



**GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT
O/o Chief Engineer (Jaipur),
"Nirman Bhawan", Vidhyadhar Nagar,
Jaipur (Raj.)-302039**



BID DOCUMENT

PART-A

Name of work: C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

CPWD-6 FOR e-TENDERING

 सत्यमेव जयते	GOVERNMENT OF INDIA CENTRAL PUBLIC WORKS DEPARTMENT	 CPWD
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The **Executive Engineer (E)-Jaipur, CPWD, Kendriya Sadan, Block-A, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)** (E-mail ID: jced-cpwd-rj@gov.in) on behalf of the President of India invites online Percentage Rate Bids from Approved and eligible contractors of CPWD in appropriate class in single bid system for the following work:

C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

The enlistment of the contractors should be valid on the last date of submission of bids.

In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

- 1.1 The work is estimated to cost **Rs. 2,75,35,721/- (Electrical: Rs. 2,42,46,404/- + Civil: Rs. 32,89,317/-)**. This estimate, however, is given merely as a rough guide.
- 1.1.1 The authority competent to approve NIT for the combined cost and belonging to the major discipline will consolidate NITs for calling the bids. He will also nominate Division which will deal with all matters relating to the invitation of bids. For composite bid, besides indicating the combined estimated cost put to bid, should clearly indicate the estimated cost of each component separately. The eligibility of bidders will correspond to the combined estimated cost of different components put to bid.
2. Agreement shall be drawn with the successful bidder on prescribed Form No. CPWD-7 amended up to date which is available as a Govt. of India Publication and sample also available on website www.cpwd.gov.in. Bidder shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
3. The time allowed for carrying out the work will be **06 (Six) Months** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
4. The site for the work is available.
5. The architectural and structural drawings shall be made available in phased manner, as per requirement of the same as per approved programme of completion submitted by the contractor after award of work. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.
6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.
9. Earnest Money of **Rs. 5,50,714/-** in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (for balance amount as prescribed) from any of the Commercial Banks (drawn in favour of **Executive Engineer (E), Jaipur Central Electrical Division, CPWD, Jaipur payable at Jaipur**) shall be scanned and uploaded on the e-Tendering website within the period of bid submission. The original EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission. The EMD receiving Executive Engineer (including NIT issuing EE/AE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT.

A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any Commercial bank having validity for a period of 90 days for single bid works and 180 days for two bid system or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

The earnest money given by all the tenderers except the lowest tenderer shall be refunded immediately after the expiry of stipulated bid validity period or immediately after acceptance of the successful bidder, whichever is earlier. However, in case of two/ three bid system, earnest money deposit of bidders unsuccessful during technical bid evaluation etc. should be returned within 30 days of declaration of result of technical bid evaluation.

Copy of Enlistment Order and certificate of work experience and other documents as specified in the notice inviting e- tender shall be scanned and uploaded on the e-Tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in e-tender notice shall have to be submitted by the lowest bidder within a week physically in the office of tender opening authority. Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD deposited with any division of CPWD and other documents scanned and uploaded are found in order.

The bid submitted shall be opened **at 3.:30 PM on 29/09/2026***

10. The bid submitted shall become invalid and e-Tender processing fee shall not be refunded if:
 - (i) The bidder is found ineligible.
 - (ii) The bidder does not upload scanned copies of all the documents stipulated in the bid document.
 - (iii) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of bid opening authority.
 - (iv) If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above / below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
11. The contractor whose bid is accepted will be required to furnish performance guarantee as mentioned in schedule E and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of aforesaid provisions by the subcontractors, if any engaged by the contractor for the said work within the period specified in Schedule F.
12. **The description of the work is as follows:**
C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders, shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
15. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
16. The contractor shall not be permitted to bid for works in the CPWD Circle (Division in case of contractors of Horticulture/Nursery category) responsible for award and execution of contracts, in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Chief Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Central Public Works Department or in the Ministry of Housing & Urban Affairs. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
17. No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India, as aforesaid, before submission of the bid or engagement in the contractor's service.
18. The **bids** for the **work** shall remain open for acceptance for a period of **30 (thirty) days** from the date of opening of bids in case of single bid system ~~and 75 days (seventy five) days from the date of opening of technical bids in case bids are invited in 2 or 3 bids system.~~ Further
 - (i) If any tenderer withdraws his tender or makes any modifications in the terms & conditions of the tender which is not acceptable to the department within 7 days **after last date of submission of bids**, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the earnest money absolutely **irrespective of letter of acceptance for the work is issued or not.**
 - (ii) If any tenderer withdraws his tender or makes any modifications in the terms & conditions of the tender which is not acceptable to the department **after** expiry of 7 days **after last date of submission of bids**, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit **100%** of the earnest money absolutely **irrespective of letter of acceptance for the work is issued or not.**
 - (iii) **In case of forfeiture of earnest money as prescribed in para (i) and (ii) above**, the bidders shall not be allowed to participate in the rebidding process of the **same** work.
19. This Notice Inviting bid shall form a part of the contract document. The successful bidder/contractor, on acceptance of his bid by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work, sign the contract consisting of: -
 - (a) The Notice Inviting bid, all the documents including additional conditions, specifications and drawings, if any, forming the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - (b) Standard CPWD Form-7 or other Standard CPWD Form as applicable.
20. **For Composite Bids**
 - 20.1 The Executive Engineer in charge of the major component will call bids for the composite work. The cost of bid document and Earnest Money will be fixed with respect to the combined estimated cost put to tender for the composite bid.

- 20.2 The bid document will include following three components:
- Part A.** CPWD-6, CPWD-7 including schedule A to F for the major / minor component (Electrical/Civil) of the work, Standard **General Conditions of Contract 2023 Construction Works** for CPWD as amended/ modified up to last date of submission of bids.
- Part B.** General/ specific conditions, specifications etc. applicable to major component (Electrical) of the work
- Part C.** General/ specific conditions, specifications etc. applicable to minor component (Civil) of the work
- Part D.** Schedule of quantities applicable to major and minor component of the work.
- 20.2A The contractor shall have to associate other agency(s) for execution of each of the work(s), which fulfils the eligibility criteria as defined after taking prior approval. The contractor and the associated specialized agencies shall give required affidavit to confirm their association. Tender accepting authority may approve change of sub agency in case it is required during the currency of contract. However, the contractor shall also be eligible to carry out himself any or all of these works without associating any specialized agency provided: -
- a) He fulfills the prescribed eligibility criteria respectively for these work(s).
OR
- b) He directly procures the equipment of approved make from manufacturer and gets it installed from authorized agency / service provider of the manufacturer.
OR
- c) Specialized agency as per criteria mentioned below.

Sl. No.	Specialized work(s) / item of work(s)	Criteria of associated agencies
(A)	Electrical Works	
i)	EI Works	a) Certificate of registration of CPWD in appropriate class of composite category. b) Electrical contractor license OR undertaking that they will either obtain valid electrical license at the time of execution of electrical work OR associate contractor having valid electrical license of appropriate class.
ii)	Sub-station equipments	Experience of having successfully completed works during last seven years ending previous day of last date of submission of application. a) One work of financial value not less than Rs. 192 lacs with capacity of 80% of individual transformer OR b) Two works each of financial value not less than Rs. 144 lacs with capacity of 80% of individual transformer OR c) Three works each of financial value not less than Rs. 96 lacs with capacity of 80% of individual transformer Similar works means Supply, Installation, Testing and Commissioning of Sub-station
(B)	Civil Works	
i)	Water Proofing	Experience of having successfully completed works during last seven years ending previous day of last date of submission of application. a) One work of financial value not less than Rs. 0.82 lacs OR b) Two works each of financial value not less than Rs. 0.62 lacs OR c) Three works each of financial value not less than Rs. 0.41 lacs Similar works means Execution of Water Proofing Work

In addition to this the associated agency has to submit an Affidavit as under: -

“I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for associated agency in CPWD in future forever.”

In case the main contractor himself meets the required eligibility criteria as laid down by the Department for specialized component of work, he shall be allowed to execute the same after due verification etc., otherwise the bidder must associate himself with agency of the appropriate class and category eligible to bid for specialized components.

- 20.3 The bidders must associate himself, with agencies as per NIT conditions.
- 20.4 The eligible bidders shall quote percentage rate for all items of major component as well as for all items of minor components of work.
- 20.5 After acceptance of the bid by competent authority, the EE in charge of major component of the work shall issue letter of award on behalf of the President of India. After the work is awarded, the main contractor will have to enter into one agreement with EE in charge of major component and has also to sign two or more copies of agreement depending upon number of EE's/DDH in charge of minor components. One such signed set of agreement shall be handed over to EE/DDH in charge of minor component(s).

EE of major component will operate Part-A, Part-B & Part-D of the agreement. EE/DDH in charge of minor component(s) shall operate Part-A, Part-C & Part-D of the agreement.

- 20.6 Entire work under the scope of composite bid including major and all minor components shall be executed under one agreement.
- 20.7 Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works.
- 20.8 The main contractor has to associate agencies for specialized component (s) conforming to eligibility criteria as defined in the bid document and has to submit detail of such agency(s) to Engineer-in-charge of relevant component (s) within prescribed time. Name of the agency(s) to be associated shall be approved by Engineer-in-charge of relevant component(s).
- 20.9 In case the main contractor intends to change any of the above agency/ agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge of relevant specialized component(s).

The new agency/ agencies shall also have to satisfy the laid down eligibility criteria. In case, Engineer-in-charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.

- 21.10 The main contractor has to enter into MoU with agency(s) associated by him. Copy of such MoU shall be signed by EE/DDH in charge of each relevant component as well as to EE in-charge of major component. In case of change of associate contractor, the main agency(s) has to enter into agreement/MoU with the new contractor associated by him.
- 20.11 Running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor components shall be made by the Engineer-in-charge of the discipline of minor component directly to the main contractor. The CMB shall be maintained independently by Engineer-in-Charge of major and minor components.
- 20.12A The Composite work shall be treated as complete when all the components of the work are complete. The completion certificate of the composite work shall be recorded by Engineer-in-charge of major component after record of completion certificate of all other components.
- 20.12B Final bill of whole work shall be finalized and paid by the EE of major component. Engineer(s) in charge of minor component(s) will prepare and pass the final bill for their component of work and pass on the same to the EE of major component for including in the final bill for composite contract.
- 21. In case of reduction in scope of work no claim on account of reduction in value of work, loss of expected profit, consequential overheads etc. shall be entertained.

22. **List of documents to be scanned and uploaded within the period of bid submission:**

(i)	Insurance Surety Bond, Demand Draft/ Account Payee Banker's Cheque / FDR/ Bank Guarantee of any commercial Bank against EMD.
(ii)	Copy of receipt for deposition of original EMD to division office of any Executive Engineer [including NIT issuing EE] CPWD.
(iii)	Copy of Enlistment order of the CPWD contractors in appropriate class.
(iv)	GST registration Certificate, if already obtained by the bidder. If the bidder has not obtained GST registration as applicable, then he shall scan and upload following undertaking (as per Form-“B” enclosed) along with bid documents: “If work is awarded to me, I/We shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any payment by the CPWD, whichever is earlier, failing which I/We shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and/or for any action taken by CPWD or GST department in this regard”.
(v)	Undertaking on structural stability and soundness as per prescribed format Form 'F'.
vi)	Copy of certificate of compulsory ERP Training obtained by enlisted contractor either himself or his authorized representative.
(vii)	Any other document as specified in the NIT.

Receipt of deposition of original EMD

Receipt No. _____ dated _____

1.	Name of work	:	C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).
2.	NIT No.	:	17/CE/Jaipur/2026-27/Recall-2nd
3.	Estimated Cost	:	Rs. 2,75,35,721/- (Electrical: Rs. 2,42,46,404/- + Civil: Rs. 32,89,317/-)
4.	Amount of Earnest Money Deposit	:	Rs. 5,50,714/-
5.	Last date of submission of bid	:	29/09/2026*Upto 3:00 PM.

(*To be filled by EE at the time of issue of NIT and uploaded alongwith NIT)

1. Name of Contractor :
2. Form of EMD#
3. Amount of original Bank guarantee as Earnest Money Deposit :#
4. Date of submission of EMD :#

Signature, Name and Designation of EMD
receiving Officer
alongwith Office Stamp

(#To be filled by EMD receiving EE/DDH)

**Executive Engineer (E)-Jaipur,
CPWD, Kendriya Sadan, Block-A
Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)
(For & on behalf of President of India)**

Form 'F'

**Undertaking on structural stability and soundness of
already completed buildings and infrastructure projects**

I/we undertake and confirm that any building / infrastructure constructed by our firm /partnership firm/ company has not suffered any failure, making it unfit for intended use, either due to structural design and defects or due to use of sub-standard materials or execution of sub-standard work, poor workmanship or any other reason during the last 25 (twenty-five) years.

I/we, further, undertake that if such information comes to the notice of CPWD, then Engineer-in-Charge shall be free to terminate the bid/agreement and to forfeit the entire amount of earnest money deposit, performance guarantee and security deposits.

I/we, also undertake that in addition to above, the Engineer-in-Charge shall be free to debar us forever from tendering in CPWD.

The decision of Engineer-in-Charge or any higher authority shall be final and binding.

**Signature of
notary with seal**

**Signature of bidder or an
authorized person of the
firm with stamp**

Note: Affidavit to be furnished on a 'non-judicial' stamp paper of Rs. 200/- (scanned copy of the notarized affidavit to be uploaded at the time of submission of bid).

INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR e-TENDERING FORMING PART OF BID DOCUMENT AND TO BE POSTED ON WEBSITE

The **Executive Engineer (E)-Jaipur, CPWD, Kendriya Sadan, Block-A, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)** (E-mail ID: iced-cpwd-rj@gov.in) on behalf of the President of India invites online Percentage Rate Bids from Approved and eligible contractors of CPWD in appropriate class in single bid system for the following work:

Sr. No.	NIT No.	Name of work & Location	Estimated Cost put to tender	Earnest Money	Period of Completion	Last date and time of online submission of bid, EMD Declaration, and other documents as specified in the notice/bid document	Time & Date of opening of Bid
1	2	3	4	5	6	7	8
1	17/CE/Jaipur/2026-27/Recall-2nd	C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).	Electrical: Rs. 2,42,46,404/- + Civil: Rs. 32,89,317/- Total Rs. 2,75,35,721/-	Rs. 5,50,714/-	06 (Six) Months	Upto 3:00 PM on 29/09/2026*	At 3:30 PM on 29/09/2026*

XXX To be filled in by the Executive Engineer

The contractor submitting the tender should read the schedule of quantities, additional conditions, additional specifications, particular specifications, CPWD- 6 and other terms and conditions given in the NIT and drawings. The bidder should also read the **General Conditions of Contract 2023 Construction Works** for CPWD Works with up-to-date correction slips, which is available as Government of India Publications; however, provisions included in the tender document shall prevail over the provisions contained in the standard form. The set of drawings and NIT shall be available in the office **Executive Engineer (E)-Jaipur, CPWD, Kendriya Sadan, Block-A, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)**. The contractor should also visit the site of work and acquaint himself with the site conditions before tendering. He should only submit his tender if he considers himself eligible and in possession of all required documents. The following conditions, which already form part of the tender conditions, are specially brought to his notice for compliance while submitting the tender online. They are requested to comply following instructions.

- Tenders with any condition including that of conditional rebates shall be rejected forthwith.
- The successful bidder shall be required to submit a Performance Guarantee as mentioned in schedule E (as per guidelines issued vide O.M. No. DG/CON/Construction 2023/20 dated 27/02/2026) within 7 days of issue of letter of intent. This period can be further extended by Engineer-in-Charge up to a maximum period of 7 days on the written request of the contractor and with late fee as defined in Schedule F.
- GST, Labour-Cess, Stamp Duty / Stamp Paper, Royalty as per Govt. norms/policies as applicable shall be borne by the contractor himself. The contractor shall quote his rates considering all such taxes and hence their quoted rates should be inclusive of all the tax components.
- It will be obligatory on part of the Contractor/ Bidder to tender for and sign the tender documents for all the component parts. The department reserves right to accept tender in full or in part without assigning any reasons.

- The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.

2. Information and instructions for bidder posted on website shall form part of bid document.
3. The bid documents consisting of plans, specifications, the schedule of quantities of various types of works to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen in the office **Executive Engineer (E)-Jaipur, CPWD, Kendriya Sadan, Block-A, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)** between hours of 11:00 AM and 4:00 PM from **22/09/2026*** to **28/09/2026*** every day except on Sunday and public holidays or can be seen and downloaded from website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.
4. Applicant has to deposit earnest money of **Rs. 5,50,714/-** in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (for balance amount as prescribed) from any of the Commercial Banks **in favour of Executive Engineer (E), Jaipur Central Electrical Division, CPWD, Jaipur** along with tender document. A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any Commercial bank having validity for a period of 90 days for single bid works ~~and 180 days for two bid system or more~~ from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

But the bid can only be submitted after deposition of original EMD either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission and uploading the mandatory scanned documents such as Insurance Surety Bonds, Account Payee Demand draft or Bankers Cheque or Fixed Deposit Receipts or/ and Bank Guarantee (for balance amount as prescribed) from any of the Commercial Bank towards EMD in favour of Executive Engineer as mentioned in NIT, receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE/ AE), CPWD and other documents as specified.

The bids will be submitted upto 3:00 PM on 29/09/2026*. The bid shall be opened at 3:30 PM on 29/09/2026*

5. Those contractors who are not registered or have not updated their profile on the website mentioned above, are required to get registered / update their profile beforehand. The necessary training materials including the videos with step-to-step process are available on download section of <https://etender.cpwd.gov.in>.
6. The intending bidder must have valid Class-III digital signature certificate with encryption key (combo type) to perform any operations / transactions on the e-tendering portal / website and the bidder should download and install the eMsigner on their system as per instructions available on download section of <https://etender.cpwd.gov.in>.
7. On opening date, the contractor can login and see the tender opening process. After opening of tenders, he will receive the competitor's tender sheets.
8. Contractor can upload documents in the form of JPG format and PDF format.
9. Contractor must ensure to quote rate in the prescribed column(s) meant for quoting rate in figures appears in yellow colour and the moment rate is entered, it turns sky blue.

In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO).

However, If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

10. Certain modifications may be required. Addendum / Corrigendum shall be uploaded by the Engineer-in-Charge, if felt necessary by him, which shall form part of tender document.
11. The bidders are advised to visit the site before submitting his bid to have more clarity about the site conditions and availability of space for execution of the work.

12. *The existing enlisted contractor either himself or his authorized representative shall take compulsory ERP (Enterprise Resource Planning) training through any of the CPWD Regional Training institutes (RTIs) at Delhi, Mumbai, Chennai and Kolkata, National CPWD Academy (NCA) Ghaziabad, Training arranged by Graduates of ERP "Train the Trainers Programme" conducted by NCA, Ghaziabad or through any other special training arranged by ERP unit of CPWD. Training will be valid only when participants are registered in LMS (Learning Management System) of ERP and certificate is issued through LMS of ERP.*

List of documents to be scanned and uploaded within the period of bid submission:

(i)	Insurance Surety Bond, Demand Draft / Account Payee Banker's Cheque / FDR / Bank Guarantee of any commercial Bank against EMD.
(iii)	Copy of receipt for deposition of original EMD to division office of any Executive Engineer [including NIT issuing EE] CPWD.
(iii)	Enlistment order of the CPWD contractors in appropriate class.
(iv)	GST registration Certificate, if already obtained by the bidder. If the bidder has not obtained GST registration as applicable, then he shall scan and upload following undertaking (as per Form- "B" enclosed) along with bid documents: "If work is awarded to me, I/We shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any payment by the CPWD, whichever is earlier, failing which I/We shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and/or for any action taken by CPWD or GST department in this regard".
(v)	Undertaking on structural stability and soundness as per prescribed format Form 'F'.
(vi)	Copy of certificate of compulsory ERP Training obtained by enlisted contractor either himself or his authorized representative.
(vii)	Any other document as specified in the NIT.

**Executive Engineer (E)-Jaipur,
CPWD, Kendriya Sadan, Block-A
Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)
(For & on behalf of President of India)**

☐ To be filled in by the Executive Engineer

**GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT**

**Name of work: C/o 33 kV Sub-station for dedicated line from 132kV GSS
Jakhrana to CISF, MPRTC, Behror (Raj.).**

**Part A
Volume II**

**CPWD FORM NO. 7
GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT**

STATE: Rajasthan
BRANCH: B&R

Zone: Chief Engineer-Jaipur
DIVISION: EE(E), Jaipur

COMPOSITE PERCENTAGE RATE TENDER & CONTRACT FOR WORKS

Tender for the work of: C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

- i) To be submitted/uploaded online by **3:00 PM on 29/09/2026**** through website www.etender.cpwd.gov.in or www.cpwd.gov.in to Executive Engineer (E)-Jaipur, CPWD, Kendriya Sadan, Block-A, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.).
- ii) The bid to be opened online in presence of tenderers who may be present at **3:30 PM on 29/09/2026**** in the office of Executive Engineer (E)-Jaipur, CPWD, Kendriya Sadan, Block-A, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.).

T E N D E R

I/We have read and examined the Notice Inviting Tender, Schedule A, B, C, D, E & F, Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, Clauses of Contract, Special Conditions, Schedule of Rate and other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule 'F', viz. Schedule of Quantities and in accordance in all respects with the Specifications / Special conditions, Designs, Drawings and instructions in writing as referred to in this tender document and with such materials as are provided for, by and in respects in accordance with, such conditions so far as applicable.

I/we agree to keep the tender open for **30 (Thirty) days** from the due date of its opening in case of single bid system ~~75 (Seventy-Five) days from the date of opening of technical bid in case tenders are invited on 2 /3 bid/ system for specialized work~~ and not to make any modification in its terms and conditions.

I/We have deposited EMD for the prescribed amount in the office of concerned Executive Engineer as per the bid document.

A copy of earnest money deposit receipt of prescribed amount deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed) issued by a Commercial Bank is scanned and uploaded. If I/we fail to furnish the prescribed Performance Guarantee within prescribed period, I/we agree that the President of India or his successor in office shall without prejudice to any other right or remedy be at liberty to forfeit the said Earnest Money absolutely. Further if I/we fail to commence the work as specified. I/we agree that President of India or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said Performance Guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I / We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for tendering in CPWD in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

I/We hereby declare that I/we shall treat the tender documents, drawings and other records connected with the work as Secret / Confidential documents and shall not communicate information / derived therefrom to any person other than a person to whom I/we am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated: Witness: - Address: - Occupation: -	}	Signature of Contractor Postal Address: - Telephone No. Fax:- E-Mail:-	}
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ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the President of India for a sum of Rs.....
 (Rupees.....)

The letters referred to below shall form part of this contract agreement.

- i)
- ii)
- iii)

Signature

Dated: -

Executive Engineer
For & on behalf of the President of India.

To be filled in by the Executive Engineer

To be filled in by the contractor

SCHEDULES (A to F) FOR ELECTRICAL & CIVIL WORK

SCHEDULE 'A'

Schedule of quantities-

As per NIT

SCHEDULE 'B'

Schedule of materials to be issued to the contractor

S.No.	Description of item.	Quantity.	Rate in figures & words at which the material will be charged to the contractor	Place of issue
(1)	(2)	(3)	(4)	(5)
			NIL	

SCHEDULE 'C'

Tools and plants to be hired to the contractor

S.NO.	DESCRIPTION.	HIRE CHARGES PER DAY	PLACE OF ISSUE
		NIL	

SCHEDULE 'D'

Extra schedule for specific requirements/ documents for the work, if any.

1. Special conditions - As per NIT
 2. Particular Specifications. - As per NIT
 3. Annexures - As per NIT
- Form of performance security (Bank Guarantee Bond), Form of earnest money deposit (Bank Guarantee Bond), guarantee bond for Water Proofing, Sanitary Installations/ Water Supply/ Drainage, for removal of defects in Stone/ tile work, Aluminium Doors, Windows Ventilator Work etc.

SCHEDULE 'E'

Reference to General Conditions of Contract

General Conditions of Contract 2023 Construction Works for CPWD works as modified & corrected upto previous day of the last date of submission of the tender.

1.1 Name of Work : **C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).**

1.2 Estimated Cost of work: -

- | | | | |
|------|--------------------------|---|--------------------------|
| (i) | For Electrical component | : | Rs. 2,42,46,404/- |
| (ii) | For Civil component | : | Rs. 32,89,317/- |
| | Total | : | Rs. 2,75,35,721/- |

1.3 Earnest Money : **Rs. 5,50,714/- (composite) (To be returned after receiving performance guarantee)**

1.4 Performance Guarantee

(a) 5% of tendered value or estimated cost put to tender (ECPT) (whichever is higher)

(b) Where the tendered amount is less than eighty percent (80%) of the estimated cost put to tender (ECPT), the performance guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount.

1.5 Security Deposit

2.50% of tendered value.

~~OR~~

~~2.50% of tendered value plus 50% of PG for contracts involving maintenance of the building and services/ other work after construction of same building and services / other work~~

SCHEDULE 'F':

General Rules & Directions: -

1. Officer Inviting Tender

**Executive Engineer (Electrical), Jaipur
CPWD, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)**
or his successor thereof

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3

See below under Clause-12

Definitions: -

2(i) Engineer-In-Charge

**Executive Engineer (Electrical), Jaipur
CPWD, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)**
or his successor thereof for Electrical works
**Executive Engineer (Civil), Jaipur-II
CPWD, A.G. Colony, Bajaj Nagar, Jaipur (Raj.)**
or his successor thereof for Civil works

2(ii) Accepting Authority

Chief Engineer-Jaipur, CPWD, Jaipur
or his successor thereof.

2(iii) Percentage on cost of materials and labour to cover all overheads and profits

15%

2(iv) Standard Schedule of Rates

DSR(E&M)-2025 for Electrical works and DSR-2023 (Civil) for Civil works with up-to-date correction slips & market rates.

2(v) Department

Central Public Works Department (CPWD)

2(vi) Standard CPWD Contract Form

General Conditions of Contract Construction Works 2023, CPWD Form 7 as modified & corrected upto previous day of the last date of submission of the tender.

Clause-1: -

(i) Time allowed for submission of performance guarantee, programme chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, Provident Fund Nos. or proof of applying thereof from the date of issue of letter of acceptance.

7 days

(ii) Maximum allowable extension with late fee @0.1% per day of the performance guarantee amounts beyond the period provided in (i) above

7 days

Clause-2: -

(i) Authority for fixing compensation under Clause 2

Chief Engineer-Jaipur, CPWD, Jaipur
or his successor thereof.

Clause-5: -

Number of days from the date of issue of letter of acceptance for reckoning date of start

14 days

Mile Stone

Refer Para (A) Table of Milestones as per NIT.

Time allowed for execution of work

06 (Six) Months

Authority to decide: -

- i. Authority to convey the decision of shifting of milestone and extension of time

**Executive Engineer (Electrical), Jaipur
CPWD, Sector-10, Vidhyadhar Nagar, Jaipur (Raj.)**
or his successor thereof

- ii. Authority to decide rescheduling of milestone and extension of time

CE-Jaipur or his successor thereof

- iii Shifting of date of start in case of delay in handing over of site.

CE-Jaipur or his successor thereof

Schedule of handing over of site: -

Part	Portion of site	Description	Time period for handing over reckoned from date of issue of letter of intent
Part A	Portion without any hindrance	Full site of work	On the day of issue of letter of commencement of work by the Engineer-in-charge
Part B	Portions with encumbrances	Nil	Nil
Part C	Portions dependent on work of other agencies	Nil	Nil

Schedule of issue of Designs: -

Part	Portion of design	Description	Time period for issue of design reckoned from date of receipt of tenders
Part A	Portion already in NIT	Soil investigation report	Available
Part B-1	Portions of Architectural Designs to be issued	(a) All Architectural working drawings (without details of toilet etc.) (b) Misc. balance architectural drawings.	Will be issued at the time of award of work Will be issued at appropriate time as per requirement of work in phased manner
Part B-2	Portions of Civil Designs to be issued	a) Part Foundation details of Building. b) Complete Foundation details of Building c) Complete structural drawings d) Misc. balance structural drawings.	a) Will be issued at the time of award of work b) Will be issued at the time of award of work c) Will be issued within 30 days of start of work d) Will be issued at appropriate time as per requirement of work in phased manner
Part B-3	Portions of E&M designs to be issued	All E&M designs	Agency will submit within 30 days from the date of award of work for approval.

Clause 5.2:-

Nature of hindrance register: Online system
(either Physical or Online)

Clause 5.4:-

Schedule of rate of recovery for delay in submission of the modified programme in terms of delay days

Sl.No.	Contract Value	Recovery Rs.
I.	Less than or equal to Rs. 1 crore	500
II.	More than Rs. 1 Crore but less than or equal to Rs. 5 Crore	1000
III.	More than Rs. 5 Crore but less than or equal to Rs. 20 Crores	2500
IV.	More than Rs. 20 Crores	5000

Clause-6:-

Electronic Measurement Book (EMB) through
CPWD ERP portal

Yes, **Applicable**

(Measurement to be recorded by contractor)

Clause-7: -

Gross work to be done together
with net payment / adjustment of
advances for material collected,
if any, since the last such payment
for being eligible to interim payment

Rs. 40.00 Lakh (Electrical work)

Rs. 5.00 Lakh (Civil work)

Clause-7A:-

Yes, **Applicable**

Clause-7B:-

Yes, **Applicable** (*Authority letter to be
given by contractor as per Annexure-II*)

Clause 8A: -

- (i) This shall not apply for maintenance or upgradation contracts not involving any services.
- (ii) For other works, the recovery shall be made @ **0.1% (Zero-point one percent) of accepted Tendered Value OR recovery rate limit specified below, whichever is more:**

Sl.No.	Contract Value	Recovery Rs.
I.	Less than or equal to Rs. 1 crore	2000
II.	More than Rs. 1 Crore but less than or equal to Rs. 5 Crore	5000
III.	More than Rs. 5 Crore but less than or equal to Rs. 20 Crores	25000
IV.	More than Rs. 20 Crores	50000

Clause-10A:-

- (i) List of testing equipment to be
provided by the contractor at site lab.

Refer particular specifications (Civil)
as per NIT and as per requirement at site

- (ii) Maintenance of Material at site
(MAS) Register by the contractor

Applicable

(as per Appendix-XX of GCC)

Clause-10-B(ii): -

Whether clause 10-B (ii) shall be applicable

Not Applicable

Clause-10C:-

Component of Labour expressed as
Percentage of work.

Applicable

(10% of Electrical work and 25% of Civil work)

Clause-10CA: -

Deleted

Clause-10CC: -

Not Applicable

Clause-11:- Specifications to be followed for
execution of work

Electrical - As per all CPWD General
Specifications for Electrical Works amended
upto date and other terms & conditions
enclosed

Civil - C.P.W.D. Specifications 2019 Vol. I & II
with correction slips issued upto last date of
submission of bids.

Clause-12:-

- 12.2(c) Deviation limit beyond which clause **12.2(c)** shall apply for building work 100%
- (i) Deviation limit beyond which clause **12.2(c)** shall apply for foundation works (except items mentioned in earth work Sub-Head in DSR and related items) 100%
- (ii) Deviation limit for items mentioned in Earth work Sub-head of DSR and related items 100%

Clause-16:-Competent Authority for deciding reduced rates.

Chief Engineer-Jaipur, CPWD, Jaipur
or his successor thereof.

Clause 18:-List of mandatory machinery, tools & plants to be deployed by the contractor at site

As required for timely execution of work

Clause 19C:- Authority to decide penalty for each default

Engineer-in-Charge of respective Civil / Electrical Component of work or his successor thereof

Clause 19D:- Authority to decide penalty for each default

Engineer-in-Charge of respective Civil / Electrical Component of work or his successor thereof

Clause 19G:-Authority to decide penalty for each default

Engineer-in-Charge of respective Civil / Electrical Component of work or his successor thereof

Clause 19K:-Authority to decide penalty for each default
(The provisions of this clause, shall not be applicable for works with estimated cost put to tender being less than Rs. 5.00 Crores).

Engineer-in-Charge of respective Civil / Electrical Component of work or his successor thereof

Clause-25: -

- | | | |
|-------|----------------------------------|-----------------|
| (i) | Conciliator: | SDG-Chandigarh |
| (ii) | Arbitrator Appointing Authority: | CE-Jaipur |
| (iii) | Place of Arbitration: | Jaipur / Online |

Clause-32: - Requirement of Technical Representative(s) and Recovery Rates

Sl. No.	Minimum Qualification of Technical Representative	Number (of major + Minor component)	Minimum Experience (Years)	Designation (Technical Staff)	Rate at which recovery shall be made from contractor in the event of non- deployment.	
					Figures	Words
1.	Graduate Engineer / Diploma Engineer	Civil (1) & Elect. (1)	Project Planning / Quality / Billing Engineer	2 years OR 5 years respectively	Rs. 15,000/- Per Month Per Person	Rs. Fifteen Thousand Per Month Per Person

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.

Diploma holder with minimum 10 years relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Clause-38:-

- | | |
|---|--|
| i) Schedule / Statement for determining theoretical quantity of cement & bitumen | As per Delhi Schedule of Rates 2023 with amendments upto the last date of submission of bids. |
| ii) Variations permissible on theoretical quantities. | |
| a) Cement | |
| For works with estimated cost put to tender not more than Rs. 25 Lakh. | 3% plus / minus. |
| For works with estimated cost put to tender more than Rs. 25 Lakh. | 2% plus / minus. |
| b) Steel Reinforcement and structural steel sections for each diameter, section and category. | 2% plus / minus. |
| c) Bitumen for all work. | 2.5% Plus side only and NIL on minus side |
| c) All other materials. | Nil. |

TABLE OF MILE STONE (S)

Name of work: C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

Mile stone(s) as per table given below:-

SI No.	Description of Milestone (Physical)	Time Allowed in days (from date of start)	Amount to be withheld in case of non-achievement of milestone
1.	1/8 th of the work i/c submission of MoU's.	01 Month	1% of accepted tendered amount.
2.	1/4 th of the work.	02 Months	1% of accepted tendered amount.
3.	1/2 of the work.	3½ Months	1% of accepted tendered amount.
4.	3/4 th of the work.	05 Months	1% of accepted tendered amount.
5.	Completion of entire work as per agreement including cleaning of site all complete in all respect. Testing and commissioning of all installations i/c handing over of same.	06 Months	1% of accepted tendered amount.

