



भारत सरकार

GOVERNMENT OF INDIA

केंद्रीय लोक निर्माण विभाग

CENTRAL PUBLIC WORKS DEPARTMENT

कार्यालय अधीक्षण अभियंता (त्रिची)

OFFICE OF THE SUPERINTENDING ENGINEER (TRICHY)

एन आई टी कैम्पस, तिरुची / NIT CAMPUS, TRICHY

Name of work: Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.

NIT

No. 33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27

Estimated cost put to tender	CIVIL :	Rs. 2,22,78,475/-
	E&M :	Rs. 22,77,498/-
	Total :	Rs. 2,45,55,973/-
Earnest money	Rs.4,91,119/-	
Stipulated period of completion of work	06 (Six) months	

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*Certified that this NIT contains page numbers from **1 to 203** (Two hundred three) including cover pages.*

Assistant Engineer (Admin)
CPWD, Trichy - 620 015

Assistant Engineer (E&M)(P)
CPWD, Trichy - 620 015

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कार्यालय अधीक्षण अभियंता (त्रिची)
OFFICE OF THE SUPERINTENDING ENGINEER (TRICHY)
एन आई टी कैम्पस, तिरुची / NIT CAMPUS, TRICHY

NOTICE INVITING TENDER (BRIEF PARTICULARS)

NIT No.	33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27		
Name of work & Location	Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.		
Estimated cost put to tender	CIVIL :	Rs. 2,22,78,475/-	
	E&M :	Rs. 22,77,498/-	
	Total :	Rs. 2,45,55,973/-	
Earnest money	Rs.4,91,119/-		
Stipulated period of completion of work	06 (Six) months		

All fields indicated with “ ** ” are to be filled by the Executive Engineer.

Assistant Engineer (E)(P)
CPWD, Trichy - 620 015

Assistant Engineer (Admin)
CPWD, Trichy - 620 015

This NIT for the above-mentioned work amounting to Rs.2,45,55,973/- (Rupees Two Crore Forty-Five Lakhs Fifty-Five Thousand Nine Hundred and Seventy-Three only) is hereby approved.

Superintending Engineer (Trichy)
CPWD, NIT Campus, Trichy - 620 015

PART-A

INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR e TENDERING

The Executive Engineer (Trichy) - I, Trichy Central Division, CPWD, NIT Campus, Trichy - 620 015 on behalf of President of India invites online ~~Item—rate/percentage rate~~ bids from **CPWD enlisted contractors of appropriate class in building (composite) category**, for the following work(s):

Table 1: Brief Particulars and Timelines

1	NIT No.	33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27
2	Name of work & Location	Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.
3	Estimated cost put to tender (In Rs.)	CIVIL : Rs. 2,22,78,475/- E&M : Rs. 22,77,498/- Total : Rs. 2,45,55,973/-
4	Earnest money (In Rs.)	Rs.4,91,119/-
5	Stipulated period of completion of work	06 (Six) months
6	Last date & time of submission of bid, copy of receipt for deposition of original EMD and other documents as specified in the bid document	21/10/2026 up to 15:00 Hrs.
7	Date & time of opening of tender.	21/10/2026 on 15:30 Hrs.
9	EMD to be drawn/ pledged in favour of	Executive Engineer, Trichy Central Division,, CPWD, Trichy, Tamilnadu
9a	Details of Bank Account	Name of Account Holder: Executive Engineer, Trichy Central Division,, CPWD, Trichy, Tamilnadu Name of the Bank & Branch: State Bank Of India, Tiruchirappalli. Bank Account Number: 00000030175546387 IFSC Code: SBIN0000930 PAO Code: 043951 CDDO Code: 100249

1. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he consider himself eligible and he is in possession of all the documents required.
2. Information and Instructions for bidders posted on website shall form part of bid document.
3. 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 can be seen and downloaded from website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.
4. 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 or Account Payee Demand draft or Banker's Cheque or Fixed Deposit Receipts or/and Bank Guarantee including e-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.
 - 4.1. **Where EMD is furnished in the form of a Demand Draft or Fixed Deposit Receipt, the instrument shall:**
 - a) be issued/purchased from the bidder's own bank account, with the name of the bidder and relevant account details clearly recorded on the instrument or certified by the issuing bank; and
 - b) in the case of a Fixed Deposit Receipt, be duly pledged in favour of the authority specified in the NIT, with the pledge clearly endorsed on the instrument, and shall not be subject to any other lien, pledge or claim.
 - 4.2. The bidder may upload a Banker's Certificate in the prescribed format as supporting evidence. Such certificate shall not be mandatory where the instrument itself clearly establishes compliance with the above requirements. An instrument not duly pledged, or not establishing that it has been issued from the bidder's account, shall not be accepted and the bid shall be rejected.
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 bid opening process. After opening of bids he will receive the competitor bid sheets.
8. Contractor can upload documents in the form of JPG format and PDF format.
9. Contractor must ensure to quote rate in the column (5) meant for quoting rate in figures appears in yellow colour and the moment rate is entered, it turns sky blue.
10. 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).
11. 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.
12. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.
13. The Contractor/ bidder shall not divert any advance payments or part there off or any other purpose other than needed for completion of the contracted work. All advance payments received as per terms of the contract are required to be re-invested in the contracted work to ensure timely availability of resources in terms of materials, labour, plant & machinery needed for the required pace of progress for timely completion of work.
14. 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 before last date of submission of Bids. Training will be valid only when participants are registered in LMS (Learning Management System) of ERP and certificate is issued through LMS of ERP.

15. The enlisted contractor will not be allowed to participate in the tendering process without uploading the certificate of above training. The bid uploaded without attaching the certificate of ERP Training will be REJECTED.
16. The bidder shall upload an undertaking in the prescribed format regarding change/no change in constitution, partnership, directorship, name of firm, authorized signatory or any other credential after enlistment. In case any such change has taken place after enlistment, the bidder shall also upload approval/acknowledgement/order of the competent enlistment authority along with all supporting documents. Bids submitted without the prescribed undertaking shall be rejected.
17. The name of bidder, constitution of firm, PAN, GSTIN and address details shall be consistent with the enlistment and other bid documents. Any mismatch shall be supported by valid legal/official documents uploaded with the bid. Unexplained mismatch or non-submission of supporting documents shall render the bid liable to rejection.
18. Authorization letter/Power of Attorney/Board Resolution/partnership authorization, as applicable, in favour of the person signing/submitting the bid shall be uploaded along with the bid. The authorization document shall clearly establish the authority of the signatory to sign and submit the bid on behalf of the bidder/firm/company/partnership/LLP. Bids submitted without valid authorization, wherever applicable, shall be rejected.
19. Intending bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders 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 tender. The tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent upon any misunderstanding or otherwise shall be allowed. The tenderer 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 tender by a tenderer 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.

20. The Department may seek clarification regarding documents already uploaded by the bidder, wherever considered necessary. However, such clarification shall not confer any right on the bidder to submit fresh essential documents, replace invalid documents or cure material deficiencies after the last date and time of submission of bid.
21. The bidders shall note that, only ISI marked TMT reinforcement bars of grade Fe-500D or more conforming to **Bar Set-II** specification (as per OM No. CSQ/SE(TAS)/EE(TAD)/Steel/2021/50-H dated 17.02.2021, OM No. CSQ /SE (TAS)/Steel/2024/262-H dated 14.08.2024, and OM No. CSQ /SE(TAS) /Steel/2024/85-H dated 09.04.2025 issued by CPWD Directorate) shall be utilised in work. Bidders are advised to quote their rates accordingly.

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

- A) Insurance Surety Bond/ Demand Draft/ Account Payee Banker's Cheque / FDR/ Bank Guarantee including e-Bank Guarantee (for balance amount as prescribed) of any commercial Bank against EMD (Bank guarantee shall be in the prescribed form as given in *FORM OF BANK GUARANTEE FOR EMD (APPENDIX-A1)*).
- B) Receipt for deposition of original EMD (*RECEIPT OF DEPOSITION OF ORIGINAL EMD (APPENDIX A3)*).
- C) Enlistment Order of the Contractor.
- D) 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 under taking (*UNDERTAKING FOR GST REGISTRATION CERTIFICATE (APPENDIX-A4)*) along with bid documents.
- E) ERP (Enterprise Resource Planning) training certificate issued through LMS of ERP of either himself or his authorised representative through any of the CPWD Regional Training Institutes 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/ Any other special training arranged by ERP Unit of CPWD.

Note: The bid uploaded without attaching the certificate of ERP Training issued through LMS of ERP will not be considered for opening of Bid and such bids will be REJECTED.

- F) Declaration about Site Inspection as per prescribed format (*DECLARATION ABOUT SITE INSPECTION (APPENDIX-A7)*).

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

- G) *BANKER'S CERTIFICATE FOR DEMAND DRAFT / FIXED DEPOSIT RECEIPT TOWARDS EMD (APPENDIX-A2)* for EMD submitted in the form of DD/ FDR.
- H) Undertaking regarding change/no change in constitution, partnership, directorship, name of firm, authorised signatory or any other credential after enlistment, in the prescribed format (*UNDERTAKING REGARDING CHANGE IN CONSTITUTION / PARTNERSHIP / DIRECTORSHIP / NAME OF FIRM / AUTHORIZED SIGNATORY (APPENDIX-A5)*), along with approval/acknowledgement/order of the competent enlistment authority and supporting documents, wherever any such change has taken place. (*Not applicable for sole proprietorship*)
- I) Authorisation letter/ Power of Attorney/ Board Resolution/ partnership authorisation in favour of the person signing/submitting the bid. (*Not applicable for sole proprietorship*)

Executive Engineer (Trichy) - I
CPWD, NIT Campus, Trichy - 620 015

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT
OFFICE OF THE EXECUTIVE ENGINEER (TRICHY-I)
NIT CAMPUS, THUVAKUDI, TRICHY – 620 015

No. 69(1)/**

Dated: **/**/****

NOTICE INVITING e-TENDER

The Executive Engineer (Trichy) - I, Trichy Central Division, CPWD, NIT Campus, Trichy - 620 015 on behalf of President of India invites online ~~Item~~ **rate/percentage rate** bids from **CPWD enlisted contractors of appropriate class in building (composite) category**, for the following work(s):

1	NIT No.	33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27
2	Name of work & Location	Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.
3	Estimated cost put to tender (In Rs.)	CIVIL : Rs. 2,22,78,475/- E&M : Rs. 22,77,498/- Total : Rs. 2,45,55,973/-
4	Earnest money (In Rs.)	Rs.4,91,119/-
5	Stipulated period of completion of work	06 (Six) months
6	Last date & time of submission of bid, copy of receipt for deposition of original EMD and other documents as specified in the bid document	21/10/2026 up to 15:00 Hrs.
7	Date & time of opening of tender.	21/10/2026 on 15:30 Hrs.

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 can be seen and downloaded from website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.

Executive Engineer (Trichy) - I
CPWD, NIT Campus, Trichy - 620 015

Copy for information to:

1. The Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 15.
2. The Executive Engineer (E&M), CPWD, NIT Campus, Trichy - 15.
3. Notice Board.

Executive Engineer (Trichy) - I

CPWD-6 FOR e-TENDERING

- 1 ~~Item-rate/percentage rate~~ tenders are invited on behalf of President of India from ~~CPWD enlisted contractors of appropriate class in building (composite) category~~ for the work of "Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy."

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

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

- 1.1 The work is estimated to cost `2,45,55,973/-. 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 tenders. He will also nominate Division which will deal with all matters relating to the invitation of tenders. 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.

- ~~1.2 Intending tenderer is eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:-~~

~~Criteria of eligibility for submission of tender documents~~

- ~~1.2.1 Conditions for Non-CPWD registered contractors only, if bids are also open to non-CPWD contractors.-~~

~~For works estimated cost upto tendering limit of class -I Building & Roads (erstwhile Composite/ Building/ infrastructure) category Contractor (However, for Horticulture it may be modified as per bidding limit of CPWD class I contractors of Horticulture category).~~

~~Three similar works each of value not less than Rs. ***/- or two similar work each of value not less than Rs. ***/- or one similar work of value not less than Rs. ***/- (all figures rounded to nearest convenient figure) during the last 7 years ending last day of the month previous to the one in which tenders are invited).~~

~~Note:-~~

~~For works costing above tendering limit of class -II Building & Roads (erstwhile Composite/Building/infrastructure) category Contractors but upto tendering limit of class-I category Contractor (However, for Horticulture category, it may be modified as per bidding limit of CPWD-~~

~~class II and CPWD Class I contractors respectively of Horticulture category) when bids are open to non-CPWD contractors also, then class II contractors of CPWD registered shall also be eligible if they satisfy the eligibility criteria specified in 1.2.1 above.~~

~~1.2.2 Criteria of eligibility for CPWD as well as non-CPWD contractors.~~

~~For works estimated to cost above the tendering limit of class -I (Super) Buildings & Roads (erstwhile Composite/ Building/ infrastructure) category Contractor (However for Horticulture category, it may be modified as per bidding limit of CPWD class I contractors of Horticulture Category).~~

~~Three similar works each of value not less than Rs. ***/- or two similar work each of value not less than Rs. ***/- or one similar work of value not less than Rs. ***/- (all figures rounded to nearest convenient figure) during the last 7 years ending last day of the month previous to the one in which tenders are invited).~~

~~The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to previous day of last day of submission of bid.~~

~~To become eligible for issue of bid, the bidders shall have to furnish 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 bidding 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 (Scanned copy to be uploaded at the time of submission of bid).~~

~~1.2.3 When bids are invited from non CPWD contractors and CPWD class II contractors as per provisions of clause 1.2.1 above, it will be mandatory for non CPWD contractors and CPWD class-II contractors to upload the work experience certificate(s) and the affidavit as per the provisions of clause 1.2.2.~~

~~But for such bids, Class-I contractors of CPWD are eligible to submit the bids without submission of work experience certificate and affidavit. Therefore, CPWD class-I contractors shall upload two separate letters for experience certificate and affidavit that these documents are not required to be submitted by them. Uploading of these two letters is mandatory otherwise system will not clear mandatory fields.~~

- 2 Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD 7/8 (or other Standard Form as mentioned) which is available as a Govt. of India Publication and also available on website www.cpwd.gov.in.

Bidders 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 tender documents.

- 4 (i) The site for the work is available.

OR

~~The site for the work shall be made available in parts as specified below:-~~

~~(ii) The architectural and structural drawing for the work is available~~

OR

The 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.

- 5 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 date and time of submission of tender as notified. **No post-tender modification is allowed by the tenderers except through negotiations, if required. In case, any tenderer does so, the tender will be rejected and the tenderer will be debarred for future tendering in CPWD for two years by the concerned enlisting authority (in case of CPWD enlisted contractor) and by the concerned CE/SE (in case of non-enlisted contractor).**
- 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 tender as notified.
- 8 When tenders are invited in three stage system and if it is desired to submit revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted then the tender submitted earlier shall become invalid.
- 9 Earnest Money in the form of Insurance Surety Bonds or Account Payee Demand Draft, Fixed Deposit Receipt, Bankers Cheque or Bank Guarantee including e-Bank Guarantee (for balance amount as prescribed) from any of the Commercial Banks **(drawn in favour of Executive Engineer, Trichy Central Division,, CPWD, Trichy, Tamilnadu)** 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 including e-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 the 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, who has deposited EMD with any division of CPWD and other documents scanned and uploaded are found in order.

The bid submitted shall be opened at 15:30 Hrs on 21/10/2026.

- 10 The bid submitted shall become invalid and e-Tender processing fee (if applicable) 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 or 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 sub contractors, 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 per PART-A, BRIEF PARTICULARS AND SCOPE OF THE PROJECT.

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 bidders 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 tender and reserves to itself the

authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.

- 14 Canvassing whether directly or indirectly, in connection with tenderers is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to 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 tender and the tenderer shall be bound to perform the same at the rate quoted.
- 16 The contractor shall not be permitted to tender 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 a Divisional Accountant or as an officer in any capacity between the grades of Superintending 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 gazette officer in the Central Public Works Department or in the Ministry of 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 gazette 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 tender or engagement in the contractor's service.
- 18 The bid for the works shall remain open for acceptance for a period of thirty (30) days from the date of opening of bids in case of single bid system/~~seventy five (75) days from the date of opening of technical bids in case bids are invited on 2 or 3 bid system.~~

Further,

- (i) If any tenderer withdraws his tender within 7 days after last **date and time (24 hours basis)** 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 after expiry of 7 days after last **date and time (24 hours basis)** 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) **Withdrawal of the tender, by the tenderer, shall only be made through e-tender portal. Any other method i.e., letter / e-mail etc. shall not be considered. The tender inviting authority gets intimation through SMS and e-mail in this regard.**
- (iv) In case of forfeiture of earnest money as prescribed in para (i) and (ii) above, the bidder 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 bidders/ 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:-

- (i) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of 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.
- (ii) Standard C.P.W.D. Form 7/8 or other Standard C.P.W.D. Form as applicable.

20 For Composite Tenders

20.1.1 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.

20.1.2 The bid document shall include the following parts:

PART-A: CPWD-6, CPWD-7/8 including schedule A to F for the major component of the work, Standard General Conditions of Contract for CPWD 2023 as amended/ modified up to date.

PART-B (CIVIL): General / specific conditions and specifications applicable to major component of the work.

PART-C (E&M): Schedule A to F for minor component of the work. Competent authority under clause 2 and clause 5 shall be same authority as mentioned in schedule A to F for minor components), General/specific conditions and specifications applicable to minor component(s) of the work.

