASE MAY BE FOR A PARTICULAR BEAM SPAN FOR LEFT AND RIGHT SUPPORT RESPECTIVELY. REINFORCEMENT AT SUPPORT SHOULD MEAN REINFORCEMENT AT TML FACE OF THE RESPECTIVE COLUMN SUPPORT OR BEAM SUPPORT AS THE CASE MAY BE.
2. EXTRA BOTTOM REINFORCEMENTS WITH NO CURTAILMENT AT THE FACE OF COLUMN SUPPORT WHEN NOT CONTINUOUS IN ADJACENT SPANS SHOULD BE EMBEDDED BY LENGTH 'E' WITHIN THE RESPECTIVE COLUMN.
3. FOR COLUMN CONNECTED BEAMS CLOSED SPACED VERTICAL STIRRUPS SHOULD BE PROVIDED UPTO '2D' OR ½ 2SL', WHICHEVER IS GREATER FROM FACE OF COLUMN (#).
4. AT SPLICED SECTION OF REINFORCEMENT IN BEAMS PROVIDE VERTICAL STIRRUPS 2-L 8ϗ@ 150 C/C.
5. PLACEMENT OF THE FIRST VERTICAL STIRRUP IN A COLUMN CONNECTED BEAM SHOULD NOT EXCEED 50mm FROM FACE OF THE COLUMN.
6. DURING CONSTRUCTION OF GRADE BEAM DOWEL BARS FOR STAIR WAIST SLAB SHOULD BE LEFT AS SHOWN IN THE LAYOUT.
7. IN SECONDARY BEAMS THERE IS NO NEED TO EMBED THE REINFORCEMENTS (TOP & BOTTOM) IN THE SUPPORTING BEAMS BY 'Le', ONLY THE BEAM WIDTH LENGTH IS SUFFICIENT.



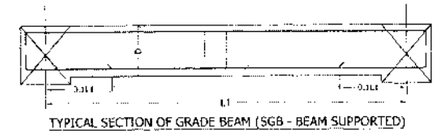
TYP. SEC. OF GRADE BEAM

SCHEDULE OF GRADE BEAMS (T.O.C 0.0m)

BEAM MARKED	SPAN 'L' (m)	SIZE (mm) WIDTH 'b'	SIZE (mm) DEPTH 'D'	TOP REINFORCEMENT LEFT SUPPORT (ϗ)	TOP REINFORCEMENT SPAN (ϗ)	TOP REINFORCEMENT RIGHT SUPPORT (ϗ)	BOTTOM REINFORCEMENT LEFT SUPPORT (ϗ)	BOTTOM REINFORCEMENT SPAN (ϗ)	BOTTOM REINFORCEMENT RIGHT SUPPORT (ϗ)	STIRRUPS '0.25L' OR '2D' FROM FACE OF COLUMNS #	STIRRUPS BALANCE MIDDLE SPAN
GB7	5.100	250	450	2-16 + 1-20	2-16	2-16 + 1-20	2-12	2-12 + 2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB8	5.100	250	450	2-16 + 1-16	2-16	2-16 + 2-12	2-12	2-12 + 2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB9	3.425	250	450	2-16 + 1-12	2-16	2-16 + 1-16	2-16	2-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB10	1.700	250	350	2-12 + 2-12	2-12 + 2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 100 C/C
GB11	3.425	250	450	2-12	2-12	2-12 + 2-16	2-12	2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	1.800			2-12 + 2-16	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB12	5.100	250	450	2-16 + 1-20	2-16	2-16 + 1-20	2-16	2-16 + 1-12	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB13	5.100	250	450	2-12 + 2-12	2-12	2-12 + 2-12	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB14	5.100	250	450	2-16 + 2-16	2-16	2-16 + 2-16	2-16	2-16 + 1-12	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.425			2-16 + 2-16	2-16	2-16 + 1-16	2-16	2-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.800			2-16 + 1-16	2-16	2-16 + 1-12	2-16	2-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.425			2-16 + 1-12	2-16	2-16 + 1-16	2-16	2-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	5.100			2-16 + 1-16	2-16	2-16 + 2-16	2-16	2-16 + 1-12	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB15	3.800	250	450	2-12	2-12	2-12 + 1-20	2-12	2-12 + 2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
	3.425			2-12 + 1-20	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB16	3.425	250	450	2-16 + 1-16	2-16	2-16 + 1-12	2-16	2-16	2-16	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
GB17	5.100	250	450	2-16 + 1-16	2-16	2-16 + 1-16	2-12	2-12 + 1-12	2-12	2-L 8ϗ @ 100 C/C	2-L 8ϗ @ 175 C/C
SECONDARY GRADE BEAM											
SGB1	3.450	250	400	2-12	2-12	2-12	2-12	2-12 + 1-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
	3.625			2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB2	3.625	250	400	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
	3.450			2-12	2-12	2-12	2-12	2-12 + 1-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB3	2.500	250	450	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB4	1.700	250	350	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB5	3.450	250	400	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB6	3.625	250	400	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB7	3.425	250	400	2-12	2-12	2-12	2-12	2-12 + 1-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
	3.800			2-12	2-12	2-12	2-12	2-12 + 1-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB8	5.100	250	400	2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB9	3.425	250	400	2-12	2-12	2-12	2-12	2-12 + 1-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C
SGB10	3.800	250	400	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϗ @ 175 C/C	2-L 8ϗ @ 175 C/C



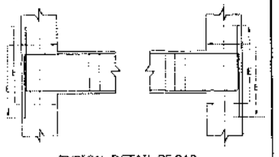
TYPICAL SECTION OF CONTINUOUS GRADE BEAM (COLUMN SUPPORTED)



TYPICAL SECTION OF GRADE BEAM (SGB - BEAM SUPPORTED)

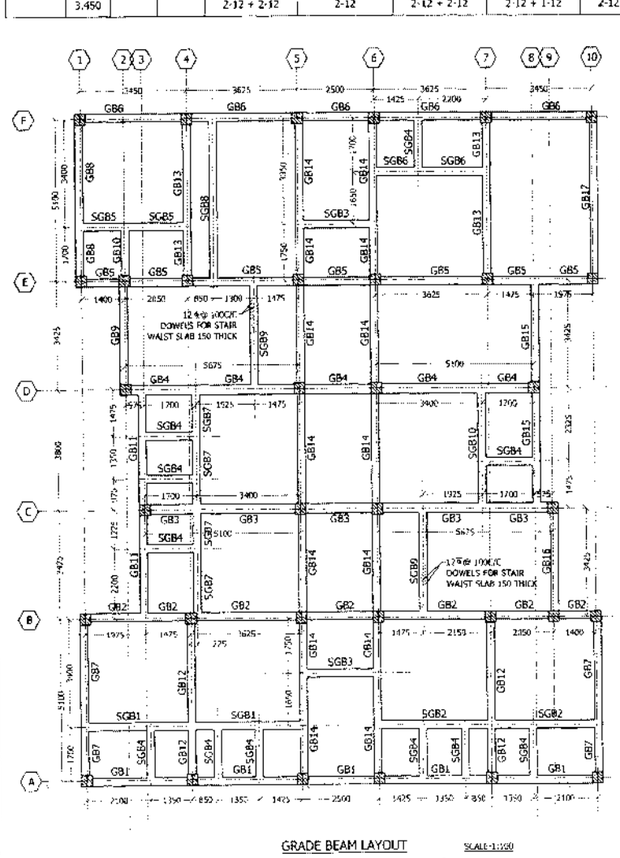
REINFORCEMENT 'E' OF BEAMS IN END COLUMNS (TOP & BOTTOM)

DIA OF BAR (mm)	EMBEDDED LENGTH 'E' (mm)
12	800
16	1100
20	1350



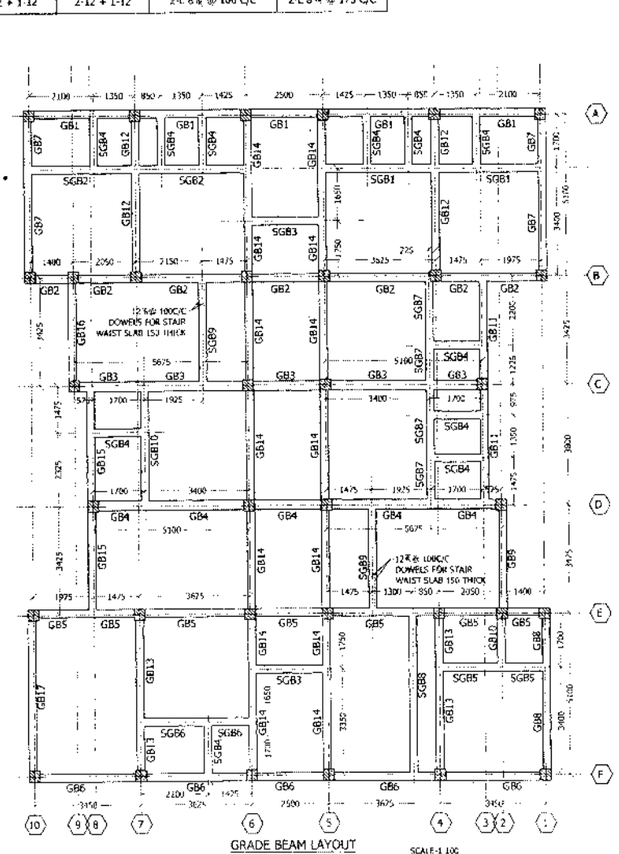
TYPICAL DETAIL OF BAR EMBEDMENT IN END COLUMN