Note: Mile stones shall be applicable both for Major component (Electrical work) as well as for Minor component (Civil work) of the work.

(On non-judicial stamp paper of minimum Rs. 100)
(Guarantee offered by Bank to CPWD in connection with the execution of contracts)
Form of Bank Guarantee for Earnest Money Deposit / Performance Guarantee/ Security
Deposit/Mobilization Advance

1. Whereas the Executive Engineer (name of division) CPWD on behalf of the President of India (hereinafter called "The Government") has invited bids under..... (NIT number) dated for..... (name of work) The Government has further agreed to accept irrevocable Bank Guarantee for Rs. (Rupeesonly) valid upto (date)* as Earnest Money Deposit from (name and address of contractor) (hereinafter called "the contractor") for compliance of his obligations in accordance with the terms and conditions of the said NIT.

OR**

Whereas the Executive Engineer (name of division), CPWD on behalf of the President of India (hereinafter called "The Government") has entered into an agreement bearing number..... with (name and address of the contractor) (hereinafter called "the Contractor") for execution of work (name of work) The Government has further agreed to accept an irrevocable Bank Guarantee for Rs. (Rupees..... only) valid upto..... (date) as Performance Guarantee/Security Deposit/Mobilization Advance from the said Contractor for compliance of his obligations in accordance with the terms and conditions of the agreement.

2. We, (indicate the name of the bank) (hereinafter referred to as "the Bank"), hereby undertake to pay to the Government an amount not exceeding Rs. (Rupees only) on demand by the Government within 10 days of the demand.
3. We, (indicate the name of the Bank), do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupees only)
4. We, (indicate the name of the Bank), further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.
5. We, (indicate the name of the Bank), further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. We, (indicate the name of the Bank), further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.
7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
8. We, (indicate the name of the Bank), undertake not to revoke this guarantee except with the consent of the Government in writing.

9. This Bank Guarantee shall be valid up to..... unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged. Date

Witnesses:

- | | | |
|----|------------------------------------|--|
| 1. | Signature.....
Name and address | Authorized signatory
Name
Designation
Staff Code No.
Bank Seal |
| 2. | Signature.....
Name and address | |

*Date to be worked out on the basis of validity period of 90 days where only financial bids are invited and 180 days for two/three bid system from the date of submission of tender.

**In paragraph 1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee/security deposit/mobilization advance, as the case may be.

FORM “B”

Undertaking regarding obtaining GST registration Certificate

If work is awarded to me, I/We shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any payment by the CPWD, whichever is earlier, failing which I/We shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and/or for any action taken by CPWD or GST department in this regard.

**Signature of Bidder(s) or an authorized
Officer of the firm with stamp**

**Government of India
Central Public Works Department**

**Name of work: C/o 33 kV Sub-station for dedicated
line from 132kV GSS Jakhrana to CISF,
MPRTC, Behror (Raj.).**

PART-B
(ELECTRICAL WORK)

ELIGIBILITY CRITERIA FOR SPECIALISED E&M WORKS

The contractor shall have to associate other agency(s) for execution of each of the work(s), which fulfils the eligibility criteria as defined after taking prior approval. The contractor and the associated specialized agencies shall give required affidavit to confirm their association. Tender accepting authority may approve change of sub agency in case it is required during the currency of contract. However, the contractor shall also be eligible to carry out himself any or all of these works without associating any specialized agency provided: -

a) **He fulfills the prescribed eligibility criteria respectively for these work(s).**

OR

b) **He directly procures the equipment of approved make from manufacturer and gets it installed from authorized agency / service provider of the manufacturer.**

OR

c) **Specialized agency as per criteria mentioned below.**

Sl. No.	Specialized work(s) / item of work(s)	Criteria of associated agencies
	Electrical Works	
i)	El Works	a) Certificate of registration of CPWD in appropriate class of composite category. b) Electrical contractor license OR undertaking that they will either obtain valid electrical license at the time of execution of electrical work OR associate contractor having valid electrical license of appropriate class.
ii)	Sub-station equipments	Experience of having successfully completed works during last seven years ending previous day of last date of submission of application. a) One work of financial value not less than Rs. 192 lacs with capacity of 80% of individual transformer OR b) Two works each of financial value not less than Rs. 144 lacs with capacity of 80% of individual transformer OR c) Three works each of financial value not less than Rs. 96 lacs with capacity of 80% of individual transformer Similar works means Supply, Installation, Testing and Commissioning of Sub-station

In addition to this the associated agency has to submit an Affidavit as under: -

“I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for associated agency in CPWD in future forever.”

In case the main contractor himself meets the required eligibility criteria as laid down by the Department for specialized component of work, he shall be allowed to execute the same after due verification etc., otherwise the bidder must associate himself with agency of the appropriate class and category eligible to bid for specialized components.

**CONDITIONS FOR ENGAGEMENT OF ASSOCIATED AGENCIES
FOR E&M WORKS**

1. The lowest tenderer have to submit electrical contractor license and experience certificate issued by competent authority within two weeks of award of work in case he himself is eligible for carrying internal EI & other specialized E&M work as per eligibility criteria mentioned in **Schedule-F**, and if not, then he will associate specialized agencies as per eligibility criteria mentioned in **Schedule-F**. The main contractor shall submit the details of such specialized agencies to be associated in **Annexure-A** within two weeks of award of work. Following documents for association of electrical contractors for internal EI work or other specialized E&M Works shall be submitted by main contractor to the EE(E), Jaipur Central Electrical Division, CPWD, Jaipur in charge for deciding the eligibility :-
 - A. Willingness from an eligible electrical contractors/specialized agency to get associated with the applicant for execution of the electrical component of works as per the conditions set out in the MOU as per the proforma given in **Annexure-B** to be signed between the contractor and the associated eligible electrical contractor/ specialized agency.
 - B. For association of Electrical contractor for electrical works: -
 - (i) Copy of their registration documents with CPWD (if applicable)
 - (ii) Copy of Electrical Contractor's License issued by competent authority
 - (iii) Copy of Goods and Service Tax (GST) Registration
 - (iv) Copy of ESIC and EPF Registration.

OR

For association of Electrical contractor for specialized E&M works: -

 - (i) Copy of Completion Certificate as per eligibility criteria mentioned in Schedule-F issued by competent authority.
 - (ii) Copy of Goods and Service Tax (GST) Registration
 - (iii) Copy of ESIC and EPF Registration.

(Copy of all above documents will be self-attested by the main agency and associated agency.)
 - C. MOU signed on Rs. 100/- with eligible electrical contractor/specialized agency meeting the eligibility criteria and same as specified for specialized works. The MOU in the enclosed form as per **Annexure-C** shall be signed by both the parties i.e. contractor as 1st party and associated electrical contractor as 2nd party.
2. In the event of the concerned E&M agency not performing satisfactorily or failure of associate to complete the E&M work, the contractor on the written direction of the department, shall remove the Associate deployed on the work and shall submit name of new associate who fulfill the conditions mentioned in NIT to execute the leftover work without any loss of time or variation in cost to the department in this regard. Contractor shall meet all the guarantee for the equipments already supplied for which payment has been released by the Deptt. in part. If any equipment supplied for the work, during the currency of the earlier Associate and paid partly by the Deptt., becomes redundant /not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of E&M work, the contractor shall be liable for replacement of the equipment(s) at no cost to Department. No change of Associated Electrical Contractor /Specialized Agency will be allowed without prior approval of the EE(E) Jaipur Central Electrical Division, CPWD, Jaipur.
3. The contractor/ specialized agency shall be responsible and liable for proper and complete execution of the Electrical work and ensure coordination and completion of both civil and electrical work.
4. The associate contractor/specialized agency along with contractor shall attend the inspection of the work by the Engineer-in-Charge of E&M works as and when required.
5. The associate or contractor/specialized agency shall sign a tripartite Agreement/Contract along with the main tenderer and the departmental officer, for technical compliance of specification, guarantee etc.
6. The associate or contractor/ specialized agency shall attend the inspection of the work by the Engineer-in-Charge of E&M works as and when required.

**PROPOSAL FOR ASSOCIATING ELECTRICAL AGENCIES for
ELECTRICAL INSTALLATION**

We hereby propose the following electrical agencies as per details mentioned against each. Their Willingness Certificates are also attached as per **Annexure-B**.

S No	Name of electrical contractor/ Firm	Category and class of registration in CPWD	Registration No.	Electrical License	Validity of registration	Consent letter attached (yes/No)
1.						
2.						
3.						

Note :- A copy of registration order shall be attached for each agency.

Contractor's signature

WILLINGNESS CERTIFICATE

Name of work: **C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).**

I hereby give my willingness to work as Associate Specialized Agency for electrical component of the above mentioned work.

I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-Charge. Also I will engage full time technically qualified supervisor/engineer for the works. I will attend inspection of officers of the department as and when required.

Dated:

Signature of the Associate Specialized Agency

Memorandum of understanding
Rs. 100/- Non-judicial stamp

This Memorandum of Understanding (MOU) is made on the _____ at _____
Between

M/s _____ (Main Contractor) having his registered office at _____ which expression shall unless repugnant to the subject or context include its administrators, successors and assigns.

And

M/s _____ (Associate contractor) registered in CPWD as class: _____ Electrical contractor and having his registered office at _____ which expression shall unless repugnant to the subject or context include its administrators, successors and assign.

Whereas, the Central Public Work Department, have issued tender papers to quote for the following work to M/s _____ (Main Contractor).

Name of work: - C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

Whereas, This Memorandum of Understanding has been entered into to execute the above work by the Main Contractor and Associate Contractor.

Whereas, both the parties have gone through and understood the various conditions and clauses of the tender and willingly agree to abide by them.

This MOU shall be valid till the duration of completion of above work and shall be extended if so required by the CPWD.

Now, therefore it is agreed between the parties here to as follows:-

- 1 The associated electrical contractor shall completely execute, perform and do all the works mentioned and described in the main agreement for its electrical components according to the specifications, terms and conditions etc. of the main agreement.
- 2 The associated electrical contractor shall execute and complete the works in all respect up to full satisfaction of the CPWD officers and attend to them during their inspection at site, meetings etc., whenever required by the CPWD officers.
- 3 The cost of electrical works executed by the associated electrical contractor will include the cost of all the materials, accessories, equipments, tools & plants, laborers technical persons required etc. in all respect.
- 4 The associated electrical contractor is responsible for getting recorded measurements and preparation, submissions & pursuance of payment of the bills of the work done for electrical portion of the main agreement.
- 5 **The rate will be as per the schedule enclosed.**
- 6 The Quantity will be as per actual measurement as received from CPWD to main contractor and the rate will be as per the mutually agreed.
- 7 The payment to associate contractor will be released after the payment to main contractor is made by the CPWD.
- 8 The technical staff required for the associate discipline shall be of associate contractor.
- 9 The guarantee of the installation after the completion of the work shall be responsibility of the associate electrical contractor as required by the CPWD.

- 10 There is Service Tax (GST) liability; work being related to the construction of the Central Govt. Deptt. However, if any liability of the Service Tax (GST) is imposed on the associated electrical contractor then it will be paid by main contractor.
- 11 Either party shall not repudiate the contract in mid-way without the consent of each other. Otherwise it will be treated as breach of agreement for any reason whatsoever.
- 12 The main agency shall be solely responsible for deferment & rescheduling of each milestone fixed as per contract documents and in such eventuality, the consequences arising out of the same rests on main agency.
- 13 The main contractor only shall be responsible for getting extension of delay regularized and liability what so ever flowing out shall lies with them. There shall be no direct or indirect impact on associate contractor.
- 14 TDS shall be deducted by the main contractor as per Income Tax law from associated agency. In case liability of tax other than Income Tax (Such as GST, or any other mechanism formed) is levied on associated contractor then the main agency will reimburse it in full to associated agency.
- 15 The associated contractor shall be bound to execute work upto a deviation limit of 30% in quantities of items of work at the agreement rate. Beyond deviation limit the rates will be decided by main & Associated contractor on mutually agreed basis.
- 16 For the items such as extra items, substitute items and new items other than the items of main agreement, if any incorporated in the work, then the main contractor shall pay the full amount so approved to the associate contractor.
- 17 The validity of rates shall be _____ Months after finalization & acceptance of MOU by the competent authority.
- 18 In case main contractor delays the payment to associated contractor after the payment is released by department to the main contractor then on receipt of delay in payment from associate contractor the CPWD shall directly make the payment to associated contractor.
- 19 The main contractor shall at their cost provide necessary requisite arrangement for storage of material.
- 20 Sand & cement used in the electrical work shall be provide by main contractor.
- 21 Security Deposit as deducted by the CPWD will be reimbursed by main contractor to associate contractor. However associated electrical contractor will deposit 2 ½ % of Agreement amount of Rs. _____ in shape of FDR towards S/D to be retained by main contractor which will refunded to electrical contractor after completion of electrical work.
- 22 The Income tax, Commercial tax and labour cess tax deducted by the CPWD from the bills of electrical work shall be reimbursed by the main contractor in favour of the associated electrical contractor accordingly.

In witness whereof we have put our hand seal on date _____.

Enclose:- Schedule of rates.

Signature
(Associate Contractor)

Address: _____

Signature
(Major Contractor)

Address: _____

INTERNAL AND EXTERNAL ELECTRICAL WORK

TERMS AND CONDITIONS FOR INTERNAL AND EXTERNAL ELECTRICAL WORKS

General Commercial & Technical Conditions:

- 1.0 All the works shall be carried out as per CPWD General specification for Electrical Works, Part-I (Internal)-2023; Part-II (External) 2023, Part-IV (Sub-Station), amended up to date and should also comply with relevant provisions of the Indian Electricity Rules and Acts as applicable, amended up to date.
- 2.0 The contractor is advised to visit the site of work to have an idea of the execution of the work; failure to do so shall not absolve their responsibility to do the work as specified in agreement.
- 3.0 **Rates:**
- 3.1. The work shall be treated as on works contract basis and the rates tendered shall be for complete items of work inclusive of all taxes including GST, duties, and levies etc. and all charges for items contingent to the work, such as packing, forwarding, insurance, freight and delivery at site for the materials to be supplied by the contractor, watch and ward of all materials for the work at site etc.
- 3.2. Prices quoted shall be firm.
- 4.0 **Mobilization Advance:**
No mobilization advance shall be paid for the work, unless otherwise stipulated in tender papers for any individual works/ composite work.
- 5.0 **Completeness of Tender:**
All sundry fittings, assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections as required, and all other sundry items which are useful and necessary for proper assembly and efficient working of the various components of the work shall be deemed to have been included in the tender, whether such items are specifically mentioned in the tender documents or not.
- 6.0 **Works to be done by the contractor:**
Unless and otherwise mentioned in the tender documents, the following works shall be done by the contractor, and therefore their cost shall be deemed to be included in their tendered cost: -
- (i) Cutting and making good all damages caused during installation and restoring the same to their original finish.
 - (ii) Sealing of all floor openings provided by him for pipes and cables, from fire safety point of view, after laying of the same.
 - (iii) Painting at site of all exposed metal surfaces of the installation other than pre-painted items like fittings, fans, switchgear/distribution gear items, cubicle switchboard etc. Damages to finished surfaces of these items while handling and erection, shall however be rectified to the satisfaction of the Engineer-in-Charge.
 - (iv) Testing and commissioning of completed installation.
 - (v) Storage space for all equipments, components and materials for the work.
- 7.0 **Storage and Custody of Materials:**
The contractor has to make his own arrangement for the storage of the material at site & necessary watch and ward of the electrical installation during the execution of work till the same is handed over to the department. No extra payment will be made on this account. The storage space shall however be arranged by the department at site, if available.
- The main contractor shall arrange for proper storage of the electrical fans and fittings at site and that double lock system shall be arranged for the fans and fittings after receipt at site until the time they are taken for installation. The contractor shall however be responsible for proper storage and safe custody of the same till their installation and handing over to the department.
- 8.0 **Electric Power Supply and Water Supply:**
Power and water supply will be arranged by the contractor at the site for installation and testing purpose.
- Contractor will take due care to ensure safety of electrical installation during execution of work.

- 9.0 **Tools for handling and Erecting:**
All tools and tackles required for handling of equipments and materials at site of work as well as for their assembly and erection and also necessary test instruments shall be the responsibility of the contractor.
- 10.0 **Payment Terms:**
Payment shall be made as per the relevant clauses of form PWD 7/8 forming part of the tender documents.
- 11.0 **Co-ordination with other agencies:**
The contractor shall co-ordinate with all other agencies involved in the building work so that the building work is not hampered due to delay in his work. Recessed conduit and other works, which directly affect the progress of building work, should be given priority.
- 11.1 **Care of buildings:**
Care shall be taken by the contractor to avoid damage to the building during execution of his part of the work. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove, at his costs, all unwanted and waste materials arising out of his work, from the site.
- 12.0 **Structural Alterations to Buildings:**
(i) No structural member in the building shall be damaged/altered, without prior approval from the competent authority through the Engineer-in-charge.
(ii) Structural provisions like openings, cutouts, if any, provided by the department for the work, shall be used. Where these required modifications, or fresh provisions are required to be made, such contingent works shall be carried out by the contractor at his cost.
(iii) All such openings in floors provided by the department shall be closed by the contractor after installing the cables/conduits/rising mains etc. as the case may be, by any suitable means as approved by the Engineer-in-charge without any extra payment.
(iv) All chases required in connection with the electrical works shall be provided and filled by the contractor at his own cost to the original architectural finish of the buildings.
- 13.0 **Addition to an installation:**
Any addition, temporary or permanent, to the existing electrical installation shall not be made without a properly worked out scheme/design by a qualified Electrical Engineer to ensure that such addition does not lead to overloading, safety violation of the existing system.
- 14.0 **Drawings:**
i) After award of the work, the firm will be required to submit the drawings for the proposed work including layout plan, conduit routes etc. Work will be carried out as per the approved drawings.
ii) The work shall be carried out in accordance with the drawings and the tender documents and also in accordance with modification thereto from time to time as approved by the Engineer-in-charge.
iii) All wiring diagrams shall be deemed to be 'Drawings' within the meaning of the term as used in Clause 11 of the conditions of contract (PWD 7). They shall indicate the main switch board, the distribution boards (with circuit numbers controlled by them), the runs of various mains and sub mains and the position of all points with their controls.
iv) All circuits shall be indicated and numbered in the wiring diagram and the points shall be given the same number as the circuit to which they are electrically connected.
- 15.0 **Conformity to IE act, IE Rules, and standards:**
- 15.1. All electrical works shall be carried out in accordance with the provisions of Indian Electricity Act, 2003 and Indian Electricity Rules, 1956 amended up to date (Date of call of tender unless specified otherwise). List of rules of particular importance to electrical installations under these General Specifications is given in Appendix C for reference.
- 16.0 **General requirements of components:**
- 16.1. **Quality of material:** All materials and equipments supplied by the contractor shall be new and must be in original seal-pack. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.

17.0 Inspection of materials and equipments:

- 17.1. Materials and equipments to be used in the work shall be inspected by the departmental officers. Such inspection will be of following categories:
- (i) Inspection of materials / equipments may be witnessed at the Manufacturer's premises in accordance with relevant BIS /Agreement Inspection Procedure.
 - (ii) To receive materials at site with Manufacturer's Test Certificate(s)
 - (iii) To inspect materials at the authorized dealer's go downs to ensure delivery of genuine materials at site.
 - (iv) To receive materials after physical inspection at site.
- 17.2. Adequate care to ensure that only tested and genuine materials of proper quality are used in work shall be ensured by firm. The firm shall ensure that:
- (i) Material will be ordered & delivered at site only with the prior approval of the department to ensure timely delivery.
 - (ii) As and when the order is placed for the fittings/ fixtures, cables, switchgears, poles, rising main, other main items etc., its copy shall be endorsed to the CPWD Engineer-in-charge.
 - (iii) The firm will be required to procure material like exhaust fans, MCB's & DB's, switches & sockets, wires & cables, conduits and switchgears etc. directly from the manufacturer/ authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the department.
 - (iv) Inspection at factory or at go down of the manufacturer, as required, shall be arranged by the firm for a mutually agreed date.
 - (v) Delivery of material shall be taken up only with the consent of department, after clearance of the material.
 - (vi) Department shall reserve the right to waive inspection in lieu of suitable test certificate, at its discretion.
- 17.3. Similarly, for fabricated equipments, the contractor will first submit dimensional detailed drawings for approval before fabrication is taken up in the factory. Suitable stage inspection at factory also will be made to ensure proper use of materials, workmanship and quality control.

18.0 Ratings of components:

- 18.1. All components in a wiring installation shall be of appropriate ratings of voltage, current and frequency, as required at the respective sections of the electrical installations in which they are used.
- 18.2. All conductors, switches and accessories shall be of such size as to be capable of carrying the maximum current, which will normally flow through them, without their respective ratings being exceeded.

19.0 Conformity to standards:

- 19.1. All components shall conform to relevant Indian Standard Specifications wherever existing. Materials with ISI certification mark shall be preferred.
- 19.2. Relevant Indian Standards including amendments or revisions thereof up to the date of tender acceptance shall be applicable in the respective contracts for respective items, firm to ensure its compliance.

20.0 Interchangeability:

Similar parts of all switches, lamp holders, distribution fuse boards, Switch gears, ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchangeable in each installation.

21.0 Workmanship:

- 21.1. Good workmanship is an essential requirement to be complied with. The entire work of manufacture/fabrication, assembly and installation shall conform to sound engineering practice.
- 21.2. Proper supervision/skilled workmen: The contractor shall be a licensed electrical contractor of appropriate class suitable for execution of the electrical work. He shall engage suitably skilled/licensed workmen of various categories for execution of work supervised by supervisors / Engineer of appropriate qualification and experience to ensure proper execution of work. They will carry out

instruction of Engineer-in-charge and other senior officers of the Department during the progress of work.

21.3. Use of quality materials: Only quality materials of reputed make as specified in the tender will be used in work.

21.4. Fabrication in reputed workshop: Switch boards and LT panels shall be fabricated in a factory/workshop having modern facilities like quality fabrication, seven tank process, powder/epoxy paint plant, proper testing facilities, manned by qualified technical personnel. These shall be as per make / item approved.

22.0 Testing:

All testes prescribed in this General Specification, to be done before, during and after installation, shall be carried out, and the test results shall be submitted to the Engineer-in-charge in prescribed Performa, forming part of the Completion Certificate.

23.0 Commissioning on completion:

After the work is completed, it shall be ensured that the installation is tested and commissioned.

24.0 Completion plan and completion certificate:

24.1. For all works completion certificate after completion of work as given in Appendix–E of CPWD Specification / sop shall be submitted to the Engineer-in-charge.

24.2. Completion plan drawing indicating the following, along with three copies of the same shall also be submitted.

- (i) General layout of the building.
- (ii) Locations of main switchboard and distribution boards, indicating the circuit numbers controlled by them.
- (iii) Position of all points and their controls.
- (iv) Types of fittings, viz. LED Light fixtures, pendants, brackets, bulk head, Ceiling fans, exhaust/fresh air fans etc.
- (v) Name of work, job number, tender reference, actual date of completion, names of Division/ Sub-division and name of the firm who executed the work with their signature.

25. INTERPRETING SPECIFICATIONS

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

- (a) Schedule of quantities
- (b) Technical specifications
- (c) Drawing (If any)
- (d) General Specifications
- (e) Relevant BIS or other international code in case BIS code is not available.

26. Payment terms:

On account payments for part work (after stipulated and statutory deductions) as assessed by the Engineer – in-charge for the applicable items in the Contract shall be payable at part rates not exceeding the percentage indicated against the stages of work.

S. No.	Stage of work	Percentage of quoted rate
1.	Supply of material at site	50%
2.	Installation	70%
3.	Testing and Commissioning	90%
4.	Handing over	100%

TECHNICAL SPECIFICATIONS FOR IEI WORK

1.0 GENERAL

SCOPE OF WORK:

The specifications given below pertain to the internal electrical installation work and CPWD Specifications are to be followed.

2.0 POINT WIRING:

- 2.1 The wires used for the point wiring and power wiring shall be of 650 / 1100 Volts grade FRLS/HFFR PVC insulated multi stranded copper conductor single core cables.
- 2.2 All mounting boxes for plate type accessories shall be of metallic construction and of the same make as that of the plate type switches and accessories.

3.1 COPPER AND ALUMINIUM CABLES

- 3.1.1. This specification covers the supply, installation, testing and commissioning of 1100 V grade cables.
- 3.1.2 The design, manufacture and performance of the cables should conform to the relevant IS.

4.0 MOULDED CASE CIRCUIT BREAKERS

- 4.1 The MCCBs shall comprise single units of triple pole/four pole construction as specified, shall be rated for 415 V AC.
- 4.2 All live parts shall be totally enclosed and shrouded with a heat resistant moulded insulating material housing. Operating mechanism shall be quick make, quick break and trip free type.
 - 4.2.1 The MCCB shall be provided with the following features in microprocessor release:
 - a) Inverse-time-current tripping characteristics under sustained overload.
 - b) Instantaneous tripping on short circuit
 - 4.2.2 MCCBs shall be of current limiting type.
 - 4.2.3 The rated service breaking capacity (Ics) shall not be less than the ultimate short circuit breaking capacity (Icu = 100%Icu)
 - 4.2.4 Variable Thermal setting shall be provided in all MCCB s with thermal magnetic Release.
 - 4.2.5 All circuit breaker below 250 amps rating shall be provided with thermal magnetic release & circuit breakers of 250 amps rating and above shall be provided with Microprocessor based release unless otherwise specified.
- 4.3 All MCCBs shall be provided with rotary handles and links for which nothing extra shall be paid.

5.0 GUARANTEE/WARRANTEE

- 5.1 All equipments shall be guaranteed for a period of 12 Months, from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in-Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor
- 5.2 **Additional Guarantee / Warrantee for LED fixtures:** The LED light luminaries/ fixtures provided under the contract shall be guaranteed for a period of 5 years. The contractor shall furnish an undertaking and Guarantee Bond as per Proforma **as per NIT of Part- B** for 10% (ten percent) of the cost of all LED light luminaries/fixtures. If any defect is noticed during the guarantee period, the contractor should rectify it within seven days and if not attended to the same will be got done from another agency at the risk and cost of contractor-
- 5.3 The contractor shall submit the relevant test certificates at the time of supply of equipment/Material.

GENERAL AND COMMERCIAL CONDITIONS FOR LT PANEL & FEEDER PILLAR WORKS

1.0 GENERAL

This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning putting into operation and final testing & commissioning of the equipments.

- 1.1 The work shall be executed as per CPWD General Specifications for Electrical Works Part – I, II & IV as amended up to date, relevant I.E. Rules, BIS/IEC and as per directions of Engineer-in-charge. These additional specifications/ conditions are to be read in conjunction with above and in case of variations; specifications given in the in the contract shall apply. However, nothing extra shall be paid on account of these additional specifications and conditions, as the same are to be read along with schedule of quantities for the work.
- 1.2 The tenderer should, in its own interest, visit the site and get familiarized with the site conditions before tendering.
- 1.3 No T & P shall be issued by the Department and nothing extra shall be paid on account of this.
- 1.4 **Type of Contract:** The work to be awarded by this tender shall be treated as indivisible works contract.

2.0 TERMS OF PAYMENTS

The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.

- i) 50% after initial inspection (wherever specified) & delivery at site in good condition on pro-rata basis.
- ii) 30% after completion of installation in all respects.
- iii) Balance 20% will be paid after testing, commissioning and handing over to the department for beneficial use.

3.0 Works to be carried out by CPWD

Unless otherwise mentioned in the tender specifications, the following works shall be carried out by the department.

- (i) Space for accommodating all the equipments and components involved in the work. However, watch and ward shall be responsibility of the contractor.

4.0 Works to be done by the contractor

In addition to supply, installation, testing and commissioning of all the equipments, as per schedule of work, and specifications, the following works shall be deemed to be included within the scope of work to be executed by the contractor.

- i) Tools and tackles required for handling and installation of equipments.
- ii) Protection required for the equipments from rain, dust storm etc. during transportation i.e. polythene cover and tarpaulin.
- iii) Necessary equipments for commissioning/site testing.

5.0 RATES

The rates quoted by the tenderer, shall be firm and inclusive of all taxes including GST, packing, transportation, handling etc. The tendered rates should also include charges for installation, testing, commissioning etc. at site including temporary construction of storage

- 5.1 The contractor has to carry out maintenance as per manufacturer's standards for a period of **12 Months from** the date of handing over for which nothing extra shall be paid.

6.0 COMPLETENESS OF TENDER

All sundry equipments, fittings, unit assemblies, accessories, hardware items, foundation, foundation bolts, painting, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

7.0 STORAGE AND CUSTODY OF MATERIALS

The Store room of Electrical Inquiry may be used for storage of sundry materials and erection equipments or else the agency has to make its own arrangements. No separate storage accommodation shall be provided by the department. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the installation by the department.

8.0 CARE OF THE BUILDING

Care shall be taken by the contractor while handling and installing the various equipments and components of the work to avoid damage to the building. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

9.0 COMPLETION PERIOD

The completion period indicated in the tender documents is for the entire work of planning, designing, approval of drawings etc., arrangement of materials & equipments, delivery at site including transportation, installation, testing, commissioning and handing over of the entire system to the satisfaction of the Engineer-in-charge.

10.0 GUARANTEE

10.1 All equipments shall be guaranteed for a period of 12 Months, from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in-Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

10.2 The tenderer shall guarantee among other things, the following:

- (a) Quality, strength and performance of the materials used as per manufacturers standards.
- (b) Safe mechanical and electrical stress on all parts under all specified conditions of operation.
- (c) Satisfactory operation during the maintenance period.

11.0 POWER SUPPLY

Power Supply for the purpose of Installation of LT/Feeder Panel shall be arranged by the contractor themselves and nothing shall be paid on this account.

12.0 ACCEPTABLE MAKES OF VARIOUS EQUIPMENTS

The acceptable makes of various equipments/components/accessories have been indicated in the List of Acceptable Makes of equipments/ materials". The tenderer shall work out the cost of the offer on this basis.

13.0 DATA MANUAL AND DRAWINGS TO BE FURNISHED BY THE TENDERER.

13.1 With Tender: The tenderer shall furnish along with the tender, detailed technical literature, pamphlets and performance data for appraisal and evaluation of the offer.

13.2 After award of work

The successful tendered would be required to submit the following drawings for approval of the department.

- (a) General arrangement drawing of the LT Panels, Feeder Pillars & Meter Boards with complete dimensions.
- (b) Single line diagram of LT Panels, Feeder Pillars & Meter Boards.
- (c) Schematic drawing of LT including all safety interlocking.
- (d) Details of foundations for the equipments and the weights of assembled equipments.
- (e) Equipment details proposed to be procured for the execution of the work for the approval of the Engineer-in-charge.
- (f) Cables rating & sizes, Layout and routes.
- (g) Any other drawings necessary for the job.

The successful tendered should furnish well in advance three copies of detailed instructions and manuals of manufacturers for all items of equipments regarding installation, adjustments, operation and maintenance including preventive maintenance & trouble shooting together with all the relevant data sheets, spare parts catalogue etc. all in triplicate

- 14.0 The successful tendered should furnish well in advance three copies of detailed instructions and manuals of manufacturers for all items of equipments regarding installation, adjustments, operation and maintenance including preventive maintenance & trouble shooting together with all the relevant data sheets, spare parts catalogue etc. all in triplicate.

15.0 EXTENT OF WORK

- 15.1 The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning, as may be required by the department. The term complete installation shall not only mean major items of the plant and equipments covered by specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout charts whether or not those have been specifically mentioned in bill of quantity in the tender document. However, major equipment not covered in the scope of the work and required subsequently as an additional feature, not covered in the contract specifications, shall be paid extra. The decision of the engineer-in-charge in the matter shall be final and binding upon the contractor.

- 15.2 In addition to supply, installation, testing and commissioning of sub-station equipments, following works shall be deemed to be included within the scope of work to be executed by the tenderer.

- a) Minor works necessary for installation of equipments, foundation, making of opening in walls or in floors and restoring them to their original condition/ finish and necessary grouting etc. as reqd.

16.0 INSPECTION AND TESTING

- 16.1 All the equipments and fabricated items etc. shall be offered for initial inspection at manufacturer's works. All routine tests conforming to relevant IS shall be carried out in the presence of Engineer-in-Charge or his authorized representative. Contractor will give sufficient notice for the same. The department reserves the right to inspect or not to inspect the equipment at the works of the manufacturer. In the later case confirmation in writing will be issued by the department. The department will bear to & fro expenses of the officer deputed for carrying out inspection. However, nothing extra shall be paid for conducting routine test in the presence of department's representative.

Copies of all manufacturers' routine and type test, certificates of the equipments shall be furnished to the inspecting officer at the time of inspection at the factory.

After completion of work in all respect the contractor shall offer the installation for testing and operation.

17 Defect Liability Period:

- 17.1 All the equipments shall be guaranteed for a period of 12 Months from the date of completion. Any defective materials and equipment shall be replaced free of cost at the direction of Engineer-in-Charge.

18 INTERPRETING SPECIFICATIONS

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

- (a) Schedule of quantities
- (b) Technical specifications
- (c) Drawing (If any)
- (d) General Specifications
- (e) Relevant BIS or other international code in case BIS

19.0 COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS

19.1 All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by this specification. In particular, the equipment and installation will comply with the following:

- (i) Factories Act.
- (ii) Indian Electricity Rules.
- (iii) B.I.S. & other standards as applicable.
- (iv) Workmen's compensation Act.