PART-D: Schedule of quantities applicable to major and minor component(s) of the work, Financial Bid.

- 20.1.3 The bidders must associate himself, with agencies as per NIT conditions
- 20.1.4 The eligible bidders shall quote rates for all items of major component as well as for all items of minor components of work.
- 20.1.5 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 incharge of major component and has also to sign two or more copies of agreement depending upon number of EE's/DDH incharge of minor components. One such signed set of agreement shall be handed over to EE/DDH incharge of minor component(s).
- EE of major component will operate PART-A and PART-B (CIVIL) of the agreement along with the corresponding drawings, schedule of quantities and other provisions relating to the major component.
- EE/DDH incharge of minor component(s) shall operate PART-C (E&M) of the agreement along with the corresponding drawings, schedule of quantities and other provisions relating to the respective minor component(s).
- 20.1.6 Entire work under the scope of composite tender including major and all minor components shall be executed under one agreement.
- 20.1.7 Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works.
- 20.1.8 The main contractor has to associate agencies for specialized components (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).
- 20.1.9 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.
- 20.1.10 The main contractor has to enter into MoU with agencies contractor(s) associated by him . Copy of such MoU shall be submitted to EE/ DDH in charge of each relevant component as well

as to EE incharge of major component. In case of change of associate contractor, the main contractor has to enter into MoU/agreement with the new contractor associated by him.

- 20.1.11 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 the Engineer-in-Charge of major and minor components.
- (A) 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.
 - (B) 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.

Executive Engineer (Trichy) - I
CPWD, NIT Campus, Trichy - 620 015

APPENDICES OF FORMS FOR e-TENDERING

FORM OF BANK GUARANTEE FOR EMD (APPENDIX-A1)

[On non-judicial stamp paper of minimum Rs.200]

(Guarantee offered by Bank to CPWD in connection with the execution of contracts)

- 21 Whereas the Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015, on behalf of the President of India (here in after called "The Government") has invited bids under 33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27 dated **/**/**** for Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy. The Government has further agreed to accept irrevocable Bank Guarantee for Rs. (Rupees only) in favour of Executive Engineer, Trichy Central Division,, TCD, Trichy, Tamilnadu valid upto(date..... as Earnest Money Deposit from (name and address of contractor) (herein after called "the contractor") for compliance of his obligations in accordance with the terms and conditions of the said NIT.
- 22 We, (indicate the name of the bank) (herein after 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.
- 23 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).
- 24 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.
- 25 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.

- 26 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.
- 27 This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
- 28 We, (indicate the name of the Bank), undertake not to revoke this guarantee except with the consent of the Government in writing.
- 29 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:

Authorised signatory

1. Signature

Name

Name and address

Designation

Staff code no.

2. Signature

Bank seal

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.

BANKER'S CERTIFICATE FOR DEMAND DRAFT / FIXED DEPOSIT RECEIPT TOWARDS EMD
(APPENDIX-A2)

[On Bank's Letter Head]

Date: _____

To
 Executive Engineer (Trichy) - I
 CPWD, NIT Campus, Trichy - 620 015

Subject: Banker's Certificate for Demand Draft / Fixed Deposit Receipt towards EMD for the work "Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy."

Dear Sir/Madam,

This is to certify that M/s/Shri/Smt. _____, having Bank Account No. _____ with our branch, has obtained the following instrument from this Bank towards Earnest Money Deposit for participation in the tender mentioned below:

S. N.	Particulars	Details
1.	Name of Work	Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.
2.	NIT No.	33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27
3.	Name of Bidder/Agency	_____
4.	Name of Account Holder	_____
5.	Bank Account No. debited	_____
6.	Type of Instrument	Demand Draft / Fixed Deposit Receipt
7.	Instrument No.	_____
8.	Date of Instrument	_____
9.	Amount	₹ _____
10.	Amount in words	Rupees _____ only
11.	Instrument drawn/issued in favour of	_____
12.	Valid up to / Maturity date	_____
13.	Payable at, if applicable	_____

We certify that the above-mentioned **Demand Draft / Fixed Deposit Receipt** has been issued by debiting Bank Account No. _____ standing in the name of _____, maintained with our branch.

The instrument has been issued at the request of the above account holder/bidder for submission towards Earnest Money Deposit for the above-mentioned tender.

Additional confirmation in case of Demand Draft

(In case the above instrument is a Demand Draft)

We certify that the Demand Draft bearing No. _____ dated _____ for ₹_____ has been issued in favour of **Executive Engineer, Trichy Central Division,, CPWD, Trichy, Tamilnadu** and is payable as mentioned above.

Additional confirmation in case of Fixed Deposit Receipt

(In case the above instrument is a Fixed Deposit Receipt)

We further certify that the Fixed Deposit Receipt bearing No. _____ dated _____ for ₹_____ stands pledged/lien marked in favour of **Executive Engineer, Trichy Central Division,, CPWD, Trichy, Tamilnadu** towards Earnest Money Deposit for the above-mentioned tender.

We further confirm that:

1. The above Fixed Deposit Receipt cannot be withdrawn, cancelled, closed, transferred or encashed by the depositor without written consent of CPWD.
2. In the event of default, non-compliance or violation of tender conditions by the bidder, CPWD shall be entitled to invoke and encash the Fixed Deposit Receipt directly from the Bank, without reference or notice to the depositor.
3. The claim made by CPWD shall be honoured by the Bank on demand, up to the amount available under the said Fixed Deposit Receipt.
4. This endorsement shall remain valid until its release by CPWD.

This certificate is issued at the request of our customer for submission to CPWD in connection with the above tender.

Yours faithfully,

For _____ Bank
 Signature: _____
 Name of Authorized Signatory: _____
 Designation: _____
 Branch: _____
 IFSC Code: _____
 Branch Contact No./Email: _____

Seal & Stamp of Bank

Note: Strike out whichever is not applicable, i.e. Demand Draft or Fixed Deposit Receipt. This certificate shall be issued on the letterhead of the issuing Bank and shall bear the signature, name, designation, branch details, contact details and seal of the authorized bank official.

RECEIPT OF DEPOSITION OF ORIGINAL EMD (APPENDIX A3)

(Receipt No dated)

1.	Name of Work :	Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.
2.	NIT No:	33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27
3.	Estimated Cost:	Rs.2,45,55,973/-
4.	Amount of Earnest Money Deposit:	Rs.4,91,119/-
5.	Last date of submission of bid:	21/10/2026 up to 15:00 Hrs.

[To be filled by The EXECUTIVE ENGINEER receiving the EMD]

1.	Name of Contractor:	
2.	Form of EMD:	
3.	Amount of EMD:	
4.	Date of Submission of EMD:	
5.	Email ID of EMD receiving officer	
6.	Mobile No. of EMD receiving officer	

Signature, Name and Designation of EMD
receiving Officer along with Office Stamp

UNDERTAKING FOR GST REGISTRATION CERTIFICATE (APPENDIX-A4)

To

The Executive Engineer (Trichy) - I
CPWD, NIT Campus, Trichy - 620 015

Name of Work: **Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.**

NIT No.: **33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27**

Dear Sir,

Having examined the details given in the bid document for the above work, I/we hereby submit that we are not having **GST registration as applicable** hence we here by undertake the following:

“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 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 & seal

**UNDERTAKING REGARDING CHANGE IN CONSTITUTION / PARTNERSHIP / DIRECTORSHIP /
NAME OF FIRM / AUTHORIZED SIGNATORY (APPENDIX-A5)**

[To be submitted on the letterhead of the bidder]

Date: _____

To
Executive Engineer (Trichy) - I
CPWD, NIT Campus, Trichy - 620 015

Subject: Undertaking regarding change in constitution/credentials after enlistment

Name of Work: Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.

NIT No.: 33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27

I/We, M/s/Shri/Smt. _____, having registered office at _____, do hereby solemnly affirm and declare as under:

1. That I/we am/are enlisted with CPWD vide Enlistment Order No. _____ dated _____, valid up to _____, in Class/Category _____.
2. That the present constitution/status of the bidder is as under:

S.N. Particulars	Details
1. Name of bidder/firm/company	_____
2. Constitution	Proprietorship / Partnership / LLP / Company / Other
3. Name of proprietor/ partners/ directors/ designated partners	_____
4. Name of authorized signatory	_____
5. PAN	_____
6. GSTIN	_____
7. Registered address	_____

3. That after the date of enlistment / latest renewal / latest modification of enlistment, there has been:

[Stricke off whichever is not applicable]

No change in the constitution, partnership, directorship, name of firm, authorized signatory, ownership, management or any other credential of the bidder.

OR

Change in the constitution, partnership, directorship, name of firm, authorized signatory, ownership, management or other credential of the bidder. The details of such change are as under:

S.N.	Nature of change	Date of change	Supporting document uploaded
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

4. In case of change, I/we confirm that approval/acknowledgement/order of the competent enlistment authority and all supporting documents have been uploaded along with the bid.
5. I/We further declare that the details submitted in the bid, including name of bidder, constitution, PAN, GSTIN, address, enlistment particulars and authorized signatory details, are true, correct, valid and consistent with the documents uploaded.
6. I/We understand that if any information furnished above is found to be false, incorrect, suppressed or inconsistent with the bid documents, the bid shall be liable to rejection and further action may be taken by the Department as per applicable rules.

Place: _____

Date: _____

Signature of Bidder / Authorized Signatory: _____

Name: _____

Designation: _____

Name of Firm/Agency: _____

Seal/Stamp of Firm/Agency

**UNDERTAKING ON STRUCTURAL STABILITY AND SOUNDNESS OF ALREADY COMPLETED
BUILDINGS AND INFRASTRUCTURE PROJECTS (APPENDIX-A6)**

Name of Work: **Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.**

NIT No.: **33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27**

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.

Date:

Place:

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 minimum Rs.200/- (scanned copy of the notarized affidavit to be uploaded at the time of submission of bid).

DECLARATION ABOUT SITE INSPECTION (APPENDIX-A7)

To

The Executive Engineer (Trichy) - I

CPWD, NIT Campus, Trichy - 620 015

Name of Work: **Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.**

NIT No.: **33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27**

Dear Sir,

It is hereby declared that I/ We, the bidder have inspected and examined the subject site and its surrounding and satisfy myself/ ourselves 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 which may be required and all necessary information as to risks, contingencies and other circumstances which may influence or affect my/ our bid.

I/ We, the bidder shall be responsible for arranging and maintaining at 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 me/us implies that I / We have read this notice and all other contract documents and has made myself /ourselves aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.

I/ We, the bidder have full knowledge of the site and no extra charges consequent upon any misunderstanding or otherwise shall be claimed at a later date.

Yours faithfully,

(Duly authorized signatory of the bidder)

CPWD-7/8

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS
DEPARTMENT

Percentage Rate Tender/Item Rate Tender & Contract for Works

(A) Tender for the work of:- **Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.**

(i) To be uploaded by 21/10/2026 up to 15:00 Hrs. Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015.

(ii) To be opened in presence of tenderers who may be present at 15:30 Hrs. on 21/10/2026 in the office of Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015.

TENDER

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 & 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 respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for thirty (30) days from the due date of its opening in case of single bid system/ ~~seventy five (75) from the date of opening of technical bid in case tenders are invited on 2/3 bid system for specialised 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 in 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 (strike out as the case may be). If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, 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 work as specified, I/ We agree that President of India or the 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 Earnest Money & 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

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:-

(a)

(b)

(c)

Dated:

For & on behalf of President of India

Signature

Designation: Executive Engineer (Trichy) - I

BRIEF PARTICULARS AND SCOPE OF THE PROJECT

1. Salient details of the work for which bids are invited are as given in **Table 1: Brief Particulars and Timelines**.
2. The work is situated at **OFT Campus, Trichy**.
3. Work shall be executed according to General Conditions of Contract for Central P.W.D. Works available separately at printer's outlets.
4. The Address of the officers of the CPWD connected with this work are given below:
 - a) **Executive Engineer (Trichy) - I**
CPWD, NIT Trichy Campus
Thuvakudi, NIT Campus, Trichy - 620 015
 - b) **The Executive Engineer (E&M)**
CPWD, NIT Trichy Campus
Thuvakudi, NIT Campus, Trichy - 620 015

Scope of Civil Works :

The scope of work shall include renovation, repair, strengthening and restoration of the existing 100 m long tunnel building in the Proof Range, including removal and disposal of sand filled inside the tunnel building and transportation and disposal of debris/rubbish generated during the works; dismantling and demolition of the damaged RCC roof slab and RCC walls up to 1.0 m from the roof slab level, including removal and disposal of all demolished materials; providing double-skin structural protection/strengthening to the RCC roof slab and walls using 30 mm thick AR 500 grade MS plates on the inner side and 30 mm thick E350 grade MS plates on the outer side, connected with 25 mm diameter × 600 mm long tie bolts with nuts and providing 25 mm diameter × 100 mm long shear connectors, all as per the structural drawings issued/approved by the Client; providing, erecting and dismantling double scaffolding arrangements of adequate strength and safety for carrying out demolition, strengthening, repair and reconstruction works; providing and placing M50 grade Self-Compacting Concrete (SCC) for reconstruction/strengthening of the roof slab, walls, supporting retaining walls and other structural elements as specified in the approved structural drawings; repairing exposed and damaged RCC surfaces and providing 6 mm thick cement plaster to external surfaces wherever required; providing exterior acrylic emulsion painting to the external surfaces and distemper/appropriate internal wall finish to the internal surfaces of the entire 100 m long tunnel; preparing and applying suitable primer and epoxy paint system to all exposed MS plates, including surface preparation, primer coat and finishing coats as specified; providing 75 mm thick M25 grade concrete topping over the MS plate on the roof slab to achieve the required slope/gradient for proper drainage and providing crystalline waterproofing treatment over the concrete roof surface, including surface preparation and all associated materials and application in accordance with the

manufacturer's recommendations; refilling the available sand inside the 100 m long tunnel building after completion of all structural and associated works; carrying out miscellaneous civil repair works including repair of damaged chajjas, localized RCC repairs and other associated building repairs; treating expansion joints with suitable PU grout/sealant and providing SS 304 grade cover plates over the joints, complete in all respects; repairing damaged plastered areas by providing suitable wire mesh reinforcement followed by cement plastering and finishing to match the existing surface; and providing APP sheet waterproofing treatment at locations identified as requiring waterproofing, including all necessary surface preparation, primer and finishing works. The scope shall further include renovation of the existing office rooms, including removal of defective finishes and preparation of surfaces; providing epoxy flooring to the office rooms, including surface preparation, primer and application of the complete epoxy flooring system; providing and fixing false ceiling in the office rooms, complete with necessary framing, supports and finishing; painting of existing windows and doors with suitable enamel paint, including surface preparation, primer; painting of internal walls with acrylic emulsion paint, including surface preparation, putty/primer wherever required and finishing coats; and carrying out acoustic treatment works comprising removal and disposal of all existing acoustic/sound-proofing boards from the firing room and firing control room and providing and fixing new acoustic sound-proofing materials to the walls and ceilings of the firing room and firing control room, including suitable supporting framework, fixing accessories and finishing, complete in accordance with the required acoustic performance, with acoustic treatment to both ceiling and wall surfaces wherever required. All works shall be executed complete in all respects in accordance with the approved drawings, technical specifications, applicable standards, instructions of the Client/Engineer-in-Charge and manufacturer's recommendations.

Scope of Electrical and Mechanical (E&M) Works:

1. Removing the existing old LED light fixtures and exhaust fans installed in the 100 m tunnel and replacing them with suitable flame-proof LED lighting fixtures and flame-proof exhaust fans, complete with all necessary accessories.
2. Replacing the existing old distribution boards (DBs) with new double-door distribution boards of suitable rating and configuration, complete with necessary protection devices, internal wiring, busbars and accessories.
3. Providing and installing armoured copper conductor, XLPE insulated cables for electrical wiring and power distribution in the tunnel area, including cable laying, termination, glands, lugs, supports and all necessary accessories.
4. Providing flame-proof switches and socket outlets in the shooting area and ammunition store room, complete with suitable accessories and connections.

5. Providing and installing 5-star rated inverter split air-conditioning units in the office rooms, including indoor and outdoor units, refrigerant piping, drain piping, electrical connections, supports and commissioning.
6. Providing energy-efficient LED lighting fixtures in common rooms, corridors and other designated areas, complete with all necessary wiring and accessories.
7. Providing BLDC ceiling fans in common rooms and other designated areas, including necessary electrical connections and accessories.
8. Testing, commissioning and handing over all electrical and mechanical installations after completion of the works.

General Requirements:

1. All materials, equipment and workmanship shall conform to the approved specifications, relevant Indian Standards and the structural/architectural drawings issued or approved by the Client.
2. All structural strengthening and reconstruction works shall be executed strictly in accordance with the structural drawings and instructions issued by the Client/Consultant.
3. The Contractor shall make adequate arrangements for safety, scaffolding, temporary supports, barricading and protection of the existing structures and installations throughout the execution of the works.
4. All debris, demolished materials and construction waste generated during the work shall be collected, removed and disposed of at approved locations in accordance with applicable requirements.
5. The scope shall include all labour, materials, tools, tackles, equipment, scaffolding, transportation, handling, testing, finishing and incidental works necessary for satisfactory completion and handing over of the project.
6. All completed works shall be properly cleaned, tested, inspected and handed over to the Client in a safe, functional and finished condition.