NOT TO SCALE



GRADE BEAM LAYOUT SCALE-1:100

TPSP FIELD HOSTEL - 2



GRADE BEAM LAYOUT SCALE-1:100

TPSP FIELD HOSTEL - 1

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRE UNLESS SPECIFIED OTHERWISE.
2. FIGURED DIMENSIONS ARE TO BE FOLLOWED AND DRAWING SHOULD NOT BE SCALED.
3. GRID LINES ARE DRAWN ON COLUMN CENTRES.
4. CONCRETE FOR ALL R.C.C. WORKS SHOULD BE OF GRADE M-20, NOMINAL MIX (1:1:2:3) AND REINFORCEMENT SHOULD CONFORM TO Fe 500 AS PER IS:1786-2008.
5. FOR SPAN OF BEAMS OR CLEAR TO CENTRE DISTANCE BETWEEN COLUMNS, PLEASE SEE TABLE FOR REINFORCEMENT DETAILING.
6. LAP LENGTH FOR REINFORCEMENT SHOULD BE 50 X DIA OF THE BAR, PLACED STAGGERED. REINFORCEMENTS SHOULD BE PROVIDED ALTHROUGH WITHOUT CURTAILMENT UNLESS OTHERWISE SPECIFIED.
7. LONGITUDINAL MAIN REINFORCEMENT IN BEAMS (TOP AND BOTTOM) SHOULD BE EMBEDDED TO A MINIMUM LENGTH OF 'E' SPECIFIED IN TABLE IN COLUMNS FROM FACE OF COLUMNS
8. GRADE BEAMS SHOULD BE PLACED AS PER LAYOUT WITH EITHER ONE EDGE OF THE BEAMS FLUSHING WITH ONE SIDE OF THE RESPECTIVE COLUMNS OR PLACED CENTRALLY WITH BEAM CENTRE LINES COINCIDING WITH THE COLUMN CENTRE LINES.
9. GRADE BEAMS SHOULD BE PLACED OVER COMPACTED GROUND AND LAID OVER 75MM THICK P.C.C (1:3:6).
10. CLEAR COVER TO REINFORCEMENT IN GRADE BEAM IS 30MM AND COLUMN IS 40MM RESPECTIVELY.
11. THE BUILDING FRAME AND FOUNDATION HAS BEEN DESIGNED CONSIDERING SEISMIC LOADING 'ZONE-III' CONFORMING TO IS-1893:2002.
12. THERE IS NO PROVISION OF ANY VERTICAL EXTENSION IN UPPER STOREY.

THIS DRAWING SUPERSEDES EARLIER DRAWING NO. PLN(D)/BLDG/489, SHEET NO. 03, DATED 29.10.2018

REF. H/O NOTE RC/VIEW NO. : P & E (Dist)/WBSEDCL/211 DATED 02.01.2020

IN CASE OF ANY CONFUSION PLEASE CONSULT P. & E. - Dist. DEPT.

REVISIONS

WBSEDCL

DISTRIBUTION HQ.

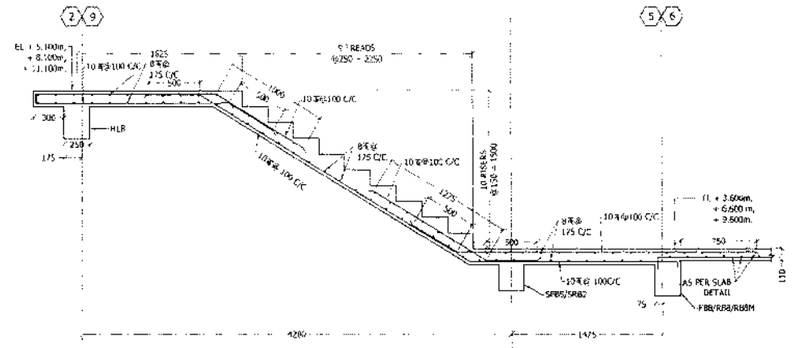
PLANNING AND ENGINEERING DEPARTMENT

TWO NOS. NEW FOUR STORIED OFFICERS FIELD HOSTEL BUILDINGS AT PURULIA PUMPED STORAGE PROJECT TOWNSHIP PREMISES, DIST.- PURULIA

LAYOUTS AND DETAILS OF GRADE BEAM

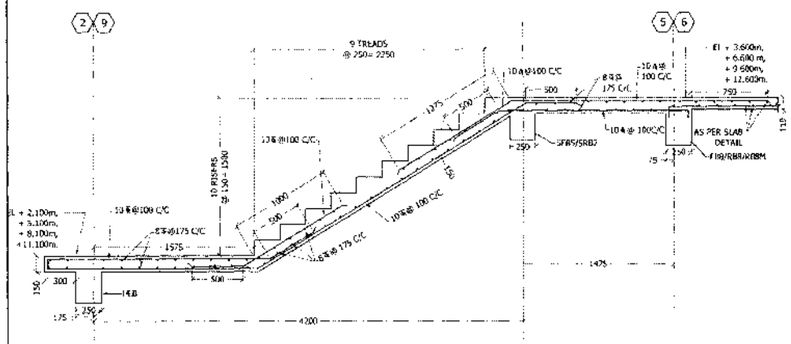
PSPD CHIEF ENGINEER WBSEDCL

DRAWN BY :	J.E.(C)-GR.I		
DESIGNED BY:	A.E.(C)		DRAWING NO. PLN(D)/BLDG/511
CHECKED BY:	D.E.(C)		
RECOMMENDED BY:	A.C.E.-I (P & E - Dist.)	SCALE: AS STATED	SHEET NO. 3 OF 7
APPROVED BY:	C.E. (P & E - Dist.)	DATE: 05.02.2020	REV. NO. 0



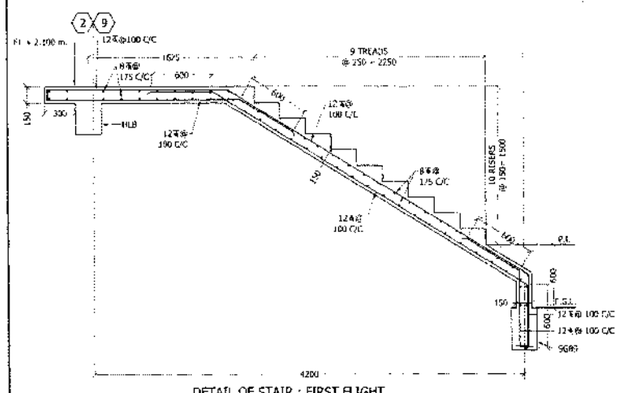
DETAIL OF STAIR : THIRD, FIFTH AND SEVENTH FLIGHT