19.2 Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

20.0 INDEMNITY

The successful tenderer shall at all times indemnify the department, consequent on this works contract. The successful tenderer shall be liable, in accordance with the Indian law and regulations for any accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising there from during the period of erection, construction and putting into operation the equipments and ancillary equipment under the supervision of the successful tenderer in so far as the latter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer on account of the above.

21.0 ERECTION TOOLS

No tools and tackles either for unloading or for shifting the equipments for erection purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

22.0 COOPERATION WITH OTHER AGENCIES

The successful tenderer shall co-ordinate with other contractors and agencies engaged in the construction of buildings, if any, and exchange freely all technical information so as to make the execution of this work/contract smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specification of the dismantled portion of the work was not undertaken by the tenderer himself.

23.0 The work will be carried out with least disturbance during shifting & shut down taken in consultation with the client department.

24.0 MOBILIZATION ADVANCE

No mobilization advance shall be paid to the contractor.

25.0 INSURANCE AND STORAGE

All consignments are to be duly insured up to the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

26.0 VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION

The contractor shall have to produce all the relevant records to certify that the genuine equipments from the manufacturers has been supplied and erected.

27.0 PAINTING

This shall include cost of painting of the entire installation. The major equipments shall be factory final finish painted. The agency shall be required to do only touching to the damages caused to the painting during transportation, handling & installation at site, if there is no major damage to the painting. However, hangers, supports etc. of bus trunking shall be painted with required shade including painting with two coats of anticorrosive primer paint at site.

TECHNICAL SPECIFICATIONS FOR LT PANELS

1.1 LT SWITCHBOARD (PANEL) AND SWITCHGEARS

This section covers the detailed requirements of Low Voltage switchboard for 415 volts, 3 phases, 50 Hz, 4 wire systems.

Standards and Codes

Updated and current Indian Standard Specifications and Codes of Practice will apply to the equipment and the work covered by the scope of this contract.

Low Voltage switchgear Assemblies IEC 61439-1/2/ IS: 8623

Low Voltage switchgear & control gear IEC 60 947-1/2/IS 13947:1993

Part I : General rules

Part II : Circuit Breakers

Part III : Switches, disconnectors, switch disconnectors and fuse combination units

Part IV : Contactors and Motor starters

Part V : Control circuit devices and switching elements Degree of Protection of Enclosures for low voltage switchgear. IEC60529 /IS 2147: 1962

1.2 LT PANELS

The scope of this section covers design, manufacture, supply, installation, testing and commissioning of Power Distribution Panels including ACBs, MCCBs, MCBs rated up to 415-430 volts. The panel shall be fabricated i/c all switch as per CPWD specification for electrical work (part-I) and Sub-station work (Part IV) amended to date.

1.2.1. Basic Structure:

- a) All electrical panels will be fabricated from 2mm thick CRCA sheet steel for robust construction properly supported with angles and channels.
- b) Panels shall be totally enclosed, dust and vermin proof, fully compartmentalized, cubical design modular construction. The covers and doors shall be very well gasket with neoprene rubber gaskets so as to obtain dust proof enclosure.
- c) The cubicle will be floor-mounted type unless specified otherwise.
- d) The cabinet will be welded construction and not of jointing construction.
- e) Door shall be made of 1.6mm/2mm sheet steel, with foamed seal polyurethane gasket, square section under tabular frame with punching in DIN pitch pattern.

1.2.2. Cubical Panel

The cubical panel shall be made out as per CPWD specification and as per relevant Indian Electricity Rules as amended till date.

The firm shall submit the drawing of cubical panel mentioning all the dimensions and schematic diagram along with detail and capacity of each switch gear. The cubical panel shall be fabricated only after approval of drawings from the Engineer-in-charge.

All incoming ACB's shall have microprocessor-based releases with overload, short circuit, earth fault protections all with adjustable settings and also with adjustable time delays; alongwith adjustable instantaneous short circuit protection; RS485 communication port.

All outgoing and bus coupler MCCB's of above 250 A capacity shall have microprocessor-based releases with overload and short circuit protection with adjustable settings and also with adjustable time delays; along with adjustable instantaneous short circuit protection

Incomers and Bus coupler shall be mechanically interlocked

All metering CT's and PT's shall be cast resin type of accuracy class 1.0 multi-function meter shall be LCD display of accuracy 1.0. All CT's shall be 15VA burden class.

All indicating lights shall be LED type only.

Air Circuit Breakers (ACBs): The ACBs shall comply to IEC 60947 Part I & II and IS 13947 Part I & II and shall be suitable for operation on 415 Volts, 50 Hz 3 Phase system.

Moulded Case Circuit Breaker: The Moulded case circuit breaker (MCCB) shall conform to latest IEC-60 947-2/ IS13947- 2. The circuit breaker shall comply with the isolation function requirement of IEC 60 947-2 section 7.1.2 to marked as suitable for isolation/ disconnection to facilitate safety of operating personnel while the breaker is in use.

Miniature Circuit Breakers (MCB): MCBs shall be hand operated, air break, quick make, quick break type conforming to applicable standards. MCB shall comply with IS : 8828, 1996/IEC 898. MCB shall have minimum power loss (watts) per pole defined as per IS/IEC and the manufacturer shall publish the values.

Current Transformers: Current transformers shall be in conformity with IS: 2705 (part I,II& III)

Test At Manufactures Work: All routine tests specified in IS: 8623-1977 shall be carried out and test certificates produced to the Department.

The bus-bars will be insulated with heat shrinkable sleeves and properly supported. All live parts shall be shrouded by means of acrylic / steel /FRP sheets to ensure no accidental contact with live parts during maintenance and provide simultaneous inspection. The bus-bar supports will be designed to withstand short circuit current equivalent to 35MVA at 415 volts. The bus-bars will be adequately insulated and protected to prevent accidental contact during operation and maintenance.

Each Panel shall be provided with an earth bus bar running along the entire length of the board. Material and size of the earth bus bar shall be as per CPWD specifications amended upto date.

1.3 FEEDER PILLARS

- 1.3.1 Outdoor type Feeder Pillars shall be suitable for 3 phase, 50Hz, 415 volts, A.C. system and shall generally conform to IS 5039. Rating and size of Feeder pillar shall be as per designed load and requirement.
- 1.3.2 The Feeder pillar shall be provided with degree of protection IP 65 as per IS : 2147.
- 1.3.3 Each door shall open to minimum 135 degrees. Locking on both the doors with two keys for each lock shall be provided with each pillar.
- 1.3.4 The enclosure shall be provided with ventilated louver cover with wire mesh, lifting hooks, supporting legs and double earth terminal with double washer.
- 1.3.5 Moulded case circuit breaker shall be provided for incoming and MCB shall be provided as per IS 8828-1978 for outgoing. Gland plate shall be 3mm thick with suitable number of flanged type brass cable glands of required sizes shall be provided.
- 1.3.6 All civil work for feeder pillar foundation shall form part of feeder pillar installation work. This shall include excavation, backfilling, brickwork, plastering and providing PVC sleeves. Cost of civil work shall deem to be included in quoted rates.

1.3.7 BUS BAR

- i) The bus bars shall be air insulated and made of high conductivity, high strength aluminum alloy complying with the requirement of gradeE-91E of IS : 5082.
- ii) Capacity of aluminum bus bars shall be considered as 1.3 Amp per sq.mm of cross section area of the bus bar and also conforming to Table -VI of CPWD specifications for Electrical Works (Part-I).
- iii) The main bus bars shall have continuous current rating throughout the length of Feeder Pillars. The cross section of neutral bus bars shall be same as that of phase bus bar for busbars of capacity upto 200Amp; for higher capacity the neutral bus bar shall not be less than half (50%) the cross section of that the phase bus bars.
- (iv) Busbars to be colour coded with PVC sleeves.

2.0 LT Switchgears

2.1 MOULDED CASE CIRCUIT BREAKERS (MCCB)

2.1.1 General

The Moulded case circuit Breaker (MCCB) shall conform to the latest IEC 60947-2 and IEC 60 947-3-1989. MCCB's shall be suitable for rated operation voltage up to 415 VAC & rated insulation voltage up to 690 VAC.

MCCB's in AC circuits shall be of triple pole / four pole construction as per enclosed BOQ. The "ON", "OFF" and "TRIP" positions of the MCCB's shall be clearly indicated and visible to the operator when mounted as in service. Front of door operating handle shall be provided with pad lock and door interlock. Front of door operating handle shall be provided with door interlock defeat mechanism to facilitate inspection of the MCCB during 'ON' position. MCCB shall be suitable for Positive isolation / disconnection according to IEC 60947-1 & 2 for optimum user safety.

The Service short circuit Breaking capacity (Ics at 415 VAC) of all MCCB's shall be as specified in BOQ and shall have (Ics=100% Icu).

All MCCB should have "Class-II" front fascia as per IEC 60664.

All circuit breaker below 250 amps rating shall be provided with thermal magnetic

Release & circuit breakers of 250 amps rating and above shall be provided with Microprocessor based release unless otherwise specified.

All MCCBs shall be provided with rotary handles, spreader links and phase barrier on both incoming & outgoing sides for which nothing extra shall be paid.

2.2 Miniature Circuit Breaker (MCB)

Miniature circuit breakers shall be of approved design and make and must be tested and validated as per IS/IEC 60898, IEC/EN 60898 and IEC 60947-2 standards.

MCBs shall be suitable for operation at 230V/415V, 50Hz supply. The MCB ratings shall be available from 1--125A in 1P/2P/3P/4P versions. The rated short circuit capacity acc to IS/IEC 60898 shall be of 10,000A. MCBs shall be offered with B, C or D tripping characteristics as per the BOQ requirements. The MCBs shall be suitable for mounting on a 35mm DIN rail.

MCBs shall carry ISI and CE marking.

MCBs shall ensure complete electrical Isolation of downstream circuit or equipment, when the MCB is switched OFF

3.0 CABLE WORK

The L.T. Power cables shall be XLPE insulated PVC sheathed type aluminum conductor armoured cable conforming to IS: 7098: 1988 (Part-I) with up-to date amendments whereas control cable shall be XLPE insulated and PVC sheathed copper conductor armoured/ unarmoured cable conforming to IS:7098 (Part-I) 1988.

All the street light Cables shall be laid in 50mm dia. HDPE pipes, as per the direction of Engineer-In-Charge. Cable laying shall be carried out as per CPWD general specifications for electrical works (part-II External)-1994.

Cable tags shall be made out of 2mm thick aluminum sheets, each tag 1-1/2 inch in dia with one hole of 2.5mm dia, 6mm below the periphery. Cable designations are to be punched with letter/number punches and the tags are to be tied inside the panels beyond the glanding as well as below the glands at cable entries. Trays tags are to be tied at all bends. On straight lengths, tags shall be provided at every 15 metres.

Prior to installation, burying of cables, following tests shall be carried out. Insulation test between phases, phase & neutral, phase & earth for each length of cable.

- a. Before laying.
- b. After laying.
- c. After jointing.

Prior to installation, the following tests shall be conducted in the presence of the Engineer-In-Charge.

- a. Insulation Resistance Test (Sectional and overall).
- b. Continuity Resistance Test.
- c. Earth Test.

All tests shall be carried out in accordance with relevant Indian Standard code of practice and Indian Electricity Rules. The Contractor shall provide necessary instruments, equipments and labour for conducting the above tests & shall bear all expenses of conducting such tests.

**GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR
FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF
LED Light Luminaries/Fixtures**

The agreement made this..... day of (Two Thousand _____ only) betweenS/o(hereinafter called the GUARANTOR of the one part) and the President of India (hereinafter called the Government of the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated and made between the GUARANTOR OF THE ONE PART AND the Government of the other part whereby the contractor inter alia undertook to render the work in the said contract recited structurally stable workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable and guaranteed against faulty performance, workmanship, improper lux, finishing and materials of fixtures.

NOW THE GUARANTOR hereby guarantee that work executed by him will be free from any material defects, etc. for **five years** to be reckoned from the date of completion of the work.

The decision of the Engineer-in-charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects, commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator and by for and on behalf of the President of India on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of :-

1. 2.

SIGNED FOR AND BEHALF OF THE PRESIDENT OF INDIA BY in the presence of :-

1. 2.

SUB-STATION, LT PANEL, FEEDER PILLAR & CABLING WORK

GENERAL TERMS & CONDITIONS FOR SUB-STATION WORK

1.0 TERMS OF PAYMENTS

The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.

S. No.	Stage of work	Percentage of quoted rate
1.	Supply of material at site	50%
2.	Installation	70%
3.	Testing and Commissioning	90%
4.	Clearance from CEA/ Local Body and Handing over	100%

2.0 INSPECTION AND TESTING

- 2.1 All major equipment i.e. HT panel, transformers, bus duct, LT panel etc. shall be offered for initial inspection at manufacturers works. The contractor will intimate the date of testing of equipment at the manufacturer's works before dispatch. The successful tenderer shall give advance notice of minimum two weeks regarding the dates proposed for such tests to the department's representative to facilitate his presence during testing. The Engineer-in-charge may witness such testing. The cost of the Engineer's visit to the factory will be borne by the department. Equipment will be inspected at the manufacturer/Authorized dealer's premises, before dispatch to the site by the contractor if so desired by the Engineer-in-charge.
- 2.2 Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturer's premises shall be furnished to the Engineer-in-charge and consignee.
- 2.3 After completion of the work in all respects the contractor shall offer the installation for testing and operation.

3.0 COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS

- 3.1 After completion of the installation, the same shall be offered for inspection by the representatives of the Central Electricity Authority if required as per rules. The contractor will extend all help including test facilities to the representatives of CEA/Local body. The observations of CEA/Local body will be attended by the contractor.

4.0 MAINTENANCE

- 4.1 Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of one year from the handing over of the installation.
- 4.2 The maintenance, routine as well as preventive, for one year from the date of taking over the installation as per manufacturers recommendation shall be carried out on quarterly basis.

5.0 INTERPRETING SPECIFICATIONS:

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

- (a) Schedule of quantities
 - (b) Technical specifications
 - (c) Drawing (if any)
 - (d) General specifications
 - (e) Relevant BIS or other international code in case BIS code is not available.
- 6.0 The work shall be executed as per CPWD's general specification for Electrical Works Part-I (Internal) 2023, Part-II (External) 2023, Part-IV (Sub-station) 2013, IE Rules, Indian Standards amended upto date and as per direction of Engineer-in-Charge. The additional specifications are to be read with above and in case of any variations; specifications given along with the tender shall apply.
- 7.0 The contractor shall bring sample of materials for approval of the Engineer-in-charge. Sample of approved materials must be kept at site for inspection/comparison with materials to be used in work by senior officers. All materials shall be delivered with manufactures test certificates and technical catalogues, technical parameters as per CPWD specifications, instructions manuals, wiring diagram etc. as required.

TECHNICAL SPECIFICATION FOR SUB-STATION EQUIPMENTS

1.0 33 KV/11 KV OUTDOOR TRANSFORMER (ONAN Type)

The transformer shall comply with the latest edition of the relevant Indian Standards / Manual. The transformer shall be copper double wound core type, oil natural air natural cooled suitable for **outdoor installation (IP 55 rated)**. The transformer shall be designed and manufactured as per latest relevant IS / BS and ECBC with up-to-date amendments. Transformer shall be suitable for continuous rating as stated in BOQ.

INPUT: 33 KV, 3 Phase, 50 Hz.

OUTPUT: 11 KV, 3 Phases, 50 Hz.

RATING: 1600 KVA

TANKS & RADIATORS

Tanks shall be of MS. plates and structures, electrically welded. The construction shall be robust and substantial, suitable for road/rail transport and to withstand vibration. Radiator tubes shall be electrical resistance welded type, round or elliptical or rectangular. They may be welded to the transformer tank or in case of very large sizes to separate detachable radiator banks connected through intermediate leak proof valves. Detachable radiator banks shall have top and bottom headers with flanged connections, with drain and vent fittings. Tanks shall be provided with lifting lugs and jacking lugs. Inspection hole with cover should also be provided for large transformers. Oil conservators shall be mounted on brackets attached to the top cover on tank. Dimensions of the conservator shall be such as to allow change in volume of oil due to change in temperature from 0°C to 100°C.

Tanks shall be thoroughly cleaned, degreased and sand blasted inside and outside. A coat of rust resisting primer shall immediately be given on outside surface. Inside surface shall be painted with oil resistance enamel paint. Tank and radiators shall be hydraulically pressure tested. Tanks shall also be tested for full vacuum.

CORES

Cores shall be built from cold rolled grain-oriented silicone steel laminations. The core laminations shall be insulated from each other by suitable high temperature resistant, oil proof, adherent coating materials. Core clamps and clamping bolts shall be heavily insulated from the core laminations.

The insulations of core bolt shall be minimum of class 'F'. The bottom and top frames shall be connected with the tie rods to make a complete structure rigid for carrying the weight of core-coil assembly without unduly stressing the laminations or windings. Lifting eyes shall be provided on the frame for removal of core assembly from the tank. Completed core shall be flash tested for insulation with 2000 Volts between the core and each of the clamps or core bolts (core being connected to earth).

All the core frames shall be bonded together with two metallic strips and connected to the tank for earthing to ensure earth return and operation of protective gear in the event of a fault. Lifting eyes (or any other provision) for lifting the core from the tank shall be provided.

WINDING & INSULATION

Winding shall be three phases with minimum class 'A' insulation. High conductivity aluminium shall be used for winding. Windings shall be suitably braced to withstand the dynamic forces due to short circuit. Winding insulation shall be uniform and windings shall have full insulation. Windings shall be individually vacuum dried before assembly as well as after assembly.

INSULATION OIL

Insulation oil shall conform to IS: 335. Transformers shall be supplied with initial fill of filtered oil.

GENERAL REQUIREMENTS

The transformer shall be indoor type as specified. Unless otherwise specified the transformer in addition shall have thermal and dynamic ability to withstand external short circuit.

COOLING

Unless otherwise specified, the transformer shall be oil immersed natural air-cooled type (ONAN).

ACCESSORIES

The transformer shall be single tank type with cable box for 33 KV HT.

EXPLOSION VENT

Explosion vent or pressure relief device shall be provided of sufficient size for rapid release of any pressure that may be generated within the tank and which might result in damage to the equipment. The device shall operate at a static pressure less than the hydraulic test pressure for transformer tank. Means shall be provided to prevent the ingress of moisture and gas accumulation.

RATING AND DIAGRAM PLATES

The following plates shall be fixed to transformer tank in a visible position.

- a. A rating plate of weather proof material bearing the data specified in the appropriate clauses in BS.
- b. A diagram plate showing the internal connections and also the voltage vector relationship of the several windings in and a plan view of the transformer giving the correct physical relationship of the terminals.

JOINTS AND GASKETS

All gaskets used for making oil tight joints shall be of proven material such as granulated cork bonded with synthetic rubber gaskets or synthetic rubber.

TESTS

The transformer shall be subjected to the following routine tests at the manufacturer's works before dispatch.

- a) Measurement of winding resistance.
- b) Voltage ratio, polarity and phase relationship.
- c) Measurement of impedance voltage.
- d) Load losses.
- e) No load losses and no-load current.
- f) Induced over voltage withstand.
- g) Separate source voltage withstands.
- i) Vector group.
- j) DV/DF Test.
- k) Magnetic Balance Test.
- l) High Voltage Test.
- m) Insulation Resistance Test
- n) All other test as specified in relevant BS Code.

The quoted rate for the transformer shall include all routine tests to be carried out at the manufacturer's works and all routine tests to be carried out at site as per specifications. The contractor shall quote separately for type tests, which shall be carried out only on the written instructions of Owner. The supplier shall give sufficient advance information about the test schedule to enable the owner to appoint his representative.

TESTING AT SITE

Prior to commissioning of the transformer, the following tests shall be performed.

- a) Insulation resistance of the winding between phases and earth of H.V and M.V. Side.
- b) Voltage ratio test at principal tap, minimum tap & maximum tap position.
- c) Magnetic Balance Test.
- d) Performance/Settings of winding Temperature Indicator, Oil Temperature Indicator.
- e) Insulation Resistance Test

2.0 CONTROL SUPPLY (SHALL BE PART OF H.T. PANEL)

The tripping circuit shall be at 24 Volt D.C. through a power pack unit.

3.0 33 KV & 11 KV SWITCH BOARD

3.1 System Design Parameters

Nominal system voltage: 33 & 11KV

Frequency: 50 Hz

3.2 HT PANEL BOARD WITH VCB

The panel shall be fully compartmentalized, with separate compartments for CT/ cable termination, bus bar chamber, breaker compartment and LT chamber, housing the LT equipment, like meters/relays etc. The panels shall be suitable for fully draw out execution with horizontal isolation. The breaker truck to have three distinct positions, i.e. test, service and isolated. Necessary interlocks to be provided to prevent operation of breaker in any intermediate position.

Bus-bars shall be of fine electrolytic copper, air insulated.

The breaker panel shall have power cable entries from top.

3.3 Specification for HT Panel Protection Relay

- 1.1 The Protection and Control device shall be of numerical type and designed to meet a high degree of dependability and security.
- 1.2 The device shall include an LCD matrix display which supports mimic (e.g. single line diagram can be drawn) and at least 8 LEDs at the front.
- 1.3 The device shall have screw terminals for connection of wires for all CT/VT inputs, power supply, logic inputs and outputs. The device shall have 4 CT inputs and 4 VT inputs. The PCB cards of the device shall be conformal coated.
- 1.4 The device shall be provided with at least 16 digital inputs and 8 digital outputs. Both digital input and output shall be freely programmable.
- 1.5 The device shall have USB communication port in the front for the setting software use and at the rear there shall be 2xRJ-45 Ethernet port. Relay shall support PRP and RSTP redundancy. The IEC 61850 communication has to support peer to peer communication (GOOSE).
- 1.6 The device shall have KEMA IEC61850 edition 2 certificates which are within 5 years from the date of issue of the certificate.
- 1.7 The device shall have facility to store at least 5 fault records, 500 event records and disturbance record (in COMTRADE format).
- 1.8 The device shall offer complete set of measurement functions. The measurement functions cover phase and residual currents, voltages, power, energy, system frequency and harmonics. Condition monitoring has to monitor continuously trip circuits, breaker wear and current transformers.

- 1.9 The device shall contain at least following necessary protections;
- Phase over current (50/51)
 - Directional phase over current (67)
 - Earth fault (50N/51N)
 - Directional earth fault (67N)
 - Directional power (32)
 - Under voltage (27) / Overvoltage (59)
 - Circuit breaker failure (50BF)
- 1.10 Over current (Directional)
The relay shall have three separately adjustable stages available: Idir>, Idir>> and Idir>>>. The first two stages shall be able to configure for both DT and IDMT standard and programmable curves with the setting ranges of 0.1 In to 4In. The third shall have DT characteristics with the setting ranges of 0.1 In to 20 In. The directional characteristics angle setting ranges from -180 degrees to +179 degrees.
- 1.11 Overcurrent (Directional)
The relay shall have three separately adjustable stages available: Idir>, Idir>> and Idir>>>. The first two stages shall be able to configure for both DT and IDMT standard and programmable curves with the setting ranges of 0.1 In to 4In. The third shall have DT characteristics with the setting ranges of 0.1 In to 20 In. The directional characteristics angle setting ranges from -180 degrees to +179 degrees.
- 1.12 Earth fault protection (Directional)
The relay shall have three separately adjustable stages available: Io dir>, Io dir.>> and Io dir>>. All stages shall be able to configure for both DT and IDMT standard and programmable curves with the setting ranges of 0.005 pu to 5 pu for the first stage, and 0.01 pu to 10 pu for 2nd and 3rd stage. The directional characteristics angle setting shall range from -180 degrees to +179 degrees.
- 1.13 Over Voltage / Under Voltage
If the system goes for very high under and over voltages in case of supply or load unbalance, it shall be possible to grade the system for Voltage protections. The relay shall have 3 under / over voltage stages each. Also, the relay shall have residual over voltage protection which can be either measured from the broken delta connection or can be derived from the three phase to neutral voltages.
- 1.14 Power protection
The relay shall have 2 stages of power protection which shall be programmed for reverse power or forward power.
- 1.15 Breaker Failure protection
The relay shall have circuit breaker failure protection which can be used to trip any upstream circuit breaker (CB), if the fault has not disappeared within a given time after the initial trip command. A different output contact of the device must be used for this backup trip.

3.4 Specification for Power quality Analyzer

- 1.1 Power Quality analyzer with Class 0.2S energy Accuracy, Sag/Swell - Waveform capture and Individual harmonics monitoring upto 63rd. Power Quality analyzer needs to be capable of Disturbance direction detection with onboard dual ethernet Port communication and with a minimum sampling rate of 256 Samples / Cycle.
- 1.2 Power Quality analyzer need to comply to Active Energy as per Class 0.2S IEC 62053-22, Reactive Energy Class as per 0.5S IEC 62053-24 and Power Factor as per Class 0.5 as per IEC 61557-12.
- 1.3 Power Quality analyzer need to measure basic parameters:
Current, voltage, frequency Active, reactive, apparent power Total and per phase Power factor Total and per phase Current measurement range (auto ranging)
- 1.4 Power Quality Analyzer need to measure energy parameters as below:
Active, reactive, apparent energy Settable accumulation modes Power Quality analyzer need to measure Demand parameters as below:
- Current Present and max. values Active, reactive, apparent power - Present and max. values Predicted active, reactive, apparent power Synchronization of the measurement window Setting of calculation mode - Block / sliding

- 1.5 Power Quality analyzer need to have minimum sampling rate of 256 Samples / Cycle.
- 1.6 Power Quality analyzer need to perform extensive analysis of:
- 1.7 Detection of Voltage Sags and Voltage Swells Disturbance Direction detection and interposing DDD over SLD in PME Software Waveform capturing over PME Total Harmonic distortion Current and voltage Individual harmonics - Upto 63rd over bar graph on the front display of the meter.
- 1.8 Power Quality analyzer need to inbuilt with memory of 512MB of standard nonvolatile memory. 10 MB of standard non-volatile memory dedicated to capture billing data, events, and waveforms. Logs of Min/max of instantaneous values, Event logs, Trending/ forecasting, SER (Sequence of event recording).
- 1.9 Power Quality analyzer need to comply to PQ reporting as per IEC 61000-4-30 Class S, - IEC 62586 PQI-S.
- 1.10 Power Quality analyzer needs to have Onboard Dual ethernet port for daisy chaining over ethernet. Meters need to have Modbus Mastering capability by connecting Slave devices over RS485 port.
- 1.11 Power Quality analyzer needs to have GPS clock (RS485) or IRIG-B (digital input) to +/- 1 millisecond.
- 1.12 Power Quality analyzer needs to have Standard: 3 digital status inputs for Breaker ON/OFF/ Trip monitoring & 1 KY (form A) energy pulse output for interfacing with other systems. Expandable DI/DO, ADI/ADO capability.
- 1.13 Power Quality analyzer needs to Bright LCD colour display with meter dimension not less than 96 X 96 mm.

3.5 ENCLOSURE

The enclosure shall be metal clad and shall comprise of standard prefabricated cold rolled sheet steel units assembled to form a rigid free standing dead front structure. The enclosure shall be totally enclosed dust and vermin proof housing confirming to protection class IP-42. Each unit of breaker enclosure shall have internal sheet metal barriers to form separate compartments for fuses, bus bars, instruments and relays, cable connections etc.

The draw out carriage on the board shall have three positions viz. services, test and draw out. Automatic Safety shutters shall be provided to ensure inaccessibility of all live parts after the breaker is drawn out. It shall not be possible to draw out the carriage with circuit breaker closed. Suitable interlocks shall be provided to prevent faulty operation.

3.6 ACCESSIBILITY

It shall be possible to remove/check components without disturbing adjacent equipment. All auxiliary equipment shall be easily accessible. All mounted equipment shall have identification tags. Unused current transformer secondary terminals must be short circuited.

3.7 POWER CONNECTIONS

The incoming and outgoing power connections shall be through 33KV/11KV 3 Core aluminium armoured XLPE cable respectively. Ample space shall be provided for connection of these cables in the breaker. The termination of power cables shall be from top.

3.8 CONTROL AND INDICATION

Circuit Breaker closing devices shall be fed from the transformer at suitable AC supply and energy stored type power pack shall be provided for tripping and closing operation and panel lighting. The relays used shall be current operated relays. Breaker positions ON/OFF/Spring charged/Test position/service position shall be indicated mechanically. For electric indication following colour shall be used.

Breaker ON : Red lamp
Breaker OFF : Green lamp
Auto trip : Yellow lamp

Push Buttons for ON and OFF positions shall be mounted on the panel for local operations.

3.9 EARTHING CONNECTIONS

The earthing of the panel shall be in accordance with the CPWD specifications for electrical works amended upto date. The entire panel board shall have a common tinned copper earth bar of suitable section with two earth terminals for effectively earthing metallic portion of the panel.

3.10 BASE FRAME

The panel shall be installed on a base frame. The base frame shall be fabricated from M.S. angle of suitable size and installed on concrete foundation and fixed with bolts and nuts.

3.11 BASE FRAME

The panel shall be installed on a base frame. The base frame shall be fabricated from M.S. angle of suitable size and installed on concrete foundation and fixed with bolts and nuts.

4.0 HT CABLE

4.1 General

HT power cables shall be 3 core aluminium conductor XLPE steel tape armoured cable. Cables shall be ISI marked. This shall be suitable for 33 KV & 11 KV earthed system. The cable shall be provided with steel armouring and tough outer PVC sheath.

The HT cables shall be brought to site on drums which shall be duly marked with name of the manufacturer and size of the cable.

The contractor shall ensure that for the HT cables brought at site, the test certificate in original issued by the factory before dispatch of the cable indicating the tests carried out and their results shall be produced to the Engineer-In-Charge. Without such certificate the cable shall not be accepted by the Engineer-In-Charge.

HT cable shall be suitably terminated with the help of heat shrinkable termination kit at both ends. Unit rate of cable quoted in Schedule 'A' shall be deemed to be exclusive of cost of termination at both ends, cable termination shall be measured and paid separately.

4.2 SPECIFICATION OF CABLES:

These cables shall have individually screened cores and be manufactured and tested according to IS: 7098 (Part II) - 1973 amended up to date & latest. The conductor for these cables shall be from electrical purity Aluminum 3/4 H or H Temper. All conductors shall be compacted circular in shape. The insulation shall be high-quality cross-linked Polythene - obtained by chemical cross linking of polythene molecules. The armoring applied over the common covering shall be of flat steel wires.

Each and every delivery length of the cable shall be subjected to routine tests as per IS:7098 (Part II) 1973 amended up to the date. The operating characteristics of these cables shall be as under.

- i) Permissible maximum continuous operating temperature - 90 °C
- ii) Permissible short circuit temperature - 250 °C
- iii) Di electric constant (Er) at 50°Hz, 30°C to 90°C - 2.4
- iv) Loss factor at 50Hz, 30 °C to 90°C - 0.5X100X-3
- v) Sp. Vol. resistivity at 20 °C-> 10^{14} Ohm cm.

4.3 LAYING OF CABLES:

All cables shall be laid as per C.P.W.D GENERAL SPECIFICATIONS FOR ELECTRICAL WORKS (PART-II EXTERNAL) - 2023 with all up to date amendments.

4.4 TESTING THE CABLES:

All cables shall be tested as per C.P.W.D GENERAL SPECIFICATIONS FOR ELECTRICAL WORKS (PART-II EXTERNAL) - 2023 with all up to date amendments.

5.0 DRAWINGS

The contractor shall submit six complete sets of drawings (soft & hard copies) to the owner/ Engineer-In-Charge after completion of the work.

These drawings must give the following information's, in addition to the information asked for in various other sections of the specifications:

- a) Location of all equipments viz. transformers, H.T. Panels, L.T. Panels, earthing stations etc.
- b) Cable routes clearly indicating the sizes & number of cables.
- c) Earthing layout - indicating the type of earth station & size of earth conductor.
- d) Wiring diagram of L.T. Panels.
- e) Complete single line diagram for Normal and Emergency supplies.