**PARTICULAR SPECIFICATIONS AND SPECIAL CONDITIONS FOR ALL
COMPONENTS OF WORK**

I) GENERAL

1. General conditions:

- 1.1. The tenderer should in his own interest visit the sites and familiarise himself with the site conditions before tendering.
- 1.2. The Contractor shall carry out the work in such a manner so as not to interfere or affect or disturb other works being executed by other agencies if any.
- 1.3. For completing the work in time, the contractor might be required to work in two or more shifts (including night shifts).

2. Applicability:

- 2.1. These conditions shall apply to the entire work, including all major, minor and specialised components.
- 2.2. Unless the context otherwise requires, the term “Engineer-in-Charge” in this Part shall mean the Engineer-in-Charge of the respective component of the work.
- 2.3. These conditions shall be read together with:
 - a) CPWD-6 and CPWD-7/8;
 - b) General Conditions of Contract;
 - c) Schedule A to F;
 - d) Schedule of Quantities;
 - e) applicable CPWD Specifications;
 - f) particular, additional and technical specifications;
 - g) tender and approved drawings;
 - h) statutory requirements; and
 - i) other documents forming part of the agreement.

3. Supplementary nature of particular specifications:

- 3.1. The particular, additional and technical specifications included in the agreement shall supplement the applicable CPWD Specifications.
- 3.2. Requirements already covered by the applicable CPWD Specifications shall apply notwithstanding that they have not been repeated in the tender document.
- 3.3. Where any provision of the particular or additional specifications

expressly modifies or supplements the applicable CPWD Specifications, the particular or additional provision shall apply to the extent of such modification or addition, subject to the order of precedence specified in the agreement.

4. Rates Taxes And Duties:

- 1.1. The work shall be treated as on works contract basis and the rates tendered shall be for complete items of works inclusive of all taxes (including works contract tax), duties, and levies etc. and all charges for items contingent to the work, such as packing, forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site i/c temporary constructional storage, risk, overhead charges, general liabilities/ obligations etc.
- 1.2. GST for the work shall be included within the quoted rates for the various items.
- 1.3. All statutory deductions like GST, Building and other construction workers welfare cess etc at applicable rates will be made from the Contractors bill.

2. Inclusions in quoted rates:

- 2.1. Unless separate payment is expressly provided in the Schedule of Quantities or elsewhere in the agreement, the quoted rates shall include the complete cost of complying with all applicable provisions of the agreement, whether or not such requirements are repeated in the description of individual items.
- 2.2. The quoted rates shall include all labour, materials, tools and plants, transportation, loading, unloading, handling, storage, protection, temporary facilities, testing arrangements, safety measures, supervision, coordination and incidental operations reasonably necessary for proper execution and completion of the work.
- 2.3. No additional payment shall be admissible merely because any ordinary accessory, fitting, fixing arrangement, connection or minor incidental operation has not been separately described, provided that it:
 - a) is reasonably inferable from the item description, drawings or specified performance;
 - b) is ordinarily necessary for completing the item; and
 - c) does not constitute a change in design, specification, capacity, quantity or scope.
- 2.4. Materials and equipment shall be brought to site in accordance with the approved procurement and execution programme. Premature, excessive or unapproved delivery shall not create any entitlement to secured advance, payment or extension of time. Payment shall be governed by the applicable provisions of the agreement.

- 2.5. The Contractor shall deploy the manpower, plant, equipment, supervision and shifts, including night shifts where necessary, required to comply with the approved programme, subject to statutory and site restrictions. Costs arising from the Contractor's method of working or from recovery of delay attributable to the Contractor shall be included in the quoted rates.
- 2.6. The quoted rates shall include the cost of complying with all site conditions and restrictions reasonably ascertainable by inspection before submission of the tender. No extra payment shall be admissible on account of the Contractor's failure to acquaint himself with such conditions.
- 2.7. The quoted rates shall include the cost of coordination, sequencing, protection, temporary arrangements and making good required for carrying out the work concurrently with works executed by other agencies.

3. Reduction in scope:

- 3.1. No claim for loss of expected profit, unabsorbed overheads or consequential loss shall be admissible merely on account of reduction or deletion of any portion of the work.

4. Discrepancies and ambiguities:

- 4.1. The Contractor shall examine and correlate the Schedule of Quantities, specifications, drawings and other agreement documents before procurement or execution.
- 4.2. Any discrepancy, ambiguity, omission or inconsistency noticed by the Contractor shall be brought to the notice of the Engineer-in-Charge in writing before proceeding with the affected work.
- 4.3. The Contractor shall not make any deviation from the agreement documents without written approval of the competent authority.
- 4.4. Approval of any drawing, material, equipment, programme, method statement or submission shall not relieve the Contractor of responsibility for compliance with the agreement.

II) APPLICABLE CODES, STANDARDS AND STATUTORY REQUIREMENTS

1. Applicable specifications and standards:

- 1.1. The work shall be executed in accordance with the specifications, codes, standards, rules and regulations specified in Schedule F and in the respective parts of the tender document.
- 1.2. Reference to any specification, code or standard shall mean the edition specified in the tender document together with amendments and correction slips applicable up to the date specified in the agreement.
- 1.3. Where no edition is specifically stated, the edition applicable as on the last date of submission of the tender shall apply.
- 1.4. Applicable requirements shall include, wherever relevant:

- a) National Building Construction Standards 2026;
- b) Indian Standards published by the Bureau of Indian Standards;
- c) applicable CPWD Specifications;
- d) statutory rules and regulations;
- e) requirements of local bodies and statutory authorities; and
- f) manufacturer's instructions where not inconsistent with the agreement.

1.5. Accessibility requirements

Buildings, external development and installations forming part of the work shall comply with the applicable statutory accessibility and barrier-free design requirements, provisions of the National Building Construction Standard and accessibility standards specified in the agreement and approved drawings.

2. Conflict between requirements:

- 2.1. In case of discrepancy between different agreement documents, the order of precedence specified in the agreement shall apply.
- 2.2. Where two applicable statutory or technical requirements cannot be reconciled, the Contractor shall refer the matter to the Engineer-in-Charge before procurement or execution.
- 2.3. No undefined requirement shall automatically be interpreted as requiring the least expensive material, method or performance standard.

3. Public-procurement requirements:

- 3.1. If the contractor proposes to supply finished goods procured directly or indirectly from vendors, from the countries sharing land border with India, such vendor will be required to be registered with the competent authority under Government of India. Such procurement shall be accepted only on furnishing the details of such registration.
- 3.2. Materials and equipment covered by the Public Procurement (Preference to Make in India) Order, 2017, as amended, shall comply with the prescribed minimum local-content requirement. The Contractor shall furnish certificates, declarations and supporting documents required to establish compliance with the applicable public-procurement requirements.

4. Statutory approvals and clearances:

- 4.1. The Contractor shall identify and comply with all statutory approvals, permissions, inspections, licences and clearances applicable to the execution, testing, commissioning and operation of the work.
- 4.2. Prior to commencement of work, all applicable statutory clearances required for taking up the work shall be obtained by the contractor.
- 4.3. After completion of the work, the completed installation shall be offered

for inspection to inspectors of the relevant statutory authorities.

4.4. The Contractor shall prepare and submit all necessary:

- a) applications and forms;
- b) drawings and calculations;
- c) equipment particulars;
- d) test certificates and reports;
- e) declarations and undertakings; and
- f) other documents required by the concerned authority.

4.5. Where any application, declaration, undertaking or document is required to be submitted or signed by the owner, client, department or its authorised representative, the Contractor shall prepare the complete documentation and provide all necessary assistance. The owner/client/department shall provide only such ownership documents and signatures as are mandatorily required to be furnished by them under law.

4.6. The Contractor shall coordinate with the concerned authorities and provide all necessary assistance during scrutiny, inspection, testing and demonstration of the installation.

4.7. Such assistance shall include provision of manpower, tools, test instruments, temporary connections, consumables, records and demonstrations.

4.8. The work or installation shall not be commissioned or put into regular use until the statutory approvals specifically required before commissioning have been obtained.

4.9. The Contractor shall be fully responsible for obtaining all required statutory approvals and the work shall be treated as complete only upon receipt of all such approvals in final form.

4.10. Statutory approvals shall include completion certificates, occupancy certificates, fire approvals, electrical safety approvals, lift licences, pollution-control approvals, water and sewerage approvals and other permissions required before occupation or regular use.

5. Allocation of statutory fees and incidental expenses:

5.1. Unless otherwise specifically provided in the Schedule of Quantities:

- a) statutory application, scrutiny, inspection, licence or approval fees payable directly to a Government or statutory authority for a permanent installation or service connection in the name of the Department or owner shall be paid by the Department or reimbursed to the Contractor on production of proof of payment;
- b) charges for preparation of documents, liaison, coordination, attendance during inspections, testing, demonstration, manpower,

instruments and incidental expenses shall be included in the Contractor's quoted rates;

- c) registration fees, licences, permissions, security deposits and charges required for the Contractor's own establishment, labour, machinery, temporary utilities or execution arrangements shall be borne by the Contractor; and
 - d) penalties, reinspection fees or additional charges arising from delay, default or non-compliance attributable to the Contractor shall not be reimbursed.
- 5.2. The Contractor shall obtain prior approval of the Engineer-in-Charge before making any payment for which reimbursement is claimed.

6. Rectification required by statutory authorities:

- 6.1. Observations arising from non-compliance with the agreement, approved drawings, applicable standards or statutory requirements existing on the last date of submission of the tender shall be attended to by the Contractor without additional payment.
- 6.2. A requirement arising solely from:
- a) a subsequent change in law or statutory requirement;
 - b) a change in the approved design basis; or
 - c) an alteration in scope ordered by the Department,
- 6.3. shall be dealt with under the applicable provisions of the GCC.

III) SITE ESTABLISHMENT

1. General:

- 1.1. The Contractor shall establish and maintain the temporary facilities necessary for safe, orderly and timely execution of the work.
- 1.2. Unless separate payment is expressly provided, the cost of the applicable facilities specified under this section shall be included in the quoted rates.
- 1.3. The facilities specifically stated as applicable in the Site Establishment Schedule shall be required for the particular work.

2. Site Establishment Schedule

S. N.	Facility or arrangement	Applicability and requirement
1	Contractor's site office, stores and work areas	Shall be provided and maintained by the Contractor as required for execution of the work
2	Site testing laboratory	A site laboratory with the minimum equipment as specified in CPWD specifications and in this bid document shall be established, made functional and maintained within one month from the award of work.
3	Temporary water supply	Shall be arranged by the Contractor
4	Temporary electrical supply	Shall be arranged by the Contractor
5	Temporary drainage and sewage disposal	Shall be provided and maintained by the Contractor as required
6	Storage and fabrication areas	Shall be provided and maintained by the Contractor as required and approved
7	PPE for Departmental officers and authorised visitors	The contractor shall make arrangement for Helmets and safety leather shoes (meant of construction work at site) 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 five members) of the department per year shall be arranged by the contractor.
8	Temporary access roads, ramps, openings in compound wall and other access provisions	Shall be provided and maintained by the Contractor at his own cost
9	Any other temporary facility	-

3. Site layout:

- 3.1. Before commencement of substantial work, the Contractor shall submit a site-establishment layout indicating, as applicable:
- a) site offices;
 - b) access and circulation;
 - c) storage areas;
 - d) fabrication areas;
 - e) testing laboratory;
 - f) plant and machinery;
 - g) temporary utilities;
 - h) waste-storage areas;
 - i) safety arrangements; and
 - j) emergency access.
- 3.2. The site layout shall be subject to approval of the Engineer-in-Charge.
- 3.3. Approval of the layout shall not relieve the Contractor of responsibility for safety, adequacy, statutory compliance or coordination.

4. Temporary services:

- 4.1. Unless otherwise specified, the Contractor shall arrange temporary water, electricity, telephone, internet, drainage and other services required for the work.
- 4.2. The Contractor shall bear all costs relating to:
- a) permissions and applications;
 - b) deposits and connection charges;
 - c) installation and distribution;
 - d) consumption;
 - e) maintenance;
 - f) standby arrangements; and
 - g) removal after completion.
- 4.3. Where the Department permits use of an existing supply, the applicable conditions, metering arrangements and rates of recovery shall be as specified in the tender document or determined under the agreement.
- 4.4. Delay or interruption in temporary services arranged by the Contractor shall not constitute a ground for additional payment or extension of time.

5. Site testing laboratory:

- 5.1. Where a site laboratory is specified under Clause 10A and Schedule F, it shall be established and made functional within the period specified in the agreement.
- 5.2. The laboratory shall be provided with the equipment, utilities, storage and record-keeping facilities specified in the tender document.
- 5.3. Tests that cannot reasonably be carried out at the site laboratory shall be conducted at an approved CPWD, Government, Government-recognised or NABL-accredited laboratory.
- 5.4. Allocation of testing charges, supply of samples, transportation and costs arising from failed tests shall be governed by the relevant quality-assurance and testing provisions of the agreement.

6. Maintenance and removal:

- 6.1. Temporary facilities shall be maintained in a safe, clean and serviceable condition throughout their required period of use.
- 6.2. On completion, the Contractor shall dismantle and remove temporary facilities and restore the affected areas unless otherwise directed by the Engineer-in-Charge.
- 6.3. Nothing extra shall be payable for such removal and restoration unless separate payment is specifically provided.

IV) PROJECT MANAGEMENT

1. Project Organisation:

- 1.1. Immediately after the award of work, the Contractor shall submit details of the key personnel proposed to be engaged at site in accordance with the relevant provisions of the General Conditions of Contract and other tender conditions.
- 1.2. The Contractor shall also submit a detailed project organisation chart showing:
 - a) Names and designations of key personnel.
 - b) Reporting relationships.
 - c) Responsibilities and authority of each position.
 - d) Contact details.
 - e) Personnel responsible for planning, execution, quality control, safety, billing, coordination, testing, and commissioning.

2. Integrated programme:

- 2.1. The Contractor shall prepare and submit an integrated programme for the entire work within the period specified in Schedule F.
- 2.2. The programme shall be prepared using the project-management

software specified in Schedule F.

2.3. The programme shall cover all major, minor and specialised components from commencement to completion and handing over.

2.4. The programme shall include:

- a) Work Breakdown Structure covering the entire scope;
- b) construction and installation methodology and sequence;
- c) activity durations and logical relationships;
- d) commencement, completion and contractual milestones;
- e) critical path and critical activities;
- f) total float and major constraints;
- g) activity-wise manpower and resource deployment;
- h) procurement, manufacture and delivery of materials and equipment;
- i) preparation, submission and approval of drawings, samples, calculations and technical data;
- j) mobilisation and deployment of machinery, equipment, temporary works and formwork, wherever applicable;
- k) coordination and interface activities between components and agencies;
- l) inspection, testing and commissioning;
- m) statutory inspections and approvals;
- n) rectification, documentation, training and handing over; and
- o) any other activity necessary for completing the work within the stipulated period.

3. Baseline programme:

3.1. After approval, the programme shall constitute the baseline programme for monitoring progress.

3.2. The approved baseline shall be retained without alteration for comparison with actual progress.

3.3. The approved programme shall be submitted in:

- a) editable native software format; and
- b) PDF format.

4. Effect of programme approval:

4.1. Approval of the programme, revised programme, resource deployment or recovery measures shall not:

- a) relieve the Contractor of any contractual responsibility;
- b) constitute acceptance of any delay;
- c) revise the stipulated date of completion;
- d) constitute approval of extension of time;
- e) entitle the Contractor to additional payment; or
- f) restrict the rights of the Engineer-in-Charge under the agreement.

5. Updating of programme:

- 5.1. The Contractor shall update the programme at the frequency specified in Schedule F and with every prescribed progress report.
- 5.2. The updated programme shall indicate:
 - a) status date;
 - b) actual start and actual finish of completed activities;
 - c) actual progress and remaining duration of ongoing activities;
 - d) forecast start and finish dates of pending activities;
 - e) current critical path and critical activities;
 - f) total float;
 - g) delayed activities and variance from baseline;
 - h) revised forecast completion date;
 - i) approved changes and rescheduled milestones; and
 - j) corrective or recovery measures.

6. Revised and recovery programme:

- 6.1. Where progress falls behind the approved programme or completion within the stipulated period is likely to be affected, the Contractor shall submit a revised or recovery programme when directed by the Engineer-in-Charge.
- 6.2. The programme shall indicate:
 - a) progress achieved;
 - b) activities affected;
 - c) reasons for deviation;
 - d) revised sequence and timing;
 - e) additional manpower, materials, machinery, shifts or other resources;
 - f) proposed corrective measures; and

g) effect on contractual milestones and completion.

6.3. Failure to submit the programme or revised programme within the prescribed period shall attract recovery at the rate specified in Schedule F.

7. Monthly progress report:

7.1. General:

The Contractor shall submit a monthly progress report within the period specified in Schedule F.

The report shall be submitted in editable electronic format and PDF format.

The monthly report shall include:

- a) executive summary;
- b) updated programme and Gantt chart;
- c) planned and achieved physical progress;
- d) progress against milestones;
- e) two-fortnight or four-week look-ahead programme;
- f) manpower and machinery deployment;
- g) status of materials and equipment;
- h) status of drawings, samples, approvals and inspections;
- i) delayed activities and constraints;
- j) corrective and recovery measures;
- k) quality-control and testing status;
- l) safety and environmental status;
- m) financial progress;
- n) status of deviations, substituted items and extra items;
- o) statutory approvals and handing-over activities; and
- p) dated progress photographs and videos.

7.2. Updated Gantt Chart:

The Contractor shall submit, along with each monthly progress report, an updated Gantt chart prepared in the approved project management software.