SCALE-1:30



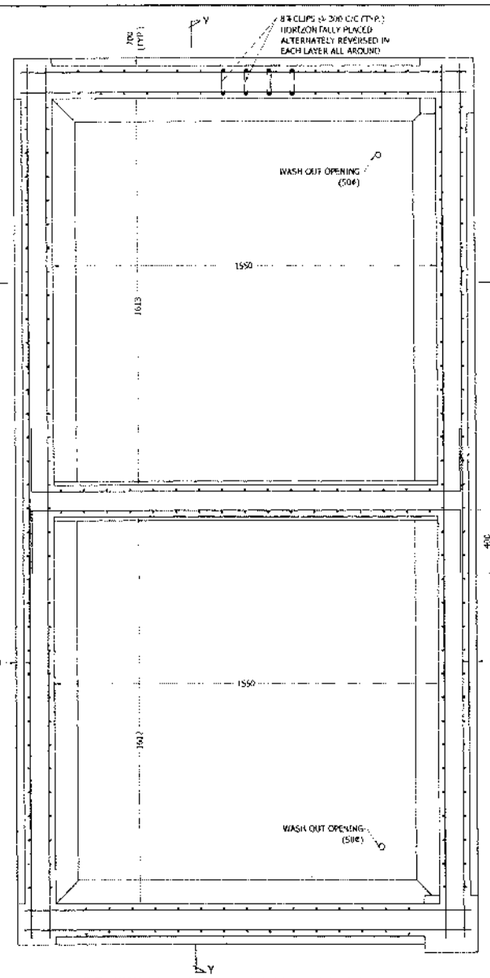
DETAIL OF STAIR : SECOND, FOURTH, SIXTH AND EIGHT FLIGHT

SCALE 1:30

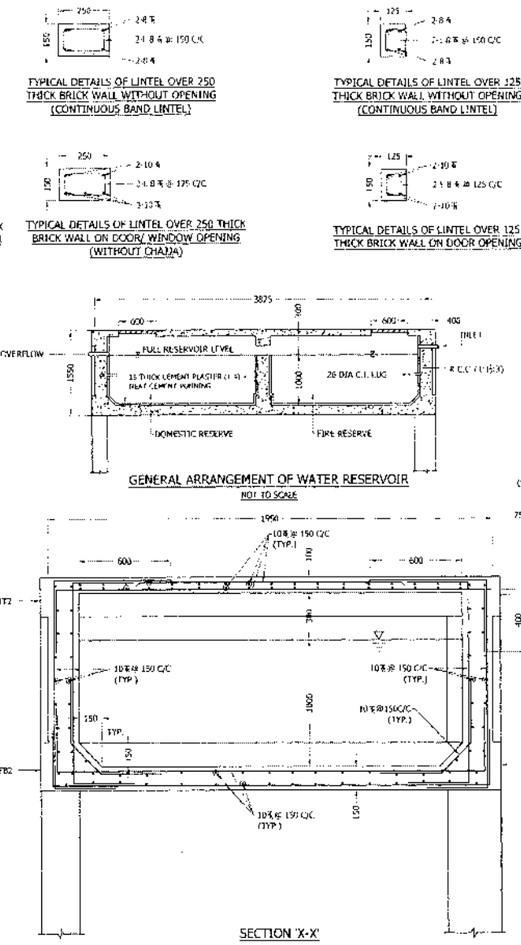


DETAIL OF STAIR : FIRST FLIGHT

SCALE-1:30



SECTIONAL PLAN OF OVERHEAD WATER RESERVOIR NOT TO SCALE

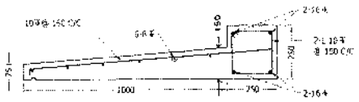


SECTION 'X-X'

NOT TO SCALE

TYPICAL DETAILS OF LINTEL OVER 250 THICK BRICK WALL WITHOUT OPENING (CONTINUOUS BAND LINTEL)

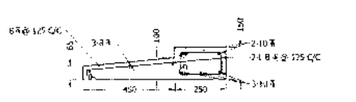
TYPICAL DETAILS OF LINTEL OVER 125 THICK BRICK WALL WITHOUT OPENING (CONTINUOUS BAND LINTEL)



TYPICAL DETAILS OF LINTEL AND CHAJJA OVER 250 THICK BRICK WALL DOOR OPENING 'D1'

TYPICAL DETAILS OF LINTEL OVER 250 THICK BRICK WALL ON DOOR/ WINDOW OPENING (WITHOUT CHAJJA)

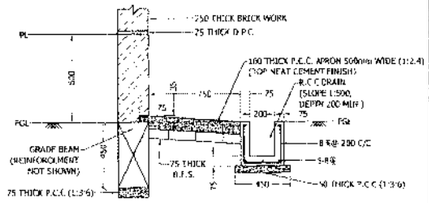
TYPICAL DETAILS OF LINTEL OVER 125 THICK BRICK WALL ON DOOR OPENING



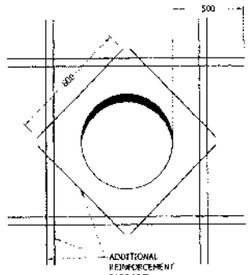
TYPICAL DETAILS OF LINTEL AND CHAJJA OVER 250 THICK BRICK WALL ON WINDOW OPENINGS 'W1' 'W2' 'W3' &'W4'

GENERAL ARRANGEMENT OF WATER RESERVOIR

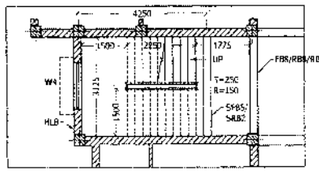
NOT TO SCALE



TYPICAL SECTION OF PLINTH PROTECTION AND SURFACE DRAIN (EXTERNAL WALL)

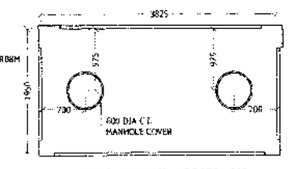


DETAIL OF ADDITIONAL REINFORCEMENT AROUND MANHOLE IN TOP SLAB



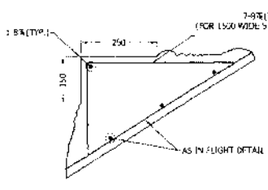
GENERAL PLAN OF STAIRCASE

SCALE-1:100

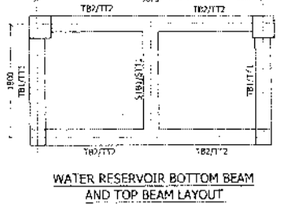


TOP PLAN WATER RESERVOIR

SCALE-1:50



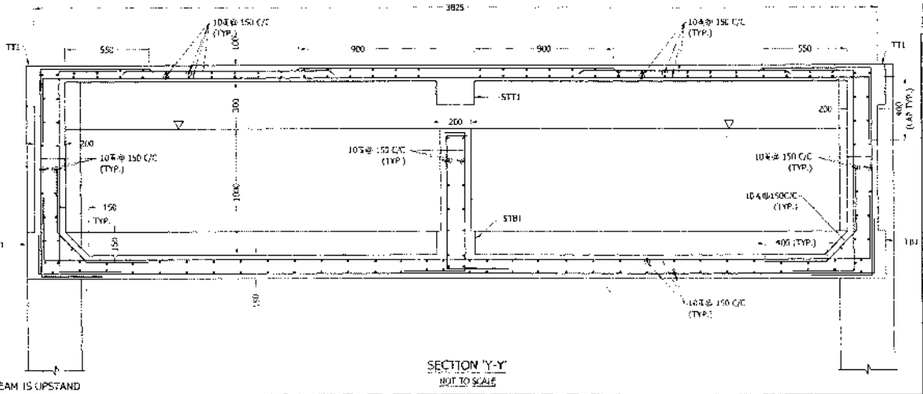
DETAILS OF BARS IN STEPS



WATER RESERVOIR BOTTOM BEAM AND TOP BEAM LAYOUT

SCALE-1:50

BOTTOM BEAM IS UPSTAND



SECTION 'Y-Y'

NOT TO SCALE

SCHEDULE OF WATER RESERVOIR BEAMS

BEAM MARKED	SPAN 'L' (m)	SIZE (mm)		TOP REINFORCEMENT			BOTTOM REINFORCEMENT			STIRRUPS	
		WIDTH 'b'	DEPTH 'D'	LEFT SUPPORT (%)	SPAN (%)	RIGHT SUPPORT (%)	LEFT SUPPORT (%)	SPAN (%)	RIGHT SUPPORT (%)	0.25L' OR '2D' FROM FACE OF COLUMNS #	BALANCE MIDDLE SPAN
TB1	1.800	250	300	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ⌀ @ 100 C/C	2-L 8 ⌀ @ 100 C/C
TB2	3.675	250	300	2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12 + 2-12	2-12	2-L 8 ⌀ @ 100 C/C	2-L 8 ⌀ @ 175 C/C
STB1	1.800	250	300	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ⌀ @ 175 C/C	2-L 8 ⌀ @ 175 C/C
TT1	1.800	250	250	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ⌀ @ 100 C/C	2-L 8 ⌀ @ 100 C/C
TT2	3.675	250	250	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ⌀ @ 100 C/C	2-L 8 ⌀ @ 175 C/C
STT1	1.800	250	250	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ⌀ @ 175 C/C	2-L 8 ⌀ @ 175 C/C

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRE UNLESS SPECIFIED OTHERWISE.
2. GRID LINES ARE DRAWN ON COLUMN CENTRES.
3. FIGURED DIMENSIONS ARE TO BE STRICTLY FOLLOWED AND DRAWING SHOULD NOT BE SCALED.
4. CONCRETE FOR ALL R.C.C WORKS SHOULD BE OF GRADE M-20, NOMINAL MIX (1:1.5:3).
5. CONCRETE FOR R.C.C. WORKS IN OVERHEAD WATER RESERVOIR SHOULD BE OF GRADE M-20, NOMINAL MIX (1:1.5:3). HOWEVER MINIMUM CEMENT CONTENT SHOULD NOT BE LESS THAN 320 kg/m³ AND SHOULD NOT BE MORE THAN 400 kg/m³. THE MAXIMUM FREE WATER CEMENT RATIO IS 0.45.
6. REINFORCEMENT SHOULD CONFORM TO Fe-500 AS PER IS:1786-2008.
7. THE MIXING, PLACING AND COMPACTION OF CONCRETE USING VIBRATOR SHOULD BE CONTROLLED AT SITE UNDER CLOSE SUPERVISION.
8. CURING OF CONCRETE SHOULD BE DONE FOR AT LEAST 14 DAYS FOR ALL VERTICAL AND HORIZONTAL RCC MEMBERS. DURING THIS PERIOD THE CONCRETE SURFACE SHOULD NOT BE ALLOWED TO DRY
9. CLEAR COVER TO REINFORCEMENT:
   a) COLUMN = 40mm, b) GRADE BEAM = 30mm
   c) FLOOR BEAM & ROOF BEAM = 25mm
   d) FLOOR SLAB & ROOF SLAB = 20mm
   e) LINTEL = 25mm, CHAJJA = 15mm
   f) WATER RESERVOIR
   i) RCC WALL & FLOOR SLAB
   INTERNAL COVER = 45mm, EXTERNAL COVER = 30mm
   ii) COVER SLAB: INTERNAL & EXTERNAL COVER = 20mm.
10. LAP LENGTH FOR REINFORCEMENT SHOULD BE 50 X DIA. OF THE BAR, PLACED STAGGERED. REINFORCEMENTS SHOULD BE PROVIDED ALTHOUGH WITHOUT CURTAILMENT UNLESS OTHERWISE SPECIFIED. NO LAPPING OF REINFORCEMENT SHOULD BE DONE IN ANY OTHER LOCATION EXCEPT AS SHOWN IN THE DRAWING.
11. THERE IS NO PROVISION OF VERTICAL EXTENSION IN UPPER STOREY.