LIST OF PREFERRED MAKES FOR ELECTRICAL WORK

S. No.	Material	Preferred Make
	ELECTRICAL INSTALLATIONS & GENERAL	
1	WIRES AND CABLES a) PVC INSULATED FRLS / HFFR COPPER CONDUCTOR SINGLE CORE CABLE b) 1.1 KV GRADE XLPE POWER CABLE AND CONTROL CABLE c) FIRE SURVIVAL CABLE d) 11 KV/33 KV GRADE XLPE POWER CABLE e) COMMUNICATION CABLE f) SUBMERSIBLE CABLE	POLYCAB/ KEI/ HAVELLS/ RR KABEL/ FINOLEX / BONTON
2	a) MS CONDUIT AND ITS ACCESSORIES b) MS / GI PERFORATED CABLE TRAY	AKG / BEC / NIC
3	PVC CONDUIT AND ITS ACCESSORIES	AKG / BEC / NIC / POLYCAB / ASTRAL
4	GI RACEWAY	HONEYWELL / OBO BAPTERMAN / LEGRAND / HATHER / SCHNEIDER
5	MODULAR SWITCH & SOCKET	HAVELLS (CRABTREE MURANO) / SCHNEIDER (ZENCELO) / LEGRAND (MYRUS)
6	ANCHOR FASTENER	HILTI/ 3M/ FISCHER
7	CABLE LUGS AND BRASS GLAND	GRIPWEL / DOWELL/ COMET / 3M/ REYCHEM / JAINSONS
8	a) CAT-6 UTP b) CAT-6A, UTP c) INFORMATION OUTLET d) UTP PATCH CORD e) FIBRE OPTICS CABLE	PANDUIT/ BELDEN / SYSTIMAX / LEGRAND
9	UPVC PIPE / HDPE PIPE/DWC PIPE	DURALINE/ REX/ TIRUPATI
10	RACK FOR ALL (EPABX / AUDIO VIDEO / CCTV etc.)	PANDUIT/ APC INDIA / 3C3 / IMPULSE / NEXXUX / BELDEN / VALRACK
11	PAINT, PRIMER	ASIAN PAINT/ NEROLAC / BERGER/ ICI
12	MS PIPE, GI PIPE	SAIL/ TATA/ JINDAL (HISSAR)/SAIL
13	SERVER / DESKTOP	DELL / HP / IBM / LENOVO / PANASONIC
14	WI- FI SYSTEM & NETWORK SWITCHES	CISCO/ JUNIPER/ NEXXUUS / IMPLUSE / BELDEN / EXTREME
15	STRUCTURAL STEEL	TATA/ SAIL/ JINDAL HISSAR / APL-APOLLO
16	WATER SUPPLY, STP, DRAINAGE, SUBMERSIBLE PUMPS	KIRLOSKAR /KSB/ GRUNDFOSS/WILO/ XYLEM/ ARMSTRONG/LUVI
	DG SET	
1	DIESEL ENGINE	CUMMINS / CATERPILLER/PERKINS/ KIRLOSKAR OIL ENGINE LTD. /VOLVO PENTA
2	ALTERNATOR	STAMFORD/ KIRLOSKAR ELECTRIC / CROMPTON / LEROY SOMER
3	PROTECTION RELAYS & CT'S	LAURITZ KNUDSEN / SIEMENS/ SCHNEIDER ELECTRIC
4	BATTERY	EXIDE / AMARON/ AMARAJA
5	DG SET - ACOUSTIC ENCLOSURE & ASSEMBLER	KIRLOSKAR (JACKSON) / SUDHIR / CUMMINS INDIA
6	AMF CONTROLLER	AS PER OEM
7	POWER/ AUXILIARY CONTACTOR/ CAPACITOR DUTY CONTACTOR / METERS INCLUDING DIGITAL METERS / INDICATING LAMP (LED TYPE) / PUSH BUTTON / STARTERS /OVERLOAD RELAY / TIMER	LAURITZ KNUDSEN/ SIEMENS/ SCHNIEDER ELECTRIC/ ABB / LEGRAND
	SUB-STATION	
1	33 KV & 11 KV VCB/HT PANEL	ABB / SCHNEIDER ELECTRIC/ SIEMENS
2	DRY TYPE TRANSFORMER	KIRLOSKAR/ VOLTAMP/ ABB/CROMPTON GREEVES
3	OIL TYPE TRANSFORMER	CROMPTON / KIRLOSKAR / ABB / ESENNAR
4	ACB	SCHNEIDER ELECTRIC – MASTERPACT NW (6.0A)/ LAURITZ KNUDSEN - U POWER OMEGA (MTX3.5)/ SIEMENS 3WT ETU / ABB EMAX (PR123) / LEGRAND DMX3 MP 4.10
5	MCCB	SCHNEIDER – COMPACT NSX/ LAURITZ KNUDSEN - D-SINE / ABB TMAX / LEGRAND DPX3
6	MCB/ RCCB/ ISOLATOR	SCHNEIDER - ACTI9/ HAGER – NOVELLO+ / SIEMENS BETA GUARD / ABB SB200M / LAURITZ KNUDSEN – EXORA / LEGRAND – DX3
7	MCB DB	HAGER (NOVELLO+) / SIEMENS (BETAGARD) /SCHNEIDER (ACTI-9)/ABB (ITUS) / LAURITZ KNUDSEN – EXORA / LEGRAND – EKINOX3
8	MAIN LT PANEL/ SUB LT PANELS/ CAPACITOR PANEL/ SYNCHRONIZING PANEL WITH ACCESSORIES/ STARTER PANEL	NEPTUNE/ ADVANCE PANELS & SWITCHGEAR (P) LTD / ADLEC / TRICOLITE /ASPL/ENGINEERS & ENGINEERS / MILESTONE / SPC ELECTOTECH / EXPERT ENGINEERS

S.No.	Material	Preferred Make
9	BUS DUCT, END FEED UNIT, TAP-OFF BOX (PLUG-IN TYPE)	SCHNEIDER ELECTRIC/ LEGRAND / LAURITZ KNUDSEN/RR
10	AIR INSULATED COMPACT RISING MAINS, END FEED UNIT, TAP-OFF BOX (PLUG-IN TYPE)	SCHNEIDER ELECTRIC/ LEGRAND / LAURITZ KNUDSEN/ C&S / GODREJ
11	HT, LT JOINTING KIT & TERMINATION KIT	REYCHEM / 3M / ABB
12	SOFT STARTERS	SIEMENS/ SCHNEIDER/ ABB / LAURITZ KNUDSEN
13	CT, PT	ADVANCE / KAPPA / AE
14	INDUSTRIAL SOCKET & PLUG	LEGRAND / SIEMENS / HAGER / ABB / SCHNEIDER
15	INDICATION LAMPS (LED TYPE) / PUSH BUTTON	SIEMENS / SCHNEIDER / ABB / LAURITZ KNUDSEN
UPS		
1	UPS	SCHNEIDER (APC)/ EATON/ EMERSON (VERTIV)/ PEGASUS/ ABB / NUMERIC
LIGHTING, FIXTURES & FANS		
1	BLDC CEILING FAN / EXHAUST FAN / KITCHEN FRESH AIR/ WALL FAN	HAVELLS/ CROMPTON/ USHA/BAJAJ / ALMONARD
2	LED EXIT SIGNAGE	MR. LITE/ PROLITE / GLOLITE / 3M / AUTOGLOW
3	a) LED INDOOR LUMINAIRES b) LED DECORATIVE LIGHT LUMINAIRES c) LED STREET LIGHT d) BOLLARDS & OUTDOOR FITTINGS e) FAÇADE LIGHTING f) ARCHITECTURAL LIGHTING	PHILIPS/ REGENT/ LIGHTING TECHNOLOGY
4	MS DECORATIVE POLE /GI ORNAMENTAL POLE	PHILIPS / BAJAJ / HILITE/ TWINKLE LUXMAX / HAVELLS / LUSTER
5	POLYCARBONATE JUNCTION BOX WITH CONNECTOR	HENSEL / RITTAL/ SCHNIEDER / CAPE / NEPTUNE
6	SENSORS & TIMER FOR LIGHT CONTROL	PHILIPS / HONEYWELL / SCHNEIDER ELECTRIC / HAVELLS
EPABX		
1	IP-PBX SYSTEM / IP PHONE	CISCO / CORAL / TADIRAN / MATRIX / SIEMENS / NEC
FIRE ALARM SYSTEM		
1	a) ADDRESSABLE FIRE ALARM CONTROL PANEL b) ADDRESSABLE DETECTORS c) GRAPHIC USER INTERFACE SOFTWARE d) MONITOR & CONTROL MODULE e) RESPONSE INDICATORS f) MANUAL CALL BOXES & HOOTERS g) INPUT /OUTPUT DEVICES	EDWARDS / NOTIFIER (HONEYWELL) / SIEMENS / BOSCH
PUBLIC ADDRESS SYSTEM		
1	a) PUBLIC ADDRESS SYSTEM CONSOLE AND ALL ACCESSORIES b) P.A. SPEAKERS c) AMPLIFIERS	BOSCH/ BIAMP/ HONEYWELL
FIRE FIGHTING SYSTEM		
1	a) 2-WAY/4-WAY FIRE BRIGADE CONNECTION b) AIR RELEASE VALVE c) LANDING VALVE d) BRANCH PIPE e) FIRST AID HOSE REEL AND DRUM f) RRL HOSE PIPE g) FIRE MAN AXE	SAFEX/ NEWAGE/ LIFE GUARD / EXFLAME / MINIMAX / SUPEREX
2	DIESEL ENGINE (FIRE-FIGHTING)	CUMMINS/ KIRLOSKAR / CATER PILLER
3	FIRE EXTINGUISHERS	CEASEFIRE/ MINIMAX/ NEWAGE / SAFEX / KANEX
4	FLEXIBLE DROP & FLEXIBLE COUPLINGS	LIFE GUARDS / VICTAULIC/ TYCO
5	a) INSTALLATION CONTROL VALVE b) DELUGE VALVE SPRINKLER HEADS	TYCO / VICTAULIC / HD / HONEYWELL / NEWAGE / MINIMAX
6	SPRINKLER PANEL, CURTAIN SYSTEM PANEL PRESSURE RELEASE VALVE ZONE CONTROL VALVE (ZCV)	TYCO / HONEYWELL / HD / NEWAGE / EVERSAFE
7	ALL FIRE FIGHTING PUMPS	GRUNDFOSS / WILO / MATHER PLATT / KIRLOSKAR
8	ELECTRICAL MOTOR	ABB/ KIRLOSKAR ELECTRIC CO./ SIEMENS INDIA LTD / CROMPTON
9	THERMAL INSULATION FOR EXHAUST PIPE	UPTWIGA/ LLOYD INSULATION/ OWENS CORNING/ KIMMCO
10	M.S. FITTINGS	VS / DRP / VICTAULIC / UNIK
11	WELDING RODS	ADORE / ESAB/ MARGLAM
12	BUTTERFLY (MANUAL, GEAR OPERATED) VALVES, NON-RETURN VALVES, SLUICE VALVES, Y-TYPE STRAINER FOOT VALVE WITH STRAINER AIR RELEASE VALVE, BALL VALVES	AUDCO / ZOLOTO / SANT / HONEYWELL / ADVANCE / KIRLOSKAR
13	TAMPER SWITCH FOR BUTTERFLY VALVE	HONEYWELL/ POTTER/ RAPID CONTROL/ SYSTEM SENSOR/ PACIFIC FIRE
14	PRESSURE SWITCH FLOW TEST METER	DANFOSS/INDFOS/ VIKING/ DELTA CONTROL

15	PRESSURE GAUGE LIQUID FILLED	FEIBIG/ H. GURU/ EMERALD/ WAAREE
	HVAC	
1	SPLIT TYPE AC	HITACHI/ MITUSBISHI/ O-GENERAL
2	REFRIGERANT PIPING	MANDEV / MEXFLOW / RR SHRAMIK
3	CLOSED CELL NITRILE RUBBER INSULATION/ EPDM INSULATION	ARMAFLEX /AEROCCELL / ALP
4	INLINE FANS	SYSTEMAIR/ KRUGER/GREENHECK/ HUMIDIN/ NICOTRAAIR
5	CHILLER	TRAIN/ TROX/ YORK/DAIKEN
6	CHILLER PUMP	ARMSTRONG/ GROUND FOSS/XYLEM
7	AIR HANDLING UNITS/ TREATED FRESH AIR UNITS	SYSTEMAIR/ EDGETECH/ TRANE/ VTS/ BALANCE/ ZECO / WAVES
8	AIR WASHER	SYSTEMAIR/ EDGETECH / TRANE/ VTS/ BALANCE/ ZECOW/ WAVES
9	AIR SEPARATOR	XYLEM/ EMERALD/ ANERGY/ KD AGENCIES
10	COOLING TOWERS (CTI/ CERTIFIED)	ADVANCE/ MARLEY/ PAHARPUR/ BELL
11	GI SHEETS DUCTING ETC	SAIL/ TATA/ JINDAL
12	CO2 SENSOR	SCHNEIDER/ HONEYWELL/ SIEMENS
13	PPR PIPE	JINDAL HISSAR / ASTRAL / FUSION
14	CENTRIFUGAL & AXIAL FANS VANE AXIAL IN-LINE FANS AND THEIR MOTORS	KRUGER/ GREENHECK/ NICOTRA/ WITH MOTOR FROM THEIR APPROVED OEM
15	VIBRATION ISOLATOR RUBBED PAD DUCT SUPPORT ARRANGEMENT	DUNLOP/ RESISTOFLEX/ GERB
16	GRILL DIFFUSER FIRE DAMPERS LOUVERS VOLUME CONTROL DAMPER	SYSTEM AIR/ CARRYAIRE/ COSMOS/ TRISTER / GREENHECK/ BALANCE
17	FLEXIBLE GROOVED FITTINGS, COUPLINGS	VICTAULIC/ TYCOGRINNEL/ VIKING
18	PRE FABRICATED DUCT DUCT FLANGE (WITH GI SHEETS OF MAKES)	ZECO/ ROLLASTAR/ DUCTOFAB/ WAVES
19	VARIABLE FREQUENCY DRIVE	DANFOSS/ ABB / HONEYWELL/ SIEMENS / SCHNEIDER
20	ALUMINUM TAPE	JOHNSON/BIRLA-3M/NIPPON INDUSTRIES
	SOLAR POWER	
1	POWER CONDITIONING UNIT (PCU)	SMA(GERMANY)/DELTA/SCHNEIDER ELECTRIC/ABB/PANASONIC
2	SOLAR PV PANEL	TATA SOLAR/ WAAREE ENERGY/ADANI SOLAR
3	SOLAR INVERTERS	DELTA / ABB / SMA
	STP	
1	PLANT MANUFACTURER	GRANNUS WATER AND ENVIRONMENTAL SOLUTIONS PVT. LTD./ CIMERA ENGINEERS/ SPECTRUM ENGINEERING TECH PVT. LTD. / ION EXCHANGE / ZETA4/ WATERNEER
2	AIR BLOWER	EVEREST / BETA / ROBUSCHI
3	AIR DIFFUSERS	REHAU / SSI AERATION / MM AQUA
4	RAW SEWERAGE TRANSFER PUMP / SLUDGE RECYCLE PUMP / FILTER FEED PUMP / NON CLOG HORIZONTAL CENTRIFUGAL PUMP/ DE WATERING PUMP / DOSING PUMP/ SBR FEED PUMP/ FILTER FEED PUMP/ SLUDGE PUMP/ CHLORINE DOSING PUMP	ARMSTRONG / XYLEM / GRUNDFOS/ / WILO
5	FILTER PRESS	SACHINFILTECH / PHARMATECH / HITECH
6	TUBE SETTLER MEDIA /MBBR MEDIA	WELBRICK / PHARMATECH / MM AQUA
7	M.S. FILTER	WELBRICK / ION EXCHANGE / ASTHA / THERMAX / ZETA4
8	OZONATOR	CREATIVE/ OZONICS/ ORAPL / CHEMTRONICS / FARADAY
9	NON CLOGG HORIZONTAL SCREW TYPE FILTER PRESS PUMP	ROTO/ POSITIVE/ ROTAMAC/ TUSHACO
10	CENTRIFUGE	APOLLO/ WELBRICK/ GWSPL/ PHARMATECH / GEA
11	PRESSURE GAUGE	H GURU / FEIBIG / GLUCK / BAUMER
12	BUTTERFLY / DUAL PLATE CHECK VALVES	AUDCO / ZOOTO / ADVANCE / CASTLE / SANT
13	PLC	DELTA/ SIEMENS/ SCHNEIDER
	AUDIO-VIDEO	
1	LED VIDEO WALL / LED DISPLAY	SAMSUNG/LG/ PANASONIC / SONY
2	PROJECTOR	CHRISTIE / BARCO / NEC
3	WIRELESS AND WIRED MICROPHONE BOUNDARY MICROPHONE GOOSNECK MICEOPHONE WIRELESS CHARGER FOR WIRELESS GOOSNECK MICEOPHONE ANTENNA & SPLITTER/ COMBINER	SHURE / SENNHEISER / AUDIO TECHNICA
4	DIGITAL PODIUM	AHA/ UNI/ BRONX
5	NETWORK VIDEO ENDPOINT	QSC/KRAMER/EXTRON/ LIGHTWARE/ CRESTON/ LUMENS
6	FULL RANGE CEILING SPEAKERS 2 WAY SPEAKER – TYPE 1 & 2 SUBWOOFER SURROUND SPEAKER PASSIVE COLUMN ARRAY LOUDSPEAKER – TYPE 1 & 2	QSC/ BOSE / TW AUDIO
7	AMPLIFIER	QSC/ LAB GRUPPEN / POWER SOFT

8	DIGITAL SIGNAL PROCESSOR	QSC/ BOSE / SYMETRIX
9	DIGITAL IP BASED CHAIRMAN UNIT DIGITAL IP BASED DELEGATE UNIT WIRELESS DELEGATE UNIT WIRELESS CHAIRMAN UNIT WIRELESS CONFERENCE CONTROLLER	SENNHEISER/ SHURE / TELVIC
10	MATRIX SWITCHER, DISTRIBUTION AMPLIFIER, TRANSMITTER & RECEIVER	LIGHTWARE/ EXTRON/ CRESTRON
11	TABLE MOUNT ENCLOSURE	KRAMER/CRESTRON/ LOGIC
12	PTZ CAMERAS	SONY/ LUMENS/ QSC/ PANASONIC
13	RECORDER & STREAMING SYSTEM	LUMENS/ MEDIA POINTE/ PANASONIC/ SONY
14	CONTROL TOUCH PANEL AND CONTROL SYSTEM	CRESTRON/QSC/EXTRON
15	SPEAKER & MICROPHONE CABLE	KRAMER / BELDONE / KRYSTAL
16	HDMI CABLE ACTIVE USB CABLE	CRESTRON/ EXTRON/ LIGHTWARE
17	VIDEO CONFERENCE SYSTEM	CISCO/ POLYCOM/ CRESTRON
	CCTV	
1	PTZ, BULLET, DOOM CCTV CAMERA, NVR	STQC CERTIFIED
	BOOM BARRIER	
1	BOOM BARRIER	DESIGNA / NEPTUNE / GODREJ
	FIRE SUPPRESSION SYSTEM	
1	FIRE SUPPRESSION SYSTEM	SVS BUILDWELL / SAFEX / LIFEGUARD
	WTP	
1	WTP	ZETA4 / WATERNEER / ION EXCHANGE

Note:

1. If approved make/brand of any material is not given in the list, the same will be approved by the NIT approving authority.
2. The contractor shall submit samples & technical submittals of all material before procurement for approval & shall procure after approval directly from manufacturer and the Authorized dealers only.
3. Material not specified in attached list of acceptable makes shall be got approved from Engineer-in-charge & consultant before use on work. Decision of Engineer-in-charge & Consultant shall be final in this respect.
4. Either the model shall be got approved or Sample shall be submitted for approval by Engineer in Charge before confirming order to supplier.
5. Contractor shall normally not use more than two (except for Equipment's: Lifts, DG Set, Transformer, HVAC Equipment's, UPS, where only One make is allowed) out of the above preferred makes.
6. All items shall conform to e-waste management and handling rules 2011 issued by Min. of Environment and Forest, Government of India or ROHS (restrictions on use of Hazardous substances) / WEEE compliant as per EU norms or American norms. Certificate shall be submitted wherever applicable.
7. The material shall not be older by more than Six months from date of supply at site.
8. Proof of dispatch from factory/dealer shall always be submitted to Engineer-in-charge for verification.

The contractor gives an authority letter addressed to the Engineer-in-charge on a non-judicial stamp paper of Rs. 100 in the format given below:-

Authority Letter for Payment to Third Party

To,

**The Executive Engineer (E)-Jaipur
C.P.W.D., Jaipur**

Sub:- Authority for payment to third party.

I/We authorize the **Executive Engineer (E)-Jaipur, CPWD, Jaipur** to pay directly on my / our behalf to (name of third party) an amount of Rs. (Rupees in words) for the work done or supplies made by (name of third party). I/We shall be responsible for the quality and quantity of the same under the provisions of agreement No.

Signature of Contractor

Note:-

1. The total payment to third party (or parties) shall not exceed 10% of the agreement cost of the work.
2. Full reasons for proposing such third party payment shall be recorded and prior written approval of the next higher authority shall be obtained before making such payment.

Government of India
Central Public Works Department

Name of work: C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

PART-C
(CIVIL WORK)

ELIGIBILITY CRITERIA FOR SPECIALISED CIVIL WORKS

The contractor shall have to associate other agency(s) for execution of each of the work(s), which fulfils the eligibility criteria as defined after taking prior approval. The contractor and the associated specialized agencies shall give required affidavit to confirm their association. Tender accepting authority may approve change of sub agency in case it is required during the currency of contract. However the contractor shall also be eligible to carry out himself any or all of these works without associating any specialized agency provided:-

a) He fulfills the prescribed eligibility criteria respectively for these work(s).

OR

b) Specialized agency as per criteria mentioned.

Sl. No.	Specialized work(s) / item of work(s)	Criteria of associated agencies
(i)	Water Proofing	Experience of having successfully completed works during last seven years ending previous day of last date of submission of application. a) One work of financial value not less than Rs. 0.82 lacs OR b) Two works each of financial value not less than Rs. 0.62 lacs OR c) Three works each of financial value not less than Rs. 0.41 lacs Similar works means Execution of Water Proofing Work

In addition to this the associated agency has to submit an Affidavit as under: -

“I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for associated agency in CPWD in future forever.”

**PROPOSAL FOR ASSOCIATING AGENCIES for
WATER PROOFING WORK**

We hereby propose the following agencies as per details mentioned against each. Their Willingness Certificates are also attached as per **Annexure-B**.

S. No.	Name of contractor/ Firm	Category and class of registration in CPWD	Registration No.	Validity of registration	Consent letter attached (yes/No)
1.					
2.					
3.					

Note :- A copy of registration order shall be attached for each agency.

Contractor's signature

WILLINGNESS CERTIFICATE

Name of work: **C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).**

I hereby give my willingness to work as Associate Specialized Agency for civil component of the above mentioned work.

I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-Charge. Also I will engage full time technically qualified supervisor/engineer for the works. I will attend inspection of officers of the department as and when required.

Dated:

Signature of the Associate Specialized Agency

Memorandum of understanding
Rs. 100/- Non-judicial stamp

This Memorandum of Understanding (MOU) is made on the _____ at _____

Between

M/s _____ (Main Contractor) having his registered office at _____ which expression shall unless repugnant to the subject or context include its administrators, successors and assigns.

And

M/s _____ (Associate contractor) registered in CPWD as class : _____ Electrical contractor and having his registered office at _____ which expression shall unless repugnant to the subject or context include its administrators, successors and assign.

Whereas, the Central Public Work Department, have issued tender papers to quote for the following work to M/s _____ (Main Contractor).

Name of work : C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

Whereas, This Memorandum of Understanding has been entered into to execute the above work by the Main Contractor and Associate Contractor.

Whereas, both the parties have gone through and understood the various conditions and clauses of the tender and willingly agree to abide by them.

This MOU shall be valid till the duration of completion of above work and shall be extended if so required by the CPWD.

Now, therefore it is agreed between the parties here to as follows :-

- 1 The associated contractor shall completely execute, perform and do all the works mentioned and described in the main agreement for its water proofing work components according to the specifications, terms and conditions etc. of the main agreement.
- 2 The associated contractor shall execute and complete the works in all respect up to full satisfaction of the CPWD officers and attend to them during their inspection at site, meetings etc., whenever required by the CPWD officers.
- 3 The cost of water proofing work executed by the associated contractor will include the cost of all the materials, accessories, equipments, tools & plants, laborers technical persons required etc. in all respect.
- 4 The associated contractor is responsible for getting recorded measurements and preparation, submissions & pursuance of payment of the bills of the work done for electrical portion of the main agreement.
- 5 **The rate will be as per the schedule enclosed.**
- 6 The Quantity will be as per actual measurement as received from CPWD to main contractor and the rate will be as per the mutually agreed.
- 7 The payment to associate contractor will be released after the payment to main contractor is made by the CPWD.
- 8 The technical staff required for the associate discipline shall be of associate contractor.
- 9 The guarantee of the execution after the completion of the work shall be responsibility of the associate contractor as required by the CPWD.

- 10 There is Service Tax (GST) liability; work being related to the construction of the Central Govt. Deptt. However, if any liability of the Service Tax (GST) is imposed on the associated contractor then it will be paid by main contractor.
- 11 Either party shall not repudiate the contract in mid way without the consent of each other. Otherwise it will be treated as breach of agreement for any reason whatsoever.
- 12 The main agency shall be solely responsible for deferment & rescheduling of each milestone fixed as per contract documents and in such eventuality, the consequences arising out of the same rests on main agency.
- 13 The main contractor only shall be responsible for getting extension of delay regularized and liability what so ever flowing out shall lies with them. There shall be no direct or indirect impact on associate contractor.
- 14 TDS shall be deducted by the main contractor as per Income Tax law from associated agency. In case liability of tax other than Income Tax (Such as GST, or any other mechanism formed) is levied on associated contractor then the main agency will reimburse it in full to associated agency.
- 15 The associated contractor shall be bound to execute work upto a deviation limit of 30% in quantities of items of work at the agreement rate. Beyond deviation limit the rates will be decided by main & Associated contractor on mutually agreed basis.
- 16 For the items such as extra items, substitute items and new items other than the items of main agreement, if any incorporated in the work, then the main contractor shall pay the full amount so approved to the associate contractor.
- 17 The validity of rates shall be _____ months after finalization & acceptance of MOU by the competent authority.
- 18 In case main contractor delays the payment to associated contractor after the payment is released by department to the main contractor then on receipt of delay in payment from associate contractor the CPWD shall directly make the payment to associated contractor.
- 19 The main contractor shall at their cost provide necessary requisite arrangement for storage of material.
- 20 Sand & cement used in the electrical work shall be provide by main contractor.
- 21 Security Deposit as deducted by the CPWD will be reimbursed by main contractor to associate contractor. However associated contractor will deposit 2½% of Agreement amount of Rs. _____ in shape of FDR towards S/D to be retained by main contractor which will refunded to associated contractor after completion of electrical work.
- 22 The Income tax, Commercial tax and labour cess tax deducted by the CPWD from the bills of water proofing work shall be reimbursed by the main contractor in favour of the associated contractor accordingly.

In witness whereof we have put our hand seal on date _____.

Enclose :- Schedule of rates.

Signature
(Associate Contractor)
Address : _____

Signature
(Major Contractor)
Address : _____

SPECIAL CONDITIONS (CIVIL)

1.0 General

- 1.1 Except for the items, for which Particular Specifications are given or where it is specifically mentioned otherwise in the description of the items in the schedule of quantities, the work shall generally be carried out in accordance with the “**CPWD specifications 2019 Vol. I & II**” with upto date correction slips, additional / Particular Specifications, Architectural / structural drawings and as per instructions of Engineer-in-Charge.

The several documents forming the tender are to be taken as mutually complementary to one another. Detailed drawings shall be followed in preference to small scale drawings and figured dimensions in preference to scaled dimensions.

Should there be any difference or discrepancy between the description of items as given in the schedule of quantities, particular specifications for individual items of work (including special conditions) and I.S. Codes etc., the following order of preference shall be observed:

- (i) Description of Schedule of Quantities
- (ii) Particular Specifications and Special Conditions, if any.
- (iii) Drawings
- (iv) CPWD Specifications.
- (v) Indian Standard Specifications of B.I.S.
- (vi) Manufacturers' specifications & as decided by Engineer-in-charge.

“In the event of any variation/ discrepancy in the drawings, specifications and tender documents etc. the decision of the Engineer-in-charge shall be final binding and conclusive on the contractor and in the case the contractor have any doubt and the same should be got clarified immediately from the Engineer-in-charge and no claim of the contractor shall be entertained thereafter. Moreover, the agency is not allowed to take benefit out of any clerical/ grammatical mistake in the standard clauses/Schedule of Quantities/Specifications etc. being used in the agreement”.

The works to be governed by this contract shall cover delivery and transportation upto destination, safe custody at site, insurance, erection, testing and commissioning of the entire works.

The works to be undertaken by the contractor shall interalia include the following:

- i. Preparation of detailed SHOP drawings and AS BUILT drawings wherever applicable.
- ii. Obtaining of Statutory permissions where-ever applicable and required.
- iii. Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
- iv. Warranty obligation for the equipments and/or fittings/fixtures supplied by the contractor.

Contractor shall provide all the shop drawings or layout drawings for all the coordinated services before starting any work or placing any order for any of the services etc. These shop drawings/layout drawings shall be got approved from Engineer-in-charge before implementation and this shall be binding on the contractor. The contractor shall submit material submittals along with material sample for approval of Engineer-in-charge prior to delivery of material at site.

- 1.2 Any reference made to any Indian Standard Specifications, shall imply to the latest version of that standard, including such revisions / amendments as issued by the Bureau of Indian Standards upto last date of receipt of tenders. The Contractor shall keep at his own cost all such publications including relevant Indian Standard Codes applicable to the work at site.
- 1.3 The work shall be executed and measured as per metric dimensions given in the Schedule of Quantities, drawings etc. (FPS units wherever indicated are for guidelines only).
- 1.4 In the item of providing and fixing precast reinforced cement concrete in shelves the cost of cutting chases and making good the same shall be inclusive in the item and nothing extra shall be paid on this account.
- 1.5 In the item of finishing walls with water proofing cement/ exterior paint, only the plain/flat area shall be measured for payment and nothing extra shall be paid on account of pointed wall surface.
- 1.6 All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested before covering.

- 1.7 Samples including brand / quality of materials and fittings to be used in the work shall be got approved from the Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work.
- 1.8 Equipments like concrete pumps excavators/Transit mixers etc. shall be allowed to be moved away from the site when, in written opinion of Engineer-in-Charge, the same are no longer required at site of work.
- 1.9 The contractor, his authorized representative, workmen etc. shall strictly observe orders pertaining to fire precautions prevailing in the area.
- 1.10 Contractor(s) shall study the soil investigation report for the site, available in the office of the Engineer-in-Charge and satisfy himself about complete characteristics of soil and other parameters at site. However, no claim on the alleged inadequacy or incorrectness of the soil data supplied by the department shall be entertained.
- 1.11 The tenderer shall see the approaches to the site. In case any approach from main road is required at site or existing approach is to be improved and maintained for cartage of materials by the contractor, the same shall be provided, improved and maintained by the contractor at his own cost.
- 1.12 Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at his own cost.
- 1.13 The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing barriers. He shall be responsible for all damages and accidents caused to work due to negligence on his part. No hindrances shall be caused to traffic, during the execution of the work.
- 1.14 The contractor shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, compound wall, services etc. are to be constructed.
- 1.15 The contractor shall provide at his own cost suitable weighing, surveying and leveling and measuring arrangements as may be necessary at site for checking. All such equipments shall be got calibrated in advance from laboratory, approved by the Engineer-in-Charge. Nothing extra shall be payable on this account.
- 1.16 Contractor shall provide permanent bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural and plumbing drawings.
- 1.17 Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to approved manufacturers specifications where CPWD Specifications are not applicable. The contractor should get the materials (fixtures/fittings) tested from approved labs wherever required at his own cost.
- 1.18 The work shall be carried out in accordance with the Architectural drawings and Structural drawings, to be issued from time to time, by the Engineer-in-Charge. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work, nomenclature of items, specifications etc. and satisfy himself that the information available there from is complete and unambiguous. The figures & the written dimensions of the drawing shall supersede the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Engineer-in-Charge for immediate decision before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and/ or incomplete information and no claim, whatsoever shall be entertained on this account.
- 1.19 The contractor should submit the shop drawing of staging and shuttering for approval of Engineer-in-Charge before actually commencing the execution of work under the item. Nothing extra shall be payable on this account.
- 1.20 Other agencies may also simultaneously execute and install the works and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings, trenches etc. as may be required for such related works (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be available as specified elsewhere in the contract) and the contractor shall fix

the same at the time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

- 1.21 All material shall only be brought at site as per program finalized with the Engineer-in-Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.
- 1.22 The contractor shall procure the required materials in advance so that there is sufficient time for testing of the materials and approval of the same before use in the work.
- 1.23 Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services. In case temporary supporting of such services is required to facilitate the work, the same shall be done by the contractor at no extra cost.

In case the existing services are to be shifted permanently, then before dismantling the existing services, alternate/diversion of service lines has to be laid by the contractor so that there is no interruption in use of existing services. The contractor has to plan the alternate suitable route for diversion/shifting of service lines and get the same approved from the Engineer-in-Charge before starting shifting of services. Nothing extra shall be paid except the payment of dismantling and laying of new service lines as per conditions of contract.
- 1.24 The contractor shall be responsible for the watch and ward / guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the client department. No extra payment shall be made on this account.
- 1.25 The contractor shall be fully responsible for the safe custody of materials brought by him/ issued to him even though the materials may be under double lock key system.
- 1.26 For construction works which are likely to generate malba / rubbish, contractor shall dispose of malba, rubbish & other unserviceable materials and wastes at his own cost to the notified specified dumping ground and under no circumstances these shall be stacked / dumped even temporarily, outside the construction premises.
- 1.27 The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, preparatory works, working during monsoon, working at all depths, height, lead, lift and location etc. until / unless specified otherwise and any other incidental works required to complete this work. Nothing extra shall be payable on this account.
- 1.28 For works below ground level the contractor shall keep that area free from water. If dewatering or bailing out of water is required, the contractor shall do it and nothing extra shall be paid except otherwise provided in the items of schedule of quantities.
- 1.29 Results of sub-surface investigations conducted at site are indicated in extracts of the report attached. This information about the soil and sub-soil water conditions is being made available to the Contractor, in good faith, for guidance only and the Contractor is advised to obtain details directly as may be considered necessary by him before quoting rates in the tender. No claim whatsoever on account of any discrepancy between the sub-surface strata conditions that may be actually encountered at the time of execution of the work and those given in these tender documents, in-accuracy or interpretation thereof shall be entertained from the Contractor under any circumstances. The ground water table is a variable condition and the information given in the report is only indicative and it may vary from time to time.
- 1.30 Any legal or financial implications resulting out of disposal of earth shall be sole responsibility of the contractor. Nothing extra over the schedule shall be paid on this account.
- 1.31 The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by Collector / MC etc. and any other statutory bodies shall be

adhered to, by the contractor, during the execution of work. The Contractor shall also adhere to all traffic restrictions notified by the local authorities. It is clarified that the extra sewerage charges (one time charges for commencement of work) required to be paid to the Municipal Corporation / other statutory bodies shall be paid by the department and need not be considered by the contractor. The water charges (for municipal water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for the drinking purposes from the municipal authorities or any other statutory body, the consequent sewerage charges shall be borne by the contractor. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges) payable to such authorities for carrying out the work, shall be borne by the Contractor. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the Department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts. The fee payable to statutory authorities for obtaining the various permanent service connections and Occupancy Certificate for the building shall be borne by the Department.