The updated Gantt chart shall:

- a) Retain the approved baseline programme for comparison.
- b) Indicate the status date.
- c) Show actual start and actual finish dates of completed activities.
- d) Show percentage progress and remaining duration of ongoing activities.

- e) Show revised forecast start and finish dates of pending activities.
- f) Indicate the critical path, critical activities, total float, milestones, and activity dependencies.
- g) Clearly identify delayed activities and variance from the approved baseline programme.
- h) Reflect approved changes, revisions, extensions of time, and rescheduled milestones, wherever applicable.
- i) Indicate the current forecast date of completion of the work.

7.3. Physical progress format:

S.N.	WBS/ Activity/ Component/ Location	Unit	Reporting-period planned	Reporting-period achieved	Cumulative planned	Cumulative achieved	Variance	Target for next period /Remarks

7.4. Financial progress format:

S.N.	Particular	During reporting period	Cumulative up to previous report	Cumulative up to reporting date	Remarks
1	Gross value of work executed				
2	Value of work billed				
3	Payments received				
4	Advances received/adjusted				
5	Recoveries and amounts withheld				
6	Pending bills				
7	Extra, substituted and deviation items				
8	Forecast value for succeeding period				

7.5. Look-ahead programme:

The Contractor shall submit a look-ahead programme for the succeeding two fortnights or such other period as directed by the Engineer-in-Charge.

The look-ahead programme shall be consistent with the current approved programme and shall be submitted in the following tabular formats:

a) Activity-wise Look-Ahead Programme

S.N.	WBS / Activity / Location	Unit	Current status / quantity completed	Target for next month	Planned start	Planned finish	Milestone / Remarks

b) Resource, Approval and Constraint Plan

Activity Ref.	Manpower required (trade and number)	Materials and delivery dates	Plant / machinery / shuttering required	Drawings / approvals / inspections required	Constraints / interfaces and corrective action

7.6. Progress photographs and video:

The progress report shall be accompanied by dated and location-referenced photographs covering the principal areas and activities.

Video records shall be submitted where specified in Schedule F or directed by the Engineer-in-Charge.

Photographs and videos shall be captioned and indexed in the following format:

S.N.	File/ Photo/ Video No.	Date and time	Location/ Activity	Description of progress shown	Remarks

7.7. Manpower Statement:

The manpower statement shall be submitted separately for key personnel and labour deployment in the following formats.

Key Personnel Deployment

S.N .	Name	Designation	Qualification / Experience	Responsibility	Location of deployment	Date deployed / Contact

a) Labour Deployment Statement

S.N .	Trade / Category	Planned manpower	Actual manpower	Block / Location	Shift	Shortfall / Surplus	Additional mobilisation proposed and date

8. Review meetings:

- 8.1. Review meetings shall be held fortnightly, monthly or at such frequency as directed by the Engineer-in-Charge.
- 8.2. The Contractor's Project-in-Charge and relevant representatives shall attend the meetings.
- 8.3. A senior management representative authorised to commit resources shall attend monthly review meetings when required.
- 8.4. The agenda shall include:
 - a) programme versus actual progress;
 - b) milestone and critical-path status;
 - c) targets for the succeeding period;
 - d) materials, manpower and machinery;
 - e) drawings, approvals and statutory clearances;
 - f) delayed activities and constraints;
 - g) recovery measures;
 - h) quality and safety matters;
 - i) coordination and interface issues;
 - j) contractual matters requiring decision;
 - k) physical and financial progress; and
 - l) testing, commissioning and handing-over status.

9. Minutes and action-taken report

- 9.1. Minutes of all review meetings shall be prepared and circulated by the agency designated by the Engineer-in-Charge.
- 9.2. The Contractor shall comply with the decisions and action points recorded in the minutes within the prescribed time.
- 9.3. The Contractor shall submit an action-taken report at the succeeding meeting in the following format:

S.N .	Meeting date /Minutes referenc e	Issue or decision	Respon sibility	Due date	Action taken/Complia nce reference	Status	Remarks

- 9.4. Meeting minutes shall record coordination and implementation decisions but shall not by themselves constitute:
- a) an order for deviation or extra work;
 - b) approval of additional payment;
 - c) extension of time; or
 - d) alteration of any contractual provision,

unless separately approved by the competent authority under the applicable provisions of the agreement.

10. **Non-submission:**

- 10.1. Failure or delay in submission of the prescribed programme, updated programme, progress report or related records shall attract recovery at the rate specified in Schedule F, without prejudice to other action permissible under the agreement.

V) **INSPECTION OF WORK**

1. **Right of inspection:**

- 1.1. In addition to inspections provided under the GCC and applicable CPWD Specifications, the work, materials, equipment, records, workshops, factories and fabrication facilities shall be open to inspection by:
- a) officers and representatives of CPWD;
 - b) Chief Technical Examiner's Organisation of the Central Vigilance Commission;
 - c) Vigilance Unit of CPWD;

- d) Third-Party Quality Assurance agency;
- e) Project Management Consultant, where engaged;
- f) User Department;
- g) committees, consultants or agencies appointed by CPWD; and
- h) statutory or other authorities authorised by the Engineer-in-Charge.

2. Contractor's representative:

- 2.1. During normal working hours, and at other times for which reasonable notice has been given, the Contractor or an authorised responsible representative shall remain available to:
- a) receive instructions;
 - b) provide access;
 - c) produce drawings, records and certificates;
 - d) arrange samples and tests;
 - e) provide measurements and supporting documents; and
 - f) assist the inspecting authority.

3. Inspection at factory or workshop:

- 3.1. Where inspection at a manufacturer's works, factory, workshop or fabrication facility is specified, the Contractor shall arrange the inspection and provide the necessary access, records and testing facilities.
- 3.2. The allocation of travel, boarding, lodging and inspection charges shall be as specified in the relevant technical specification or Schedule of Quantities.
- 3.3. Inspection or witnessing of tests shall not constitute final acceptance of the material or equipment.

4. Concealed work:

- 4.1. No material, installation or work that will subsequently be covered, concealed or rendered inaccessible shall be covered until the required inspection, testing, measurement and recording have been completed.
- 4.2. Before covering concealed work, the Contractor shall, as applicable:
- a) offer the work for inspection;
 - b) complete prescribed tests;
 - c) record joint measurements;
 - d) record location, level and identification details; and
 - e) take dated and location-referenced photographs.

- 4.3. Where work is covered without the prescribed inspection or records due to the Contractor's omission, the Engineer-in-Charge may require opening up, testing and reinstatement at the Contractor's cost.

5. Rectification and compliance:

- 5.1. Observations made during inspection shall be communicated through the Engineer-in-Charge or authorised CPWD officer.
- 5.2. Deficiencies attributable to non-compliance with the agreement shall be rectified by the Contractor within the stipulated period without additional payment.
- 5.3. The Contractor shall submit a compliance report with supporting records, photographs and test results, where applicable.

6. Certification by consultants or other agencies:

- 6.1. Any inspection, approval or certification by a consultant, TPQA agency, committee or other appointed agency shall not relieve the Contractor of:
- a) contractual responsibility;
 - b) performance obligations;
 - c) defect-liability obligations;
 - d) guarantees and warranties; or
 - e) liability for defective materials or workmanship.

7. Records to be maintained at site:

- 7.1. The Contractor shall maintain at site, as applicable:
- a) current agreement documents;
 - b) approved drawings and shop drawings;
 - c) approved programme and current updated programme;
 - d) milestone and progress status;
 - e) material-approval and inspection records;
 - f) test registers and test certificates;
 - g) site-order and compliance records;
 - h) quality-assurance records;
 - i) safety and environmental records;
 - j) quantities executed and balance quantities;
 - k) status of deviations, substituted items and extra items;
 - l) statutory approvals; and
 - m) other records prescribed under the agreement.

8. Display and visitor facilities:

- 8.1. Where specified, the Contractor shall provide and maintain a work-information display board showing the essential particulars and current progress of the work.
- 8.2. Where specified, adequate helmets, safety shoes, reflective jackets and other necessary PPE shall be maintained for authorised visitors.

9. Assistance for technical and vigilance examination:

- 9.1. The Contractor shall provide the documents, measurements, records, samples, manpower, tools, equipment, access and assistance required for inspection by CTE, CPWD Vigilance or any other authorised authority without additional payment, except where separate payment is expressly provided.

VI) QUALITY ASSURANCE AND MATERIAL CONTROL

1. Quality Assurance Plan and method statements:

- 1.1. The Contractor shall prepare and submit a project-specific Quality Assurance Plan in accordance with the applicable CPWD Specifications, CPWD Quality Assurance Manual(s), relevant Indian Standards and other requirements forming part of or referred to in the agreement. The Quality Assurance Plan shall be submitted within the period specified by the Engineer-in-Charge and approved before commencement of the relevant work.
- 1.2. The Contractor shall also submit, sufficiently in advance of the corresponding activity, activity-wise Inspection and Test Plans, method statements and checklists consistent with the approved Quality Assurance Plan and the applicable CPWD quality-control procedures.
- 1.3. The Quality Assurance Plan and related submissions shall, as applicable, specify:
 - a) Organisation structure, responsibilities and authority of quality-control personnel.
 - b) Applicable specifications, codes, standards, approved drawings and acceptance criteria.
 - c) Material-source approval, sampling, inspection and testing procedures.
 - d) Stage-wise inspections, hold points, witness points and approval requirements.
 - e) Mandatory tests, test frequencies, sample sizes and testing locations.
 - f) Requirements for calibration and control of measuring and testing instruments.
 - g) Procedures for identification, storage, handling and traceability of

materials and equipment.

- h) Control of workmanship, mock-ups, samples and benchmark installations.
 - i) Procedures for recording, reporting, rectification and closure of non-conformities.
 - j) Formats and registers for inspections, tests, approvals, calibration, non-conformities and other quality records.
- 1.4. The Quality Assurance Plan shall be updated whenever required due to changes in the scope, specifications, construction methodology or directions of the Engineer-in-Charge.
- 1.5. Review or approval of the Quality Assurance Plan, Inspection and Test Plans, method statements or checklists shall not relieve the Contractor of responsibility for complying with the agreement or for the quality, safety, performance and durability of the work.

2. Material and equipment approval:

- 2.1. The contractor shall, on demand by the engineer-in-charge, furnish proof to the satisfaction of the engineer-in-charge regarding purchase of materials and equipment from the manufacturer/ manufacturer's authorised outlets.
- 2.2. Materials to be used in work are to be ISI marked where available. Prior approval of the engineer-in-charge shall be taken for all the materials required to be used on works.
- 2.3. The contractor shall procure only such quantities as are reasonably required for execution of the work. No claim shall be entertained for excess procurement, wastage or unused materials. All surplus materials shall remain the property of the contractor and shall be removed from site after completion of the work. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.
- 2.4. Materials and equipment requiring approval shall not be procured in bulk or incorporated in the work until the applicable source, make, technical particulars, certificates and samples have been approved, unless otherwise permitted in writing by the Engineer-in-Charge. Approval of a make, manufacturer, source or sample shall not constitute acceptance of every subsequent supply.
- 2.5. A material or equipment item found defective or non-conforming after approval shall be removed, replaced or rectified at the Contractor's cost.

3. Samples, mock-ups and benchmark installations

- 3.1. Samples required for approval or testing shall be supplied without additional payment. Sampling, packing, identification, transportation and delivery to the approved laboratory shall be included in the quoted rates unless expressly provided otherwise.

- 3.2. Mock-ups, sample panels, sample rooms and sample installations expressly specified in the tender documents, or reasonably required by the Engineer-in-Charge during execution where necessary to establish compliance with the specified material, workmanship, finish, colour, pattern, layout, functional performance or installation methodology, shall be prepared, completed and approved before bulk execution of the corresponding work. The approved samples shall form the benchmark for subsequent execution.
- 3.3. Payment for such mock-ups or samples shall be regulated as specified in the Schedule of Quantities. Where no separate provision exists, their cost, including dismantling, removal, replacement or incorporation into the permanent work as directed by the Engineer-in-Charge, shall be deemed included in the rates of the relevant items.
- 3.4. Approval of a mock-up shall not authorise any deviation from the agreement unless such deviation is separately approved in writing under the applicable provisions of the agreement.

4. Mandatory Tests and Testing Costs:

- 4.1. The Contractor shall carry out all field, site-laboratory, independent laboratory, factory, routine, acceptance, type and performance tests required under the agreement, Schedule of Quantities, applicable CPWD Specifications and Quality Assurance Manuals, statutory requirements, approved Quality Assurance Plan and Inspection and Test Plans, and relevant Indian Standards, to the extent applicable to the material, equipment or work.
- 4.2. The Contractor shall ensure that the prescribed tests are conducted at the specified stages and frequencies and that the material, equipment or work is not covered up, dispatched, incorporated or proceeded with beyond an identified hold point until the required inspection or testing has been completed and the results have been accepted, wherever such acceptance is required.
- 4.3. Where the agreement, applicable specification or approved Inspection and Test Plan requires testing by an independent or third-party laboratory, such testing shall be carried out at an approved testing laboratory.
- 4.4. The cost of sampling, packing, identification, transportation, testing, retesting where necessitated by failure, and submission of reports for all mandatory tests shall be borne by the Contractor unless expressly provided otherwise in the Schedule of Quantities or elsewhere in the agreement.
- 4.5. Testing and acceptance of any material, equipment or work shall not relieve the Contractor of responsibility for its conformity, quality, performance, durability or compliance with the agreement.

5. Failed, doubtful and additional tests:

- 5.1. The cost of retesting, additional testing, investigation, opening up, core cutting, load testing or other examination necessitated by failure, doubtful quality or non-conformity attributable to the Contractor shall be borne by the Contractor.
- 5.2. Where additional testing is directed for reasons not arising from any failure, deficiency, doubtful quality, omission or non-conformity attributable to the Contractor, and the results establish conformity, its financial treatment shall be regulated under the applicable provisions of the agreement. Where the results disclose non-conformity, the cost of such testing and all consequential action shall be borne by the Contractor.

6. Testing laboratories, sampling and instruments

- 6.1. All third-party tests mandated under the agreement, and tests that cannot reasonably be conducted in the site laboratory, shall, with the prior approval of the Engineer-in-Charge, be carried out at an institution or laboratory having adequate facilities and demonstrated competence for the relevant material, test and test method.
- 6.2. Subject to availability of the required testing facilities and prior approval of the Engineer-in-Charge, such tests may be carried out at:
 - a) Indian Institutes of Technology
 - b) National Institutes of Technology
 - c) Government engineering colleges
 - d) Government polytechnic colleges
 - e) Government laboratories
 - f) NABL-accredited laboratories having valid accreditation covering the relevant test, material and test method subject to approval by the competent authority.
- 6.3. Samples for testing shall be selected, identified, sealed and documented in the presence of the Engineer-in-Charge or his authorised representative. The Contractor shall arrange the packing, transportation and delivery of the samples to the approved laboratory without substitution, damage or tampering.
- 6.4. Measuring, inspection and testing instruments shall be suitable for the intended purpose and shall have the required range, accuracy, resolution and least count. Instruments requiring calibration shall possess valid calibration certificates traceable to national or international standards, and shall be recalibrated at the prescribed intervals and whenever their accuracy is doubtful.
- 6.5. Test reports shall clearly identify the work, material, manufacturer or source, batch or lot, sample identification, date of sampling, applicable test standard, test method and results. Reports shall be submitted

directly by the laboratory or through a verifiable digital or physical record acceptable to the Engineer-in-Charge.

- 6.6. Approval of the testing institution or laboratory shall not relieve the Contractor of responsibility for the authenticity of the sample, correctness of the testing arrangements or conformity of the material, equipment or work with the agreement.

7. Proprietary products and traceability:

- 7.1. Proprietary materials and equipment shall be supported by invoices, batch or serial particulars, test certificates, technical data, safety data sheets (wherever applicable) and documents issued by the manufacturer or authorised supplier.
- 7.2. Documents shall be sufficient to establish authenticity, source, date of manufacture, shelf life, applicable warranty and conformity with specifications.
- 7.3. Materials or equipment requiring batch-wise or serial-number traceability shall be identified so that source, certificate, location of use and inspection status can be established.

8. Non-conforming work and materials; maintenance of records:

- 8.1. Any material, equipment or work found not conforming to the agreement, approved drawings, specifications, approved samples or directions of the Engineer-in-Charge shall be clearly identified and, wherever practicable, segregated and protected against unintended use or incorporation in the work. The same shall be rectified, replaced, removed or rejected as directed by the Engineer-in-Charge, at the Contractor's cost.
- 8.2. The Contractor shall maintain complete records of inspections, tests, approvals, non-conformities, corrective actions, rectifications, replacements, removals and final compliance throughout execution.
- 8.3. Quality records shall be maintained in an indexed and retrievable form and shall be submitted as part of the completion and handing-over documentation.
- 8.4. Rejected or substandard materials shall not be used in the work and shall be removed from the site within the period directed by the Engineer-in-Charge. The following procedure shall be followed:
 - a) Whenever any material brought to the site by the Contractor is rejected, an entry shall be made in the Site Order Book by the Assistant Engineer/Assistant Executive Engineer, indicating the description and approximate quantity of the rejected material.
 - b) Pending removal, the rejected material shall be suitably marked and kept separately at a location approved by the Engineer-in-Charge so as to

prevent its inadvertent use.