REF. U/O NOTE RECIEVE NO. : P & E./Dvp.-WBSEDCL/10 DATED 07.12.2018

IN CASE OF ANY CONFUSION PLEASE CONSULT P. & E. - Dist. DEPT.

REVISIONS

WBSEDCL

DISTRIBUTION HQ.

PLANNING AND ENGINEERING DEPARTMENT

TWO NOS. NEW FOUR STORIED OFFICERS FIELD HOSTEL BUILDINGS AT PURULIA PUMPED STORAGE PROJECT TOWNSHIP PREMISES, DIST.- PURULIA

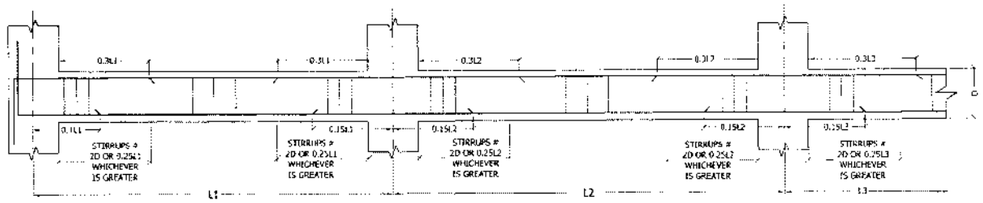
LAYOUT AND DETAILS OF FRONT AND REAR STAIR, LINTEL & CHAJJA AND OVERHEAD WATER RESERVOIR

DRAWN BY :	J.E.(C)-GR.I		
DESIGNED BY:	A.E.(C)		
CHECKED BY:	D.E.(C)	DRAWING NO. PLN(D)/BLDG/511	
RECOMMENDED BY:	A.C.E.-I (P & E - Dist.)	SCALE: AS STATED	SHEET NO. 4 OF 7
APPROVED BY:	C. E. (P & E - Dist.)	DATE: 05.02.2020	REV. NO. 0

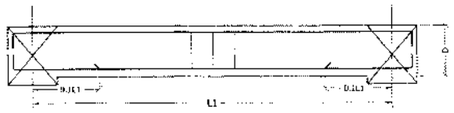
PSPD (CHIEF ENGINEER) WBSEDCL

SCHEDULE OF SECONDARY FLOOR BEAMS (T.O.C +3.6 m, +6.6 m & +9.6 m)

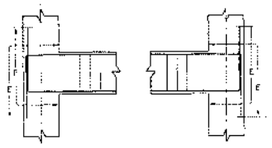
BEAM MARKED	SPAN 'L' (m)	SIZE (mm) WIDTH 'b'	SIZE (mm) DEPTH 'D'	TOP REINFORCEMENT LEFT SUPPORT (ℓ/4)	TOP REINFORCEMENT SPAN (ℓ)	TOP REINFORCEMENT RIGHT SUPPORT (ℓ/4)	BOTTOM REINFORCEMENT LEFT SUPPORT (ℓ/4)	BOTTOM REINFORCEMENT SPAN (ℓ)	BOTTOM REINFORCEMENT RIGHT SUPPORT (ℓ/4)	STIRRUPS '0.25L' OR '2D' FROM FACE OF COLUMNS #	STIRRUPS BALANCE MIDDLE SPAN
SFB1	3.450	250	400	2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
	3.625			2-12	2-12	2-12	2-12	2-12 + 1-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
SFB1M	3.625	250	400	2-12	2-12	2-12	2-12	2-12 + 1-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
	3.450			2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
SFB2	2.500	250	450	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
SFB3	1.700	250	350	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
SFB4	3.425	250	400	2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
	3.800			2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
SFB4M	3.800	250	400	2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
	3.425			2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϕ @ 175 C/C	2-L 8ϕ @ 175 C/C
SFB5	3.425	250	400	2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C



TYPICAL SECTION OF CONTINUOUS FLOOR BEAM (COLUMN SUPPORTED OR PRIMARY BEAMS)



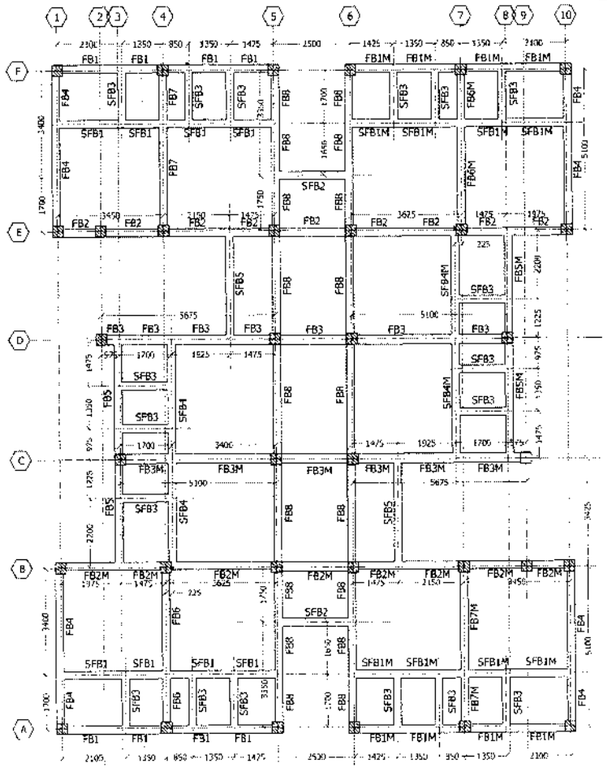
TYPICAL SECTION OF FLOOR BEAM (BEAM SUPPORTED OR SECONDARY BEAMS)



TYPICAL DETAIL OF BAR EMBEDMENT IN END COLUMN

NOT TO SCALE

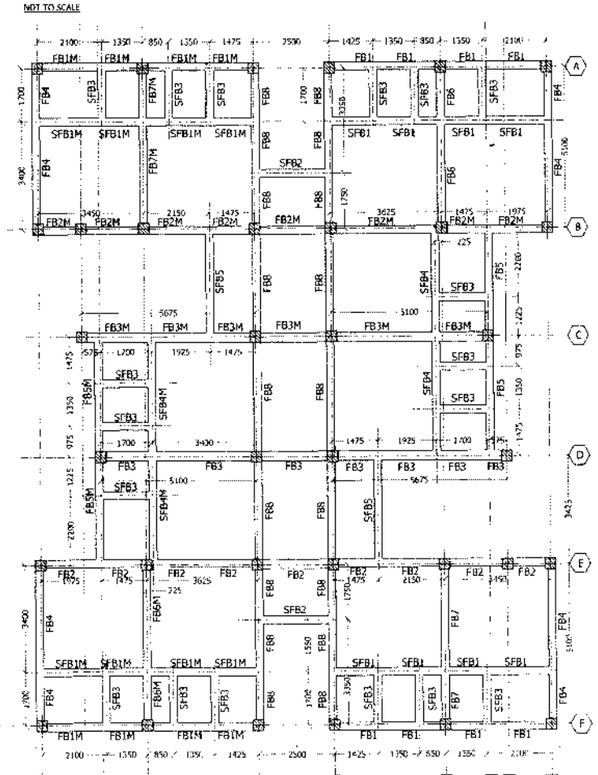
EMBEDDED LENGTH OF MAIN REINFORCEMENT 'E' OF BEAMS IN END COLUMNS (TOP & BOTTOM)	
DIA OF BAR (mm)	EMBEDDED LENGTH 'E' (mm)
12	800
16	1100
20	1350



FIRST, SECOND AND THIRD FLOOR BEAM LAYOUT

TPSP FIELD HOSTEL - 2

SCALE 1:100



FIRST, SECOND AND THIRD FLOOR BEAM LAYOUT

TPSP FIELD HOSTEL - 1

SCALE 1:100

SCHEDULE OF PRIMARY FLOOR BEAMS (T.O.C +3.6 m, +6.6 m & +9.6 m)