- 1.32 **Royalty** at the prevalent rates shall be paid by the Contractor as per the terms of supply between them on all materials such as boulders, metals, sand and bajri etc. collected by him for the execution of the work, directly to the revenue authority of the state government concerned. Nothing extra shall be payable on this account.
- 1.33 No foreign exchange shall be made available by the Department for importing (purchase) of equipment, plants, machinery, materials of any kind or any other items required to be carried out during execution of the work. No delay and no claim of any kind shall be entertained from the Contractor, on account of variation in the foreign exchange rate.
- 1.34 The Contractor shall conduct his work so as not to interfere with or hinder the progress of the work being performed by other Contractors or by the Engineer-in-Charge. As far as possible, he shall arrange his work and place, so as not to interfere with the operations of other Contractors or shall arrange his work with that of the others, in an acceptable and coordinated manner and shall perform it in proper sequence.
- 1.35 The Contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the Department from any and all damages and claims that may arise on any account. The Contractor shall indemnify the Department against all claims in respect of patent rights, royalties, design, trademarks of name or other protected rights, damages to adjacent buildings, roads or members of public, in course of execution of work or any other reasons whatsoever, and shall himself defend all actions arising from such claims and shall indemnify the Department in all respect from such actions, costs and expenses. Nothing extra shall be payable on this account.
- 1.36 The Contractor shall make all necessary arrangements for protecting from rains, the work already executed and for carrying out the further work, during monsoon including providing and fixing temporary shelters, protections etc. Nothing extra shall be payable on this account. Also, no claims for hindrance shall be entertained on this account.
- 1.37 In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained notwithstanding any other provisions elsewhere in the contract agreement. Also, the Contractor shall make good, at his own cost, the damages caused, if any.
- 1.38 The Contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupants of the adjacent properties and to the public in general. The Contractor shall take all care, as not to damage any other adjacent property or other services running adjacent to the plot. If any damage is done, the same shall be made good by the Contractor at his own cost and to the entire satisfaction of the Engineer-in-Charge. The Contractor shall use such methodology and equipment's for execution of the work, so as to cause minimum environmental pollution of any kind during construction, to have minimum construction time and minimum inconvenience to road users and to the occupants of the buildings on the adjacent plot and public in general, etc. He shall make good at his own cost and to the entire satisfaction of the Engineer in Charge any damage to roads, paths, cross drainage works or public or private property whatsoever caused, due to the execution of the work or by traffic brought thereon, by the Contractor. Further, the Contractor shall take all precautions to prevent any pollution of streams and waterways. All waste or superfluous materials shall be carted away by the Contractor, entirely to the satisfaction of the Engineer-in-Charge. Utmost care shall be taken to keep

the noise level to the barest minimum so that no disturbance as far as possible is caused to the occupants / users of adjoining buildings. No claim whatsoever on account of site constraints mentioned above or any other site constraints not specifically stated here, shall be entertained from the Contractor. Therefore, the Contractors are advised to visit site and get firsthand information of site constraints. Accordingly, they should quote their tenders. Nothing extra shall be payable on this account.

- 1.39 All ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level, temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates, completion certificates from local bodies etc., protection works, barricading, testing facilities / laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. Before start of the work, the Contractor shall submit to the Engineer-in-Charge, a site / construction yard layout, specifying areas for construction, site office, positioning of machinery, material yard, cement and other storage, steel fabrication yard, site laboratory, water tank, etc.
- 1.40 The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc. under various labour laws and other regulations applicable to the works, at his site office.
- 1.41 No tools and plants including any special T&P etc. shall be supplied by the Department and the Contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.
The Contractor shall be allowed to use the facilities if available at site & arranged by the associate-Contractors and other agencies working at site of the work. The Contractor shall be
 - (i) Allow to use of scaffolding already erected, toilets, sheds etc.
 - (ii) Properly co-ordinate their work with the work of other Contractors.
 - (iii) Provide control lines and benchmarks to his associate-Contractors and the other Contractors.
 - (iv) Provide electricity and water at mutually agreed rates.
 - (v) Provide hoist and crane facilities for lifting material at mutually agreed rates.
 - (vi) Co-ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.
 - (vii) Adjust work schedule and site activities in consultation with the Engineer-in-Charge and other Contractors to suit the overall schedule completion.
 - (viii) Resolve the disputes with other Contractor amicably and the Engineer-in-Charge shall not be made intermediary or arbitrator. The contractor shall indemnify the Department against any claim(s) arising out of such disputes.
- 1.42 On completion of work, the contractor shall submit at his own cost four prints of "as built" drawings of the completed work to the Engineer-in-Charge. These drawings shall have the following information.
 - a) Run off of all piping and their diameters including soil, waste pipes and vertical stacks.
 - b) Ground and invert level of all drainage pipes together with locations of all manholes and connections, upto out fall.
 - c) Run off of all water supply lines with diameters, location of control valves, access panels etc.In case the contractor fails to supply "as built drawing" aforesaid within 30 days of the date of completion, then the recovery @ Rs. 10,000/- for each such set of drawings shall be made from the contractor's final bill.
- 1.43 The contractor shall have to arrange water of desirable quality for the construction purpose for which he may have to install RO/ Water Softening plant at site or might have to bring/ purchase water from outside as per decision of Engineer-in-charge. Nothing extra shall be paid on this account.
- 2.0** Unless otherwise specified in the schedule of quantities or CPWD specifications, the rates for respective items shall be all inclusive and apply to the following: -
 - (i) All lifts & all heights, floors including terrace, leads and depths.
 - (ii) All labour, material, tools and plants and other inputs involved in the execution of the item.
 - (iii) Any of the conditions and specifications mentioned in the tender documents.
 - (iv) Providing sunk flooring in bath-rooms, kitchen, etc.
 - (v) Any legal or financial implications resulting out of disposal of earth, if any.
 - (vi) Payment of Royalty at the prevailing rates, if any, on the boulders, metal, shingle, sand and bajri etc. or any other material collected by him for the work direct to revenue authorities.

- (vii) Performance test of the entire installation(s) before the work is finally accepted.
- (viii) Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been built in the items.
- (ix) All incidental charges for cartage, storage and safe custody of materials brought to site.
- (x) Pumping/ bailing out surface water/rain water/ sub soil water, if necessary for any reason.

3.0 QUALITY ASSURANCE/ TESTING OF MATERIALS

3.1 GENERAL:-

- 3.1.1 All incidental expenditure on security, construction of cement godown, access roads, arrangement of water, electricity etc. to be incurred by the agency for arranging, installing and operation of Batch Mix Plant shall be deemed to have been included in his quoted rates and no claim whatsoever will be tenable on this account.
- 3.1.2 With each Running Bill, the details of test carried out shall be submitted by the contractor as per Performa **as per NIT of Part-B.**
- 3.1.3 Samples of materials required for testing shall be provided free of charge by the contractor. The tests are to be carried out in the approved laboratories for testing as approved by ADG/SDG. All expenditure to be incurred for testing of samples e.g. taking samples, packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor.
- a) All the test in field lab setup at construction site shall be carried out by the Engineering Staff deployed by the contractor which shall be 100% witnessed by JE & 50% of tests shall be witnessed by AE-in-charge. At least 10% of the tests are to be witnessed by the EE/ SE division office.
 - b) All the entries in the registers will be made by the designated Engineering staff of the contractor and same should be regularly reviewed by JE/AE/EE/SE division office.
 - c) Contractor shall be responsible for safe custody of all the test registers.
 - d) Submission of copy of all Test Registers, Material at Site Register along with each alternate Running Account Bill and Final Bill shall be mandatory. These registers should be duly checked by AE(P)/EE in Division Office & receipts of registers should also be acknowledged by Accounts Officer by signing the copies and register to confirm receipt in division office
 - e) Extensive testing of the materials used for construction is a pre-requisite for attaining high quality of the work. This shall also require specialized tests, physical, chemical, ultrasonic, x-ray and various other types of tests which cannot possibly be carried out in a site laboratory. These tests also require specialized personnel who regularly deal in such testing. Therefore, the need arises for carrying out the tests in outside laboratories.
 These laboratories are in the Government / Semi Government or Private sector. Labs of all Government institutes, PSUs, IITs, NITs, Government Engineering Colleges, Central and State Government research Centres, Centrally and State Government funded laboratories comes under Government labs and shall be approved by the SDG/ADG of the region after due verification / consultation with the Labs.
 The SDGs/ADGs will approve the NABL / BIS labs or equivalent private labs based on their suitability in their jurisdiction. For this purpose, labs accredited by NABL / approved by BIS or any other accreditation body which operates in accordance with ISO/IEC 17011 and accredits labs as per ISO/IEC-17025 for testing and calibration scopes are eligible.
- 3.1.4 **Ultrasonic pulse velocity/load testing** or special testing is to be done for concrete as per the CPWD guidelines, the cost of the same shall be borne by the contractor.
- 3.1.5 In case there is any discrepancy in frequency of testing as given in list of mandatory tests and that in individual sub-heads of work as per CPWD Specifications higher of the two frequencies of testing shall be followed and nothing extra shall be payable on this account.
- 3.1.6 Special attention shall be paid towards line and level of internal and external plastering, exposed smooth surface of RCC members by providing fresh shuttering plates, sealing shuttering joints, accurate joinery work in wooden doors and windows, thinnest joints in stone/ tiling / cladding work, non-hollowness in floor and dado tiles work, protection of scratches over flooring by impounding layer of plaster of Paris, water tight pipe linings, absence of hollow vertical joints in brick masonry, proper compaction of filled up earth etc. to achieve an Institution of International standards and up keeping of quality assurance shall be of paramount importance, as such.

3.2 FIELD LABORATORY

The contractor has to establish field laboratory at site including all necessary equipment's and skilled manpower for the **Field Tests as per NIT of Part-B** at this own cost to have proper quality control. For performing the above tests, the **Field Testing Equipment's and Instruments as per NIT of Part-B** are to be arranged and maintained by the contractor.

- 3.2.1 The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material / work beyond set-out tolerance limit shall be summarily rejected by the Engineer-in-Charge & contractor shall be bound to replace / remove such sub-standard / defective work immediately.
- 3.2.2 The list of Laboratory/ Field equipment referred above are to be arranged and maintained by the contractor at the site of work. In case the equipment required for any test is not available at site, the department shall get the test conducted from the third party. However, in that event, besides providing free materials of sample, the cost of taking of sample, packing, transportation, testing charges etc. shall be borne by the contractor irrespective of the results.
- 3.2.3 The contractor shall establish field laboratory including additional room (of minimum area of 20 sqm. each) for preserving samples of material till the completion of whole work. Nothing extra shall be paid for establishing field laboratory.

3.3 SAMPLE OF MATERIALS:-

- 3.3.1 BIS/ISI Marked materials and fittings shall be used with the approval of Engineer-in-Charge. Wherever BIS/ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant Specifications or IS codes for the approval of Engineer-in-Charge.

All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-Charge which shall be preserved till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-in-Charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per **List of Preferred Makes as per NIT of Part-B** for approval of Engineer-in-Charge.

- 3.3.2 To avoid delay, contractor should submit samples as stated above well in advance so as to give timely orders for procurement. If any material, even though approved by Engineer-in-Charge is found defective or not conforming to specifications shall be replaced / removed by the contractor at his own risk & cost.
- 3.3.3 BIS marked materials except otherwise specified shall also be subjected to quality test besides testing of other materials as per the specifications described for the item/material. Wherever BIS marked materials are brought to the site of work, the contractor shall, furnish manufacturer's test certificate or test certificate from approved testing laboratory to establish that the material procured by the contractor for incorporation in the work satisfies the provisions of specifications relevant to the material and / or the work done.

BIS marked items (except cement & steel for which separate provisions have been made in para 4.0) required on the work shall be got tested, for only important tests, which govern the quality of the product, as decided by the Engineer-in-Charge. The frequency of such tests (except the mandatory test) shall be 5% of the frequency as specified in BIS. For mandatory test, frequency shall be as specified in the CPWD Specifications.

- 3.3.4 For certain items, if frequency of tests is neither mentioned in the CPWD Specifications & BIS, then tests shall be carried out as per decision of Engineer-in-Charge.

4.0 CEMENT & STEEL REINFORCEMENT (IF NOT STIPULATED TO BE SUPPLIED BY THE CONTRACTOR).

- 4.1 Contractor has to produce manufacturers test certificate and challan for each lot of Cement & Steel Reinforcement procured at site.

4.2 CEMENT:-

- 4.2.1 The contractor shall procure Portland Pozzolona Cement conforming to IS: 1489 (Part-1) as required in the work, from reputed manufacturers of cement as per attached list of preferred make or from any other reputed cement Manufacturer having a production capacity not less than one million tonnes per annum as approved by **SDG Chandigarh/Chief Engineer-Jaipur** for that zone.
- 4.2.2 Samples of cement arranged by the contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of relevant BIS Codes. The cement for such testing purpose shall be supplied by the contractor free of charge. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS Codes, the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so. The cost of tests shall be borne by the contractor.
- 4.2.3 Cement shall be brought at site in bulk supply of approximately 100 tonnes or as decided by the Engineer-in-Charge.
- 4.2.4 Cement godowns having sufficient capacity as decided by the Engineer-in-Charge shall be constructed by the contractor at site of work for which no extra payment shall be made. The contractor shall be responsible for the watch and ward and safety of the cement go-downs. The contractor shall facilitate the inspection of the cement go-downs by the Engineer-in-Charge at any time.
- 4.2.5 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in **Clause-38** of the contract and shall be governed by the conditions laid therein.
- 4.2.6 If the quantity of cement actually used in the work is found to be more than the theoretical quantity of cement including authorized variation, nothing extra shall be payable to the contractor on this account. In the event of it being discovered that after the completion of the work, the quantity of cement used is less than the quantity ascertained as herein before provided (allowing variation on the minus side as stipulated in **Clause-38**), the cost of quantity of cement not so used shall be recovered from the contractor as specified in schedule. Decision of the Engineer-in-Charge in regard to theoretical quantity of cement which should have been actually used as per the schedule and recovered at the rate specified, shall be final and binding on the contractor.
- For non-scheduled items, the decision of the **Chief Engineer-Jaipur, CPWD, Jaipur** regarding theoretical quantity of the cement, which should have been actually used, shall be final and binding on the contractor.
- 4.2.7 Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-Charge.
- 4.2.8 In case the contractor brings surplus quantity of cement the same shall be removed from the site after completion of work by the contractor at his own cost after approval of the Engineer-in-Charge.
- 4.2.9 Cement, which is not used within 90 days from its date of manufacture, shall be retested at approved laboratory. Until the results of such tests are found satisfactory, it shall not be used on the work.
- 4.2.10 The cement shall be brought at site in bulk supply of approximately 50 tonnes or as decided by the Engineer- In- Charge. The cement godown of the capacity to store a minimum of 2000 bags of cement or as decided by NIT approving authority in case less than 100MT cement is required for the work, shall be constructed by the contractor at site of work for which no extra payment shall be made. For small maintenance works, NIT approving authority shall decide the requirement of the storage/godown.
- 4.2.11 The contractor shall be responsible for the watch and ward and safety of the cement godown. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge at any time.
- 4.2.12 The cement shall be got tested by the Engineer-In-Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The cost of tests shall be borne by the contractor.

- 4.2.13 The theoretical consumption of cement shall be worked out as per procedure prescribed in **clause-38** of the contract and shall be governed by conditions laid therein. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made after ensuring structural soundness and stability on the basis of testing. In case of excess consumption, no adjustment needs to be made.
- 4.2.14 The cement brought to the site and the cement remaining unused after completion of the work shall not be removed from site without the written permission of the Engineer-in-charge.
- 4.2.15 The damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-In-Charge. If he does not do so within 3 days of receipt of such notice, the Engineer-In-Charge shall get it removed at the cost of the contractor.
- 4.2.16 Chief Engineers/CPMs/ADGs/SDGs may change the brand of Cement depending upon availability in local market but conforming to grade mentioned in the NIT and only with ISI mark, if warranted. The name of manufacturers should be finalized after taking into consideration the availability and cost factor. Conditions for cement proposed to be procured in silos may be approved by the NIT approving authority alongwith mode of storage, measurement, testing and grade requirements.

4.3 STEEL REINFORCEMENT: -

- 4.3.1 Only ISI marked TMT Bars of various grades shall be procured from steel manufacturer.
1. The Special Director General, CPWD Shall approve the steel manufacturers subject to the guidelines for eligibility criteria and other technical parameters given below.

Credentials for eligibility criteria & other technical parameters for steel manufacturers:

The manufacturer should meet the following eligibility criteria:

- a) The steel manufacturer should have following documentary evidence:
 - i) Certificate of incorporation.
 - ii) Memorandum of articles of Association.
 - iii) Credit rating of the company from CARE/CRISIL/ICRA (the grading should not be C/D grade for minimum last 3 years).
 - b) The Steel manufacturer must have following licenses and certificates :
 - i) ISI Certificate for billets (IS 2830 : 2012)
 - ii) ISI Certificate for TMT Bars (IS 1786 : 2008 (Amendment -1 November 2012))
 - c) The Steel manufacturer should also preferably have the following licenses :
 - i) ISO 9001 : 2015
 - ii) ISO 14001 : 2015
 - iii) OHSAS 18001 :2007
 - d) The steel manufacturer should be using iron ore as the basic raw material. The entire gamut of iron and steel production is owned by the same company or its subsidiary company(ies) and the iron making capacity is sufficiently matching the steel making capacity, adopting any of the refining technologies for manufacturing steel & TMT Bars as given under are eligible :
 - i) BF-BOF route
 - ii) COREX- BOF Route
 - iii) DRI-EAF Route (Each Electric Arc Furnace should be 100 MT or more)
 - e) Billets produced must be ISI marked (IS 2830:2012)
 - f) The TMT bars produced must be ISI marked (IS 1786:2008)
 - g) The steel manufacturer should have the following in house testing facilities (NABL Accredited):
 - i) Computerized Universal Testing Machine
 - ii) Spectrometer
 - iii) Bend Re-bend facility as per IS: 1786:2008 (Amendment-1 November 2012).
 - iv) Raw material laboratory: Arrangement for testing carbon, Sulphur & Phosphorous etc.
 - v) Other testing facilities as specified in IS: 1786:2008 & IS: 2830:2012.
- 4.3.2 For reinforced cement concrete or pre-stressed concrete works, the reinforcement bars shall consist of the following grade conforming to IS 1786: 2008 (Indian Standard Specification for high strength deformed steel bars and wires for concrete reinforcement): Fe 500D/ Fe 550D.

- 4.3.3 The contractor shall obtain manufacturer's certificate stating the process of manufacture, chemical composition and test sheet giving result of each mechanical test applicable to the material purchased and submit it to the Engineer-in-Charge. Each test certificate shall indicate the number of the cast to which it applies, corresponding to the number or identification mark to be found on the material.
- 4.3.4 The Engineer-in-Charge shall get each consignment tested for both chemical composition and physical properties (including bend and re-bend test) as specified in IS: 1786 from NABL accredited laboratory of any Government laboratory.
- 4.3.5 Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes.
- 4.3.6 In case the test results indicate that the steel arranged by the contractor does not conform to the specifications the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week time on written orders from the Engineer-in-Charge to do so.
- 4.3.7 The steel reinforcement bars shall be brought to the site in bulk supply of 10 tonnes or more, or as decided by the Engineer-in-charge.
- 4.3.8 The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.
- 4.3.9 For checking nominal mass, tensile strength, bend test, re-bend test one sample for each, specimens of sufficient length shall be cut from each size of the bar at random, and at frequency not less than that specified below:

Size of bar	For consignment upto or below 100 tonnes	For consignment above 100 tonnes
Under 10 mm dia bars	One sample foreach 25 tonnes or part thereof	One sample for each 40 tonnes or part there of
10 mm to 16 mm dia bars	One sample for each 35 tonnes or part there of	One sample for each 45 tonnes or part there of
Over 16 mm dia bars	One sample for each 45 tonnes or part there of	One sample for each 50 tonnes or part there of

- 4.3.10 The contractor shall supply free of charge the steel required for testing including its transportation to testing laboratories. The cost of tests shall be borne by the contractor.
- 4.3.11 The theoretical consumption of steel shall be worked out as per procedure prescribed in **clause-38** of the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment need to be made.
- 4.3.12 The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

Annexure-I

Sl.	Item	Check point	Remarks
1.	Steel Producer having manufacturing facilities at Plant.	a) Factory address and Registration no.	
		b) Certificate of manufacturing process.	
		c) Refining process of steel Producer.	
		c.1 BF-BOF route	
		c.2 Corex- BOF route	
		c.3 DRI – EAF route	
		With documentary evidence either for BOF or EAF	
		d. Steel plant having infrastructure for producing sponge iron, billete and TMT Rebars	
		e. Production and Quality Flow Chart	
		f. Plant Evaluation and Process Verification	
		g. List of Plant & Machinery	

2.	Established	Document verification for: a. Govt. / PSU Approvals 2. Established b. Supply orders of TMT Re-bars in Govt. Projects (Minimum-5 years) c. Verification of direct supply orders to any State/Central Govt. Department d. User Certificate issued by any Govt. Department directly	
3.	Indigenous	Documentary evidence like; a. Certificate of Incorporation b. Memorandum of Articles of Association c. Credit rating of the company from CARE/CRISIL/ICRA should not be C/D grade (minimum last 3 year) a. Test Results from Govt./NABL accredited laboratories b. In-house testing facility for physical/Chemical tests (NABL accredited)	
4.	Reliable	d. Calibration Certificates e. List of Lab Equipments: e.1 Spectrometer e.2 Computerized UTM	
5.	Use of Iron-Ore/Processes Iron ore as basic raw materials	Verification of Iron-Ore/ Process iron ore invoices	
6.	In-house rolling facility	Plant verification to identify in-house rolling facilities, production of liquid steel & crude steel	
7.	Licenses & Certificates	a. ISO 9001:2008 Certification b. ISO 14001:2004 Certification c. OHSAS18001:2007 Certification d. IS 1786:2008 (TMT Re-bars) e. IS 2830:1992 (Billets)	
8.	Product Range	TMT Re-bars FE 415/415D/500/500D/550/550D CRS(Corrosion Resistant) & EQR (Earthquake Resistant) TMT Re-bars Size 8 to 36 mm dia	

Note:-

DRI - EAF-> Direct Reduce Iron - Electric ARC Furnace
BF- BOF-> Blast Furnace - Basic Oxygen Furnace
COREX-BOF->COREX Furnace - Basic Oxygen Furnace

- 4.3.13 The contractor shall submit original vouchers from the manufacturer for the total quantity of steel supplied under each consignment to be incorporated in the work. All consignment received at the work site shall be inspected by the Site staff along with the relevant documents before acceptance. The contractor shall obtain Original Vouchers and Test Certificates and furnish the same to the Engineer-in-Charge in respect of all the lots of steel brought by him from approved supplier to the site of work. The original vouchers and test certificates shall be defaced by the Site staff and kept on record in the site office.
- 4.3.14 Reinforcement including authorized spacer bars and lapages shall be measured in length of different diameters as actually (not more than as specified in the drawings) used in the work nearest to a centimeter. Wastage and unauthorized overlaps shall not be measured.
- 4.3.15 The standard sectional weights referred to as in Table 5.4 in para 5.3.4 in CPWD Specifications will be considered for conversion of length of various sizes of M.S. Bars, Steel Bars and T.M.T. bars into Standard Weight.
- 4.3.16 Records of actual Sectional weights shall also be kept dia-wise and lot-wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The

decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as Derived Actual Weight. However, for the stipulated issue of steel reinforcement up to and including 10mm diameter bars, the actual weight of steel issued shall be modified to take into account the variation between the actual and the standard coefficients and the contractors' accounts will be debited by the cost of modified quantity.

- 4.3.17 (a) If the Derived Weight as in sub-para (4.3.13) above is less than the Standard Weight as in Sub-para (4.3.12) above then the Derived Actual Weight shall be taken for payment provided, it is within the following tolerances specified in IS1786-2008, otherwise whole lot will be rejected.

Tolerances on Nominal Mass

Nominal Size in mm	Tolerance on Nominal mass Percent		
	Batch	Individual sample*	Individual sample for coil**
a) Upto and including 10	± 7	-8	± 8
b) Over 10 upto and Including 16	± 5	-6	± 6
c) Over 16	± 3	-4	± 4

* For individual sample plus tolerance is not specified.

**For coils batch tolerance is not specified.

(b) If the Derived Actual Weight is found more than the Standard Weight, the Standard Weight as per in sub-para (4.3.13) above shall be taken for payment. In such case nothing extra shall be paid for the difference between the Derived Actual Weight and the Standard Weight.

5.0 SECURITY

- 5.1 The contractor shall take all steps necessary that all persons employed on any work in connection with the contract have notice that the Indian Official Secrets Act 1923 applies to them & will continue so to apply even after the execution of such works under the contract.
- 5.2 The contract is confidential and must be strictly confined to the contractor's own use (except so far as confidential disclosure to sub-contractors or suppliers as necessary) and to the purpose of the contract.
- 5.3 All documents, copies thereof & extracts there from furnished to the contractor shall be returned to the Engineer-in-Charge on the completion of the work / works or the earlier determination of the contract.

6.0 LABOUR AND SECURITY

- 6.1 Contractor should provide his plan for labour huts as per his requirement and get it approved from the Engineer-in-Charge. The contractor will be provided space for labour huts etc. inside the campus but the space requirement and location, as assessed by Engineer-in-Charge shall be final and binding.
- 6.2 Contractor has to follow the security requirement of the campus and obtain necessary entry passes for the labour and vehicles and follow security checks at entry / exit gates, restriction on movement of vehicle, restricted timings of working etc. The Department however shall assist the contractor in obtaining such passes for movement of vehicles and labour. No claim whatsoever shall be entertained on account of delay in entry of vehicles and labour including restrictions in working hours, if there is any.
- 6.3 The contractor shall employ only Indian Nationals after verifying their antecedents and loyalty. The contractor shall, on demand submit list of his agents, employees and work people concerned & shall satisfy as to the bonafides of such people.
- 6.4 The contractor & his work people shall observe all relevant rules regarding security promulgated in which work is to be carried out by the Controlling Administrative Authority of the campus/area (hereinafter referred to as "Administrator").

- 6.5 The contractor, his representative, workman shall be allowed to enter through specified gates & timing as laid down by the controlling authority. They shall be issued an identity card or an individual pass in accordance with the standing rules & regulations & they should possess the same while working. The contractor shall be responsible for the conduct & actions of his workmen, agents / representatives.
- 6.6 Normally contractor shall be allowed to carryout work between 7 AM to 6 PM. However, he may also be allowed to carry out the work beyond 6 PM & upto 7 AM if the site conditions / circumstances so demand with prior written permission from the "Administrator". However, if the work is carried out in more than one shift or at night, no claim on this account shall be entertained.
- 6.7 Normally contractor's material / vehicles etc. shall be allowed to move in / go-out between 7 AM to 7 PM only & no movement of material / vehicles out of site of work shall be allowed during night hours unless specific permission is obtained from the "Administrator".
- 6.8 **In case if a separate entry has been allowed, the contractor has to make all arrangement for making a separate entry gate and barricading of the working area to segregate/separate the same from other areas. All these have to be done by the contractor at his own cost including safeguarding any untoward incident in the restricted area due to separate entry gate and barricading arranged by the contractor. No extra amount on this account shall be payable by the department.**

7.0 TRANSPORTATION AND OFFICE INFRASTRUCTURE:

- 7.1 In order to complete the work within the scheduled time if the contractor shall be required to do the work in more than one shift and accepted by the department the contractor will provide vehicular facilities to the CPWD site staff to reach the site and their residence at his own cost for their services required beyond the normal office hours. In case the contractor fails to provide the facilities Engineer-in-Charge shall be at liberty to make the arrangement themselves and deduct the respective cost from the contractor's bills.
- 7.2 For Quality Control Measures, Preparation of Bills and Monitoring the Quality, the contractor shall provide (min. two number) Computer having Intel core i5 3rd generation processor, Latest MS-Windows, A-3 Colored Inkjet & A-4 LaserJet Printers, Scanners, UPS etc. with required number of data entry operators(two or more) in the site office of Engineer-in-Charge.
- 7.3 The contractor shall make arrangement for Helmets and leather shoes (meant of construction work at sites) for all field staff of the department during the entire period of construction for safety reasons. One helmet and two pairs of shoes per staff member (maximum ten members) of the departments per year shall be arranged by the contractor.
- 7.4 The contractor shall establish fully furnished site office having two rooms for field staff (1 Nos. AEs and 1 Nos. JEs) with toilet facility. The electricity and water charges shall be paid by the agency.

It is clarified that nothing extra shall be payable for transportation and office infrastructure. The site office & conference hall shall be removed after the work is completed by the contractor. The office furniture for field staff shall be arranged by CPWD.

8.0 DOCUMENTATION

The Contractor shall render all help and assistance in documenting the total sequences of this project by way of photography, slides, audio / video recording & other records etc. Nothing extra shall be payable to Contractor on this account. However, cost of photographs, slides, audio / video graph etc. shall be borne by the Department. The original films shall be the property of the Department. No copy shall be prepared without the prior approval of the Engineer- in – Charge.

9.0 PROGRAM CHART: -

- 9.1 The Contractor shall submit a Programme Chart (Time and Progress) for each milestone alongwith performance guarantee and get it approved from the department. The chart shall be prepared in direct relation to the time stated in the contract documents for completion of the items of the work. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-charge and the contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the work. The contractor shall in all cases in which time allowed for

any work exceeds one month (save for special jobs for which a separate program has been agreed upon) complete the work as per milestones given in Schedule 'F'.

- 9.2 The work has to be completed in stages as indicated in the **Table of Milestones under Schedule 'F' as per NIT of Part-B** and the program should be prepared in such a manner to achieve these Milestones as indicated therein or earlier.
- 9.3 The program chart should include the following: -
- a) Descriptive note explaining sequence of various activities.
 - b) Network (PERT / CPM / BAR CHART) prepared on MS project which will indicate resources in financial terms, manpower and specialized equipments for every important stage.
 - c) Program for procurement of materials by the contractor.
 - d) Program of procurement of machinery / equipments having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.
- 9.4 If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved program referred above, the contractor shall produce a revised program showing the modifications to the approved program by additional inputs to ensure completion of the work within the stipulated time.
- 9.5 The submission of revised program or approval by the Engineer-in-Charge of such program or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.

Notwithstanding the fact that the contractor will have to pay to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and/or extra amounts for any other reason

10.0 PROGRESS AND MONITORING OF WORK:

- 10.1 Apart from the above integrated program chart, the contractor shall be required to submit monthly progress report of the work in a computerized form. The progress report shall contain the following, apart from whatever else may be required as specified:
- (i) Construction schedule of the various components of the work through a bar chart for the next three quarters (or as may be specified), showing the milestones, targeted tasks and up to date progress.
 - (ii) Progress chart of the various components of the work that are planned and achieved, for the month as well as cumulative up to the month, with reason for deviations, if any in a tabular format.
 - (iii) Plant and machinery statement, indicating those deployed in the work.
 - (iv) Man-power statement, indicating individually the names of all the staff deployed on the work, along with their designations.
 - (v) Financial statement, indicating the broad details of all the running account payment received up to date, such as gross value of work done, advances taken, recoveries effected, amount withheld, net payments details of cheque payment received etc.
- 10.2 For completing the work in time, the Contractor might be required to work in two or more shifts (including night shifts). No claim whatsoever shall be entertained on this account, not with-standing the fact that the Contractor may have to pay extra amounts for any reason, to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the Contractor with them.
- 10.3 The work should be planned in a systematic manner so that chase cuttings in the walls, ceilings and floors is minimized. Wherever absolutely essential, the chase shall be cut using chase cutting machines. Chases will not be allowed to be cut using hammer / chisel. The electrical boxes should be fixed in walls simultaneously while raising the brick work. The contractor shall ensure proper co-ordination of various disciplines viz. building works, sanitary & water supply & electrical installations etc.
- 10.4 The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others

in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of Engineer-in-charge.

10.5 The Contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the plot so as to achieve early completion. The agency may deploy adequate equipment, machinery and labour as required for the completion of the entire work within the stipulated period specified. Also, ancillary facilities shall be provided commensurate with requirement to complete the entire work within the stipulated period. Nothing extra shall be payable on this account. Adequate number/sets of equipment in working condition, along with adequate stand-by arrangements, shall be deployed during entire construction period. It shall be ensured by the Contractor that all the equipment, Tools & Plants, machineries etc. provided by him are maintained in proper working conditions at all times during the progress of the work and till the completion of the work. Further, all the constructional tools, plants, equipment and machineries provided by the Contractor, on site of work or his work shop for this work, shall be exclusively intended for use in the construction of this work.

10.6 All material shall only be brought at site as per program finalized with the Engineer-in-Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.

11.0 ENGAGING SPECIALISED AGENCIES FOR WORKS: -

11.1 The Contractor shall engage specialized agencies having adequate technical capability and experience of having executed at least one work of similar items of 80% or more magnitude or two works of similar items of value minimum 60% individually for executing the following items of the work and/or any other items of work where specialized firm is required to be engaged as per contract conditions. For determining the required magnitude, the value of the work executed may be suitably enhanced with the prevailing approved cost index.

(i) Water proofing treatment work of all types.