- c) Upon removal of the material from the site, the Assistant Engineer/Assistant Executive Engineer shall record a certificate against the original entry, indicating the date, approximate quantity and mode of removal. Where removal is by vehicle, the vehicle registration number shall also be recorded.
 - d) Where the Assistant Engineer/Assistant Executive Engineer is unable to remain present at the time of removal, the Junior Engineer may verify and record the removal particulars, which shall subsequently be countersigned by the Assistant Engineer/Assistant Executive Engineer.
- 8.5. No rejected or substandard material shall be removed from its designated storage location, taken out of the site, returned to the site, reused, transferred or disposed of without the knowledge of the Engineer-in-Charge or the authorised departmental representative.
 - 8.6. Rejected materials shall not be re-presented for approval unless they have been rectified or reprocessed through an approved procedure and are clearly identified as such.
 - 8.7. No non-conforming work shall be covered up, concealed or incorporated into subsequent work pending a decision on its disposition.
 - 8.8. Rectification, replacement or removal of non-conforming work or materials, and all associated testing, dismantling, re-execution, transportation and disposal necessitated by a non-conformity attributable to the Contractor, shall be carried out at the Contractor's cost and shall not entitle the Contractor to additional payment or extension of time.
 - 8.9. No payment shall be admissible for rejected materials, equipment or work merely because the same has been delivered to the site, installed, measured, inspected or previously approved.

VII) COMMON SITE, COORDINATION, SAFETY AND ENVIRONMENTAL REQUIREMENTS

1. Coordination of openings and embedded provisions:

- 1.1. Contractors and specialised agencies shall provide timely interface information for openings, sleeves, inserts, supports, foundations, trenches and embedded provisions required for their respective components.
- 1.2. Such information shall be incorporated in the coordinated drawings before execution of the affected civil or structural work.
- 1.3. Costs arising from delayed or incorrect interface information attributable to a Contractor or its specialised agency shall be borne by that Contractor.

2. Coordinated drawings:

- 2.1. The Contractor shall prepare and submit, where applicable:

- a) coordinated services drawings;
 - b) builder's-work drawings;
 - c) shop and fabrication drawings;
 - d) setting-out drawings;
 - e) equipment-layout and foundation drawings;
 - f) statutory-submission drawings; and
 - g) as-built drawings.
- 2.2. Coordinated drawings shall identify the interfaces between civil, electrical, mechanical, plumbing, fire-fighting, HVAC, lift and other components before execution of the affected work.
- 2.3. Approval of coordinated, shop or as-built drawings shall not relieve the Contractor of responsibility for correctness, coordination or compliance with the agreement.
- 2.4. As-built drawings shall be progressively updated during execution and shall not be prepared solely from the tender drawings after completion.
- 3. Existing services and property:**
- 3.1. Existing drains, pipes, cables, overhead lines, structures, finishes and other services or property encountered during the work shall be protected against damage. Damage caused by the Contractor shall be made good promptly at their cost.
- 3.2. Where an existing service is required to be diverted or altered by an approved design decision not arising from the Contractor's default, the work shall be measured and paid under the applicable provisions of the agreement unless included in the Schedule of Quantities.
- 3.3. Discovery of antiquities and objects of interest:
- Any fossil, coin, article of antiquity, archaeological remain or object of geological or historical interest discovered during excavation or construction shall be protected against removal or damage. The Contractor shall immediately inform the Engineer-in-Charge and shall proceed only in accordance with the directions of the competent authority.
- 4. Access, security and permits:**
- 4.1. The Contractor shall comply with the site-specific access, identity-card, security-clearance, working-hour, permit-to-work and restricted-area requirements stated in the Site Requirements Schedule. Costs of compliance shall be included in the quoted rates unless expressly provided otherwise.
- 5. Safety:**
- 5.1. The Contractor shall comply with the GCC, applicable CPWD safety provisions, statutory requirements and approved safety plan. Work-

specific method statements and permits shall be provided for high-risk activities such as excavation, work at height, lifting, hot work, confined spaces, energised installations and shutdown work.

- 5.2. Temporary works, scaffolding, working platforms, barricading, access and protective arrangements shall be designed, provided, inspected and maintained by competent personnel.

6. Environmental management and waste:

- 6.1. The Contractor shall comply with applicable environmental statutes, lawful directions of competent authorities and the project-specific Environmental Management Plan, where specified.
- 6.2. Dust, noise, wastewater, debris, packaging, surplus material and hazardous waste shall be controlled, stored, transported and disposed of through lawful means.
- 6.3. Trees and vegetation:

Existing trees and vegetation shall not be removed, cut or damaged except where removal is shown in the approved scope and the required permission has been obtained. Compensatory plantation and maintenance shall be carried out where specified in the Site Requirements Schedule, Schedule of Quantities or approved drawings.

- 6.4. Penalties or additional charges arising from the Contractor's default or unlawful disposal shall be borne by the Contractor.

7. Protection, watch and ward and making good:

- 7.1. The Contractor shall protect materials, equipment, completed work and areas handed over for execution and shall remain responsible for watch and ward until completion or formal taking over, as applicable.
- 7.2. Damage to adjoining property, existing installations or completed work caused by the Contractor shall be made good at its cost.

VIII) COMPLETION, DOCUMENTATION AND HANDING OVER

1. Prerequisites for handing over:

- 1.1. Before offering the work or a component for completion, the Contractor shall complete the work, tests, commissioning, rectification, cleaning, restoration and documentation required under the agreement.

2. Common completion documents:

- 2.1. The Contractor shall submit, as applicable: as-built drawings; test and commissioning records; statutory approvals; warranties and guarantees; guarantee bonds; material and equipment certificates; software, licences, passwords and configuration backups; inventories; keys; photographs; and other records specified in the agreement.

3. Operation and maintenance information and training:

- 3.1. For installations requiring operation or maintenance, the Contractor shall submit approved operation and maintenance manuals, preventive-maintenance schedules, spare-parts lists, vendor and service-contact details and shall provide the specified training before handing over.

4. Site clearance and restoration:

- 4.1. Temporary facilities, surplus materials, debris and Contractor's property shall be removed and affected areas restored, except where the Engineer-in-Charge directs retention.

5. Completion and payment:

- 5.1. Submission of the specified completion documents, guarantees, statutory approvals and training records may be treated as a prerequisite for completion certification and release of final bill.
- 5.2. Taking over, use, inspection or certification shall not relieve the Contractor of defect-liability, guarantee, warranty or other obligations under the agreement.

6. Completion/Occupancy Certificate:

- 6.1. Wherever completion certificates, occupancy certificates, fire approvals, electrical safety approvals, lift licences, pollution-control approvals, water and sewerage approvals or any other approval/clearance from a local body, fire authority or any statutory authority is required as per applicable rules, the same shall be deemed to be included in the scope of the Contractor. Work shall be treated as complete only upon receipt of all such approvals in final form.

IX) SPECIAL TERMS & CONDITIONS FOR SECURITY, SITE & SAFETY REQUIREMENTS FOR OFT TRICHY WORKS

1. Site Constraints & Security Restrictions

- i. The site has space constraints. Intending tenderers are advised to inspect the site before participating in the bid. No claim on this account shall be entertained at any stage.
- ii. The Security Agencies / user department(OFT) may impose restrictions on working methods and on movement of labour, materials, tools and equipment inside the campus. The contractor shall strictly comply with all such instructions, including security clearance, police verification, issue of identity cards, access control, restricted working hours, biometric attendance and other safety requirements.
- iii. **No extension of time shall be granted and no extra payment whatsoever shall be admissible** to the contractor on account of compliance with security, safety, access control, police verification, site constraints

or instructions issued by Security / Safety / Estate authorities. Any delay arising due to such compliances shall be deemed to have been considered while quoting the tender and shall be made good by deployment of additional resources at the contractor's own cost.

2. Deployment of Labour & Police Verification

1. Police Verification is mandatory for the contractor, supervisors and all labourers deployed at site.
2. All supervisors, engineers and permanent staff of the contractor shall possess valid Police Verification Certificates (PVCs) and produce the same on demand.
3. Contract workers engaged for more than **seven (07) days** shall also possess valid PVCs throughout the execution period. In case of re-deployment, fresh PVCs shall be submitted.
4. Contract workers engaged for less than seven (07) days shall furnish personal details in the prescribed format, including photograph, address, identification marks and biometrics (where feasible).

3. Master List, Affidavit & Responsibility

1. The contractor shall submit a Master List of all personnel (labourers, supervisors and staff) to the Security Office in the prescribed proforma, furnishing complete antecedents.
2. The contractor shall submit a notarised affidavit on judicial stamp paper (₹10/- or as applicable under State law) taking full responsibility for all supervisors and labourers, with photographs affixed.
3. The affidavit shall be valid for three months or till receipt of satisfactory Police Verification Report (PVR), whichever is earlier.
4. In case of adverse PVR, permission of the concerned person to enter the premises shall be withdrawn immediately without notice.

4. Identity Cards, Tokens & Access Control

1. Identity cards / passes shall be issued by the Security Office based on affidavit / PVC and shall be returned after completion of work.
2. Contractors, supervisors and workers shall be subject to routine checks at entry gates as well as at the work site.
3. If needed Biometric attendance of all contractor's personnel shall be recorded daily.
4. No person shall be permitted to work inside the premises for more than one contract at a time.

5. Working Hours & Prohibited Items

1. Contractor labour shall be permitted to work between 08:30 hrs and 17:30 hrs only.
2. Work beyond normal working hours shall be carried out only with prior written approval of the competent authority of OFT.
3. Mobile phones, electronic gadgets, tobacco products and alcoholic substances are strictly prohibited inside the premises.

6. Safety Clearance & Work Permits

1. The contractor shall obtain necessary Security Clearance / Safety Work Permit before commencement of any work.
2. All applicable statutory safety regulations and local safety instructions shall be strictly followed.
3. The work area shall be clearly demarcated and adequately barricaded. Clearance from factory / estate authorities shall be obtained before commencement of work.
4. All temporary constructions shall be dismantled and the site restored after completion of work.

7. Work at Height & Medical Fitness

For work at height, the contractor shall obtain **medical fitness certificates** from a registered medical practitioner (MBBS/MD) for the concerned workers and produce the same before issue of work permit.

8. Liability, Compensation & Indemnity

1. The CPWD/OFT shall not be responsible for any injury, accident or damage to contractor's personnel or equipment during execution of work.
2. The contractor shall bear all medical expenses, compensation and statutory liabilities, including compensation payable to legal heirs in case of fatal accidents, arising out of judicial or statutory orders.
3. In case of work inside restricted factory areas, the contractor shall comply with all security and safety regulations and shall indemnify and keep the authorities harmless from any loss, damage, accident or compensation.

9. Statutory Compliance & Breach

The contractor shall be fully responsible for compliance with all applicable **labour laws, safety laws and statutory regulations**. **Strict compliance** of all the above conditions is mandatory. Any violation shall be treated as **breach of contract** and action shall be taken as per agreement terms and conditions.

PROFORMA OF SCHEDULES FOR MAJOR COMPONENT (CIVIL)

(Separate Performa for Civil, Elect. & Hort. Works in case of Composite Tenders)

SCHEDULE 'A'

Schedule of quantities (as per **PART-D, SCHEDULE OF QUANTITIES FOR CIVIL WORKS**)

SCHEDULE 'D'

Extra schedule for specific requirements/ document for **PART-A, PART-B (CIVIL)**.
the work, if any:

SCHEDULE 'E'

Reference to General Conditions of contract. **GCC MAINTENANCE WORKS 2023 as modified & corrected up to the previous day of last date of submission of bid.**

Name of Work: **Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.**

Estimated cost of work: **Major component (CIVIL) : Rs. 2,22,78,475/-**
Minor component (E&M) : Rs. 22,77,498/-
Total : Rs. 24,555,973/-

(i) Earnest money deposit: **Rs. 4,91,119/-**

(ii) 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.

(iii) Security Deposit: **2.5% of tendered value**

SCHEDULE 'F'**GENERAL RULES & DIRECTIONS:**

Officer inviting tender: **Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015 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**

Definitions:

2(v) Engineer-in-Charge: **Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.**

2(viii) Accepting Authority: **Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.**

2(x) Percentage on cost of materials and Labour to cover all overheads and profits: **15%**

2(xi) Standard Schedule of Rates: **a) DSR-2023 as modified and corrected upto the previous day of last date of submission of tender multiplied by a correction factor of 0.973 enhanced by Cost Index.
b) DSR (E&M) 2025 as modified and corrected upto the previous day of last date of submission of tender enhanced by Cost Index.**

2(xii) Department: **CPWD**

9(ii) Standard Contract Form: **CPWD GCC MAINTENANCE WORKS 2023, CPWD Form 7/8 as modified & corrected up to the previous day of last date of submission of bid.**

Clause 1

(i) Time allowed for submission of Performance Guarantee, programme chart (Time and progress) and applicable **7 days**

labour licenses, registration with EPFO, ESIC and BOCW welfare board or proof of applying there of from the date of issue of letter of acceptance

- (ii) Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period **3 days** provided in (i) above

Clause 2

Authority for fixing compensation under clause 2: **Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.**

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start Mile stone(s) as per table given below:- **10 days or date of handing over of site whichever is later**

Sl.No.	Description of Milestone (Physical)	Time allowed in days (from date of start)	Amount to be with-held in case of non achievement of mile stone
1.	Civil: Removal/disposal of sand inside the tunnel; dismantling of damaged RCC roof slab and walls; disposal of debris; site preparation and preparatory works for structural strengthening. Electrical: Submission of drawings, TDS and submission of documents for associated agencies for approval.	1.5 months	1.25% of tendered value
2.	Civil: Providing double-skin protection using 30 mm thick AR 500 and E350 MS plates, including shear connectors, as per approved structural drawings;	3.0 months	1.25% of tendered value

	associated structural steel works.		
3.	Civil: Providing M50 Self Compacting Concrete for roof slab, walls and retaining walls; epoxy primer/painting to MS plates; 75 mm M25 shotcrete over roof slab and crystalline waterproofing, APP waterproofing for rooms and crack sealing. Electrical: Supply of all materials including Fittings, Fans, Panels and Cables.	4.5 months	1.25% of tendered value
4.	Civil: Refilling sand inside tunnel; renovation of office rooms including flooring, false ceiling and painting; replacement of acoustic boards in firing/firing control rooms; painting and replacement of glass panes; completion of all balance works and handing over the site. Electrical: Installation, Testing, Commissioning and handing over of all equipment's.	6.0 months	1.25% of tendered value

Time allowed for execution of work:

06 (Six) months

- (i) Authority to convey decision of shifting of milestone and extension of time: Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.
- (ii) Authority to decide rescheduling of milestone and extension of time: Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.
- (iii) Authority to decide shifting of date of start in case of delay in handing over of site: Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 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	Entire Site	10 Days
Part B	Portions with encumbrances	Nil	Not Applicable
Part C	Portions dependent on work of other agencies	Nil	Not Applicable

Clause 5.1(iv)

- (i) Time and progress chart and progress report – mutually agreed software: Primavera/ MS Projects.
- (ii) Rate of recovery for delay in submission of Time and Progress Chart: Rs. 14,000/- per week or part thereof
- (iii) Rate of recovery for delay in submission of monthly progress report beyond 5th day of each month: Rs. 5,000/- per week or part thereof

Clause 5.2

Nature of Hindrance Register: Electronic – online system through ERP (as per DG/MAN/394, Dt. 28.01.2020 & DG office OM issued vide No. 13/2/2023/WII/DG/177, Dated: 09.11.2023 and any other subsequent amendment issued from time to time during the progress of the work)

Clause 5.4

- (i) The form of application by the contractor for seeking Electronic – online system through ERP (as per DG/MAN/394, Dt. 28.01.2020 &

rescheduling of milestones or seeking extension of time: DG office OM issued vide No. 13/2/2023/WII/DG/177, Dated: 09.11.2023 and any other subsequent amendment issued from time to time during the progress of the work)

- (ii) Rate of recovery for delay in submission of revised programme when the progress of work falls behind approved program by more than 10% of the stipulated period of completion of contract: Rs. 2,000/- per day

Clause 6

Computerised Measure Book (CMB) / Electronic Measurement Book (EMB)

Mode of measurement: Electronic Measurement Book (EMB)

Clause 7

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment Rs. 37,00,000/- for being eligible to interim payment:

Clause 7A

Whether clause 7A shall be applicable: Yes

Clause 8

Competent Authorities to inspect and issue part/ final completion certificate: Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.

Clause 8A

Compensation for non submission of completion plans: Rs. 2,00,000/-

Authority to decide compensation for non submission of completion plans: **Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.**

Clause 10A

List of testing equipment to be provided by the contractor at site lab: **As per LIST OF EQUIPMENT FOR FIELD TESTING LABORATORY (CIVIL)**

Clause 10B (ii & iii)

Whether Clause 10 B (ii) shall be applicable: **No**

Clause 10C

Whether Clause 10C shall be applicable: **Applicable**

Component of labour expressed as percent of value of work: 25 %

Clause 10CC

Whether Clause 10CC shall be applicable: **Not applicable**

Clause 11

Building information model (BIM) is applicable and BIM professional to be deployed by contractor **No**

Specifications to be followed for the execution of work:

Specifications specified in contract documents for both civil & electrical works: **Detailed Specifications, Particular Specifications, Technical Specifications etc. included in this Bid document under PART-B (CIVIL).**

CPWD specifications for CPWD Specifications 2019 Vol.1 and Vol.2
Civil works:

Other specifications: All relevant BIS codes of practice, National Building Construction Standards 2026 (NBCS 2026), Energy Conservation sustainable Building Code (ECSBC), National Electrical Code (NEC), Structural & Non-structural elements for Fire safety, Harmonized Guidelines and Standards for Universal Accessibility in India, The Indian Electricity Act, Central Electricity Authority rules, Local Bodies Norms, Statutory bodies Norms and other relevant Codes, Guidelines, Regulations, Recommendations, Norms, Specifications etc.