BEAM MARKED	SPAN 'L' (m)	SIZE (mm) WIDTH 'b'	SIZE (mm) DEPTH 'D'	TOP REINFORCEMENT LEFT SUPPORT (ℓ/4)	TOP REINFORCEMENT SPAN (ℓ)	TOP REINFORCEMENT RIGHT SUPPORT (ℓ/4)	BOTTOM REINFORCEMENT LEFT SUPPORT (ℓ/4)	BOTTOM REINFORCEMENT SPAN (ℓ)	BOTTOM REINFORCEMENT RIGHT SUPPORT (ℓ/4)	STIRRUPS '0.25L' OR '2D' FROM FACE OF COLUMNS #	STIRRUPS BALANCE MIDDLE SPAN
FB1	3.450	250	450	2-16 + 1-16	2-16	2-16 + 1-12	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.625			2-16 + 1-12	2-16	2-16 + 1-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB1M	3.625	250	450	2-16 + 1 16	2-16	2-16 + 1-12	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.450			2-16 + 1-12	2-16	2-16 + 1-16	2 16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB2	1.400	250	450	2-16 + 1 16	2-16 + 1-16	2-16 + 1-16	2-16 + 1-12	2-16 + 1-12	2-16 + 1-12	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
	2.050			2-16 + 1-16	2-16 + 1-16	2-16 + 1-16	2-16 + 1-12	2-16 + 1-12	2-16 + 1-12	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
	3.625			2-16 + 1-16	2-16	2-16 + 1-12	2-16 + 1-12	2-16 + 1-12	2-16 + 1-12	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	2.500			2-16 + 1-12	2-16	2-16 + 1-12	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
	3.625			2-16 + 1-12	2-16	2-16 + 1-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.450			2-16 + 1-16	2-16	2-16 + 1-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB3	5.675	300	450	2-20 + 2-16	2-20	2-20 + 2-16	2-16	2-16 + 2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	2.500			2-20 + 2-16	2-20	2-20 + 1-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
	5.100			2-20 + 1-16	2-20	2-20 + 1-16	2-16	2-16 +1-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB3M	5.100	300	450	2-20 + 1-16	2-20	2-20 + 1-16	2-16	2-16 + 2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	2.500			2-20 + 1-16	2-20	2-20 + 2-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
	5.675			2-20 + 2-16	2-20	2-20 + 2-16	2-16	2-16 + 1-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB2M	3.450	250	450	2-16 + 1-16	2 16	2-16 + 1-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.625			2-16 + 1-16	2-16	2-16 + 1-12	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	2.500			2-16 + 1-12	2-16	2-16 + 1-12	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
	3.625			2-16 + 1-12	2-16	2-16 +1-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	2.050			2-16 + 1-16	2-16 + 1-16	2-16 + 1-16	2-16 +1-12	2-16 +1-12	2-16 +1-12	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
	1.400			2-16 + 1-16	2-16 + 1-16	2-16 + 1-16	2-16 +1-12	2-16 +1-12	2-16 +1-12	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 100 C/C
FB4	5.100	250	450	2-20 + 1-20	2-20	2-20 + 1-20	2-16	2-16 + 1-12	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB5	3.425	250	450	2-16	2-16	2-16 + 2-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.800			2-16 + 2-16	2-16	2-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB6	5.100	250	450	2-20 + 2-16	2-20	2-20 + 1-20	2-16	2-16 + 2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB7	5.100	250	450	2-20 + 1-20	2-20	2-20 + 2-16	2-16	2-16 + 2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB8	5.100	250	450	2-20 + 1 20	2-20	2-20 + 1-20	2-16	2-16 + 1-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.425			2-20 + 1-20	2-20	2-20	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.800			2-20	2-20	2-20	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.425			2-20	2-20	2-20 + 1-20	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	5.100			2-20 + 1-20	2-20	2-20 + 1-20	2-16	2-16 + 1-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB7M	5.100	250	450	2-20 + 2-16	2-20	2-20 + 1-20	2-16	2-16 + 2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB6M	5.100	250	450	2-20 + 1-20	2-20	2-20 + 2-16	2-16	2-16 + 2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
FB5M	3.800	250	450	2-16	2-16	2-16 + 2-16	2-16	2-16	2-16	2-L 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C
	3.425			2-16 + 2-16	2-16	2-16	2-16	2 16	2-16	2-.. 8ϕ @ 100 C/C	2-L 8ϕ @ 175 C/C

ADDITIONAL NOTES FOR BEAM DETAILING:-

1. THE TABLE FOR REINFORCEMENT DETAIL SHOULD BE READ IN THE DIRECTION GRID ① TO ⑩ OR Ⓐ TO Ⓕ AS THE CASE MAY BE FOR A PARTICULAR BEAM SPAN FOR LEFT AND RIGHT SUPPORT RESPECTIVELY.
2. REINFORCEMENT AT SUPPORT SHOULD MEAN REINFORCEMENT AT THE FACE OF THE RESPECTIVE COLUMN SUPPORT OR BEAM SUPPORT AS THE CASE MAY BE.
3. EXTRA BOTTOM REINFORCEMENT WITH NO CURTAILMENT AT THE FACE OF COLUMN SUPPORT WHEN NOT CONTINUOUS IN ADJACENT SPANS SHOULD BE EMBEDDED BY LENGTH 'E' WITHIN THE RESPECTIVE COLUMN.
4. FOR COLUMN CONNECTED BEAMS CLOSED SPACED VERTICAL STIRRUPS SHOULD BE PROVIDED UPTO 2D/ OR 0.25L, WHICHEVER IS GREATER FROM FACE OF COLUMN (JF).
5. AT SPACED SECTION OF REINFORCEMENT IN BEAMS PROVIDE VERTICAL STIRRUPS 2-L 8ϕ@ 150 C/C.
6. PLACEMENT OF THE FIRST VERTICAL STIRRUP IN A COLUMN CONNECTED BEAM SHOULD NOT EXCEED 50mm FROM FACE OF THE COLUMN.
8. IN SECONDARY BEAMS THERE IS NO NEED TO EMBED THE REINFORCEMENTS (TOP & BOTTOM) IN SUPPORTING BEAMS BY 'L/4', ONLY THE BEAM WIDTH IS SUFFICIENT.

TABLE FOR CLEAR COVER	
DESCRIPTION	CLEAR COVER IN mm
COLUMN SIDES	40
FLOOR BEAM	25

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRE UNLESS SPECIFIED OTHERWISE.
2. FIGURED DIMENSIONS ARE TO BE FOLLOWED AND DRAWING SHOULD NOT BE SCALED.
3. GRID LINES ARE DRAWN ON COLUMN CENTRES
4. CONCRETE FOR ALL R.C.C. WORKS SHOULD BE OF GRADE M-20, NOMINAL MIX (1:1½:3) AND REINFORCEMENT SHOULD CONFORM TO Fe 500 AS PER IS: 1786-2008.
5. FOR SPAN OF BEAMS OR CENTRE TO CENTRE DISTANCE BETWEEN COLUMNS, PLEASE SEE TABLE FOR REINFORCEMENT DETAILING.
6. LAP LENGTH FOR REINFORCEMENT SHOULD BE 50 X DIA. OF THE BAR, PLACED STAGGERED. REINFORCEMENTS SHOULD BE PROVIDED ALTHROUGH WITHOUT CURTAILMENT UNLESS OTHERWISE SPECIFIED.
7. LONGITUDINAL MAIN REINFORCEMENT IN BEAMS (TOP AND BOTTOM) SHOULD BE EMBEDDED TO A MINIMUM LENGTH OF 'E' SPECIFIED IN TABLE IN COLUMNS FROM FACE OF COLUMNS.
8. FLOOR BEAMS SHOULD BE PLACED AS PER LAYOUT WITH EITHER OUTSIDE FACE OF THE BEAMS FLUSHING WITH ONE SIDE OF THE RESPECTIVE COLUMNS OR PLACED CENTRALLY WITH BEAM CENTRE LINES COINCIDING WITH THE COLUMN CENTRE LINES.
9. THE BUILDING FRAME AND FOUNDATION HAS BEEN DESIGNED CONSIDERING SEISMIC LOADING 'ZONE-III' CONFORMING TO IS-1893:2002.
10. THERE IS NO PROVISION OF ANY VERTICAL EXTENSION IN UPPER STOREY.

REF. U/O NOTE RECEIVE NO. : P & E (Dist)-WBSEDCL/31 DATED 22.01.2018

IN CASE OF ANY CONFUSION PLEASE CONSULT P. & E.- Dist. DEPT.

GRID ORIENTATION

PSPD
CHIEF ENGINEER
WBSEDCL

REVISIONS

WBSEDCL

DISTRIBUTION HQ.