11.2 The Specialized agency for the work shall be got approved from the Engineer-in-Charge well before actual commencement of the item of work. The contractor shall submit the list of specialized agencies except for Internal Electrical Installation, proposed to be engaged by him along with necessary performance certificates, within 30 days from the date of issue of acceptance letter to substantiate technical capability and experience of the agency for prior approval of the Engineer-in-Charge.

11.3 For Internal Electrical Installation work as contained in the Electrical component work, the Electrical Agency to be engaged as an associate electrical contractor for the Internal E.I./External E.I work should be enlisted contractor of CPWD in appropriate class as per the value of the work. The firm will be required to submit the credentials of the associate electrical contractor including their registration documents, electrical contractor license, GST documents apart from submission of the MOU. However, contractor shall submit MOU to Executive Engineer (Elect.) in-charge, signed with eligible Electrical Contractor/Agency along with consent letter of Electrical Agency **within 60 days from the date of start.** It will be obligatory on the part of main contractor to sign the tender documents for all the components.

11.4 If the main contractor fails to associate agency/agencies for execution of minor components of work within prescribed time or furnishes incomplete details or furnishes details of ineligible agencies even after the tenderer is given due opportunity, the entire scope of such component of works shall be withdrawn from the tender and the same shall be got executed by the Engineer-in-Charge at the risk and cost of the main contractor.

11.5 Same milestones shall be applicable for all components of work.

11.6 For the specialized item of door & window fittings, water supply and sanitary installations; the contractor shall engage such vendors/installers as approved by the manufacturers. Provisions mentioned under Sr. No. 11.1 above shall not be applicable for the items mentioned herein above.

~~12.0 SAMPLE ACCOMMODATION:-~~

~~The contractor shall construct one **Sample Room along with toilet in Building** complete in all respects including all Civil works and Electrical fittings/ fixtures, not later than **150 days**. The sample accommodation shall be inspected and approved by the Engineer in Charge. Slight changes with regard to the fixtures/ fittings/ details/ dimensions etc. may occur as per the actual requirement or in order to enhance the functionality of the product or the unit. Thus, the procurement for all the internal fittings/fixtures/ fabricated material and other material etc. shall be done by the contractor only after the approval of the sample quarter. A penalty **@ Rs.5,000/- per week** shall be levied on the contractor in~~

case of their failure to construct the sample accommodation within the stipulated period mentioned above.

13.0 DEFECT LIABILITY:

- 13.1 The contractor's liability during the defect liability period from the final date of completion as per **Clause 17**, shall be limited to rectification of defects including replacement as follows which in the opinion of Engineer-in-Charge are not manmade.

Sl. No.	Description	Defect Liability
(i)	Concrete/ RCC	(a) Rectification of structural / superficial / non-structural cracks. (b) Rectification of dampness / seepage in roof slab / junctions & sunken portion. (c) Rectification of cracks in beam, shade, column.
(ii)	Brick work/ Concrete Block Masonry	(a) Rectification of cracks in panel wall / portion. (b) Cracks / settlement of dwarf walls. (c) Rectification of efflorescence/ leaching.
(iii)	Joinery	(a) Replacement of warped joinery. (b) Cracks in panels, rails / styles etc.
(iv)	Builders Hardware	(a) Repairs / Replacement of loosened / pre-mature failure of fittings. (b) Tightening / Replacement of sag in mosquito proofing.
(v)	Steel & Iron work	(a) Rectification / Replacement of defective part of rolling shutter. (b) Redoing of defective portion in fabrication / welding including painting. (c) Steel windows, grills, gates etc. – defects to be rectified.
(vi)	Roof treatment	(a) Rectification of leakage / seepage of roof slab including covering at junction till guarantee period.
(vii)	Plastering	(a) Rectification of structural / superficial cracks if any. (b) Rectification of protruding / peeling off plaster if any. (c) Rectification of efflorescence
(viii)	Flooring	(a) Rectification of sinking portion of plinth protection including saucer drain. (b) Settlement of foundation & floors, hollow sounding, cracks in tiles/stones.
(ix)	Plumbing / Sanitary fittings	(a) Making good of leakage through soil / waste pipe joints. (b) Replacement of looking mirror if found wavy. (c) Rectification of leakage of overhead tanks. (d) Leakage / seepage of sunken floor, blockage of taps / pipes, non-functioning of cistern.
(x)	Finishing	(a) Making good of defective / dissimilar patches of painting to match with remaining surfaces, peeling of paint.
(xi)	Internal Water Supply	(a) Repairs / Replacement of defective taps / fittings. (b) Repair to leakage of GI water pipe lines including joints. (c) Removal of blockage of GI pipe lines.
(xii)	Roads	(a) Repair of sinked portion of road & potholes, if any
(xiii)	Sewage	(a) Rectification of slope / system if found defective during use. (b) Rectification of major blockage in Sewer lines. (c) Cracks & settlement of sewage lines.
(xiv)	Drains	(a) Repair to Drains. (b) Settlement of Drains
(xv)	External Water Supply	(a) Repairs to installations & fittings.
(xvi)	Roads	(a) Repair of sinking portion of road & potholes, if any.
(xvii)	General	(b) All manufacturing defects of structures / fixtures / fittings / equipments other than listed above including any defects of shrinkage or other faults that appear in the work within twelve Months after a certificate of its completion is given by the Engineer-in-Charge shall be rectified by the contractor.

14.0 SAFETY MEASURES

- 14.1 Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at his own cost.

14.2 Warning / Caution Boards

All temporary warning / caution boards / glow signage display such as “Construction Work in Progress”, “Keep Away”, “No Parking”, Diversions & protective Barricades etc. shall be provided and displayed during day time by the Contractor, wherever required and as directed by the Engineer-in-Charge. These glow signage and red lights shall be suitably illuminated during night also. The Contractor shall be solely responsible for damage and accident caused, if any, due to negligence on his part. Also, he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. This signage shall be dismantled & taken away by the Contractor after the completion of work, only after approval of the Engineer – in – Charge. Nothing extra shall be payable on this account.

14.3 Sign Boards

The Contractor shall provide and erect a display board of size and shape as required and paint over it, in a legible and workman like manner, the details about the salient features of the project, as required by the Engineer-in-Charge. The Contractor shall fabricate and put up a sign board in an approved location and to an approved design indicating name of the project, client / owner, architects, structural consultants, Department etc. besides providing space for names of other Contractors, Associate contractors and specialized agencies. Nothing extra shall be payable on this account.

- 14.3.1 Necessary protective and safety equipments shall be provided to the Site Engineer, Supervisory staff, labour and technical staff of the contractor by the Contractor at his own cost and used at site.

- 14.3.2 No inflammable materials including P.O.L shall be allowed to be stored in huge quantity at site. Only limited quantity of P.O.L may be allowed to be stored at site subject to the compliance of all rules / instructions issued by the relevant authorities and as per the direction of Engineer -in- Charge in this regard. Also all precautions and safety measures shall be taken by the Contractor for safe handling of the P.O.L products stored at site. All consequences on account of unsafe handling of P.O.L shall be borne by the Contractor.

15.0 Special condition for Hardware and Sanitary Wares:

- 15.1 Engineer-in-Charge will take a decision regarding model numbers of equivalent Door/window hardware, sanitary ware & Water Supply accessories at the time of execution, in case the material, from the manufacturer whose model number is mentioned, is not available. However, in case, the equivalent model so approved, is cheaper than the model already mentioned in item/approved makes list, the price adjustment will be made based on the difference in market rate. In case, the rate of subsequently approved model is more, no extra payment will be made on this account.

16.0 Ultrasonic Pulse Velocity Method of Test for RCC

- 16.1 The underlying principle of assessing the quality of concrete is that comparatively higher velocities are obtained when the quality of concrete in terms of density, homogeneity and uniformly is good. The consistency of the concrete as regards its general quality gets established. In case of poorer quality lower velocities are obtained. If there are cracks, voids or flaws inside the concrete which come in the way of transmission of pulse, lower velocities are obtained.
- 16.2 The quality of concrete in terms of uniformity, incidence or absence of internal flaws, cracks and segregation etc. indicative of the level of workmanship employed, can thus be assessed using the guidance given in table below, which have been evolved for characterizing the quality concrete in structure in term of the ultrasonic pulse velocity.

Velocity criterion for Concrete Quality Grading.

Sl. No.	Pulse velocity by Cross Probing (km/sec)	Concrete Quality Grading
1.	Above 4.5 Excellent	Excellent
2.	4.5 to 3.5 Good	Good
3.	3.5 to 3.0 Medium	Medium
4.	Below 3.0 Doubtful	Doubtful

Note: In Case of “doubtful” quality it may be necessary to carry further tests.

- 16.3 Pulse velocity method of test of concrete is to be conducted for CPWD works as a routine test. The acceptance criteria as per the above table will be applicable which is as per IS 13311 (part-1): 1992. From the above “Good” and “Excellent” grading are acceptable and below these grading the concrete will not be acceptable.
- 16.4 5% of the total number of RCC members in each category i.e. beam, column, slab and footing may be tested by UPV test method for establishing quality of concrete. It is suggested that test be conducted on RCC beam near joint with column, on RCC column near joint with beam, on RCC footings and rafts. On RCC rafts a suitable grid can be worked out for determining number of tests. In addition, doubtful areas such as honeycombed locations, locations, where continuous seepage is observed, construction joints and visible loose pockets will also be tested.
- 16.5 The test results are to be examined in view of the above acceptance criteria “Good” and “Excellent” and wherever concrete is found with less than required quality as per acceptance criteria, repairs to concrete will be made. Honeycombed areas and loose pockets will be repaired by grouting using Portland Cement Mortar/Polymer Modified Cement Mortar /Epoxy Mortar, etc. after chipping loose concrete in appropriate manner. In areas where concrete is found below acceptance criteria and defects are not apparently visible on surface, injecting approved grout in appropriate proportion using epoxy grout /acrylic Polymer modified cements slurry made with shrinkage compensating cement / plain cement slurry etc. will be resorted to for repairs.(refer relevant chapters from CPWD Hand Book on Repairs and Rehabilitation of RCC Buildings).Repair to concrete will be done till satisfactory results are obtained as per the acceptance criteria by retesting of the repaired area. If satisfactory results are not obtained dismantling and relaying of concrete will be done.

17.0 JURISDICTION OF COURT

Courts at **Jaipur** shall have the jurisdiction to decide any dispute arising out of or in respect of this contract.

PARTICULAR SPECIFICATIONS (Civil)

1.0 EARTH WORK: -

- 1.1 Earth work shall be executed as per **CPWD specifications 2019 Volume-I**, with upto date correction slips. In addition to that following specifications shall also be followed:

1.2 EARTH WORK FOR MAJOR WORKS

- 1.2.1 Excavation shall be undertaken to the width of the Basement/Retaining wall footing including necessary margins for construction operation as per drawing or directed otherwise. Where the nature of soil or the depth of the trench and season of the year, do not permit vertical sides, the contractor at his own expense shall put up the necessary shoring, strutting and planking or cut slopes with or without steps, to a safer angle or both with due regard to the safety of personnel and works and to the satisfaction of the Engineer. Measurement of plan area of excavation for payment shall be permitted only.
- 1.2.2 All the major excavation shall be carried out by mechanical excavator. No extra payment shall be made for that.
- 1.2.3 The contractor shall make at his own cost all necessary arrangements for maintaining water level, in the area where works are under execution low enough so as not to cause any harm to the work shall be considered as inclusive of pumping out or bailing out water, if required, for which no extra payment shall be made. This will include water coming from any source, such as rains, accumulated rain water, floods, leakages from sewer and water mains subsoil water table being high or due to any other cause whatsoever. The contractor shall make necessary provision of pumping, dredging bailing out water coming from all above sources and excavation and other works shall be kept free of water by providing suitable system approved by the Engineer-in-charge. In order to avoid possibility of basement floor of main building being getting uplifted/damaged due to water pressure, the contractor shall lower the ground water table below the proposed foundation level by boring tube wells all around the proposed building using well point sinking method or any suitable method as approved by Engineer-in-charge. Sub soil water table shall be maintained at least 50 cm. below the P.C.C. level during laying of P.C.C. water proofing treatment, laying of basement raft and beams including filling of earth/sand under the basement floor. The water table shall not be allowed to rise above base of raft level until completion of outer retaining walls including water proofing of vertical surface of walls and back filling along the walls upto ground level and until the structure attains such height to counter balance the uplift pressure. However, the contractor should inspect the site and make his own assessment about sub-soil water level likely to be encountered at the time of execution and quote his rates accordingly. Rate of all items are inclusive of pumping out or bailing out water, if required. Nothing extra on this account whatsoever shall be paid to him. The sequence of construction shall be got approved by the Engineer-in-charge.
- 1.2.4 The contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades including signs, markings, flags, lights and flagman, as necessary at either end of the excavation/embankment and at such intermediate points as directed by the Engineer-in-charge for the proper identification of construction area. He shall be responsible for all damages and accidents caused due to negligence on his part.
- 1.2.5 **The contractor shall provide suitable barricading with suitably painted single row of G.I. Sheets about 3'- 0" wide (90 cms) and 3.0 metre high nailed or bolted with wooden poles spaced 2 to 3 metre apart and each pole 1.6 m to 2 m long 8 cm. to 10 cm. dia. The poles will be embedded in mobile iron pedestal rings suitably framed for giving stable support as per direction of the Engineer-in-charge. All management (including watch and ward) of barricades shall be the full responsibility of the contractor. The barricades shall be removed only after completion of the work or part of the work. The contractor's rate shall include all above items of work and nothing extra shall be paid to the contractor over and above his quoted rates.**

2.0 R.C.C. WORK: - The contractor shall use Ready Mix Concrete (RMC) OR Site Batched Design Mix Cement Concrete.

2.1 General Requirement of READY MIX CONCRETE (RMC):-

- (a) The contractor shall has to use **Ready Mix Concrete (RMC)** as per IS: 4926. The contractor shall ensure that transit mixtures shall transport the concrete to site. All the precautions shall be taken during the transportation and handling of concrete to achieve the desired strength, durability, etc. as envisaged in the Mix Design. Contractor has to get the approval from Engineer-In-Charge regarding source of RMC by giving the details of such plants indicating name of owner / company,

its location, technical establishment, past experience and text of Memorandum of Understanding (proposed to be entered between purchaser and supplier). The Engineer-in-Charge, after satisfying himself about quality / capability of the company shall give approval in writing (subject to drawing of MOU). The MOU shall be drawn with RMC plant owner / company and submitted to Engineer-in-Charge within a week of such approval. The contractor will not be allowed to purchase RMC without completion of above formalities for use in the project. Notwithstanding the approval granted by Engineer-in-Charge in aforesaid manner, the contractor shall be fully responsible for quality of concrete including input control, production, transportation and placement etc. The Engineer-in-Charge will reserve the right to deploy his supervisor at plant site to inspect at any such stage and reject the material / concrete etc. if he is not satisfied about quality of material / product.

- (b) All measuring equipment shall be maintained in a clean and serviceable condition and their accuracy shall be checked at least once a month.
- (c) Only single sized good quality stone aggregate shall be brought to site of work from the approved source. The grading of the stone aggregate shall be controlled by blending the aggregate of different sizes in the required proportions at site of work.
The aggregate of different sizes shall be stock-piled separately, preferably a day before use.
The grading of coarse and fine aggregates shall be checked as frequently as possible and as directed by the Engineer-In-Charge to ensure that the specified grading and quality of aggregate is maintained.
- (d) It is important to maintain the Water Cement Ratio constant at its specified or approved value by making adjustment for the moisture contents of both fine and coarse aggregates.
The moisture contents in the aggregate shall be determined as frequently as possible in keeping with the weather conditions and as per the provisions of IS: 2386 (Part-III).
- (e) All other operations in concreting work like mixing, slump, laying, placing of concrete, compaction, curing etc. not mentioned in this particular specifications for Ready Mix of Concrete shall be as per CPWD Specifications.

2.2 DESIGN MIX OF CONCRETE.

2.2.1 The RCC work shall be done with Design Mix Concrete. Wherever letter M has been indicated, the same shall imply for the Design Mix Concrete. The Design Mix Concrete will be designated based on the principles given in IS: 456, 10262 & SP 23. The Conditions & Specifications stated herein shall have precedence over all conditions & specifications stated in relevant I.S. Codes/C.P.W.D. Specifications. The concrete mix shall be designed for the specified target mean compressive strength in order to ensure that work test result do not fall below the acceptance criteria specified for the concrete mix. The Contractor shall design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting the requirements specified.

- (a) The contractor has to submit design mix without use of admixtures.
- (b) Admixture may be added (by maintaining the minimum cement content as given under para- 2.1.3) in case of specific technical requirement so as to meet the workability / slump requirement or for any other reason but nothing extra is to be paid to contractor on account of adding admixtures.

2.2.2 The sources of coarse aggregate, fine aggregate, water, admixture & cement to be used in concrete work shall be identified by the contractor & he will satisfy himself regarding their conforming to the relevant specifications & their availability before getting the same approved from the Engineer-In-Charge.

- (a) **Coarse Aggregate:-** As per CPWD Specifications
- (b) **Fine Aggregate:-** As per CPWD Specifications
- (c) **Water:-** It shall conform to requirements laid down in IS:456-2000 / Para 3.1.1 of CPWD Specifications. If on testing, water from the source is not found fit for construction, the necessary arrangement for treatment of water shall have to be made by the contractor at the site and nothing extra shall be payable for the same.
- (d) **Cement:-** Portland Pozzolona Cement (Fly ash based), required in the work from reputed manufacturers of cement as per the approved make in 50 kg bags bearing manufacturer's name and ISI marking, along with manufacturers test certificate for each lot. Portland Pozzolona Cement is to be used for RCC works only subject to fulfillment of conditions of circular No. CDO/SE(RR)/ Fly ash (MAN) 02 dated 09.04.09 shall be used

for Design Mix Concrete and shall conform to IS: 1489-Part-I. However, if the contractor uses higher grade of cement nothing extra shall be paid.

(e) **Admixture/ Plasticizer:-**

The admixture shall conform to IS: 9103. Whenever required, the admixture of approved quality & approved make only shall be used to attain the required workability. Nothing extra on account of use of Admixture / Plasticizer shall be payable.

2.2.3 Water Cement Ratio and Slump :-

2.2.3.1 In proportioning a particular mix, the manufacturer/producer/contractor shall give due consideration to the moisture content in the aggregates, and the mix shall be so designed as to restrict the maximum free water cement ratio to less the 0.5.

2.2.3.2 Due consideration shall be given to the workability of the concrete thus produced. Slump shall be controlled on the basis of placement in different situations. For normal methods of placing concrete, maximum slump shall be restricted to 100mm when measured in accordance with IS:1199.

2.2.3.3 The minimum cement content, maximum free water-cement ratio and minimum grade of concrete are individually related to exposure as per Table 5 of IS: 456, 2000 and as per **CPWD Specifications 2019 (Vol-I)** with upto date correction slips.

Grade of Concrete: - The compressive strength of various grades of concrete with various parameters shall be as follows: -

GRADE DESIGNATION	COMPRESSIVE STRENGTH ON 15 Cm. CUBES min. 7 DAYS (N/mm ²)	SPECIFIED CHARACTERISTIC COMPRESSIVE STRENGTH AT 28 DAYS (N/mm ²)
(i) M-20	As per Design	20
(ii) M-25	As per Design	25
(iii) M-30	As per Design	30
(iv) M-35	As per Design	35

NOTE:-

- In the designation of a Concrete mix letter M refers to the mix and the number of the specified characteristic compressive strength of 15 cm - Cube at 28 days expressed in N/mm².
- It is specifically highlighted that in addition to the above requirements, the maximum cement content for any grade shall be limited to 530 kg. / cubicmetre.

2.2.4 Characteristic Compressive Strength compliance Requirement

Specified Grade	Mean of the Group of 4 Non-overlapping consecutive test results in N/mm ² (Min)	Individual Test Results in N/mm ² (Min)
(1)	(2)	(3)
M15 Or Above	$\geq F_{ck} + 0.825 \times \text{established standard deviation}$ (rounded off to nearest 0.5 N/mm ²) Or $F_{ck} + 3\text{N/mm}^2$, whichever is greater where f_{ck} is characteristic compressive strength of CC cube at 28 days.	$\geq F_{ck} - 3 \text{ N/mm}^2$
Note : (i) In the absence of established value of standard deviation, the values given in Table as mentioned below may be assumed, and attempt should be made to obtain results of 30 samples as early as possible to establish the value of standard deviation. (ii) For concrete of quantity up to 30 m ³ (where the number of samples to be taken is less than four as per frequency of sampling given in para 2.4, the mean of test results of all such samples shall be $f_{ck} + 4 \text{ N/mm}^2$, minimum and requirement of minimum individual test result shall be $f_{ck} - 2 \text{ N/mm}^2$, minimum. However, when the number of samples is only on as per para 2.4, the requirement shall be $f_{ck} + 4 \text{ N/mm}^2$, minimum		

- 2.2.5 The Contractor shall engage one of the following approved laboratories / test house for designing the concrete mix in accordance with relevant IS Code and to conduct laboratory tests to ensure the target strength & workability criteria for a given grade of concrete: -
- Site laboratory of approved RMC plant or own fully automatic batch mix plant approved by Engineer-in-charge.
 - IITs, NITs or any Govt. Engineering College.
 - National Council for Cement & Building Materials, Ballabhgarh.
 - CRRRI, Delhi.
 - In the event of all the above laboratories being unable to carry out the requisite design/testing; the Contractor shall have to get the same done from any other reputed laboratory with prior approval of the Engineer-in-Charge.

Note:- Admixture / Plasticizer to be used in concrete should be PCE (Poly Carboxyl Ether) based.

The various ingredients for mix design / laboratory tests shall be sent to the lab / test houses through the Engineer-in-charge and the samples of such aggregates sent shall be preserved at site by the department.

In the event if all the **above** laboratories are unable to carry out the requisite design / testing, the contractor may have it done from any other laboratory with prior approval of the **SDG-Chandigarh**.

- 2.2.6 The contractor shall submit the report on design mix from any of above approved laboratories for approval of Engineer in Charge within 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the design mix is approved. In case of White Portland Cement and the likely use of admixtures in concrete with ordinary Portland/White Portland Cement, the contractor shall design and test the concrete mix by using trial mixes with white cement and / or admixtures also, for which nothing extra shall be payable.
- 2.2.7 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, the contractor as per the directions of the Engineer-in-charge shall submit a revised laboratory mix design report conducted at laboratory established at site.
- 2.2.8 All cost of mix designing and testing, connected therewith, including charges payable to the laboratory shall be borne by the Contractor including redesigning of the concrete mix whenever required & as directed by Engineer-In-Charge.
- 2.2.9 The mix design for a specified grade of concrete shall be done for a target mean compressive strength
- $$T_{ck} = F_{ck} + 1.65s$$
- Where F_{ck} = Characteristic compressive strength at 28 days.
 s = Standard deviation which depends on degree of quality control.

The assumed values of standard deviation for different grades of concrete shall be as follows: -

GRADE OF CONCRETE	STANDARD DEVIATION
M-20	4.0
M-25	4.0
M-30	5.0
M-35	5.0

Note: The above values correspond to the site control having proper storage of cement; weight batching of all materials; controlled addition of water; regular checking of all materials, aggregate gradings and moisture content; and periodical checking of workability and strength. Where there is deviation from the above the values given in the above table shall be increased by 1 N/mm².

2.2.10 TRIAL BATCHES

- The designed mix proportions shall be checked for target mean compressive strength by means of trial batches.
- Minimum three sets of separate preliminary tests shall be carried out for each trial batch of concrete mix. Each test shall comprise of six specimens and only one test-set of six specimens shall be made on any particular day.
- The quantities of materials for each trial mix shall be sufficient for at least six specimens (cubes) and the concrete required for carrying out workability tests.

- (d) The workability of trial mix No.1 shall be measured and mix shall be carefully observed for freedom from segregation, bleeding and its finishing characteristics. The water content, if required, shall be adjusted corresponding to the required changes in the workability.
- (e) With the modified Water Content, the mix proportions shall be recalculated by keeping with water cement ratio unchanged. The mix proportion, as modified, shall form the Trial Mix No.2 and tested for the specified strength and workability.
- (f) In addition, trial mix No.3 and 4 shall be designed by keeping water contents same as that determined for trial mix 2 but varying the water cement ratio by ± 10 percent of the specified value and tested for their design characteristics.
- (g) Out of the six specimen of each set, three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28 days, while the design mix shall be approved only on the basis of test strength at 28 days.

2.2.11 APPROVAL OF DESIGN MIX

The design mix shall be considered satisfactory and approved if at least three preliminary test-sets individually satisfy the following strength and workability criteria:

- (a) The average strength of each test-set is not less than the specified target mean compressive strength (Tck).
- (b) The strength of any specimen cube is not less than 0.85 Tck.
- (c) The concrete mix is of required degree of workability and acceptable concrete finish.

2.3 General Requirement of Batch Mix Concrete:-

- (a) The contractor shall have to use BATCH MIX CONCRETE. The contractor shall ensure that transit mixtures shall transport the concrete to site. All the precautions shall be taken during the transportation and handling of concrete to achieve the desired strength, durability, etc. as envisaged in the Mix Design.
- (c) All measuring equipment shall be maintained in a clean and serviceable condition and their accuracy shall be checked at least once a month.
- (d) Only single sized good quality stone aggregate shall be brought to site of work from the approved source. The grading of the stone aggregate shall be controlled by blending the aggregate of different sizes in the required proportions at site of work
The aggregate of different sizes shall be stock-piled separately, preferably a day before use.
The grading of coarse and fine aggregates shall be checked as frequently as possible and as directed by the Engineer-In-Charge to ensure that the specified grading and quality of aggregate is maintained.
- (e) It is important to maintain the Water Cement Ratio constant at its specified or approved value by making adjustment for the moisture contents of both fine and coarse aggregates.

The moisture contents in the aggregate shall be determined as frequently as possible in keeping with the weather conditions and as per the provisions of IS: 2386 (Part-III).

2.4 OTHER OPERATIONS: -

All other operations in concreting work like mixing, slump, laying, placing of concrete, compaction, curing etc. not mentioned in this particular specifications for Ready Mix of Concrete shall be as per CPWD Specifications.

2.5 SAMPLING:-

2.5.1 General:

Samples from fresh concrete shall be taken as per IS 1199 and cubes shall be made, cured and tested at 28 days in accordance with IS 516. 15.1.1 In order to get a relatively quicker idea of the quality of concrete, optional tests on beams for modulus of rupture at 72 + 2 h or at 7 days, or compressive strength tests at 7 days may be carried out in addition to 28 days compressive strength test. For this purpose the values should be arrived at based on actual testing. In all cases, the 28 days compressive strength specified in Table 2 of code of practice, IS:456 2000 shall alone be the criterion for acceptance or rejection of the concrete.

(a) FREQUENCY OF SAMPLING: -

- (i) A random sampling procedure shall be adopted to ensure that the sampling is spread over the entire period of concreting and cover all mixing units. The concrete work shall be notionally divided into lots as under for the purpose of sampling conditions.
 - Footings, rafts etc.
 - Columns and walls at all levels.
 - Beams at all levels.
 - Slabs at all levels.

- (ii) At least one test sample shall be taken for each lot of concrete work.
- (iii) Each grade of concrete shall form different lot for testing.
- (iv) The minimum frequency of sampling of concrete of each grade shall be in accordance with **CPWD specification 2019, Vol I** with upto date correction slips.
- (v) The concrete work shall be assessed on day to day basis & samples shall be taken as specified.
- (vi) Work strength test shall be conducted in accordance with IS: 516 on random sampling.

However, the minimum frequency of sampling of concrete of each grade shall be in accordance with the following:

Quantity of Concrete in the work m3	Number of Samples
1 - 5	1
6 - 15	2
16 - 30	3
31- 50	4
51 and above	4 plus one additional sample for each additional 50 cum or part thereof.

NOTE- *At least one sample shall be taken from each Shift. Where concrete is produced at continuous production unit, frequency of sampling may be decided by Engineer-in-charge in such a manner so as to ensure that each concrete batch shall have a reasonable chance of being tested.*

2.5.2 Test Specimen

Three test specimens shall be made for each sample for testing at 28 days. Additional samples may be required for various purposes such as to determine the strength of concrete at 7 days or at the time of striking the formwork, or to determine the duration of curing, or to check the testing error. Additional samples may also be required for testing samples cured by accelerated methods as described in IS 9103. The specimen shall be tested as described in IS 516.

2.5.3 TEST RESULTS OF SAMPLES: -

The test results of the sample shall be the average of the strength of three specimens. The individual variation shall not be more than $\pm 15\%$ percent of the average. If variation is more, the test results shall be treated as invalid. 90% of the total tests shall be done at the laboratory established at site by the contractor and remaining 10% in any other laboratory as directed by the Engineer-in-Charge.

2.5.4 ACCEPTANCE CRITERIA

2.5.5 Compressive Strength

The concrete shall be deemed to comply with the strength requirements when both the following conditions are met:

- a) The mean strength determined from any group of four consecutive test results complies with the appropriate limits in col 2 of Table given under para 2.1.4 above.
- b) Any individual test result complies with the appropriate limits in col 3 of Table given under para 2.1.4 above.

2.5.6 Quantity of Concrete Represented by Strength Test Results

The quantity of concrete represented by a group of four consecutive test-results shall include the batches from which the first and last samples were taken together with all intervening batches. Where the mean rate of sampling is not specified the maximum quantity of concrete that four consecutive test results represent shall be limited to 60 m3.

2.5.7 Concrete of each grade shall be assessed separately.

2.5.8 Concrete is liable to be rejected if it is porous or honey-combed, its placing has been interrupted without providing a proper construction joint, the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction of the Engineer-in-Charge.

2.6 MEASUREMENT –

- (i) As per **CPWD Specifications 2019(Vol-I)** with upto date correction slips
- (ii) In respect of all projected slabs at all levels including cantilever, canopy, the payment for the RCC work shall be made under the item RCC slabs. The payment for shuttering at the edges shall be

made under item of centering and shuttering for RCC slabs. Nothing extra shall be paid for the side shuttering at the edge of these projected balconies / projected verandah slabs.

2.7 TOLERANCES - As per CPWD Specifications.

2.8 RATES: -

- (i) The rate includes the cost of materials, labour and T&P, including mixing, placing, transportation involved in all the operations described above except for the cost of centring, shuttering & reinforcement which will be paid for separately. It includes finishing i.e. making the top surface of smooth/in required level with trowel etc.
- (ii) In case of rejection of concrete on account of unacceptable compressive strength, governed by para "Standard of Acceptance" as above, the work for which samples have failed shall be redone at the cost of contractor. However, the Engineer-in-charge may order for additional tests (like cutting cores, ultrasonic pulse velocity test, load test on structure or part of structure, etc) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The Contractor shall take remedial measures necessary to retain the structure as approved by the Engineer-in-charge without any extra cost. However, for payment, the basis of rate payable to contractor shall be governed by the 28 days cube test results and reduced rates shall be regulated in accordance with CPWD Specifications.

2.9 RCC WORK (ORDINARY)

- 2.9.1 The work shall be done in accordance with **CPWD Specifications 2019 (Vol-I)** with upto date correction slips.
- 2.9.2 Water Cement ratio for Ordinary RCC work shall not be more than 0.5. Contractor shall use concrete mixture of proper design having arrangement for measuring water for mixing of concrete.

2.10 FORM WORK

- 2.10.1 The work shall be done in general as per CPWD Specifications.
- 2.10.2 Only M.S. centering / shuttering and scaffolding material unless & otherwise specified shall be used for all R.C.C. work to give an even finish of concrete surface. However, marine-ply shuttering in exceptional cases as per site requirement may be used on specific request from contractor to be approved by the Engineer-in-Charge. But nothing extra shall be paid on this a/c.
- 2.10.3 Nothing extra shall be paid for the centering and shuttering, circular in shape whenever the formwork is having a mean radius exceeding 6m in plan.
- 2.10.4 Nothing extra shall be paid for grid beams and the corresponding slabs having clear span more than 1.20 metres.
- 2.10.5 In order to keep the floor finish as per architectural drawings and to provide required thickness of the flooring as per specifications, the level of top surface of R.C.C. shall be accordingly adjusted at the time of its centering, shuttering and casting for which nothing extra shall be paid to the contractor except the places where different type of flooring is provided in the same room.

As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept 12 to 20mm or as required, lower than general floors shuttering should be adjusted accordingly. Nothing extra is payable on this account.

- 2.10.6 Steel shuttering as approved by the Engineer-in-Charge shall be used by the contractor. Minimum size of shuttering plates shall be 600mm x 900mm except for the case when closing pieces are required to complete the shuttering panels.

Dented, broken, cracked, twisted or rusted shuttering plates shall not be allowed to be used on the work. The shuttering plates shall be cleaned properly with electrically driven sanders to remove any cement slurry or cement mortar or rust. Proper shuttering oil or de-bonding compound shall be applied on the surface of the shuttering plates in the requisite quantity before assembly of steel reinforcement.

2.11 REINFORCEMENT:-

- 2.11.1 The reinforcement shall be done as per CPWD Specifications.
- 2.11.2 The rate of item of reinforcement of RCC work includes all operations including straightening, cutting, bending, welding, binding with annealed steel wire or welding and placing in position at all the floors with all leads and lift complete as per CPWD Specifications.
- 2.11.3 The contractor shall provide approved type of support for maintaining the bars in position and ensuring required spacing and correct cover of concrete to reinforcement as called for in the drawings, spacer blocks of required shape and size. Chairs and spacer bars shall be used in order to ensure accurate positioning of reinforcement. **Spacer blocks shall be casted well in advance with approved proprietary pre-packed free flowing mortars (Conbextra as manufactured by M/s Fosroc Chemicals India Ltd. or of approved equivalent)** of high early strength and same colour as of surrounding concrete. However, Cover Guard Bars shall also be used to maintain proper cover of RCC Columns in addition to spacer blocks as mentioned above. Pre-cast cement mortar/concrete blocks/blocks of polymer shall not be used as spacer blocks unless specially approved by the Engineer-in-charge, rate of RCC items is inclusive of cost of such cover blocks & Cover Guard Bars.