Note: Latest version and all volumes of all above Codes, Guidelines, Regulations, Recommendations, Norms, specifications etc. shall be applicable along with all amendments issued upto the previous day of the last date of submission / uploading of Bid.

Clause 12

12.2. & 12.3 Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for items of work No limit (All the deviated quantities shall be paid at agreement rates)

Clause 16

Competent Authority for Superintending Engineer (Trichy), CPWD, NIT deciding reduced rates: Campus, Trichy - 620 015 or his successor thereof.

Clause 18

List of mandatory machinery, tools & plants to be deployed by the contractor at site:- As per LIST OF MANDATORY MACHINERY, TOOLS & PLANTS TO BE DEPLOYED BY THE CONTRACTOR AT SITE (CIVIL)

Clause 19C/ 19D/ 19G/ 19K

Authority to decide penalty for each default: Executive Engineer (Trichy) - I, CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.

Clause 19J

Authority to decide levy for delay: **Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.**

Clause 25

Conciliator: **SDG - Chennai, CPWD, Chennai or his successor thereof.**

Arbitrator Appointing Authority: **Superintending Engineer (Trichy) or his successor thereof.**

Place of Arbitration **Trichy**

Clause 32

Requirement of Technical Representative(s) and recovery rate

Sl. No.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical/ Technical Representative)	Minimum Experience (Years)	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 32 (i)
1	Graduate Engineer or Diploma Engineer	Civil	Project Manager cum planning/ quality/ site/ billing Engineer	2 or 5 respectively	1	₹15,000/- per month per person
2	Graduate Engineer or Diploma Engineer	Electrical/ Mechanical	Project Manager cum planning/ quality/ site/ billing Engineer	2 or 5 respectively	1	₹15,000/- per month per person

Assistant Engineers retired from government service who are holding Diploma will be treated at par with graduate engineers.

Diploma holder with minimum 10 year relevant experience with a reputed construction company 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)(a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates printed by C.P.W.D. On the basis of Delhi Schedule of Rates 2023 printed by C.P.W.D.
- (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) Bitumen All Works 2.5% plus only & nil on minus side.
- (c) Steel Reinforcement and structural steel sections for each diameter, section and category 2% plus/minus
- (d) All other materials. Nil

Executive Engineer (Trichy) - I
CPWD, NIT Campus, Trichy - 620 015

LIST OF EQUIPMENT FOR FIELD TESTING LABORATORY (CIVIL)

1. The contractor shall establish and maintain, at his own cost, a suitable site testing laboratory for carrying out routine field and laboratory tests required under the applicable CPWD Specifications, relevant BIS standards and the approved Quality Assurance Plan.
2. The site laboratory shall be weatherproof, adequately ventilated and provided with electricity, water supply, working tables, storage racks, sample-storage arrangements, curing arrangements and such other facilities as are necessary for proper testing and record keeping.
3. The equipment listed below represents the minimum requirement for an ordinary building work. Only equipment relevant to the materials and items included in the scope of work shall be deployed. Specialised equipment may be owned, hired or arranged through an approved testing agency, provided it is made available when required without affecting the work programme.
4. Tests that cannot reasonably be performed in the site laboratory shall be carried out at a CPWD, Government, Government-recognised or NABL-accredited laboratory approved by the Engineer-in-Charge.
5. All measuring and testing equipment shall be of suitable capacity, range, accuracy and least count. Equipment requiring calibration shall have valid calibration certificates traceable to national standards through a NABL-accredited calibration laboratory.
6. The list is indicative and not exhaustive. Additional equipment required for compliance with the specifications or approved Quality Assurance Plan shall be arranged by the contractor without extra payment. The decision of the Engineer-in-Charge regarding applicability, adequacy and duration of deployment shall be final and binding.

Table 3: Minimum Field Testing Equipment for Civil Works

S.N.	EQUIPMENT	NUMBER TO BE DEPLOYED
1	Slump cone test set comprising slump cone, base plate, tamping rod, scoop and graduated scale	2 Sets
2	Cube moulds, 150 mm × 150 mm × 150 mm, conforming to applicable BIS requirements	12 Nos.
3	Standard vibration table suitable for compacting concrete cube specimens	1 No.
4	Curing tank of adequate capacity, complete with water-temperature monitoring arrangement and specimen-identification racks	1 No.

5	Platform weighing scale, minimum 100 kg capacity, suitable for aggregate samples	1 No.
6	Digital weighing balance, minimum 10 kg capacity and 1 g or better least count	1 No.
7	Set of coarse-aggregate test sieves of suitable diameter comprising the sizes applicable to the aggregates used, generally 40 mm, 20 mm, 12.5 mm, 10 mm and 4.75 mm, complete with lid and pan	1 Set
8	Set of fine-aggregate wire-cloth test sieves comprising 4.75 mm, 2.36 mm, 1.18 mm, 600 micron, 300 micron, 150 micron and 75 micron sieves, complete with lid and pan	1 Set
9	Mechanical sieve shaker suitable for the sieve sets provided, complete with timer	1 No.
10	Electrically operated thermostatically controlled drying oven capable of maintaining a temperature of 105°C to 110°C	1 No.
11	GI/stainless-steel sample trays of assorted sizes	1 Set
12	Graduated measuring cylinders and measuring jars of assorted capacities from 100 ml to 2 litres	1 Set
13	Laboratory beakers and containers of assorted capacities	1 Set
14	Tamping rods, gauging trowels, spatulas, scoops, sieve brushes and other sample-preparation accessories	1 Set
15	Thermometer suitable for measurement of water, concrete and ambient temperature	1 No.
16	Moisture-content containers with lids	12 Nos.
17	Sand-replacement apparatus and/or soil core-cutter apparatus with rammer and accessories for field-density testing, as applicable to the filling material	1 Set
18	Digital vernier caliper	1 No.
19	Measuring tapes comprising 5 m and 30 m lengths	1 Each
20	Spirit level, plumb bob and straightedge suitable for routine workmanship and dimensional checks	1 Set
21	Mortar cube moulds of the size prescribed in the applicable specification	6 Nos., where mortar/grout strength testing is specified

22	Hydrostatic test pump with calibrated pressure gauges and accessories	1 Set, where water-supply or pressure-pipe work is included
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The following equipment need not remain continuously deployed at site. It shall be mobilised by the contractor, or testing shall be arranged through an approved agency, whenever directed by the Engineer-in-Charge or required under the specifications:

Table 4: Specialised Equipment to Be Mobilised as Required for Civil Works

S.N.	EQUIPMENT	NUMBER TO BE DEPLOYED
1	Compression Testing Machine conforming to IS 14858 and of capacity suitable for the concrete grade and specimen size	As required, or testing through an approved laboratory
2	Rebound hammer with valid calibration certificate	As directed by Engineer-in-charge
3	Ultrasonic Pulse Velocity test equipment	As directed by Engineer-in-charge
4	Reinforcement cover meter	As directed by Engineer-in-charge
5	Concrete core-cutting machine with suitable diamond core bits	As directed by Engineer-in-charge
6	Pull-off tester, pull-out tester or anchor-testing equipment	Where such tests are specified
7	Digital wood-moisture meter	Where substantial timber work is included
8	Water-quality testing facilities for chemical analysis in accordance with applicable BIS requirements	Through an approved laboratory
9	Soil-testing facilities for Proctor compaction, grain-size analysis, Atterberg limits, CBR and other specified tests	Through an approved laboratory
10	Testing facilities for cement, reinforcement steel, bricks, blocks, tiles, stone, waterproofing materials and other construction materials	Through an approved laboratory

**LIST OF MANDATORY MACHINERY, TOOLS & PLANTS TO BE DEPLOYED BY THE
CONTRACTOR AT SITE (CIVIL)**

1. The contractor shall deploy machinery, tools and plants of adequate capacity and in sufficient numbers to execute the work safely and in accordance with the approved construction programme, method statements and Quality Assurance Plan.
2. The quantities stated below indicate the minimum availability for an ordinary building work. Machinery not relevant to the scope or stage of work need not remain continuously deployed. Hired machinery and machinery supplied along with ready-mixed concrete or through specialist agencies shall be acceptable, provided availability is assured whenever required.
3. All machinery, tools and plants shall be maintained in safe and serviceable condition and shall be operated only by trained and competent personnel. Machinery requiring statutory certification, inspection or load testing shall have valid certificates.
4. The Engineer-in-Charge may require additional machinery where necessary to meet the approved work programme. Nothing extra shall be payable on this account.

Table 5: Mandatory Machinery, Tools and Plants for Civil Works

S.N.	EQUIPMENT/ MACHINERY	NUMBER TO BE DEPLOYED
1	Approved ready-mixed concrete supply arrangement or calibrated weigh-batching and mixing arrangement suitable for the concrete included in the work	As per approved concreting methodology
2	Concrete mixer of suitable capacity	1 No. where site mixing is permitted
3	Concrete pump, line pump or boom placer	Mobilised for pours where required
4	Needle vibrators of suitable diameter and capacity	3 Nos., including one standby
5	Surface/plate vibrator	1 No., where slabs, floors or paving are included
6	Reinforcement bar-cutting machine	1 No.
7	Reinforcement bar-bending machine	1 No.
8	Backhoe loader/excavator of suitable capacity	As required during excavation and backfilling
9	Power-driven earth rammer or soil compactor	1 No.
10	Vibratory plate compactor	1 No., where granular filling or paving work is

		included
11	Automatic level/dumpy level with tripod and levelling staff	1 Set
12	Total station with accessories	Mobilised for initial setting-out, control-point transfer and verification, where required
13	Builder's hoist or material-lifting equipment of suitable capacity	As required for multi-storey work
14	Portable welding machine complete with cables, holder and accessories	1 No., where welding work is included
15	Rotary hammer/drilling machine	2 Nos.
16	Masonry, tile or stone cutting machine with suitable blades	1 No. of each applicable type
17	Dewatering pump of suitable capacity	As required
18	Water pump, storage tanks, hoses, sprinklers and other curing arrangements	1 Complete Set
19	Generator set or alternative temporary-power arrangement of adequate capacity	Where reliable construction power is not available
20	Steel formwork, shuttering plates, beams, staging and adjustable props	Adequate for the approved pour sequence
21	Double scaffolding and working platforms complete with guardrails, toe boards, access ladders and other safety accessories	As required
22	Wheelbarrows, material trolleys, buckets, shovels, spades and general construction hand tools	Adequate quantity
23	Water tanker	As required where continuous construction water is not otherwise available
24	Digital camera or mobile device capable of clear date-recorded photographs and videos	1 No.
25	Any other machinery, tools or plants required for safe and timely completion of the work	As directed by the Engineer-in-Charge

PART-B (CIVIL)

PARTICULAR SPECIFICATIONS AND SPECIAL CONDITIONS (CIVIL)

I) SCOPE AND GENERAL CONDITIONS FOR CIVIL WORKS

1. Scope:

- 1.1. The scope of civil works shall comprise all items and incidental operations required for complete execution, testing and handing over in accordance with the Schedule of Quantities, drawings, specifications and other agreement documents.
- 1.2. The Contractor shall prepare and submit, wherever applicable, shop drawings, coordinated drawings, material submittals, samples, method statements and as-built drawings for approval of the Engineer-in-Charge.
- 1.3. The Contractor shall obtain the statutory permissions and approvals expressly assigned to him under the agreement.

2. Coordination of Drawings:

- 2.1. Before commencing any work, the Contractor shall correlate the architectural, structural and services drawings and report any discrepancy or incomplete information to the Engineer-in-Charge.
- 2.2. Written dimensions shall prevail over scaled dimensions. Work shall not proceed on any discrepant detail without clarification from the Engineer-in-Charge.
- 2.3. Approval of drawings or setting out shall not relieve the Contractor of responsibility for correctness, coordination or compliance with the agreement.

3. Coordination with Services:

- 3.1. The Contractor shall coordinate civil works with all electrical, mechanical, plumbing, fire-fighting and other services and provide the required openings, recesses, sleeves, inserts, supports and embedded components at the appropriate stage of construction.
- 3.2. Cutting of structural members shall not be carried out without prior written approval. Permitted chases and openings shall be made using suitable power-operated equipment and properly repaired and sealed.

4. Workmanship and Resources:

- 4.1. The Contractor shall deploy competent supervision, skilled workers and suitable tools, plant and equipment appropriate to the nature, quality and programme of the work.

II) SITE ESTABLISHMENT AND MAINTENANCE FOR CIVIL WORKS

1. Site Layout and Temporary Arrangements:

- 1.1. Before commencement, the Contractor shall submit a site layout showing the proposed offices, storage areas, fabrication areas, plant, laboratory, temporary utilities, access routes and waste-storage locations.
- 1.2. Temporary facilities shall be established only at locations approved by the Engineer-in-Charge and shall not obstruct access, drainage, services or the work of other agencies.

2. Setting Out:

- 2.1. The Contractor shall establish, verify, maintain and protect all reference points, bench marks, lines and levels required for execution of the work.
- 2.2. Any discrepancy in the supplied levels, dimensions or reference points shall be reported before commencement of the affected work.
- 2.3. The Contractor shall remain responsible for the alignment, dimensions and levels of the work and shall rectify errors attributable to him at his own cost.

3. Environmental Protection and Pollution Control:

- 3.1. The Contractor shall comply with the applicable environmental laws, Construction and Demolition Waste Management Rules, and directions of MoEFCC, CPCB, SPCB/PCC, National Green Tribunal and local authorities.
- 3.2. Construction materials and debris shall be stored only at approved locations without obstructing roads, traffic or pedestrians. Stockpiles and vehicles carrying loose materials shall be suitably covered, and vehicle tyres and access roads shall be kept free from mud and dust.
- 3.3. The Contractor shall control dust, noise and emissions by suitable barricading or wind screens, water sprinkling, wet cutting or grinding, proper maintenance of machinery, use of compliant DG sets and vehicles, and provision of appropriate personal protective equipment to workers.
- 3.4. Cement slurry, silt, oil, construction runoff or other pollutants shall not be discharged into the ground, drains or water bodies. Suitable collection, diversion, treatment, reuse or authorised disposal arrangements shall be provided.
- 3.5. All construction and demolition waste shall be segregated, reused, recycled or disposed of at authorised facilities in accordance with applicable requirements. The cost of these measures shall be included in the quoted rates.
- 3.6. Any stoppage, penalty or remedial work arising from non-compliance attributable to the Contractor shall be at his risk and cost and shall not

constitute a ground for additional payment or extension of time.

4. Housekeeping and Waste Management:

- 4.1. The site shall be kept clean, orderly and free from avoidable accumulation of debris, stagnant water and surplus materials.
- 4.2. Materials and debris shall not be stored on roads, public land, access routes or areas required for subsequent construction.
- 4.3. Construction and demolition waste shall, as directed, be reused at site or transported to an authorised recycling or disposal facility in accordance with applicable statutory requirements.
- 4.4. The Contractor shall implement suitable measures for dust suppression, covered transportation, wet cutting, noise control and prevention of discharge of cement slurry, silt, oil or contaminated water into the ground, drains or waterways.

5. Scaffolding and Temporary Works:

- 5.1. The Contractor shall design, provide, inspect, maintain and remove all scaffolding, formwork, access platforms, barricades and other temporary works required for safe execution.
- 5.2. Temporary works shall comply with the applicable CPWD Specifications, safety requirements and approved method statements. Where required by the Engineer-in-Charge, their design shall be supported by calculations and drawings.

6. Drainage and Dewatering:

- 6.1. The Contractor shall maintain effective temporary drainage and keep excavations and work areas reasonably free from surface water and seepage during execution.
- 6.2. Dewatering shall be carried out by an approved method without causing instability, settlement or damage to adjoining structures, utilities or property.
- 6.3. Unless separately provided in the Schedule of Quantities, ordinary pumping, bailing and temporary drainage incidental to execution shall be included in the quoted rates. Any specially designed dewatering system shall be governed by the relevant item and tender provisions.

7. Openings, Inserts and Construction Joints:

- 7.1. Openings, recesses, sleeves, inserts and embedded components shall be coordinated and installed before concreting or masonry work. Their supply and payment shall be governed by the relevant Schedule of Quantities item or component.
- 7.2. Core cutting or subsequent openings shall be undertaken only with approval and shall be properly sealed using the specified material.
- 7.3. Construction joints shall be provided only at approved locations and

treated in accordance with the drawings and applicable specifications. Unless separately provided, the associated formwork and ordinary joint preparation shall be included in the relevant concrete or RCC item.

III) QUALITY ASSURANCE MEASURES FOR CIVIL WORKS

1. General:

- 1.1. Civil works shall be executed and tested in accordance with the applicable CPWD Specifications, CPWD Quality Assurance Manual(s), relevant Indian Standards, approved drawings, approved Quality Assurance Plan and other requirements of the agreement.

2. Quality-Control Personnel:

- 2.1. The Contractor shall deploy the quality-control and technical personnel specified in Schedule F. Where a dedicated Quality Manager is specified, such person shall be responsible for implementation and maintenance of the approved Quality Assurance Plan for the civil works.

3. Field Testing Laboratory:

- 3.1. Where required under Schedule F or elsewhere in the agreement, the Contractor shall establish and maintain a field-testing laboratory at the site with the equipment specified in the tender document and such additional equipment as may reasonably be required for carrying out the prescribed field tests.
- 3.2. The field laboratory, testing personnel, instruments, calibration and test records shall comply with the common quality-assurance provisions and the applicable CPWD Specifications and Quality Assurance Manual(s).
- 3.3. Establishment of the field laboratory shall not dispense with any mandatory independent or third-party testing required under the agreement.