PLANNING AND ENGINEERING DEPARTMENT

TWO NOS. NEW FOUR STORIED OFFICERS FIELD HOSTEL BUILDINGS AT PURULIA PUMPED STORAGE PROJECT TOWNSHIP PREMISES, DIST.- PURULIA

LAYOUT AND DETAILS OF FLOOR BEAM AT FIRST FLOOR, SECOND FLOOR AND THIRD FLOOR

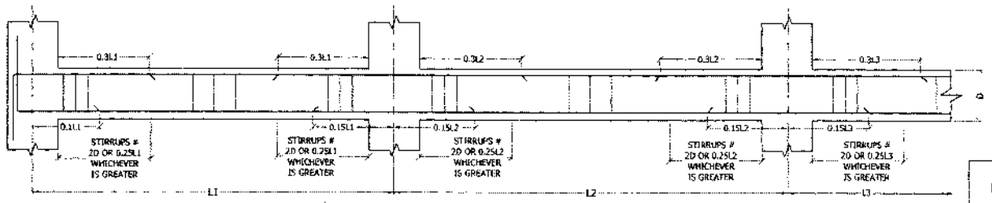
DRAWN BY :	05.02.20 J.E.(C)-GR.I	
DESIGNED BY:	05.02.2020 A.E.(C)	
CHECKED BY:	05.02.2020 D.E.(C)	DRAWING NO. PLN(D)/BLDG/511
RECOMMENDED BY:	05.02.2020 A.C.E.-I (P & E - Dist.)	SCALE: AS STATED / SHEET NO. 5 OF 7
APPROVED BY:	06.02.2020 C.E. (P & E - Dist.)	DATE: 06.02.2020 / REV. NO. 0

SCHEDULE OF SECONDARY ROOF BEAMS (T.O.C + 12.60 m)

BEAM MARKED	SPAN 'L' (m)	SIZE (mm)		TOP REINFORCEMENT			BOTTOM REINFORCEMENT			STIRRUPS	
		WIDTH 'b'	DEPTH 'D'	LEFT SUPPORT (ϕ)	SPAN (ϕ)	RIGHT SUPPORT (ϕ)	LEFT SUPPORT (ϕ)	SPAN (ϕ)	RIGHT SUPPORT (ϕ)	'0.25L' OR '2D' FROM FACE OF COLUMNS #	BALANCE MIDDLE SPAN
SRB1	2.500	250	450	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ϕ @ 175 C/C	2-L 8 ϕ @ 175 C/C
SRB2	3.425	250	400	2-12	2-12	2-12	2-12	2-12 + 2-12	2-12	2 L 8 ϕ @ 175 C/C	2-L 8 ϕ @ 175 C/C

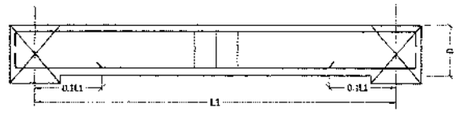
SCHEDULE OF MUMTY ROOF BEAMS (T.O.C + 15.15 m)

MRB1	5.675	250	450	2-12 + 2-12	2-12	2-12 + 2-12	2-12	2-12 + 2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
MRB2	3.425	250	450	2-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C

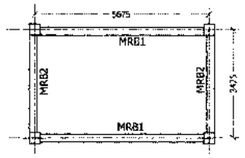


TYPICAL SECTION OF CONTINUOUS ROOF BEAM (COLUMN SUPPORTED)

EMBEDDED LENGTH OF MAIN REINFORCEMENT 'E' OF BEAMS IN END COLUMNS (TOP & BOTTOM)	
DIA OF BAR (mm)	EMBEDDED LENGTH 'E' (mm)
12	800
16	1100
20	1350

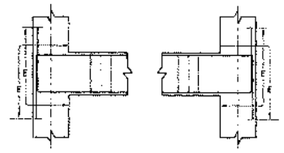


TYPICAL SECTION OF ROOF BEAM (BEAM SUPPORTED)



TYPICAL MUMTY ROOF BEAM LAYOUT AT E.L. +15.150m

SCALE-1:100



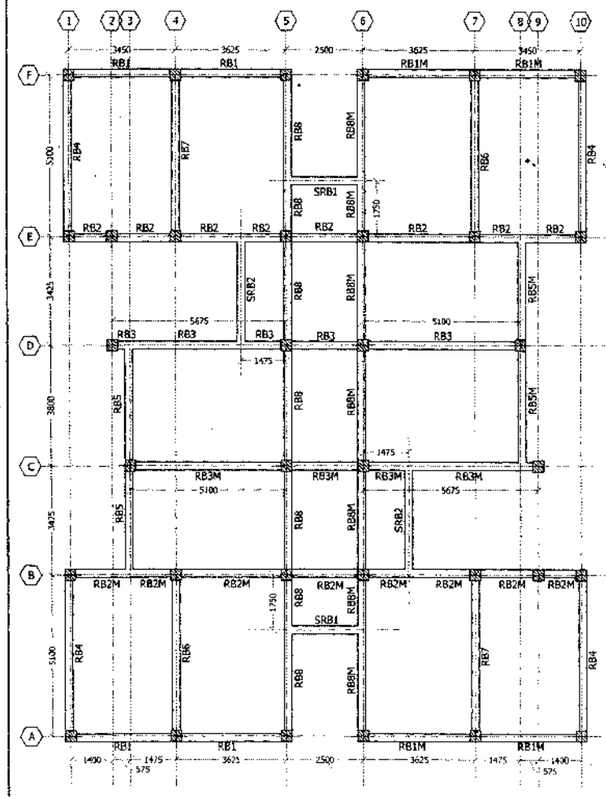
TYPICAL DETAIL OF BAR EMBEDMENT IN END COLUMN

NOT TO SCALE

TPSP FIELD HOSTEL - 1/2

SCHEDULE OF PRIMARY ROOF BEAMS (T.O.C +12.6 m)

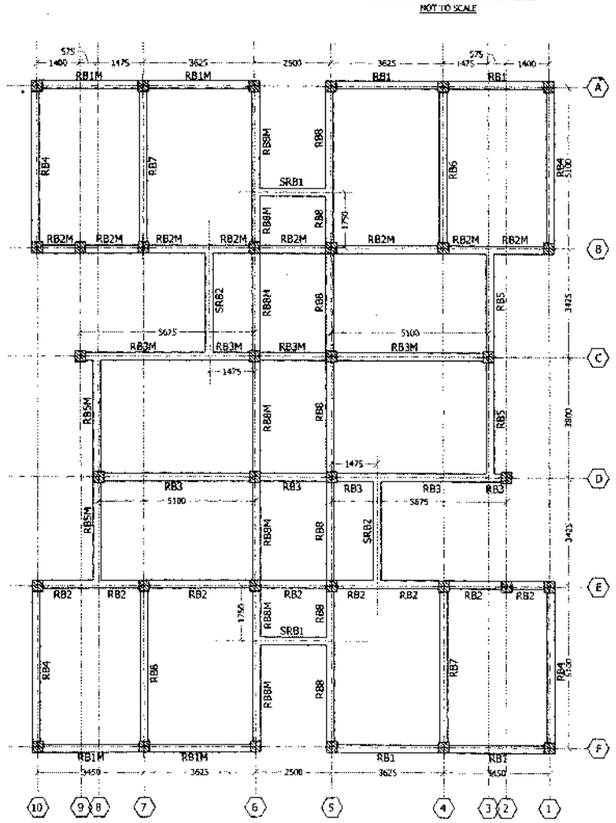
BEAM MARKED	SPAN 'L' (m)	SIZE (mm)		TOP REINFORCEMENT			BOTTOM REINFORCEMENT			STIRRUPS	
		WIDTH 'b'	DEPTH 'D'	LEFT SUPPORT (ϕ)	SPAN (ϕ)	RIGHT SUPPORT (ϕ)	LEFT SUPPORT (ϕ)	SPAN (ϕ)	RIGHT SUPPORT (ϕ)	'0.25L' OR '2D' FROM FACE OF COLUMNS #	BALANCE MIDDLE SPAN
RB1	3.450	250	450	2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.625			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB1M	3.625	250	450	2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.450			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB2	1.400	250	450	2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
	2.050			2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
	3.625			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12 + 2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	2.500			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
	3.625			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.450			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB3	5.675	300	450	2-16 + 1-16	2-16	2-16 + 1-20	2-16	2-16 + 2-12	2-16	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	2.500			2-16 + 1-20	2-16	2-16	2-16	2-16	2-16	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
	5.100			2-16	2-16	2-16	2-16	2-16	2-16	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB3M	5.100	300	450	2-16	2-16	2-16	2-16	2-16	2-16	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	2 500			2-16	2-16	2-16 + 1-20	2-16	2-16	2-16	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
	5.675			2-16 + 1-20	2-16	2-16 + 1-16	2-16	2-16 + 2-12	2-16	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB2M	3 450	250	450	2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.625			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	2.500			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
	3.625			2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12 + 2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	2.050			2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
	1.400			2-12 + 1-12	2-12 + 1-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 100 C/C
RB4	5.100	250	450	2-12 + 1-12	2-12	2-12 + 1-12	2-16	2-16	2-16	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB5	3.425	250	450	2-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.800			2-12 + 1-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB6	5.100	250	450	2-16 + 1-12	2-12	2-16 + 1-12	2-20	2-20 + 2-16	2-20	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB7	5.100	250	450	2-12 + 1-12	2-12	2-12 + 1-12	2-12	2-12 + 2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB8	5.100	250	450	2-16 + 1-12	2-12	2-16 + 1-16	2-20	2-20 + 2-16	2-20	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.425			2-16 + 1-16	2-16	2-16	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.800			2-16	2-16	2-16	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.425			2-16	2-16	2-16 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	5.100			2-16 + 1-12	2-16	2-16 + 1-12	2-12	2-12 + 2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB8M	5.100	250	450	2-16 + 1-12	2-16	2-16 + 1-12	2-12	2-12 + 2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.425			2-16 + 1-12	2-16	2-16	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.800			2-16	2-16	2-16	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.425			2-16	2-16	2-16 + 1-16	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	5.100			2-16 + 1-16	2-16	2-16 + 1-12	2-20	2-20 + 2-16	2-20	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
RB5M	3.800	250	450	2-12	2-12	2-12 + 1-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C
	3.425			2-12 + 1-12	2-12	2-12	2-12	2-12	2-12	2-L 8 ϕ @ 100 C/C	2-L 8 ϕ @ 175 C/C