2.12 PRE-CAST RCC WORK

- 2.12.1 The work shall be done in accordance with CPWD Specifications.
- 2.12.2 Pre-cast reinforced concrete units shall be of grade or mix as specified. Provision shall be made in the mould to accommodate fixing devices such as hooks etc. and forming of notches and holes. Each unit shall be cast in one operation. A sample of the unit shall be got approved from Engineer-in-charge before taking up the work.
- 2.12.3 Pre-cast units shall be clearly marked to indicate the top of member and its location.
- 2.12.4 Pre-cast units shall be stored, transported and placed in position in such a manner that these are not damaged.
- 2.12.5 The compaction of the concrete shall be done by vibrating, table or external vibrator, as approved by Engineer-in-charge. The rate quoted for the item shall include the element for framework and mechanical vibration.
- 2.12.6 Rate for item includes cost of all materials, labour, and all operations involved. Cost of M.S. frames, lugs including their welding, lifting hooks is also included.
- 2.12.7 In the item of providing and fixing precast reinforced cement concrete in shelves the cost of cutting chases and making good the same shall be inclusive in the item and nothing extra shall be paid on this account.

3.0 BRICK WORK:-

- 3.1 The masonry work shall be carried out with good quality well burnt FPS bricks of class designation 75 / AAC blocks/ Fly ash bricks as per CPWD Specifications. Exposed brick work for ground level to plinth level shall be executed with selected FPS bricks of class designation 75.
- 3.2 The rate shall also include for leaving chases / notches for dowels / cramps for all kinds of cladding to come over brick work.
- 3.3 Brick work provided around shaft or lift walls or around slab cutouts shall be measured in the brick for corresponding floor level. Nothing extra shall be paid on this account.
- 3.4 M.S. Strip/ Bar provided at every third course of half brick masonry shall be in single piece. If required, welding joint can be used without overlaps. Nothing extra shall be paid for welding and overlaps.

4.0 STONE / MARBLE WORK

- 4.1 General: - The execution of stones work shall be in general as per **CPWD Specifications 2019(Vol.- I)**, with up-to-date correction slips.

4.2 GRANITE/ MARBLE WORKS

- 4.2.1 The granite/ marble stonework shall, in general, be carried out as per the CPWD Specifications. The specifications for dressing, laying, curing, finishing, measurements, rate etc. for the granite/ marble stone flooring shall be same as that of works for the Marble flooring, skirting and risers of steps under Flooring Sub Head of the CPWD Specifications. The wall lining / veneer work with granite/ marble stone shall be as per the CPWD Specifications for Marble work Sub Head.
- 4.2.2 The decision of the Engineer-in-Charge as regards the approval of the samples for the various types of the granite/ marble stones shall be final and binding on the Contractor. No claim of any kind whatsoever shall be entertained from the Contractor on this account. The Contractor shall then procure and get the mock up prepared at site of work for approval of quality of workmanship and the granite/ marble stone as specified. The mock up shall be prepared in lift lobby, toilet etc. on one of the floors. The size of the stones shall be as per the architectural drawings. If the quality of the workmanship and the material is as per the required standards, the mock up shall be allowed as part of the work and measured for payment and shall not be dismantled. Otherwise, it shall be dismantled by the contractor as directed by the Engineer-in-Charge and taken away from the site of the work at his own cost. Nothing extra shall be payable on this account.
- 4.2.3 That the curvilinear profile of the entrance steps for the building shall be negotiated in segmental manner (using trapezoidal shaped granite stone pieces with straight edges for treads and rectangular stone pieces for the risers) and not in curved profiles as specified earlier. However, the granite/ marble stone slabs shall be cut to required sizes and shapes, as per the architectural drawings, to negotiate the curved steps in segmented manner. The risers shall also be cut to required sizes and shapes and the edges chamfered at the joints, all as per the architectural drawings. However, the Contractor shall prepare the detailed shop drawings for the same and commence work only after the approval by the Engineer-in-Charge. The rate shall also include any consequent wastage, incidental charges involved in this work. Nothing extra shall be payable on this account. For the purpose of payment, the actual area of each type of granite/ marble stone as laid shall be measured.
- 4.2.4 For the steps (risers and treads) in the linear profile, the granite/ marble stone shall be provided in single pieces up to 2.0m as per the architectural drawings, unless otherwise specifically permitted by the Engineer-in-Charge. Wherever grooves are required to be provided the same is to be done as per architectural drawings and as directed by the Engineer-in-charge. Wherever required, the joints shall be provided as per the architectural drawings. Nothing extra shall be payable on these accounts.
- 4.2.5. The granite/ marble slabs used for providing and fixing in the sills, soffits and jambs of doors, windows, ventilators and similar locations shall be in single piece unless otherwise directed by the Engineer-in-Charge. Wherever stone slab other than in single piece is allowed to be fixed, the joints shall be provided as per the architectural drawings and as per the directions of the Engineer-in-Charge. In the cabin areas, the joints in sills shall preferably be provided in line with the partition wall. Depending on the number of joints, as far as possible, the stone slabs shall be procured and fixed in slabs of equal lengths as per the architectural drawings and as directed by Engineer-in-Charge.
- 4.2.6 While fixing the granite/ marble slabs in sills, soffits and jambs of doors, windows, ventilators etc., rebates shall be made by overlapping the stones at the required places for fixing shutters for doors, windows and ventilators etc. as shown in the architectural drawings and as per the directions of the Engineer-in-Charge. Epoxy based adhesives shall be used for fixing the granite/ marble stones to each other, or wherever required. The authorized overlap as per the architectural drawings or as directed by the Engineer-in-Charge shall be measured for payment under the same item. However, any extra mortar thickness required due to the overlap arrangement shall be deemed to have been included in the rate of this item. Nothing extra shall be payable on this account. The granite/ marble stone slab shall be fixed over low-level storage cabinets using necessary adhesive as per the manufacturer's specification. The stone shall have uniform thickness and shall be provided in sizes as per the architectural drawings. The stone slab shall have uniformly leveled surface after fixing. All the joints shall be finished smoothly in a workmanlike manner.
- 4.2.7 The granite/ marble work shall be adequately protected by a layer of Plaster of Paris, which shall be maintained throughout and removed just before handing over of the works for which nothing extra shall be payable.

4.3 SAMPLES FOR STONE WORK

Samples of each item of stone work either individually or in combination shall be prepared for approval of Engineer-in-charge before commencement of work.

5.0 WOOD WORK

- 5.1 The wood work in general shall be carried out as per **CPWD Specifications 2019 (Volume-I)**, with up-to-date correction slips.
- 5.2 The factory shall be got approved from the Engineer-in-charge before commencement of work for factory made wood work. The sample of timber to be used shall be deposited by the contractor with Engineer-in-charge before commencement of work.
- 5.3 The shape and size of beading shall be as per drawings. The joints of beading shall be mitred.
- 5.4 Timber shall be of specified species, good quality and well-seasoned. It shall have uniform colour, reasonably straight grains and shall be free from knots, cracks, shakes and sapwood. It shall be close grained. The contractor shall deposit the samples of species of timber to be used with the Engineer-in-Charge for testing before commencement of the work.
- 5.5 Wood work shall not be painted, oiled or otherwise treated before it has been approved by the Engineer-in-charge. All portion of timber including architrave abutting against masonry, concrete, stone or embedded in ground shall be painted with approved wood preservative or with boiling coal tar.
- 5.6 The contractor(s) shall produce cash voucher and certificates from approved Kiln Seasoning Plants about the timber used on the work having been kiln seasoned and chemically treated by them, falling which it would not be so accepted as kiln seasoned and/or chemically treated.
- 5.7 Transparent sheet glass conforming to IS: 2835 – 1977 shall be used. Thickness being governed as under unless otherwise specified in the item in wood work/steel work:

Area of Glazing	Thickness
(a) For glazing area up to 0.50 sqm	4.0 mm
(b) For glazing area more than 0.50 sqm	6.0 mm

- 5.8 Factory made wooden flush door shutters shall be carried out as per **CPWD specifications 2019 (Vol.-I)** with upto date correction slips).
- 5.9 The work shall be executed through specialized agencies to be approved by the Engineer in Charge.
- 5.10 The contractor shall propose well in advance to Engineer-in-Charge, the names and address of the factory where from the contractor intends to get the shutters manufactured along with the credential of the firm. The contractor shall place the order for manufacturing of shutters only after obtaining approval of the Engineer in Charge whose decision in this case shall be final & binding. In case the firm is not found suitable he shall propose another factory. The factory may also be inspected by a group of officers before granting approval; shutters shall however he accepted only if these meet the specified test.
- 5.11 Contractor will arrange stage wise inspection of the shutters at factory by the Engineer-in-Charge or his authorized representative. The contractor will have no claim if the shutters brought at site in part or full lot are rejected by the Engineer-in-Charge due to bad workmanship / quality. Such defective shutters will not be measured and paid. The contractor shall remove the same from the site of work within 7 days after the written instruction in this regard are issued by the Engineer-in-Charge.
- 5.12 The shutters should be brought at site without primer / painting.

6.0 Fire Rated Doors

Fire rate doors shall conform to specifications lay down by NBC and/or relevant BIS codes etc.

7.0 STEEL WORK

All steel work shall be carried out as per **CPWD specifications 2019 (Volume-I)** with up-to-date correction slips.

8.0 FLOORING

- 8.1 All work in general shall be carried out as per **CPWD specifications 2019 (Volume-I)** with up-to-date correction slips.

- 8.2 Whenever flooring is to be done in patterns of tiles and stones, the contractor shall get samples of each pattern laid and approved by the Engineer-in-charge before final laying of such flooring. Nothing extra shall be payable on this account.
- 8.3 Different stones / tiles used in pattern flooring shall be measured separately as defined in the nomenclature of the item and nothing extra for laying pattern flooring shall be paid over and above the quoted rate. No additional wastage, if any, shall be accounted for any extra payment.
- 8.4 Samples of flooring stones/ Tile (Kota/ Marble/ Granite/ Ceramic tiles/ Vitrified tiles etc.) shall be deposited well in advance with the Engineer-in-Charge for approval. Approved samples should be kept at site with the Engineer-in-Charge and the same shall not be removed except with the written permission of Engineer-in-Charge. No payment whatsoever shall be made for these samples.
- 8.5 The Marble/ Kota/ Granite or any other stone shall be fully supported by the details establishing the quarry and its location.
- 8.6 Full width Marble/ Kota/ Granite stone over kitchen platform shall be provided which shall not be less than 900mm long except to adjust for closing pieces. The marble / stone flooring in treads and risers of staircase shall not be less than 1500mm long except to adjust the closing pieces. Nothing extra shall be paid on these accounts

8.7 Vitrified Tile Flooring

The tiles shall be of approved make and shall generally conform to Table 12 of IS15622.

The full body Vitrified tiles of specified sizes shall be used & sample of tiles shall be got approved from the Engineer-in-Charge. All tiles shall be rectified and double charge minimum. The Mandatory tests for vitrified tiles shall be got done as per CPWD Specifications (volume-1)/relevant BIS Code.

8.8 Ceramic Tiles Flooring

The tiles shall be procured from the approved manufactures of the specified shade & colour.

The floor & wall tiles shall be conforming to IS:15622 for floor and wall tiles respectively.

Tiles for dado shall be 300mm x 450mm (minimum size) or more (GROUP-III) as approved.

Tiles for flooring shall be 300mm x 300mm (minimum size) or more (GROUP-V) as approved.

Test shall be conducted to satisfy the quality of material as per CPWD Specifications

- 8.9 The rate of items of flooring is inclusive of providing sunken flooring in bathrooms, kitchen etc. and nothing extra on this account is admissible. The proper gradient shall be given to flooring for toilets, verandah, kitchen, courtyard, etc. as per the directions of Engineer-in-charge.

9.0 WATER PROOFING FOR SUNKEN FLOORS:-

- 9.1 The work shall be got executed from the specialized agency as approved by the Engineer in Charge.
- 9.2 Total quantity of the water proofing compound required shall be arranged only after obtaining the prior approval of the make by Engineer-in-charge in writing. Materials shall be kept under double lock and key and proper account of the water proofing compound used in the work shall be maintained. It shall be ensured that the consumption of the compound is as per specified requirements.
- 9.3 The finished surface after water proofing treatment shall have adequate smooth slope as per the direction of the Engineer-in-charge.
- 9.4 Before commencement of treatment on any surface, it shall be ensured that the outlet drain pipes / spouts have been fixed and the spout openings have been chased and rounded off properly for easy flow of water.

9.5 GUARANTEE BOND FOR ALL WATER PROOFING ITEMS:-

Ten years Guarantee bond in prescribed proforma **as per NIT of Part- B** shall be submitted by the contractor which shall also be signed by both the specialized agency and the contractor to meet their liability / liabilities under the guarantee bond. However, the sole responsibility about efficiency of water proofing treatment shall rest with the building contractor. (Ten per cent) of the cost of water-proofing

work shall be retained as Security Deposit in addition to normal security deposit of the whole work and the amount so deducted would be released after ten years from the date of completion of the entire work under the agreement, if the performance of the treatment is found satisfactory. If any defect is noticed during the guarantee period, the contractor shall rectify it within 15 days of receipt of intimation of defects in the work. If the defects pointed out are not attended to within the specified period, the same will be got done from another agency at the risk and cost of contractor.

10.0 FINISHING:-

- 10.1 The work shall be done in accordance with **CPWD specifications 2019 (Volume-II)** with up-to-date correction slips and/or manufacturers specifications wherever applicable.
- 10.2 All painting material of approved brand and manufacturer shall be brought to the site of work in the original sealed containers. The material brought to the site of work shall be sufficient for at least 30 days of work. The material shall be kept under the joint custody of contractor and representative of the Engineer-in-charge. The empty containers shall not be removed from the site till the completion of the work without permission of the Engineer-in-charge.
- 10.3 In the item of finishing walls with water proofing cement paint, only the plain/flat area shall be measured for payment and nothing extra shall be paid on account of pointed wall surface.

11.0 SANITARY INSTALLATIONS /WATER SUPPLY / DRAINAGE:-

- 11.1 The contractor shall submit schematic drawing of water supply and sanitary installation showing details of layout, including internal water supply and drainage details, showing the detail of water supply lines including fittings diameter wise and fixtures connecting to soil waste through traps and connection of W.C. to main shaft pipe for drainage including its ventilation system for approval of Engineer-in-Charge.
- 11.2 For the work of water supply and sanitary installations, the contractor shall engage the approved licensed plumbers and submit the name of proposed plumbing agencies with their credentials for approval of the Engineer-in-Charge.
- 11.3 The work in general shall be carried out as per **CPWD specifications 2019 (Volume-II)** with up-to-date correction slips.
- 11.4 The tendered rates shall include the cost of cutting holes/cores in walls, floors, RCC slabs etc. wherever required and making good the same for which nothing extra shall be paid.
- 11.5 The Centrifugally spun cast iron pipe IS: 3989-1984 wherever necessary shall be fixed to RCC columns, beams etc. with rawl plugs of approved quality and nothing extra shall be paid for on this account.
- 11.6 The pig lead to be used in the jointing should be as per CPWD specifications.
- 11.7 Nothing extra for providing & fixing CP Brass caps /extension pieces wherever required for CP Brass fittings shall be paid beyond the rates payable for corresponding CP Brass fittings.
- 11.8 The entire responsibility for the quality of work will however rest with the building contractor only and he shall submit a Guarantee Bond as per Performa **as per NIT of Part- C**. 10% (ten percent) of the cost of these items would be retained as security deposit in addition to normal security deposit of the whole work and the amount so deducted would be released after five years from the date of completion of the entire work under the agreement, if the performance of the items is found satisfactory. If any defect is noticed during the guarantee period, the contractor should rectify it within seven days and if not attended to the same will be got done from another agency at the risk and cost of contractor. However, this security deposit can be released in full if bank guarantee of equivalent amount is produced and deposited with the department.
- 11.9 Providing, fixing, testing and commissioning of Hubless Centrifugally cast iron pipes and fittings (Epoxy coated inside & outside) as per ISO: 6594/ IS: 15905 standard and jointing with stainless steel shielded couplings with a double stainless steel bolt and screw housing incorporating a EPDM rubber gasket as per IS: 15905/ ASTM 1277 standard inclusive of all necessary specials like bends, tees, offsets, junctions, cowls, end plug, inspection pipes etc. laid under floor/ fixed on walls and in pipe shafts. The rate shall be including angle supports, hanger, nuts bolts, anchor fasteners, fixing clamps/ channels with U-Bolts etc. complete. Hubless cast iron pipes & fitting shall have tested for noise level which shall not be more than 25 dB (A) at 2 L/s.

12.0 **Aluminium doors, windows, ventilators etc. glazing specifications**

- 12.1 **Extent and Intent:** - The work shall be carried out for providing and installing anodized/powder coated aluminium doors, windows, claddings, louvers, glazing and other items as called for on the drawings. The drawings and specifications cover the major requirements only. The supplying of additional fastenings, accessories, fixtures and other items not mentioned specifically herein, but which are necessary to make a complete installation shall be a part of this contract. Hinges for open able panel shall be stainless steel friction hinges / stays selected for specified wind load and dead loads or specifically extruded in-built hinges.
- 12.2 **General:** - Aluminium doors, windows etc. shall be of sizes, section details as shown on the Architectural drawings. The details shown on the drawings indicate generally the sizes of the component parts and general standards. These may be varied slightly to suit the standard adopted by the manufacturers. Before proceeding with any manufacturing, the contractor shall prepare and submit complete manufacturing and installation drawings for approval of the Engineer-in-Charge and no work shall be performed until the approval of these drawings is obtained.
- 12.3 **Shop Drawings:** - The contractor shall submit the shop drawings of doors, windows, louvers, cladding and other aluminium work, based on the architectural drawings to the Engineer-in-Charge for his approval. The shop drawing shall show full size sections of doors, windows etc. thickness of metal (i.e. wall thickness) details of construction, sub frame/rough ground profile, anchoring details hardware as well as connection of windows, doors and other metal work to adjacent work. Samples of all joints and methods of fastening and joining shall be submitted to the Engineer-in-Charge for approval well in advance of commencing the work.
- 12.4 **Samples:** - Samples of doors, windows louvers etc. shall be fabricated, assembled in the factory and submitted to Engineer-in-Charge for his approval. They shall be of sizes, types etc. as decided by Engineer-in-Charge. All samples shall be provided at the cost of the contractor.
- 12.5 **Sections:** - Aluminium doors and windows shall be fabricated from extruded sections of profiles as detailed on drawings. The sections shall be extruded by the manufacturers approved by the Engineer-in-Charge. The aluminium extruded sections shall conform to BIS designation IIE/IIV 9 WP alloy, with chemical composition technical properties, as per IS: 733 and IS: 1285. The permissible tolerance of the extruded sections shall be such as not to impair the proper and smooth function/ operations and appearance of doors and windows.
- 12.6 **Fabrication:** - Doors, windows etc. shall be fabricated to sizes at factory and shall be of section, sizes, combinations and details as shown on the drawings. All doors, windows etc. shall have mechanical joints. The joints shall be designed to withstand a minimum wind load of 150 Kg. per Sqm. The design shall also incur that the maximum deflection of any member shall not exceed 1/175 of the span of the member. All members shall be accurately machined and fitted to form hairline joints prior to assembly. The joints accessories such as cleats, brackets etc. shall be of such material as not to cause any bimetallic action. The design of the joints and accessories shall be such that the accessories are fully concealed. The fabrication of doors, windows, etc. shall be done in suitable sections to facilitate easy transportation, handling and installation. Adequate provision shall be made in the door and window members for anchoring to support and fixing of hardware and other fixture as approved by the Architect.
- 12.7 **Anodizing/ powder coating:** -All aluminium sections shall be Powder coated (minimum 50 micron thickness) as per requirement as per IS: 7088 and to required colour as specified in the item as per IS: 1868 grading as specified in item schedule after cutting the member to requisite sizes before the final assembly. Powder coating shall be of minimum 50 micron thickness. Anodizing conforming to specified grade with minimum average thickness of 15 microns when measured as per IS: 612. The anodic coating shall be properly sealed by steams or in boiling water are cold sealing process as per IS:1868/IS: 6057. Polythene tape protection shall be applied on the anodised section before they are brought to site. All care shall be taken to ensure surface protection during transportation, storage at site and installation. The tape protection shall be removed on installation. The sample will be tested in the approved laboratory and cost of samples; etc. shall be borne by the contractor.
- 12.8 **Protection of finish:** - All aluminium members shall be wrapped with approved self-adhesive non-staining. PVC tapes.

12.9 **Handling and Stacking:** -

- 12.9.1 Fabricated materials shall be carried in an approved manner to protect the material against any damage during transportation. The loading and unloading shall be carried out with utmost care. On receipt of material at site, it shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of damaged pieces/ parts. Materials found to be acceptable on inspections shall be repacked in crates and stored safely.
- 12.9.2 In the case of composite windows and doors, the different units are to be assembled first. The assembled composite units should be checked for line, level and plumb before final fixing is done. Units may be serial numbered and identified as out how to be assembled in their final locations if situation so warrants.
- 12.9.3 The contractor shall be responsible for assembling composite, bedding and filling the grove with polysulphide sealant inside and outside, at transoms and mullions placing the doors, windows etc. in their respective openings. After the doors/ windows have been fixed in their correct assigned position, the open hollow sections abutting masonry concrete shall be fitted with approved polysulphide sealant densely packed and finished neat.
- 12.9.4 The contractor shall be responsible for doors, windows, etc. being set straight, plumb, level and for their satisfactory operation after fixing is complete.

12.10 **Installation:**

- 12.10.1 Just prior to installation the doors, windows, etc. shall be uncreated and stacked on edge on level bearers and supported evenly. The frame shall be fixed into position true to line and level using adequate number of expansion machine bolts, anchor fasteners, of approved size and manufacture and in an approved manner. The holes in concrete/masonry members for housing anchor bolts shall be drilled with an electric drill.
- 12.10.2 The door/ windows assembled as shown on drawings shall be placed in correct final position on the opening and marks made on concrete members at jambs, sills and heads against the holes provided in frames for anchoring. The frame shall then be removed from the opening and laid aside. Neat holes with parallel sides of appropriate size shall then be drilled in the concrete members with an electric drill at the marking to house the expansion bolts. The expansion bolts shall then be inserted in the holes, struck with a light hammer till the nut is forced into the anchor shell. The frame shall then be placed in final position in the opening and anchored to the support through cadmium plated machine screws of required size and anchored to the support through cadmium plated machine screws of required size threaded to expansion bolts. The frame shall be set in the opening by using wooden wedges at supports and be plumbed in position. The wedges shall invariably be placed at the meeting at points of glazing bars and frame.
- 12.11 **EPDM Rubber / Neoprene gaskets:** The contractor shall provide and install EPDM Rubber / Neoprene gaskets of approved size and profile at all locations as shown and as called for to render the doors, windows etc. absolutely air tight and weather tight. The contractor shall produce samples of the gaskets for approval and shall procure the same after approval only.
- 12.12 **Fittings:** Hinges, stays, handles, tower bolts, locks and other fittings shall be of quality and manufacturer as approved by the Engineer-in-Charge.
- 12.13 **Manufacturer's Attendance:** The manufacturer immediately prior to the commencement of glazing shall adjust and set all windows and doors and accept responsibility for the satisfactory working of the opening frames.
- 12.14 **Poly-sulphide:** The gaps between frames and supports and also any gaps in the door and windows sections shall be raked out as directed and filled with poly-sulphide of approved colour and make to ensure complete water tightness. The poly-sulphide shall be of such colour and composition that it would not stain the masonry/concrete work, shall receive paint without bleeding, will not sag or run and shall not set hard or dry out under any conditions of weather. The sample of poly-sulphide to be used for this purpose shall be got approved from the Engineer-in-Charge before its actual use.

12.15 Details of Test :

12.15.1 The various tests on aluminium sections shall be conducted in accordance with the relevant IS codes.

12.15.2 The minimum number of tests for anodizing/powder coating and corrosion resistance shall be as given below: -

Sr. No.	Details	No. of Tests
1.	Doors, windows and ventilators	One test for every 1000 kg or part thereof.

12.15.3 The samples of major member of each unit of doors/ windows shall be selected at random by Engineer-in-Charge as such that all the aluminium section shall be got tested.

12.16 **Acceptance Criteria:** - The entire responsibility for the quality of work will however rest with the building contractor only. The aluminium work shall carry Five years guarantee after completion of work against unsound material, workmanship and defective anodizing/ powder coating as per Guarantee Bond. Five years guarantee in prescribed Performa attached under **as per NIT of Part C** must be given by the specified firm, which shall be counter signed by the contractor, in token of his overall responsibility. **10% (ten percent) of the cost of these items would be retained as security deposit and the amount so deducted would be released after five years from the date of completion of the entire work under the agreement, if the performance of the items is found satisfactory.** If any defect is noticed during the guarantee period, the contractor should rectify it within seven days and if not attended to the same will be got done from another agency at the risk and cost of contractor. However, this security deposit can be released in full if bank guarantee of equivalent amount is produced and deposited with the department.

12.17 Rates: -

12.17.1 The rates of the item shall include the cost of materials, labour required in all the above operations.

12.17.2 The rates exclude the cost of stainless steel friction hinges / stays selected for specified wind load and dead loads or specifically extruded in-built hinges, and rest of the fittings shall also be paid separately.

13.0 SPECIFICATION OF STRUCTURAL GLAZING

The scope of work includes designing, structural analysis, fabrication, testing, protection, installing and fixing in position semi (grid) unitized system of structural glazing. Contractor shall execute structural Glazing work as per approved architectural drawings.

Design & drawings: Work is to be carried out as per architectural drawings showing general arrangement for structural glazing work. However, detailed working /shop drawings giving sizes of various members vision panel, openable panel, spandrel panel flashing etc are to be got prepared & submitted by the contractor for approval to Engineer-in-charge before starting actual work. Agency has to submit drawings as per site condition and various design parameters which are applicable for such skilled work. Sizes & arrangement of members as indicated in architectural drawings and / or BOQ for general arrangement shall be checked for their sufficiency alongwith accuracy of arrangement/ accurate dimension of various members including spans.

Aluminum section: Structural Glazing frame work consisting of fixed panel/ openable / etc. are to be fabricated out of heavy duty aluminum extruded tubular and other aluminum sections as per architectural drawings. Aluminum section shall be as per grade 6063 T5 or T6 as per BS 1474, including super durable powder coating 60-80 microns conforming to AAMA 2604 of required colour and shade as approved by Engineer-in-charge. Sections to be protected with masking tapes against external scratch and shall be removed only at the time of fixing.

Anchoring & Jointing: The anchoring /bracing of the glazing to the RCC slab/beams/columns shall be done with required no. of galvanized / powder coated extended M.S brackets with dash fasteners in the concrete and stainless steel bolts including providing and fixing of aluminum shims of variations. The anchoring system shall be designed to withstand the dead load of the structural glazing as well as stresses due to wind pressure.

The transoms and mullions are to be jointed with appropriate stainless steel screws, heavy duty aluminum angle, cleat, box sleeves etc. complete as per drawings.

Fixing of Glass in Structural Glazing:

The glazing frame shall be aligned for each vertical mullion for the entire height and for each transom for the entire width horizontally by laser beam equipment to ensure 100 percent "X" and "Y" alignment.

All the joints of structural Glazing system & the periphery of glass shall be properly sealed with specified weather silicon. EPDM gaskets of suitable profiles to accommodate glasses in all the vision areas shall be provided at all glazing area to make the glazing water & air tight.

ADDITIONAL CONDITIONS OF CONTRACT SPECIFIC TO GREEN BUILDING PRACTICES

- 1.0** The contractor shall strictly adhere to the following conditions as part of his contractual obligations:
- 1.1 SITE**
- 1.1.1 The contractor shall ensure that adequate measures are taken for the prevention of erosion of the topsoil during the construction phase.
- 1.1.2 The Contractor should follow the construction plan as proposed by the Architect /Engineer in- Charge to minimize the site disturbance such as soil pollution due to spilling
- 1.1.3 No excavated earth shall be removed from the campus unless suggested otherwise by Engineer in Charge. All subsoil shall be reused in backfilling/landscape, etc. as per the instructions of the Engineer in Charge. The surplus excavated earth shall be disposed of by the contractor at his own cost for reuse. Royalty on the soil is to be deposited with the State Govt. Deptt.
- 1.1.4 The contractor shall not change the natural gradient of the ground unless specifically instructed by the Engineer in Charge. This shall cover all-natural features like water bodies, drainage gullies, slopes, mounds, depressions, etc. Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by the Engineer-in-charge.
- 1.1.5 The contractor shall not carry out any work which results in the blockage of natural drainage.
- 1.1.6 The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Engineer-in-charge.
- 1.1.8 Overloading of trucks is unlawful and creates the erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering must take place. No overloading shall be permitted.
- 1.2 CONSTRUCTION PHASE AND WORKER FACILITIES**
- 1.2.1 The contractor shall specify and limit construction activity in pre- planned/designated areas and shall start construction work after securing the approval for the same from the Engineer in Charge. This shall include areas of construction, storage of materials, and material and personnel movement.
- 1.2.2 **PRESERVE AND PROTECT LANDSCAPE DURING CONSTRUCTION**
- (a) The contractor shall ensure that construction activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.
- (b) The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.
- (c) Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by Engineer in Charge.
- (d) The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.
- 1.2.3 The contractor shall provide potable water for all workers.
- 1.2.4 The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. Toilet facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.

- 1.2.5 The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.
- Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers.
- 1.2.6 The contractor shall ensure that no construction leachate (e.g. cement slurry etc.), is allowed to percolate into the ground.
- 1.2.7 Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.
- 1.2.8 The contractor shall comply with the safety procedures, norms and guidelines (as applicable).
- 1.2.9 The contractor shall ensure the following activities for construction workers safety, among other measures:
- Guarding all parts of dangerous machinery.
 - Precautionary signs for working on machinery
 - Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.
 - Durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.
- 1.2.10 The storage of material shall be as per standard good practices to the satisfaction of the Engineer in Charge. Watch and ward of the Contractor's materials shall be his own responsibility.
- 1.2.11 The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction
- 1.2.12 Where possible, the contractor shall select materials / vendors, harvested and manufactured regionally, within a 800-km radius of the project site.
- 1.2.13 The contractor shall ensure that a flush out of all internal spaces is conducted prior to handover. This shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.
- 1.2.14 Contractor shall make efforts to reduce the quantity of indoor air contaminants that are odorous or potentially irritating harmful to the comfort and well-being of installer and building occupants. Contractor shall ensure that the VOC (Volatile Organic Compounds) content of paints, coatings and primers are low.

1.2.15 WATER USE DURING CONSTRUCTION

Contractor should spray curing water on concrete structure and shall not allow free flow of water. Concrete structures should be kept covered with thick cloth/gunny bags and water should be sprayed on them. Contractor shall do water poundings on all sunken slabs using cement and sand mortar.

- 1.2.16 The contractor shall provide O & M Manuals wherever applicable.

1.2.17 MATERIALS & FIXTURES FOR THE PROJECT

- (i) Contractor will produce wherever feasible certificate regarding distance of the source of the relevant material.
- (ii) Unless otherwise stated cement used at site for mortar, plaster, building blocks, etc. shall be PPC (Portland Pozzolana Cement). The PPC must meet the requirements of IS 1489 (Part I) as regards to fly ash content in cement.
- (iii) The contractor shall ensure that all paints, polishes, adhesives and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Engineer in Charge before the application of any such material.
- (iv) The contractor shall ensure that all composite wood products/agro-fiber products used for cabinetwork, etc. do not contain any added urea formaldehyde resin.

1.2.18 RESOURCES CONSUMED DURING CONSTRUCTION

- (a) The contractor shall ensure that the water and electricity is not wasted during construction. The Engineer in Charge can bring to the attention any such wastage and the contractor will have to ensure that such bad practices are corrected.
- (b) The contractor shall ensure that all run-off water from the site, during construction is collected and reused to the maximum.

1.2.19 EQUIPMENT

- (a) To ensure energy efficiency during and post construction all pumps, motors and engines used during construction or installed, shall be subject to approval and as per the specifications of the Engineer in Charge.
- (b) Generally, the lighting installed by the contractor around the site and at the labour quarters during construction shall be LED bulbs of the appropriate illumination levels.