4. Civil Method Statements, Checklists and Pour Cards:

- 4.1. Activity-specific method statements, Inspection and Test Plans, checklists and, where applicable, pour cards shall be submitted sufficiently in advance for important civil activities, including:
 - a) Earthwork and filling.
 - b) Formwork, staging, reinforcement and concrete work.
 - c) Masonry and plastering.
 - d) Waterproofing and roof treatment.
 - e) Flooring, tiling and other finishing works.
 - f) Doors, windows and glazing.
 - g) Water-supply, sanitary and drainage works.

- h) Concealed, embedded and other works that will subsequently be covered.
- 4.2. No concrete pour or other identified hold-point activity shall proceed until the prescribed checks have been completed and recorded.
- 5. Shop Drawings and Bar-Bending Schedules:**
- 5.1. The Contractor shall submit, sufficiently before execution, bar-bending schedules and shop drawings for formwork, staging, temporary supports, aluminium or other fabricated works, openings, sleeves, embedded items and such other civil works as specified in the agreement or directed by the Engineer-in-Charge.
- 5.2. Review or approval of such submissions shall not relieve the Contractor of responsibility for their correctness, adequacy, stability, safety or conformity with the agreement.
- 6. Water Used in Construction:**
- 6.1. Water proposed to be used for mixing, curing or other construction purposes shall be tested for conformity with the applicable CPWD Specifications and relevant Indian Standards before use and thereafter at the prescribed frequency.
- 6.2. Where the proposed source is found unsuitable, the Contractor shall arrange water from an acceptable source at his own cost, unless otherwise provided in the agreement.
- 7. Concealed Work**
- 7.1. Pipes, conduits, drains, waterproofing and other concealed work shall be inspected, tested and measured before being covered.
- 7.2. The Contractor shall give adequate notice to the Engineer-in-Charge and maintain the required test reports, measurements and photographic records. Any work covered without inspection may be required to be exposed and reinstated at the Contractor's cost.
- 8. Civil Quality Records:**
- 8.1. The Contractor shall maintain the registers, checklists, pour cards, inspection records and test records prescribed under the applicable CPWD Quality Assurance Manual(s), approved Quality Assurance Plan and directions of the Engineer-in-Charge.
- 8.2. Such records shall be kept current, indexed and available at the site for inspection and shall be submitted at the intervals specified by the Engineer-in-Charge and as part of the completion documentation.

IV) AS BUILT DRAWINGS FOR CIVIL WORKS

1. The Contractor shall submit, at his own cost, four sets of prints and one editable digital copy of the approved as-built drawings before final handing

over or within such period as directed by the Engineer-in-Charge.

2. The as-built drawings shall incorporate all changes and deviations made during execution and shall include, as applicable:
 - a) Actual layout, alignment and sizes of soil, waste, rainwater and other drainage pipes, including vertical stacks, inspection chambers, manholes and connections up to the final outfall.
 - b) Ground levels, invert levels, pipe gradients and locations and cover levels of manholes, inspection chambers, gullies and other drainage structures.
 - c) Actual layout and sizes of internal and external water-supply lines, including the locations of valves, meters, tanks, pumps, access panels and other control or isolation points.
 - d) Locations and details of concealed civil services, sleeves, openings, embedded items, construction joints and other features required for future operation, maintenance or alteration.
 - e) Architectural, structural, site-development and external-service details wherever the executed work differs from the approved or issued-for-construction drawings.
3. The drawings shall be prepared to an appropriate scale, duly indexed and signed by the Contractor and the authorised technical personnel. Submission of as-built drawings shall not constitute approval of any unauthorised deviation from the agreement drawings or specifications.

SPECIAL CONDITIONS FOR CEMENT

I) GENERAL

1. The contractor shall procure 53 grade ordinary Portland Cement (OPC) conforming to IS: 8112 /Portland Pozzolona Cement (PPC) conforming to IS:1489 (Part-1) as required in the work from reputed manufacturers of cement as mentioned in LIST OF PREFERRED MAKES (CIVIL) or from any other reputed cement manufacture having a production capacity not less than 1 million Ton per annum as approved by Superintending Engineer (Trichy), CPWD, Trichy - 620 015 or his successor. The cement of approved make as aforesaid in 50 kg bags bearing manufacturer's name and ISI marking, along with manufacturers test certificate for each lot shall be procured by the contractor. Portland Pozzolona Cement is to be used for RCC works only subject to fulfilment of conditions of circular No. CDO/SE(RR)/ Fly ash (MAN) 02 dated 09.04.09. However, if the contractor uses higher grade of cement or uses OPC only nothing extra shall be paid. The use of PPC shall be regulated as per the conditions stipulated in the circular dated 09.04.2009.
2. IS:456-2000 Code of Practice for Plain and Reinforced Concrete (as amended upto date) shall be followed in regard to Concrete Mix Portion and its production as under:
 - a) The concrete mix design shall be done as "Design Mix Concrete" as prescribed in clause-9 of IS456 code with latest amendments.
 - b) Concrete shall be manufactured in accordance with clause 10 of above mentioned IS:456 with latest amendments covering quality assurance measures both technical and organisational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.
3. The mechanical properties such as modulus of elastic city, tensile strength, creep and shrinkage of fly ash mixed concrete or concrete using fly ash blended cements (PPCs) are not likely to be significantly different and their values are to be taken same as those used for concrete made with OPC.
4. To control higher rate of carbonation in early ages of concrete both in fly ash admixed as well as PPC based concrete, water/binder ratio shall be kept as low as possible, which shall be closely monitored during concrete production.
5. If necessitated due to low water/binder ratio, required work ability shall be achieved by use of chloride free chemical admixtures conforming to IS: 9103. The compatibility of chemical admixtures and super plasticisers with each set OPC, fly ash and/or PPC received from different sources shall be ensured by trails.
6. In environment subjected to aggressive chloride or sulphate attack in

particular, use of fly ash admixed or PPC based concrete is recommended. In case, where structural concrete is exposed to excessive magnesium sulphate, fly ash substitution/content shall be limited to 18% by weight. Special type of cement with low C3A content may also be alternatively used. Durability criteria like minimum binder content and maximum water/binder ratio also need to be given due consideration in such environment.

7. Wet curing period shall be enhanced to a minimum of 10 days or its equivalent. In hot & arid regions, the minimum curing period shall be 14 days or its equivalent.
8. Subject to General Guidelines detailed out as above, PPC manufactured conforming to IS:1489 (Part-I) shall be treated at par with OPC for manufacture of Design Mix Concrete for structural use in RCC.
9. Till the time, BIS makes it mandatory to print the % age of fly ash on each bag of cement, the certificate from the PPC manufacturer indicating the same shall be insisted upon before allowing use of such cements in works.
10. While using PPC for structural concrete work, no further admixing of fly ash shall be permitted.
11. The cement shall be brought at site in bulk supply of approximately 50 tonnes or as decided by the Engineer-in-charge.
12. The cement godown of the capacity to store a minimum of 2000 bags of cement shall be constructed by the contractor at the site of work for which no extra payment shall be made. Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the Engineer-in-charge or his authorized representative and the keys of the other lock shall remain with the contractor. 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.
13. The cement shall be got tested at a frequency of one test for 100 MT or part thereof, by Engineer-in-charge and shall be used on work only after test results have been received. The contractor shall supply free of charge the cement required for testing. The cost of test shall be borne by the contractor.
14. The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of 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 conditions therein.
15. 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.
16. Damaged cement shall be removed from site immediately by the contractor on receipt of notice in writing from the Engineer-in-charge. If he does not do so

within three days of receipt of such notice, the Engineer-in-charge shall get it removed at the cost of the contractor.

17. Cement should be kept in godowns under double locks and keys and its consumption account in variably maintained, whether the cement is supplied departmentally or arranged by the contractor. A register should be maintained at the site for this purpose. This register should contain the columns as shown in Annexure-30. (SOP for CPWD Works Manual 2024).
18. The pages of the register should be machine numbered and each page initialed by the EE. The cement godown and the register are required to be checked by the AE/EE in-charge of the work as per following schedule:
 - a) At least weekly or fortnightly, respectively in case of works at the Headquarters of AE/EE.
 - b) Whenever they visit the site of work in case of works located outside the Sub-Divisional/Divisional Head Quarters.

II) DESIGN MIX REINFORCED CEMENT CONCRETE FROM BATCH MIX PLANT OR RMC

1. Design mix is to be carried out as per IS 10262, IS 456 and other relevant IS codes / CPWD Specifications amended upto last date of bid submission.
2. The Contractor shall install fully automatic Batch Mix Plant at site or in nearby area wherever permissible. If required, Contractor will arrange concrete from RMC (Ready Mix Concrete) producing plants (located within 50 km distance from the site of work) with prior approval from Engineer-in-charge. Nothing extra shall be payable for sourcing concrete from RMC plant.
3. For all purposes, the Contractor shall carry out fully, the responsibilities of the “placement Contractor” and the “manufacturer of concrete”.
4. The Engineer-in-Charge will reserve the right to inspect at any stage and reject the concrete if he is not satisfied about quality of product at the user’s end.
5. The Engineer-in-charge reserves the right to exercise control over the: -
 - a) Ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting of tests for checking quality of materials, recording of test results and declaring the materials fit or unfit for use in production of mix.
 - b) Calibration check of the RMC /Fully Automatic Batching plant.
 - c) Weight and quantity check on the ingredients, water and admixtures added for batch mixing.
 - d) Time of mixing of concrete.
 - e) Testing of fresh concrete, recordings of results and declaring the mix fit or unfit for use. This will include continuous control on the workability

during production and taking corrective action, if required.

6. For exercising such control, the Engineer-in-charge shall periodically depute his authorized representative at the RMC/Fully automatic batching plant. It shall be responsibility of the Contractor to ensure that all necessary equipment, manpower & facilities are made available to Engineer-in-Charge and/or his authorized representative at RMC/Fully automatic batching plant.
 7. All required relevant records of produced and used concrete shall be made available to the Engineer-in-Charge or his authorized representative. Engineer-in-Charge shall, as required, specify guidelines & additional procedures for quality control & other parameters in respect of materials, production & transportation of concrete mix which shall be binding on the Contractor. Only concrete as approved in design mix by Engineer-in-Charge shall be produced and transported to the site.
 8. The concrete mix design with admixture will be carried out by the Contractor, at his own cost, through one of the following laboratories/Test houses to be approved by Engineer-in-charge: -
 - a) IITs, NITs or any Govt. Engineering College.
 - b) National Council for Cement & Building Materials
 - c) CRRI, Delhi.
 9. 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 mix design shall be PCE (Poly Caboxyl Ether) based only and agency shall quote rates accordingly. Nothing extra shall be paid on this account.
10. The contractor shall submit the mix design report from any of above approved laboratories for approval of Engineer-in-Charge within time given by Engineer-in Charge from the date of issue of letter of acceptance of the tender.
 11. In case of white Portland cement and the likely use of admixtures where CC/RCC is done with concrete pumps 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.
 12. Each time when there is change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised mix design shall be done and approval obtained from the approved Laboratory or as per the direction of the Engineer in-Charge. Preferably only single source of cement shall be kept for the work. In case contractor decides to use more than one source of approved cement brand then for each brand separate design mix shall be done and got approved by Engineer-in-charge.
 13. The Mix shall be designed to produce the grade of concrete having required

workability and characteristic strength not less than as specified.

14. The mix design for a specified grade of concrete shall be done for a target mean compressive strength $T_{ck} = F_{ck} + 1.65 S$

Where, F_{ck} = Characteristic compressive strength at 28 days

S = Standard deviation

The standard deviation for each grade of concrete shall be calculated separately.

The degree of quality control for this work is “Good” for which the standard deviation (s) obtained for different grades of concrete shall be as follows:-

Grade of Concrete	For “Good” quality of control
M 20	4.0 MPa
M 25	4.0 MPa
M 30	5.0 MPa
M 35	5.0 MPa

15. Out of the six specimens 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 likely to be attained at 28 days. All cost of mix designing and testing connected therewith including charges payable to laboratory shall be borne by the Contractor.
16. The samples of cement, aggregate (fine & coarse) to be sent to the laboratories shall be sealed in the presence of the Engineer-in-Charge and shall have his signature and cost of packaging, sealing, transportation, loading, unloading, cost of samples and the testing charges for Mix design in all cases shall be borne by the contractor.
17. Notwithstanding the approval granted by Engineer-in-Charge in aforesaid manner, the contractor shall be fully responsible for quality of concrete including input control, transportation and placement etc.
18. The Engineer-in-Charge reserves the right to exercise control over the ingredients, water and admixtures, purchased, stored and to be used in the concrete including conducting of tests for checking quality of materials fit or unfit for use in production of mix.
19. The Contractor shall submit the test data of the material used for concrete mix-design in the laboratories, so the material being used at site can be compared with those data / size etc.
20. In case of change of parameters of ingredients (fine aggregate, cement, coarse aggregate) fresh concrete mix-design to be done as mentioned in above paras and got approved from the Engineer-in-Charge before execution.
21. The contractor shall make arrangement to install a mini laboratory at site for accelerated testing of design mix concrete as per IS: 9013. The department

reserves right to take samples of design mix concrete from the mass production of the concrete for testing and compare with the laboratory's results.

22. Nothing shall be paid extra for installation and cost of batching plant and other arrangement for making necessary test of design mix concrete.
23. The item of design mix cement concrete shall be inclusive of all the ingredients including admixtures if required, labour, machinery T & P etc. (except shuttering which will be measured & paid for separately) required for a design mix concrete of required strength and workability. The rate quoted by the agency shall be net & nothing extra shall be payable on account of change in quantities of concrete ingredients like aggregates and admixtures as per the approved mix design.
24. Concrete shall be handled from the place of mixing to the place of final deposit / placement by methods, which prevent segregation, or loss of any ingredients and contamination.
25. Where concrete is conveyed by chutes, the chute shall be made of metal or fitted with metal lining. The approval of the Engineer-in-charge shall be obtained for the use of chutes in excess of 3 meters length and in such cases the concrete shall be remixed if so required by the Engineer-in-Charge or closed bottom buckets shall be used. If concrete is placed by pumping, the conduit shall be primed properly. Once pumping is started, it shall not be interrupted as far as possible. Concrete shall not be dropped into place from a height more than 1.5m.
26. Concreting of any portion of the work shall be done in presence of the representative of the Engineer-in-Charge and shall be done only after approval of the Engineer-in Charge.
27. Concreting shall be carried out continuously between constructions joints shown on the drawings or as agreed by the Engineer-in-Charge. The contractor shall closely follow the sequence of concreting where it is specified in the drawings. If concreting is interrupted before reaching the predetermined joint an approved construction joint shall be provided. Construction joints shall be minimized as far as possible. These shall be set at right angles to the general direction of the member. The surface film of the first placed concrete should preferably be removed while the concrete is still green to expose the aggregate and leave a sound irregular surface. However, care shall be taken not to disturb the concrete already laid.
28. Admixtures: Wherever required, admixtures of approved quality only shall be mixed with concrete as specified. The admixtures shall conform to IS: 9103. The

chloride content in the admixture shall satisfy the requirements of BS: 5075. The total amount of chlorides in the admixture mixed concrete shall also satisfy the requirements of IS 456-2000.

29. Use of ready mixed concrete (RMC) may also be permitted, with prior approval of Engineer -in - Charge, without any extra payment. Separate account of design mix concrete and RMC shall however be kept. The ready mixed concrete shall conform to the requirement of durability, workability and strength as laid down for design mix concrete.

30. Use of Fly Ash and Fly Ash Blended Cements in RCC Structures: -

- a) The concrete mix design shall be done as "Design Mix Concrete" as prescribed in clause - 9 of IS 456 mentioned above.
- b) Concrete shall be manufactured in accordance with clause 10 of above mentioned IS: 456 covering quality assurance measures both technical and organizational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.
- c) The mechanical properties such as modulus of elasticity, tensile strength, creep and shrinkage of fly ash mixed concrete or concrete using fly ash blended cements (PPCs) should not likely to be significantly different and their values are to be taken same as those used for concrete made with OPC. Fly ash when used in the production of concrete shall be strictly in conformity with IS : 3812 (Para 1 & 10).
- d) To control higher rate of carbonation in early ages of concrete both in flyash admixed as well as PPC based concrete, water / binder ratio shall be kept as low as possible, which shall be closely monitored during concrete manufacture. If necessitated due to low water / binder ratio, required workability shall be achieved by use of chloride free chemical admixtures conforming to IS: 9103. The compatibility of chemical admixtures and super plasticizers with each set OPC, fly ash and / or PPC received from different sources shall be ensured by trials.
- e) In environment subjected to aggressive chloride or sulphate attack in particular, use of flyash admixed or PPC based concrete is recommended. In cases, where structural concrete is exposed to excessive magnesium sulphate, flyash substitution / content shall be limited to 18% by weight. Special type of cement with low C3A content may also be alternatively used. Durability criteria like minimum binder content and maximum water / binder ratio also need to be given due consideration in such environment.
- f) Wet curing period shall be enhanced to a minimum of 10 days or its equivalent. In hot and arid regions, the minimum curing period shall be 14 days or its equivalent.