ROOF BEAM LAYOUT

SCALE-1:100

TPSP FIELD HOSTEL - 2

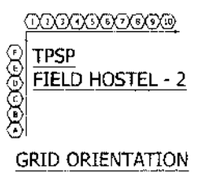


ROOF BEAM LAYOUT

SCALE-1:100

TPSP FIELD HOSTEL - 1

TPSP FIELD HOSTEL - 1



TPSP FIELD HOSTEL - 2

GRID ORIENTATION

TABLE FOR CLEAR COVER	
DESCRIPTION	CLEAR COVER IN mm
COLUMN SIDES	40
ROOF BEAM	25

ADDITIONAL NOTES FOR BEAM DETAILING:-

1. THE TABLE FOR REINFORCEMENT DETAIL SHOULD BE READ IN THE DIRECTION GRID ① TO ⑩ OR ⑩ TO ① AS THE CASE MAY BE FOR A PARTICULAR BEAM SPAN FOR LEFT AND RIGHT SUPPORT RESPECTIVELY.
2. REINFORCEMENT AT SUPPORT SHOULD MEAN REINFORCEMENT AT THE FACE OF THE RESPECTIVE COLUMN SUPPORT OR BEAM SUPPORT AS THE CASE MAY BE.
3. BOTTOM REINFORCEMENT WITH NO CURTAILMENT AT THE FACE OF COLUMN SUPPORT WHEN NOT CONTINUOUS IN ADJACENT SPANS SHOULD BE EMBEDDED BY LENGTH 'E' WITHIN THE RESPECTIVE COLUMN.
4. FOR COLUMN CONNECTED BEAMS CLOSED SPACED VERTICAL STIRRUPS SHOULD BE PROVIDED UPTO '2D' OR '0.25L', WHICHEVER IS GREATER FROM FACE OF COLUMN (#).
5. AT SPLICED SECTION OF REINFORCEMENT IN BEAMS PROVIDE VERTICAL STIRRUPS 2-L 8Φ @ 150 C/C.
6. PLACEMENT OF THE FIRST VERTICAL STIRRUP IN A COLUMN CONNECTED BEAM SHOULD NOT EXCEED 50mm FROM FACE OF THE COLUMN.
7. IN SECONDARY BEAMS THERE IS NO NEED TO EMBED THE REINFORCEMENTS (TOP & BOTTOM) IN SUPPORTING BEAMS BY 'Ld', ONLY THE BEAM WIDTH IS SUFFICIENT

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRE UNLESS SPECIFIED OTHERWISE.
2. FIGURED DIMENSIONS ARE TO BE FOLLOWED AND DRAWING SHOULD NOT BE SCALED.
3. GRID LINES ARE DRAWN ON COLUMN CENTRES.
4. CONCRETE FOR ALL R.C.C. WORKS SHOULD BE OF GRADE M-20, NOMINAL MIX (1:1½:3) AND REINFORCEMENT SHOULD CONFORM TO Fe-500 AS PER IS:1786-2008.
5. FOR SPAN OF BEAMS OR CENTRE TO CENTRE DISTANCE BETWEEN COLUMNS, PLEASE SEE TABLE FOR REINFORCEMENT DETAILING.
6. LAP LENGTH FOR REINFORCEMENT SHOULD BE 50 x DIA. OF THE BAR, PLACED STAGGERED. REINFORCEMENTS SHOULD BE PROVIDED ALTHOUGH WITHOUT CURTAILMENT UNLESS OTHERWISE SPECIFIED.
7. LONGITUDINAL MAIN REINFORCEMENT IN BEAMS (TOP AND BOTTOM) SHOULD BE EMBEDDED TO A MINIMUM LENGTH OF 'E' SPECIFIED IN TABLE IN COLUMNS FROM FACE OF COLUMNS.
8. ROOF BEAMS SHOULD BE PLACED AS PER LAYOUT WITH EITHER ONE EDGE OF THE BEAMS FLUSHING WITH ONE SIDE OF THE RESPECTIVE COLUMNS OR PLACED CENTRALLY WITH BEAM CENTRE LINES COINCIDING WITH THE COLUMN CENTRE LINES.
9. THE BUILDING FRAME AND FOUNDATION HAS BEEN DESIGNED CONSIDERING SEISMIC LOADING 'ZONE-III' CONFORMING TO IS 1893:2002.
10. THERE IS NO PROVISION OF ANY VERTICAL EXTENSION IN UPPER STOREY.

REF:- W/O NOTE RECIEVE NO : P & E (Dist)-WBSEDCL/01 DATED 02.01.2018

IN CASE OF ANY CONFUSION PLEASE CONSULT P. & E.- Dist. DEPT.

REVISIONS

WBSEDCL

DISTRIBUTION HQ.

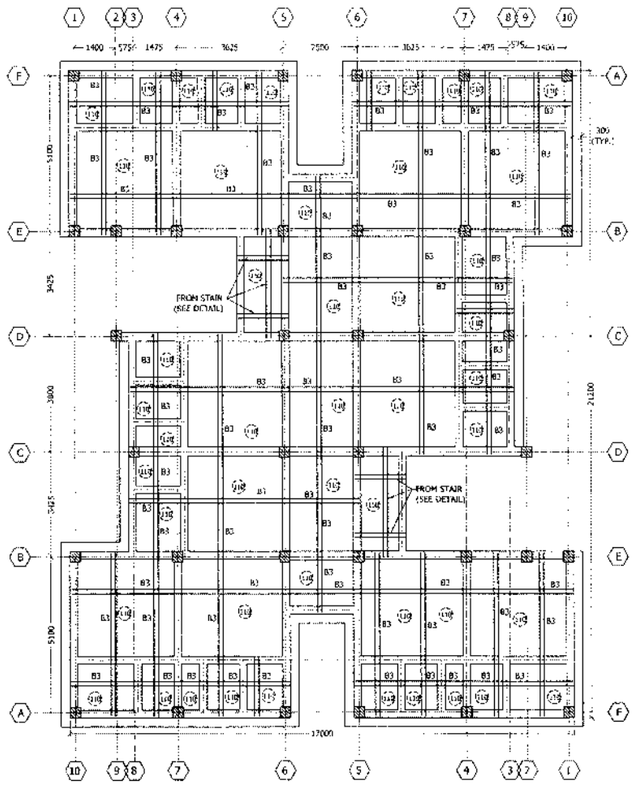
PLANNING AND ENGINEERING DEPARTMENT

TWO NOS. NEW FOUR STORIED OFFICERS FIELD HOSTEL BUILDINGS AT PURULIA PUMPED STORAGE PROJECT TOWNSHIP PREMISES, DIST.- PURULIA

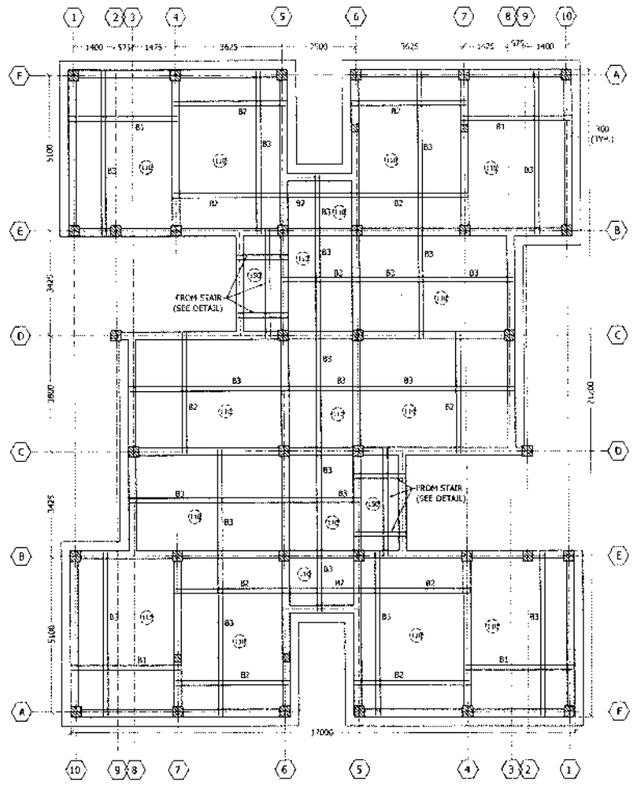
LAYOUT AND DETAILS OF ROOF BEAM AND MUMTY ROOF BEAM