SPECIAL CONDITIONS
REGARDING ROYALTY OF MATERIALS TO BE USED IN CONSTRUCTION WORK

राजस्थान सरकार, खान (ग्रुप-2) विभाग के पत्र क्रमांक प.13(6) खान/ग्रुप-2/80-पार्ट जयपुर, दिनांक 15.11.2011 के अनुसार राजकीय विभागों, स्वायत्तशासी संस्थाओं, राजकीय उपक्रमों में कार्यरत निर्माण ठेकेदारों से निर्माण कार्य में काम आने वाले खनिजों मेसेनरी स्टोन, मिट्टी बोल्टर, बजरी, कंकर, मोरम, साधारण मिट्टी (ईट मिट्टी को छोड़कर) की रायल्टी वसूली के संबंध में।

उपरोक्त विषयांतर्गत पूर्व में जारी किये गये परिपत्र दिनांक 06.10.2008 / 08.10.2008 को माननीय उच्च न्यायालय, जोधपुर द्वारा एस.बी. सिविल रिट सं. 1309/09 में पारित आदेश दिनांक 17.01.2011 से पिटीशनकर्ता द्वारा रायल्टी पेड खनिज प्राप्त कर काम में लिये जाने के बावजूद उक्त परिपत्र अल्पावधि अनुमति पत्र लेने हेतु बाध्य करता है, इस कारण निरस्त किया है तथा परिपत्र को संशोधित कर जारी करने की छूट प्रदान की गई। उक्त निर्णय के प्रकाश में परिपत्र दिनांक 06.10.2008 / 08.10.2008 के अतिक्रमण में राजकीय विभागों, स्वायत्तशासी संस्थाओं, राजकीय उपक्रमों में कार्यरत निर्माण ठेकेदारों से निर्माण कार्य में काम आने वाले खनिजों पर देय रायल्टी के भुगतान बाबत निम्न प्रक्रिया तय की जाती है। यह प्रक्रिया तुरंत प्रभाव से लागू होगी।

1. संबंधित निर्माण विभाग को कार्यादेश की प्रति मय जी-शिड्यूल, जिसमें निर्माण में काम आने वाले खनिजों की मात्रा का विवरण हो (घनमीटर अथवा टनों में), संबंधित खनि अभियंता / सहायक खनि अभियंता कार्यालय में प्रस्तुत करनी होगी।
2. ठेकेदार को निर्माण कार्य शुरू करने से पूर्व निम्न में से कोई एक विकल्प संबंधित खनि अभियंता / सहायक खनि अभियंता कार्यालय में शपथ पत्र के साथ प्रस्तुत करना होगा।
विकल्प-ए :- यदि ठेकेदार अपने स्तर पर खनिजों का खनन करने हेतु अल्पावधि अनुमति पत्र प्राप्त करना चाहता है जिसका कार्य समाप्ति पर अधिशुल्क निर्धारण कराना चाहता है एवं रायल्टी की राशि रनिंग बिलों से कटवाना चाहता है।
विकल्प-बी :- यदि ठेकेदार अल्पावधि अनुमति पत्र प्राप्त करना चाहता है, परन्तु रायल्टी की राशि रनिंग बिलों से कटाने के बजाय खान विभाग में अल्पावधि अनुमति पत्र प्राप्त करते समय अग्रिम रूप से जमा कराना चाहता है।
विकल्प-सी :- यदि ठेकेदार सम्पूर्ण खनिज रायल्टी पेड खरीदना चाहता है तथा रनिंग बिल की स्टेज पर निर्धारण के लिए रायल्टी भुगतान का समुचित रिकॉर्ड प्रस्तुत करेगा।
विकल्प-डी :- यदि ठेकेदार विकल्प बी व सी को सम्मिलित रूप से काम में लेना चाहता है।
3. ठेकेदार द्वारा उपरोक्त बिन्दु संख्या 2 के अनुसार विकल्प प्रस्तुत कर दिये जाने पर संबंधित खनि अभियंता / सहायक खनि अभियंता द्वारा इसकी सूचना निर्माण विभाग को दी जायेगी एवं निर्माण विभाग विकल्पों के अनुसार, नीचे दी गई व्यवस्था के अनुरूप, रायल्टी वसूली बाबत कार्यवाही करेगा।
4. विकल्प-ए के ठेकेदारों के प्रथम बिल पारित करने के पूर्व निर्माण-विभाग खनि अभियंता / सहायक खनि अभियंता द्वारा जारी अल्पावधि अनुमति पत्र की प्रति प्राप्त करेगा, अन्यथा बिल का भुगतान नहीं किया जायेगा। ऐसे ठेकेदारों के रनिंग बिलों से रायल्टी की कटौती निम्नानुसार निर्धारित दर से की जाकर चेक अथवा महालेखाकार के यहाँ समायोजन के माध्यम से मय कटौती विवरण के जमा करानी होगी -

1. सड़क निर्माण (वाइडनिंग सहित)	3%
2. भवन निर्माण	2%
3. सड़क नवीनीकरण	1.5%
4. अन्य कार्य जिनमें खनिज का उपयोग होता हो	1%

उक्त विकल्प के ठेकेदार यदि अतिरिक्त राशि जमा हो जाने के कारण रिफण्ड चाहते हैं तो उन्हें निर्माण कार्य समाप्ति के 30 दिवस की अवधि में अपना रिकॉर्ड यथा काम में लिये गये खनिज का ब्यौरा (निर्माण विभाग से प्रमाणितशुदा) खनिज प्राप्त किये जाने का स्रोत, उसके बिल/रवन्ना/अधिकृत ठेकेदार की रायल्टी पर्ची जिनमें निर्माण विभाग के ठेकेदार का नाम अंकित हो, अधिशुल्क निर्धारण हेतु खनि अभियंता / सहायक खनि अभियंता कार्यालय में प्रस्तुत करने होंगे। उक्त 30 दिवस की अवधि में रिकॉर्ड प्रस्तुत नहीं करने पर निर्माण विभाग द्वारा रनिंग बिलों से काटी गई राशि को अंतिम माना जायेगा।

5. विकल्प-बी के ठेकेदारों को अल्पावधि अनुमति पत्र प्राप्त करते समय खनिज की रायल्टी संबंधित खनि अभियंता / सहायक खनि अभियंता कार्यालय में जमा करानी होगी। निर्माण विभाग द्वारा ऐसे ठेकेदारों के रनिंग बिल कटौती किये बगैर पारित किये जा सकेंगे, परन्तु अंतिम रनिंग बिल खनि अभियंता / सहायक खनि अभियंता से अनापत्ति प्राप्त किये बिना पारित नहीं किया जायेगा।
6. विकल्प-सी के ठेकेदारों द्वारा संबंधित रनिंग बिल तक काम में लिये गये खनिज का ब्यौरा (निर्माण विभाग से प्रमाणितशुदा), खनिज प्राप्त किये जाने का स्रोत उनके बिल/रवन्ना/अधिकृत ठेकेदार की रायल्टी पर्ची जिनमें निर्माण विभाग के ठेकेदार का नाम अंकित हो, अधिशुल्क निर्धारण हेतु खनि अभियंता / सहायक खनि अभियंता कार्यालय में प्रस्तुत करने होंगे। खनि अभियंता / सहायक खनि अभियंता द्वारा अधिशुल्क निर्धारण आदेश जारी कर दिये जाने पर निर्माण विभाग द्वारा संबंधित रनिंग बिल पारित किया जा सकेगा, परन्तु अंतिम रनिंग बिल खनि अभियंता / सहायक खनि अभियंता द्वारा अनापत्ति प्राप्त किये बिना पारित नहीं किया जायेगा।
7. विकल्प-डी के ठेकेदारों को अल्पावधि अनुमति पत्र प्राप्त करते समय खनिज की रायल्टी संबंधित खनि अभियंता / सहायक खनि अभियंता कार्यालय में जमा करानी होगी। रायल्टी पेड प्राप्त किये गये खनिज का ब्यौरा (निर्माण विभाग से प्रमाणितशुदा), खनिज प्राप्त किये जाने का स्रोत उनके बिल / रवन्ना / अधिकृत ठेकेदार की रायल्टी पर्ची जिनमें निर्माण विभाग के ठेकेदार का नाम अंकित हो, अधिशुल्क निर्धारण हेतु खनि अभियंता / सहायक खनि अभियंता कार्यालय में प्रस्तुत करने होंगे। खनि अभियंता / सहायक खनि अभियंता कार्यालय में प्रस्तुत करने होंगे। खनि अभियंता / सहायक खनि अभियंता द्वारा अधिशुल्क निर्धारण आदेश जारी कर दिये जाने पर निर्माण विभाग द्वारा संबंधित रनिंग बिल पारित किया जा सकेगा, परन्तु अंतिम रनिंग बिल खनि अभियंता / सहायक खनि अभियंता से अनापत्ति प्राप्त किये बिना पारित नहीं किया जायेगा।
8. BOT/BOOT के तहत होने वाले निर्माण कार्यो अथवा जिन निर्माण कार्यो के बिलों का भुगतान किसी भी विभाग द्वारा नहीं किया जाता है, उसमें विकल्प-ए, सी एवं डी लागू नहीं होगा, इनकी बजाय विकल्प-बी लागू होगा।
9. कार्य समाप्त होने पर निर्माण विभाग द्वारा ठेकेदार द्वारा उपयोग की गई खनिज की वास्तविक मात्रा का विवरण तथा काटी गई रायल्टी राशि का ब्यौरा संबंधित खनि अभियंता / सहायक खनि अभियंता को देना होगा।
10. यदि निर्माण विभाग द्वारा उक्तानुसार प्रक्रिया का पालन नहीं किया गया अथवा ठेकेदार द्वारा अवैध रूप से खनिज का उपयोग किया गया है तो खनिज की दस गुणा रायल्टी वसूली योग्य होगी, जिसको जमा कराने की जिम्मेदारी संबंधित निर्माण विभाग की होगी। संबंधित खनि अभियंता / सहायक खनि अभियंता एमएमसीआर, 1986 के नियम 66 तथा भू-राजस्व अधिनियम के प्रावधानों के अनुसार उक्त राशि वसूल कर सकेगा।

11. ठेकेदार द्वारा प्रतिबंधित क्षेत्रों जैसे चारागाह भूमि, केचमेंट एरिया, वन / अभ्यारण्य / राष्ट्रीय उद्यान तथा उनके सेफ्टी जोन क्षेत्र, विभिन्न न्यायालयों द्वारा प्रतिबंधित क्षेत्रों में खनन कार्य नहीं किया जायेगा एवं स्वीकृत खनन पट्टा / लाईसेंस क्षेत्र में या किसी खातेदारी भूमि में बगैर पट्टाधारी / लाईसेंसधारी या संबंधित खातेदार की लिखित सहमति के बिना खनन कार्य नहीं किया जायेगा। इस बाबत अल्पावधि अनुज्ञापत्र का आवेदन पत्र पेश करते समय ही शपथ पत्र देना होगा।
- यह परिपत्र वित्त (राजस्व डिवीजन) विभाग की आर्डर डी संख्या 101103210 दिनांक 30.10.2011 की सहमति से जारी किया जाता है तथा इस विषय में राजस्व सरकार द्वारा माननीय सर्वोच्च न्यायालय में दायर की गई एसएलपी पर होने वाले निर्णय के अध्यक्षीन रहेगा।

राजस्थान सरकार, खान (ग्रुप-2) विभाग के पत्र क्रमांक प.13(6) खान/ग्रुप-2/80-पार्ट जयपुर, दिनांक 18.10.2012 के अनुसार इस विभाग के समसंख्यक परिपत्र दिनांक 15.11.2011 के बिन्दु संख्या 6 में आंशिक संशोधन किया जाता है कि इस बिन्दु में वर्णित रॉयल्टी पेड खनिज प्राप्त करने वाले ठेकेदारों के अधिशुल्क निर्धारण प्रत्येक रनिंग बिल व अंतिम बिल की स्टेज पर किये जाने की बजाय प्रथम रनिंग बिल की स्टेज एवं अंतिम बिल की स्टेज पर ही किये जाए।

इसके अलावा उक्त परिपत्र के बिन्दु संख्या 8 को निम्नप्रकार प्रतिस्थापित किया जाता है :-

"BOT/BOOT के तहत होने वाले निर्माण कार्यों, जिनमें बिलों का भुगतान निर्माण विभाग द्वारा संवेदक को नहीं किया जाता है, उनमें विकल्प-‘ए’ लागू नहीं होगा, विकल्प-बी लागू होगा, विकल्प-सी एवं विकल्प-डी इस शर्त के साथ लागू होंगे कि कार्य समाप्ति पर संवेदक द्वारा निर्माण विभाग से खनिज की मात्रा का विवरण प्राप्त किया जाकर अधिशुल्क निर्धारण हेतु बिन्दु संख्या 4 में वर्णित दस्तावेज खनि अभियंता को प्रस्तुत करने होंगे एवं खनि अभियंता द्वारा रायल्टी की अदेयता का प्रमाण-पत्र जारी किया जावेगा। निर्माण विभाग द्वारा संवेदक को टोल वसूली अधिकार पत्र / कार्य पूर्ण का प्रमाण पत्र तब तक जारी नहीं किया जावेगा, जब तक संवेदक खनि अभियंता से रॉयल्टी की अदेयता का प्रमाण पत्र प्राप्त कर प्रस्तुत नहीं कर दें।

राजस्थान सरकार, खान (ग्रुप-2) विभाग के पत्र क्रमांक प.13(6) खान/ग्रुप-2/80-पार्ट जयपुर, दिनांक 09.01.2013 के अनुसार इस विभाग के समसंख्यक परिपत्र दिनांक 15.11.2011 में निर्माण विभाग के ठेकेदारों से खनिजों पर रायल्टी वसूली एवं परमिट के संबंध में व्यवस्था की गई है, जिसमें आंशिक संशोधन परिपत्र दिनांक 18.10.2012 से किया गया है। उक्त के क्रम में परिपत्र दिनांक 15.11.2012 में बिन्दु संख्या 12 निम्न प्रकार जोड़ा जाता है :-

"12. जो ठेकेदार रायल्टी पेड खनिज प्राप्त कर निर्माण कार्य सम्पादित करना चाहते हैं, परन्तु प्रथम या अंतिम रनिंग बिल की स्टेज पर अधिशुल्क निर्धारण नहीं करवाना चाहते हैं, उन्हें विकल्प ‘ई’ के रूप में वर्गीकृत किया जाकर उनके अंतिम बिल से रायल्टी की कटौती निम्नानुसार निर्धारण दर से की जाकर चेक अथवा ए0जी0 एडजेस्टमेंट के माध्यम से खान विभाग के आय मद में जमा करवाई जाए :-

1. सड़क निर्माण / वाइडनिंग एवं भवन निर्माण कार्य	3%
2. रिपेयरिंग एवं अन्य कार्य	1.5%

उक्त विकल्प लेने वाले ठेकेदारों को कार्य शुरू करने से पूर्व एक शपथ पत्र निर्माण विभाग में देते हुए प्रति खान विभाग को पृष्ठांकित किया जाना होगा कि वे अवैध खनन से खनिज प्राप्त नहीं करेंगे एवं खान विभाग द्वारा खनन स्रोत एवं परिवहन पर अवैध खनन निर्गमन के विरुद्ध की जाने वाली कार्यवाही पर किसी प्रकार की उजरदारी उनके द्वारा प्रस्तुत नहीं की जायेगी।

उक्त विकल्प BOT/BOOT ठेकेदारों द्वारा लिये जाने पर उन्हें कार्य की कुल लागत का उपरोक्त दरों से राशि खनि अभियंता कार्यालय में तीन समान किस्तों में कार्य समाप्ति से पूर्व जमा करानी होगी। निर्माण विभाग द्वारा कार्य की अंतिम संशोधित लागत से खनि अभियंता को अवगत कराया जाएगा तथा तीनों किस्त जमा हो जाने के खनि अभियंता द्वारा सत्यापन किये जाने पर बिन्दु संख्या 8 अनुसार निर्माण विभाग के अभियंता द्वारा टोल वसूली अधिकार पत्र / कार्य पूर्णता प्रमाण पत्र जारी किये जायेंगे।

LIST OF FIELD TESTS

- i) Particle size and shape
- ii) Slump test
- iii) Flakiness & Elongation Index tests
- iv) Compressive strength (concrete or bricks) test
- v) Rebound Hammer test
- vi) Bulking of sand
- vii) Silt content of sand
- viii) Temperature measuring with thermometer with brass protected end 0-200° C

FIELD TESTING EQUIPMENT AND INSTRUMENTS

A. Testing Equipment at Field Laboratories

- i) Balances
 - a) 7kg to 10 kg. Capacity, Semi-self-indicating type-Accuracy 10 gm
 - b) 500 gm. Capacity, Semi-self-indicating type Accuracy 1 gm
 - c) Pan Balance – 5 Kg. Capacity, accuracy 10 gm.
 - d) Weighing scale platform type 100kg capacity.
- ii) Sieves: as per IS 460-1962.
 - a) I.S. Sieves – 450 mm internal dia of sizes 100 mm, 80 mm, 63 mm, 50mm, 40 mm, 25 mm, 20 mm, 12.5 mm, 10 mm, 6.3 mm, 4.75 mm complete with lid and pan.
 - b) IS Sieves – 200 mm internal dia(brass frame) consisting of 2.36 mm, 1.18 mm, 600 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid and pan.
- iii) Sieve shaker capable of 200 mm and 300 mm dia sieves, motorized operated with timing switch assembly.
- iv) Equipment for slump test – Slump Cone, Steel Plate, tamping rod, steel scale, scoop.
- v) Duly calibrated 100 tonnes compression testing machine, electrical-cum manually operated.
- vi) Graduated measuring cylinders 200 ml capacity
- vii) Enamel trays (for efflorescence test for bricks and other tests)
 - a) 300 mm X 250 mm X 40 mm
 - b) Circular plates of 250 mm dia
 - c) 600 mm X 450 mm X 500 mm
 - d) 450 mm X 300 mm X 40 mm.
- viii) ISI marked 150X150X150 mm concrete cube moulds as per site requirement – 18 Nos.
- ix) Graduated cylinder 1000 ml. Capacity.
- x) Pumps & pressure gauges for hydraulic testing of pipes.
- xi) Moisture meter
- xii) Oven
- xiii) PH Meter.
- xiv) Any other equipment for site tests as outline in BIS and as directed by the Engineer-in-charge.

B. Field Testing Instruments

- i) Steel tapes – 3 m
- ii) Digital Vernier Calipers
- iii) Digital Micrometer Screw 25 mm gauge
- iv) A good quality plumb bob
- v) Spirit level minimum 30 cms long with 3 bubbles for horizontal vertical
- vi) Wire gauge (circular type) disc.
- vii) Foot rule
- viii) Long nylon thread
- ix) Rebound hammer for testing concrete
- x) Magnifying glass
- xi) Screw driver 30 cms long
- xii) Ball pin hammer, 100 gms
- xiii) Plastic bags for taking samples
- xiv) Digital Distance meter
- xv) Leveling machine
- xvi) Theodolite
- xvii) Total survey station
- xviii) Ultrasonic Pulse velocity meter
- xix) **Water Testing Kit**

Note: The above list is only indicative and not exhaustive. (If the contractor fails to bring any of the equipments mention under A & B of above necessary recovery shall be made from the contractor.)

PROFORMA FOR TESTS CARRIED OUT

NAME OF THE WORK:
AGREEMENT NO. & DATE:

DIVISION/
SUB-DIVISION

Sl. No.	Item	Quantities as per agreement	Frequency as per specification	No. of tests required	R.A. bill No.	Upto date quantity	No. of tests required	No. of tests actually done	Remarks
1	2	3	4	5	6	7	8	9	10

Signature of Contractor

CEMENT/PAINT REGISTER

NAME OF WORK:
AGREEMENT NO.

DIVISION
SUB-DIVISION

Particulars of Receipt

Date of Receipt	Source of receipt with details if any	Batch No.	Date of manufacture	Date of expiry	Qty. received	Progressive Total	Date of Issue	Qty Issued	Items of work for which Issued	Qty. Returned at the end of day's work
1	2	3	4	5	6	7	8	9	10	11

Particulars of Issue

Net Qty. Issued	Progressive Total	Daily Balance in Hand	Contractor's Initial	J.E.'s Initial		Periodical Check	
						By AE	By EE
12	13	14	15	16		17	18

**GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR
FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF
WATER-PROOFING WORKS (All Water - Proofing Items)**

The agreement made this..... day of (Two Thousand _____ only) betweenS/o(hereinafter called the GUARANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated and made between the GUARANTOR OF THE ONE PART AND the Government of the other part whereby the contractor inter alia undertook to render the building and structures in the said contract recited completely water and leak-proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain water and leak proof, for ten years from the date of completion of work.

NOW THE GUARANTOR hereby guarantee that work executed by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date of the completion of work.

The decision of the Engineer-in-charge with regard to nature and cause of defect shall be final and binding on Guarantor.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect being found render the building water proof to the satisfaction of the Engineer-In-Charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the water proofing or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and / or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator and by for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of :-

1. 2.

SIGNED FOR AND BEHALF OF THE PRESIDENT OF INDIA BY in the presence of :-

1. 2.

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR
FOR REMOVAL OF DEFECTS AFTER COMPLETION
IN RESPECT OF SANITARY INSTALLATIONS / WATER SUPPLY / DRAINAGE WORK

The agreement made this..... day of (Two Thousand only) betweenS/o(hereinafter called the GUARANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated and made between the GUARANTOR OF THE ONE PART AND the Government of the other part, whereby the contractor inter alia, undertook to render the work in the said contract recited leak proof with sound material and workmanship.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable, leak proof and guaranteed against faulty material and workmanship, and finishing for five years from the date of completion of work.

NOW THE GUARANTOR hereby guarantee that work executed by him will be free from any leakage, seepage, cracks in pipes and guaranteed against faulty material and workmanship improper slope, defective galvanizing etc. for Five years to be reckoned from the date of completion of the work.

The decision of the Engineer-In-Charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect to satisfaction of Engineer-in-charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all defects or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator and by for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of :-

1. 2.

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY..... in the presence of :-

1. 2.

**GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR
FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF
STONE WORK / TILE WORK / STONE CLADDING WORK**

The agreement made this..... day of (Two Thousand _____ only) betweenS/o(hereinafter called the GUARANTOR of the one part) and the President of India (hereinafter called the Government of the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated and made between the GUARANTOR OF THE ONE PART AND the Government of the other part whereby the contractor inter alia undertook to render the work in the said contract recited structurally stable workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable and guaranteed against faulty workmanship, improper slope, finishing and materials.

NOW THE GUARANTOR hereby guarantee that work executed by him will be free from any material defects, structural defects, cracks, hollow pockets, improper slope, faulty joints etc. for **five years** to be reckoned from the date of completion of the work.

The decision of the Engineer-in-charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects, commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator and by for and on behalf of the President of India on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of :-

1. 2.

SIGNED FOR AND BEHALF OF THE PRESIDENT OF INDIA BY in the presence of :-

1. 2.

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR
FOR REMOVAL OF DEFECTS AFTER COMPLETION
IN RESPECT OF ALUMINIUM DOORS, WINDOWS VENTILATOR WORK.

The agreement made this..... day of (Two Thousand only)..... betweenS/o(hereinafter called the GUARANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated and made between the GUARANTOR OF THE ONE PART AND the Government of the other part, whereby the contractor inter alia, undertook to render the work in the said contract recited structurally stable, workmanship, powder coating, anodizing, colouring and sealing etc.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable and guaranteed against faulty material and workmanship, defective anodizing/ powder coating for five years from the date of completion of work.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable and guaranteed against faulty material and workmanship, defective anodizing/ powder coating for five years to be reckoned from the date of completion of the work.

The decision of the Engineer-In-Charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect to satisfaction of Engineer-in-charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all defects or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator and by for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of:-

1. 2.

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY..... in the presence of:-

1. 2.

LIST OF PREFERRED MAKES FOR CIVIL WORKS

Name of work: C/o 33 kV Sub-station for dedicated line from 132kV GSS Jakhrana to CISF, MPRTC, Behror (Raj.).

S.No	Material	Preferred Make
1	ANTI TERMITE PESTICIDES	BAYER, FMC INDIA, HINDUSTAN INSECTICIDES
2	STEEL (TMT FE-500D)	TATA., RINL, JINDAL STEEL & POWER LTD, JSW STEEL LTD., SAIL
3	STRUCTURAL STEEL SECTIONS	TATA, JINDAL, SAIL, RINL
4	CEMENT [OPC/PPC]	ACC, AMBUJA, ULTRATECH, WONDER, JK LAXMI, JK SUPER, SHREE
5	READY MIXED CEMENT CONCRETE	ACC, ULTRA TECH, AFCON
6	WHITE CEMENT	BIRLA WHITE, J.K. WHITE, ULTRATECH
7	VITRIFIED TILES (DOUBLE CHARGED / FULL BODY/ULTRA SLIM /ANTISKID / ACID-ALKALI RESISTANT)- (ALL TILES SHALL BE PROCURED FROM FULLY OWNED FACTORY OF THE MANUFACTURER AND NOT FROM JV / OUTSOURCED)	SOMANY, KAJARIA, NITCO, RAK
8	CERAMIC GLAZED TILES	SOMANY, KAJARIA, NITCO, RAK
9	WATER-PROOF CEMENT PAINT, SYNTHETIC ENAMEL PAINT, PLASTIC EMULSION PAINT, DISTEMPER/ACRYLIC EMULSION PAINT, TEXTURED PAINT, STEEL PRIMER, WOOD PRIMER, CEMENT PRIMER, EXTERIOR WATERPROOFING PAINT, WOOD FINISH (MELAMINE & PU POLISH)	ASIAN PAINT, NEROLAC, BERGER
10	PLY BOARD, PLYWOOD (PINE BOARD), LAMINATE, FLUSH DOOR (ALL FLUSH DOORS SHALL BE PROCURED FROM FULLY OWNED FACTORY OF THE MANUFACTURER AND NOT FROM JV / OUTSOURCED), PRELAMINATED PARTICLE BOARD	GREEN, MERINO, CENTURY, DURO
11	SELF LEVELLING COMPOUND	MAPAI, ARDEX ENDURA, BIZZAR
12	EPDM GASKET	HANU, ANAND, VICTOR
13	WOOD ADHESIVE	FEVICOL, 3M, ARALDITE, SIKA
14	FIRE SEALANT	HILTI, 3M, MCCOY
15	TILE ADHESIVE, STONE ADHESIVE, EPOXY GROUTING COMPOUND	PIDILITE, ARDEX ENDURA, WEBER,
16	DASH, ANCHORING FASTENERS	HILTI, FISCHER, CANON
17	ALUMINIUM COMPOSITE PANEL	ALUCOBOND, REYNOBOND
18	READY MIX GYPSUM PLASTER	SAINT GOBAIN, USG BORAL, ULTRATECH
19	READY MIX CEMENT PLASTER	WEBER, ULTRATECH, BIRLA WHILTE
20	SILICON SEALANT	GE, DOW CORNING, PIDILITE
21	GYPSUM BOARD	USG BORAL, LAFAGE, SAINT GOBAIN, KNAUF DANOLINE

S.No	Material	Preferred Make
22	FLOAT GLASS, REFLECTIVE GLASS, TINTED GLASS, HIGH PERFORMANCE GLASS, LOOKING GLASS / MIRROR LACQUERED GLASS, HIGH PERFORMANCE GLASS, FIRE RESISTANT GLASS	MODI GLASS, SAINT GOBAIN GLASS
23	MECHANICAL COUPERS	USHA MARTIN, DEXTRA, HALFEN
24	CRYSTALLIANE CEMENTITIOUS WATERPROOFING COMPOUND	XYPEX CONSTRUCTION CHEMICAL, KRYTONE,
25	BITUMEN MEMBRANE FOR WATERPROOFING, HDPE MEMBRANE FOR WATERPROOFING, POLYUREA MEMBRANE FOR WATERPROOFING	SIKA, SAINT GOBAIN, SOPREMA, FOSROC PIDILITE
26	HOLLOW METAL PRESSED DOORS (METAL DOORS)	NAVAIR, TATA PRAVESH, SHAKTI HORMANN
27	ROLLER BLIND	VISTA, MAC, HUNTER DOUGLUS
28	HYDRAULIC DOOR CLOSER, FLOOR SPRING, DOOR AUTOMATION, HARDWARES FOR FIRE RATED DOORS, STAINLESS STEEL FITTINGS/HARDWARE FOR WOODEN/METAL/GLAZED/STEEL DOOR & WINDOWS, FRICTION STAY HINGES, HARDWARE FITTINGS FOR ALUMINIUM WINDOWS & DOORS	DORMA, GEZE, EBCO, HAFELE, HORMANN
29	ADHESIVE TAPE	3M, NORTON, TESA
30	HIGH PERFORMANCE EPOXY BASED RESIN ANCHOR SYSTEM	HILTI, FOSROC, CICO, SIKA
31	EPOXY MORTAR	FOSROC, SIKA, MYK LATICRETE, CICO
32	ALUMINIUM SECTIONS FOR DOORS & WINDOWS ETC.	JINDAL, HINDALCO, BHORUKA
33	FABRICATOR FOR ALUMINUM WORK AND STRUCTURAL GLAZING WORK	SAPA, KALCO, TECHNAL
34	MS SECTIONS (PIPES, BOXES CHANNELS)	JINDAL HISAR, TATA,
35(A)	S.S. MATERIAL	JINDAL STAINLESS STEEL LTD., TATA STEEL, SAIL
35(B)	S.S. HANDRAIL / RAILINGS	JINDAL STAINLESS STEEL LTD., DORMA, KICH
36	WALL PUTTY	JK, BIRLA, ASAIN PAINT
37	FLOOR HARDENER, POLYSULPHIDE SEALANT, WATERPROOFING COMPOUND, ADMIXTURES/CURING COUMPOUND	SIKA, FORSROC, PIDILITE, DR FIXIT
38	EXPANSION JOINT	MIGUA, CS, CAMEO
39	METAL/ALUMINUM FALSE CEILING	SAINT GOBAIN, HUNTER DOUGLUS, ARMSTRONG
40	WPC (WOOD POLYMER COMPOSITE)	GREENPLY, CENTURY, RAJSHREE
41	AAC BLOCK ADHESIVE	ARDEX ENDURA, PIDILITE, WEBER
42	UPVC WINDOWS	FENESTA, ALUPLAST, KOENMERLING, VEKA
43	VINYL / CONDUCTIVE FLOORING, DADO SKIRTING	FORBO, TARAKETT, ARMSTRONG, GERFLOOR
44	CALCIUM SILICATE TILES FALSE CEILING	AEROLITE, RAMCO, HILUX, ARMSTONG
45	FIRE CHECK DOORS (METAL/ROLLING/GLAZED)	NAVAIR, TATA PRAVESH, SHAKTI HORMANN, 4C FIRE PROTECTION PVT LTD
46	ACOUSTIC SEAL / DOOR SEAL	LORIENT, RAVEN, DORMA, 3M, HAFELE
47	INTUMESCENT FIRE / SMOKESEAL	ASTRO FLAME, RAVEN, SEALZ, LORIENT

S.No	Material	Preferred Make
48	CALCIUM SILICATE BOARD FOR FIRE DOOR	PROMOTECH, PROMINA, RAMCO
49	POLYCARBONATE SHEET	DANPALON, SOLALITE, DPI SYSTEM, EVERLITE, CPI
50	GI PIPES	JINDAL HISAR, TATA, SAIL
51	GI FITTINGS	UNIK, TATA, ZOLOTO
52	CPVC PIPES	ASTRAL, PRINCE, SFMC, SUPREME
53	HDPE PIPES	SUPREME, FINOLEX, ASTRAL, RELIANCE,
54	UPVC / SOIL, WASTE, VENT PIPES & FITTINGS	ASTRAL, PRINCE, SFMC
55	C.P. BRASS FITTING AND ACESSORIES	JAQUAR, ROCA, KOHLER, KEROVIT, HINDWARE
56	SS SINK	NILKANTH, NIRALI, JAYNA
57	SANITARY WARE (URINAL, WASH BASIN, WC ETC.)	JAQUAR, GROHE, KOHLER, KEROVIT, HINDWARE
58	GLASS MOSAIC TILE	ITALIA, CORAL, KAJARIA
59	FAÇADE AND WINDOW SYSTEM	SCHUCO, ALUK, REYNAERS, GUTMANN
60	FIRE STOP IN CURTAIN WALL SYSTEM	HILTI, 3M, FISCHER, LORIENT
61	POP OUT VENT FOR FAÇADE AND SYSTEM WINDOW HARDWARE	COTSWOLD, SCHUCO, ALUK, REYNAERS
62	ALUMINIUM OPERABLE LOUVER	TECHNAL, DOMAL, YOGI GLAZE, SCHUCO
63	AIR TRANSFER GRILL	RUSKIN, SYSTEM AIR, TROX, TREMCO
64	ENGINEERED WOODEN FLOORING AND SKIRTING	MIKASA (GREENLAM), TARKETT, HAVWOODS, PARADOR (HIL), PERGO, KAHRS
65	ENGINEERED MARBLE	HR JOHNSON, KALINGA STONE, NITCO, ASIAN
66	SS TACTILE	EMINENT, FERROTECH, SUNDARAM, JINDAL
67	BAMBOO DECKING, ROOFING & CLADDING	ECO GREEN FLOORING, EPITOME BAMBOOWOOD, LAMIWOOD
68	OUTDOOR SIGNAGES	3M, AVERY DENNISON, VEDAAANSHI SIGNS
69	ACOUSTIC PANELS	ARMSTRONG, USG BORAL, ANUTONE
70	WEATHER/STRUCTURE SILICON SEALANT	WACKER, MCCOY, DOW CORNING
71	BACKER ROD	SUPREME/SYSTRANS
72	POLYSTRENE BOARD	SUPREME, DOW CORNING, TEXAS, PIDILITE
73	DUCTILE IRON PIPES	ELECTROSTEEL, KESORAM, TISCO
74(A)	STAINLESS STEEL PIPES	JINDAL STAINLESS STEEL, J-PRESS, ALFA PRESS
74(B)	STAINLESS FITTINGS	DORMA KICH, DORSET
75	SLUICE VALVES, GATE / BALL VALVES	ZOLOTO, KIRLOSKAR, LEADER
76	FURNITURE (CHAIRS/WORKSTATIONS, STORAGE UNITS ETC.)	HERMAN-MILLER, HAYWORTH, STEELCASE, DURIAN, GODREJ,
77	CENTRIFUGALLY CAST (SPUN) IRON PIPES & FITTINGS	NECO, KAPILANSH, SKF
78	BITUMEN	IOCL, BPCL, HPCL or as approved by Ministry of Petroleum, Govt. of India and holding license to use ISI certification mark for their products

Note: - If approved make/brand of any material is not given in the list, the same will be approved by the NIT approving authority.

**Government of India
Central Public Works Department**

**Name of work: C/o 33 kV Sub-station for dedicated
line from 132kV GSS Jakhrana to
CISF, MPRTC, Behror (Raj.).**

PART-D
(SCHEDULE OF QUANTITY)