PSPD CHIEF ENGINEER WBSEDCL

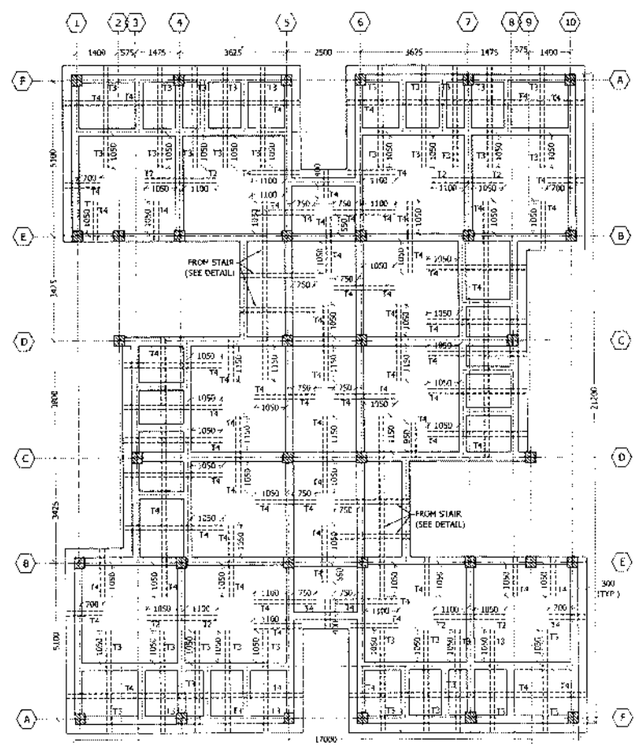
DRAWN BY :	05.02.20 J.E.(C)-GR.I		
DESIGNED BY:	05.02.2020 A.E.(C)		DRAWING NO. PLN(D)/BLDG/511
CHECKED BY:	05.02.2020 D.E.(C)		
RECOMMENDED BY:	05.02.2020 A.C.E.-I (P & E - Dist.)	SCALE: AS STATED	SHEET NO. 6 OF 7
APPROVED BY:	05.02.20 C.E. (P & E - Dist.)	DATE: 05.02.2020	REV. NO. 0



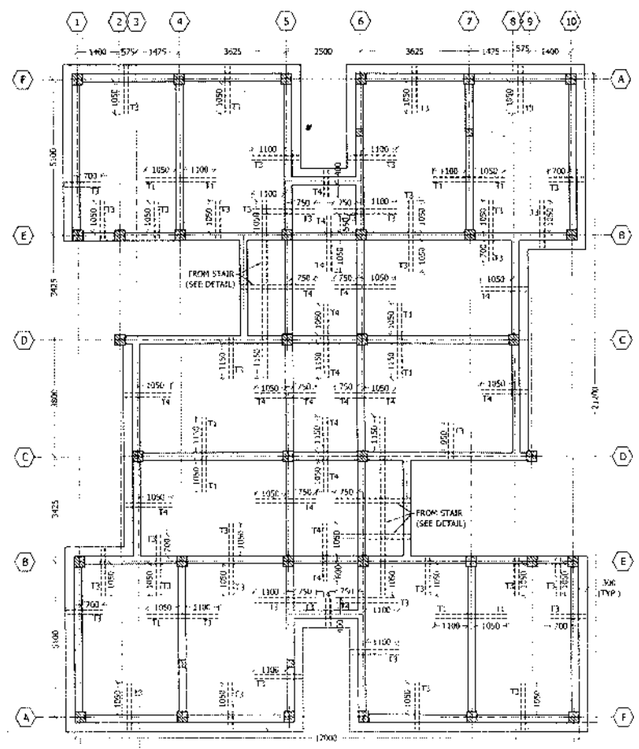
TYPICAL SLAB LAYOUT FOR BOTTOM BAR AT TOC +3.60m, +6.60m & 9.60 m
SHOWING THICKNESS OF SLAB PANELS
TPSP FIELD HOSTEL - 1/2
SCALE-1:100



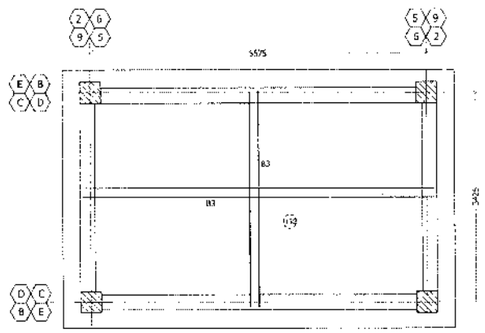
ROOF SLAB LAYOUT FOR BOTTOM BAR AT TOC +12.60 m
SHOWING THICKNESS OF SLAB PANELS
TPSP FIELD HOSTEL - 1/2
SCALE-1:100



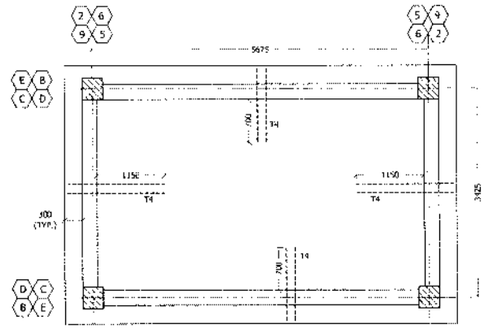
TYPICAL SLAB LAYOUT FOR TOP BAR AT TOC +3.60m, +6.60m & 9.60 m
TPSP FIELD HOSTEL - 1/2
SCALE 1:100



ROOF SLAB LAYOUT FOR TOP BAR AT TOC +12.60 m
TPSP FIELD HOSTEL - 1/2
SCALE 1:100



MUMTY ROOF SLAB LAYOUT FOR BOTTOM BAR AT TOC +15.150m (150MM THICK)
SCALE-1:50



MUMTY ROOF SLAB LAYOUT FOR TOP BAR AT TOC +15.150m (150MM THICK)
SCALE-1:50

TPSP
FIELD HOSTEL - 1

TPSP
FIELD HOSTEL - 2

GRID ORIENTATION

TABLE FOR REINFORCEMENT DETAIL OF FLOOR SLAB		
BAR MARK	BAR DIA & SPACING (mm)	REMARKS
T1	8 ϕ @ 100 C/C	TOP REINFORCEMENT
T2	8 ϕ @ 125 C/C	
T3	8 ϕ @ 150 C/C	
T4	8 ϕ @ 175 C/C	
B1	8 ϕ @ 125 C/C	BOTTOM REINFORCEMENT
B2	8 ϕ @ 150 C/C	
B3	8 ϕ @ 175 C/C	
DISTRIBUTION REINFORCEMENT AT TOP LAYER WHEREVER REQUIRED, SHOULD BE PROVIDED 8 ϕ @ 175 C/C UNLESS OTHERWISE MENTIONED.		

TABLE FOR CLEAR COVER	
DESCRIPTION	CLEAR COVER IN mm
FLOOR BEAM / ROOF BEAM	25
RCC SLAB & WALL	20

THICKNESS OF SLAB PANEL MARKED
(110) = 110mm
(150) = 150mm

NOTES :
1. ALL DIMENSIONS ARE IN MILLIMETRE AND LEVELS ARE IN MTRE UNLESS SPECIFIED OTHERWISE.
2. GRID LINES ARE DRAWN ON COLUMN CENTRES.
3. FIGURED DIMENSIONS ARE TO BE FOLLOWED AND DRAWING SHOULD NOT BE SCALED.
4. CONCRETE FOR ALL R.C.C. WORKS SHOULD BE OF GRADE M-20, NOMINAL MIX (1:1.5:3) AND REINFORCEMENT SHOULD CONFORM TO Fe-500 AS PER IS:1786-2008
5. LAP LENGTH FOR REINFORCEMENT SHOULD BE 50 X DIA OF THE BAR, PLACED STAGGERED. REINFORCEMENTS SHOULD BE PROVIDED ALTHROUGH WITHOUT CURTAILMENT UNLESS OTHERWISE SPECIFIED.
6. THICKNESS OF SLAB PANELS SHOULD BE UNIFORM AS SPECIFIED AGAINST EACH.
7. ROOF TREATMENT SHOULD BE PROVIDED OVER ROOF SLAB WITH NECESSARY SLOPES TO RAIN WATER PIPES.
8. THERE IS NO PROVISION OF ANY VERTICAL EXTENSION IN UPPER STOREY.

REF. LOI NOTE RECIEVE NO. : P & E (DSP) WBSEDCL/01 DATED 02.01.2018
IN CASE OF ANY CONFUSION PLEASE CONSULT P & E.- Dist. DEPT.

PSPD
CHIEF ENGINEER
WBSEDCL

REVISIONS	WBSEDCL	DISTRIBUTION HQ.
		PLANNING AND ENGINEERING DEPARTMENT
		TWO NOS. NEW FOUR STORIED OFFICERS FIELD HOSTEL BUILDINGS AT PURULIA PUMPED STORAGE PROJECT TOWNSHIP PREMISES, DIST.- PURULIA
		LAYOUT AND DETAILS OF FLOOR SLAB, ROOF SLAB AND MUMTY ROOF SLAB
	DRAWN BY :	J.E.(C)-GR.I. 05.02.20
	DESIGNED BY:	A.E.(C) 05.02.2020
	CHECKED BY:	D.E.(C) 05.02.2020
	RECOMMENDED BY:	A.C.E.-I (P & E - Dist.) 07.02.20
	APPROVED BY.	C.E. (P & E - Dist.) 08.02.20

DRAWING NO. PLN(D)/BLDG/511
SCALE: AS STATED
SHEET NO. 7 OF 7
DATE: 05.02.2020
REV. NO. 0