31. Use of Flyash Admixed Cement Concrete (FACC) in RCC Structures

There shall be no bar on use of FACC in RCC structures subject to following additional conditions: -

- a) Flyash shall have its chemical characteristics and physical requirements etc. conforming to IS: 3812 (Part-10) and shall be duly certified.
- b) To ensure uniform blending of fly ash with cement in conformity with IS: 456, a specific facility needs to be created at site with complete computerized automated process control to achieve design quality or with similar facility from Ready Mix concrete (RMC) plants.
- c) As per IS: 1489 (Part-I), Maximum 35% of OPC by mass is permitted to be substituted with fly ash conforming to IS: 3812 (Part-I) and same is reiterated.
- d) Separate storage for dry fly ash shall be provided. Storage bins or silos shall be weather proof and permit a free flow and efficient discharge of fly ash. The filter or dust control system provided in the bins or silos shall be of sufficient size to allow delivery of fly ash maintained at specified pressure to prevent undue emission of fly ash dust, which may interfere weighing accuracy.

32. Conditions for Ready-mix concrete: -

- 32.1. The contractor can use concrete from RMC plants also with prior approval of the Engineer in-charge, instead of preparing the same in central batching plant at site within agreement item of Batch Mix Plant without any extra cost, looking to expedite the progress and need of work. However, for procuring RMC from approved plant the contractor shall follow the following conditions. Nothing extra shall be payable to the contractor for procuring RMC from the external plant.
- 32.2. For procurement of ready-mix concrete from approved RMC plants, the contractor shall, within 15 days of award of the work, submit list of at least three RMC plant companies of repute along with details of transit mixer and pumps etc. to be deployed indicating name of owner/company, its location capacity, technical establishment, past experience and text of MOU proposed to be entered between purchaser (the contractor) and supplier (RMC Plant). The Engineer – in – Charge shall give approval in writing (subject to draw of MOU). The contractor shall draw the MOU with approved RMC plant owner / company and submit to Engineer – in – Charge within a week of such approval. The contractor will not be allowed to purchase ready mixed – concrete without completion of above stated formalities for use in this 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, transportation and placement etc.

- 32.3. The Engineer-in-charge will reserve right to inspect at any such stage and reject the concrete if he is not satisfied about quality of product. The contractor should therefore draw MOU / agreement with RMC owner / company very carefully, keeping all terms and conditions / specifications forming a part of this tender document. Including the following controls.
- 32.4. The Engineer-in-charge reserves the right to exercise control over the ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting of tests for checking quality of Materials, recordings of test results and declaring the Materials fit or unfit for use in production of mix etc.
- 32.5. The ready-mix concrete should be produced in RMC plant using fully automatic batching plant having capacity to produce 30 cum/hr. The plant should have computerized control and shall give print out of all the ingredients.
- 32.6. All required relevant records of RMC shall be made available to the Engineer-in-charge or his authorized representative. Engineer-in-charge shall, as required specify guidelines & additional procedures for quality control & other parameters in respect of materials and production & transportation of concrete mix, which shall be binding on the contractor & the RMC plant.
- 32.7. Grade OPC/ PPC as per schedule of the contract (conforming to relevant IS Codes) of brand / make / source as approved by Engineer-in-charge shall only be used for production of concrete.
- 32.8. The RMC produced concrete be accepted by Engineer-in-Charge at site after receipt of the same after fulfilling all the requirements of mix mentioned in the tender documents. The item of design mix cement concrete shall be inclusive of all the ingredients including admixtures if required, labour, machinery, T&P etc. required for a design mix concrete of required strength and workability. The rate quoted by the agency shall be net & nothing extra shall be payable on account of change in quantities of concrete ingredients like cement and aggregates and admixtures etc. as per the approved mix design.
- 32.9. Ready mix concrete shall be arranged in quality as required at site of work by transportation in a transit mixer. [The general conditions of transit mixer and other requirement shall conform to IS:5892.] Ready mix concrete shall be supplied as per the pre-agreed schedule approved by Engineer-in-charge.
- 32.10. All other operations in concreting work like Mixing, Slump, transportation, laying / placing of concrete, compaction, curing etc. not mentioned in this particular specification for Design Mix Concrete shall be as per IS : 456-2000 or amended thereafter.
- 32.11. For design mix concrete of RCC other than those specified above, the contractor shall use the Design mix concrete produced by a central batching

and mixing plant at his own cost. The contractor, if he so desires, can arrange the design mix concrete also from Ready mix concrete producer after obtaining written approval of the Engineer-in charge. Nothing extra whatsoever shall be payable on this account.

- 32.12.** Ready mix concrete shall be arranged in quantity as required at site of work. The ready-mix concrete shall be supplied as per the pre-agreed schedule approved by Engineer-in charge. Nothing extra shall be payable on this account.
- 32.13.** The item of design mix cement concrete (produced at site as well as arranged from RMC producer) shall be inclusive of all the ingredients including admixtures if required, labour, machinery, transportation etc. (except reinforcement and shuttering which will be measured & paid as per provision of contract) required for a design mix concrete of required strength and workability. The rate quoted by the agency shall be net & nothing extra shall be payable on account of changes in quantities of concrete ingredients like cement and aggregates and admixtures etc. as per approved mix design except for quantity of extra cement payable as per schedule of quantity. Other operations in concreting work like Mixing, Slump, transportation, laying / placing of concrete, compaction, curing etc. not mentioned in this particular specification for Design Mix of Concrete shall be as per IS: 456-2000.

33. Ultrasonic Pulse Velocity Method of Test for RCC

- 33.1.** 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 uniformity 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.
- 33.2.** 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.
- 33.3.** Velocity criterion for Concrete Quality Grading;

Sl. No.	Pulse velocity by Cross Probing (km/sec)	Concrete Quality Grading
1	Above 4.40	Excellent
2	3.75 to 4.40	Good
3	3.0 to 3.75	Doubtful
4	Below 3.0	Poor

(Note: In Case of “doubtful” quality it may be necessary to carry further tests. Poor shall be rejected)

- 33.4. 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:516 (Part-5 Sec-I) 2018. From the above “Good” and “Excellent” grading are acceptable and below these grading the concrete will not be acceptable.
- 33.5. 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.
- 33.6. 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 at the cost of contractor.
- 33.7. The testing charge shall be borne by the contractor.

34. Cover / Spacer Block

- 34.1. 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 cast well in advance with approved proprietary pre-packed free flowing mortars (Conbextra as manufactured by M/s Fosroc Chemicals India Ltd. Or equivalent as approved by the Engineer in charge at his discretion) of high early strength and same colour as surrounding concrete, 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.

III) **SHUTTERING / FORM WORK:**

1. The work shall be done in accordance with CPWD Specifications - 2019- Vol.I& Vol. II with upto date correction slips.
2. Film coated marine plywood shuttering/ 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 required completing the shuttering panels. Dented, broken, cracked, twisted or rusted shuttering plates shall not be allowed to be used on the work.
3. 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 deboning compound shall be applied on the surface of the shutter plates in the requisite quantity before assembly of steel reinforcement.
4. For the execution of centering and shuttering, the contractor shall use propriety "Reebol" chemical mould release agent of FOSROC or equivalent as shuttering oil as approved by Engineer in charge and nothing extra shall be paid on this account.
5. The joint filler shall be resilient closed cell expanded polyethene and non-tainting as manufactured by Supreme Industries Ltd.
6. Providing joint filler of required thickness in position to substrate using either double sided foam adhesive tape or neoprene synthetic rubber adhesive. When forming expansion joint with the Board in in-situ concrete, joint sealing slots can be readily formed in the following matter-
 - a) Before installing, simply cut off a strip of the required depth. Then install the filler flush with the finished surface.
 - b) Prior to sealing, the top strip can then be pulled easily from the joint to provide an uncontaminated sealing slot ready for preparation and sealing.
7. Plywood and steel plates used in the formwork for obtaining exposed surfaces shall be got approved from Engineer-in-Charge on each use. However, no forms will be allowed for reuse if it is doubtful to produce desired texture of exposed concrete.
8. Class of Surface Finish: -
 - 8.1. For Beams & Slabs: The finish shall be uniform, dense and smooth. no grout, no grain pattern, no crazing and no major blemishes shall be permitted. Abrupt irregularities not exceeding 3mm and gradual irregularities less than 5mm in 2m length only shall be permitted.
 - 8.2. For Columns/Wall/Fins: The finish shall be uniform and smooth leveling the surface of the compacted concrete shall be done with a screed board with

power floating the surface and over that steel trowelling the surface under firm pressure characteristics of finish shall be brush marks < 3mm gradual irregularities less than 10mm in 2m.

- 8.3. Tolerance in Finished Concrete: - The formwork shall be so made as to produce a finished concrete true to shape, lines, level, plumb and dimensions as shown in the drawings subject to the following tolerance unless otherwise specified in this specification or drawings.

9. Wall/Column/Fins:

- a) Variation from the plumb $\pm$ 6mm Upto 3m height
- b) Variation from the plumb of $\pm$ 6mm Upto 6m height conspicuous liner
- c) Variation in the size of (+)15mm wall openings (-) 6mm
- d) Variation in parapet wall thickness (a) Upto 30cm thickness $\pm$ 6mm

10. Slab, Beam & Girder Forms:

- 10.1. Variation from the level or from the specified grid for beam soffit before removal of shores,

- a) In any 3m $\pm$ 6mm
- b) In any 6m $\pm$ 10mm

- 10.2. All the tolerances mentioned above shall apply to concrete dimensions only, and not to positioning of vertical steel or dowels. The tolerances given above are specified for local aberration in the finished concrete surface and should not be taken as tolerance for the entire structure taken as whole for the setting and alignment of formwork. Any error, within the above tolerance limits, or any other if noticed in any of the structure after part or portion stripping of forms, shall be corrected in the subsequent work to bring back the structure to its true line, level and alignment.

- 10.3. All items of 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 and 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

11. As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept 12 to 20 mm or as required, lower than general floors shuttering should be adjusted accordingly. The landing level of mumty / Staircase cabin shall be kept one riser level higher than adjoining slab level so as to accommodate water proofing treatment over terrace slab. In case of kitchen slab the portion of floor trap below kitchen platform be kept at lower level as per drawings. Nothing extra is payable on this account.

SPECIAL CONDITIONS FOR STEEL

I) SPECIAL CONDITIONS FOR TMT STEEL/LOW ALLOY STEEL):-

1. The Contractor shall procure ISI marked TMT reinforcement bars of various grades of **Bar Set-II** conforming to the criteria mentioned in OM No. CSQ / SE (TAS) / EE(TAD) / Steel /2021/50-H dated 17.02.2021 & in the OM No. CSQ/SE(TAS)/Steel/2024/262-H dated 14/08/2024 and OM No. CSQ/SE(TAS)/Steel/2024/85-H dated 09/04/2025 issued by CPWD Directorate and this tender document only from Reputed Steel manufacturers as mentioned in *LIST OF PREFERRED MAKES (CIVIL)*.
2. For reinforced cement concrete or pre-stressed concrete works, the reinforcement bars shall consist of the following grades conforming to IS 1786: 2008 (Indian Standard specification for high strength deformed steel bars and wires for concrete reinforcement): Fe 550D or more grade.
3. The contract shall obtain manufacturer's certificate stating the process of manufacturer, 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. The steel reinforcement bars shall be brought to the site in bulk supply of ten tonnes or more as decided by the Engineer-in-charge.
5. The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent 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. All reinforcement bars should be made corrosion resistant by applying suitable coating so as to be fit for use in coastal region. Nothing extra shall be paid on this account.
6. For checking nominal mass, tensile strength, bend test, re-bend test etc. specimen of sufficient length shall be cut from each size of the bar at random at frequency not less than that specified below:

Size of bar	For consignment below 100 tonnes	For consignment above 100 tonnes
Under 10 mm dia bars	One sample for each 25 Tones or part thereof.	One sample for each 40 Tones or part
10mm to 16mm Dia bars	One sample for each 35 tonnes or part thereof.	One sample for each tones or part thereof.
Over 16 mm dia bars	One sample for each 45 tonnes or part thereof.	One sample for each tones or part thereof.

7. The contractor shall supply free of charge the steel required for testing including transportation to testing laboratories. The cost of tests shall be borne by the contractor.
8. The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as 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 leading to under designing of the structural. The work shall be summarily rejected, otherwise recovery at the rate so prescribed shall be made after ensuring structural soundness and stability. In case of excess consumption, no adjustment needs to be made.
9. 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.
10. The contractor shall submit original vouchers from the manufacturer for the total quantity of steel supplied under each consignment to be used 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 recording the site office.
11. Reinforcement including authorized spacer bars and laps 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.
12. 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,
13. Steel Bars and T.M.T. bars in to Standard Weight.
14. 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 taken into account the variation between the

actual and the standard coefficients and the contractors' accounts will be debited by the cost of modified quantity.

- a) If the Derived Weight as in sub-para above is less than the Standard Weight as in Sub-para above then the Derived Actual Weight shall be taken for payment provided, if it is within the following tolerances specified in IS 1786-2008, otherwise whole lot will be rejected.
- b) **Tolerance on Nominal Mass:**

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

* For individual sample plus tolerance is not specified.

**For coils batch tolerance is not specified.

- c) If the Derived Actual Weight is found more than the Standard Weight, the Standard Weight as per in sub-para 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. The standard weight of TMT bars in CPWD specification will be considered for CRS bars standard weight.

II) SPECIAL CONDITION FOR STRUCTURAL STEEL (TEE, ANGLE, CHANNEL, STRUCTURAL TUBES AND PLATES & R.S . JOIST):-

1. The contractor shall procure Structural steel (Tee, Angle, Channel, Structural Tubes and plates & R.S. joist) only from Reputed Steel manufacturers as mentioned in *LIST OF PREFERRED MAKES (CIVIL)*.
2. In case of non-availability of structural steel from primary producers the NIT approving authority may permit use of structural steel procured from steel producers having valid BIS licence confirming to IS -2062-2006.
3. Samples shall be taken and got tested by the Engineer-in-charge confirming to relevant BIS code. In case the test results indicate that the structural steel arranged by the contractor does not conform to the specification, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week's time or written orders from the Engineer-in-charge to do so.
4. The structural steel 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.
5. The contractor shall supply free of charge the structural steel sample required for testing including its transportation to testing laboratories. The cost of test shall be borne by the department if it confirms to relevant BIS code else the testing charges shall be borne by the contractor.
6. 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.
7. If the actual weight of structural steel to be used in the work differs from standard weight, the following procedure shall be followed for arriving at the quantity for payment.
 - a) If the actual weight is more than standard weight only standard weight shall be considered for payment.
 - b) If the actual weight is less than standard weight but within the permissible variation, only actual weight shall be considered for payment.

SPECIAL CONDITIONS FOR OTHER CIVIL WORKS

I) FINISHING

1. The work shall be carried out as per applicable CPWD Specifications.
2. The plastering work shall be carried out as per applicable CPWD Specifications.
3. Necessary Geo-synthetic fibre / GI chicken wire mesh of minimum 200 mm wide shall be provided at junctions of dissimilar materials (i.e. masonry walls with RCC members etc.) before plastering on inner and outside of junctions.
4. Necessary grooves shall be provided at the junction of dissimilar materials (on inner and outer side of junctions) and shall be neatly finished wherever directed by Engineer in Charge. Necessary drip course shall be provided in Chajjas, Balcony, Projecting Roof, Beams etc.
5. Nothing extra shall be payable for the items mentioned at (3) & (4) above.
6. The Primer, Synthetic Enamel paint, distemper, acrylic emulsion paint, etc., of makes as approved by the Engineer in charge and of low VOC, shall only be used and 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 60 days of work or as decided by the Engineer in charge. 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.

II) CONSTRUCTION JOINTS

1. Construction joints in PCC, RCC and Light Weight Concrete works etc., shall be provided only at places as per approved structural drawings. It shall not in any manner structurally or functionally affect the structure. If, any additional construction joint is required to be provided, it shall be done with approval of the Engineer in charge. The centring, shuttering, strutting etc., required for the construction joint in PCC, RCC and Light Weight Concrete works shall be provided as per the CPWD Specifications. Nothing extra shall be payable on this account.
2. **Treatment to the construction joints and rectification of defects:**
 - 2.1. All care shall be taken to minimize the number of construction joints in the basement raft and walls as well as in the levelling course of PCC at base. Still, wherever the construction joints are provided, these shall be slightly opened up and then suitably filled with cement mortar 1:3 (1 cement: 3 fine sand) after applying a bond coat of cement slurry. The aluminium nipples shall be fixed in the cavity and crevices, if required. Then cement slurry of w/c ratio 0.5 shall be pressure grouted through these nipples as required,

which shall then be suitably cut. Nothing extra shall be payable on this account.

- 2.2. All care shall be taken to avoid any honey combed concrete or any cavity. Still, if any honey combed concrete or cavity in RCC wall is encountered the same shall be rectified by removing all loose concrete by chiseling. The chipped concrete surface shall be cleaned and made dust free by blowing compressed air and then washed clean with water (but without excess water). Then a bond coat of polymer modified cement slurry @ 2.2 kg of cement per sqm of concrete surface, in two coats, shall be applied as specified. The second coat shall be applied immediately within 15-20 minutes of application of the first coat. A coat of polymer modified cement plaster of mix 1:3 (1 cement: 3 fine sand) of the required thickness shall be applied as specified to fill the cavity if the required thickness is less than 20 mm. If the required thickness is more than 20 mm. the cavity shall be filled by concrete of relevant grade after providing the required centering and shuttering. The surface shall then be moist cured for minimum 7 days. Nothing extra shall be payable on this account.

III) EXPANSION JOINT

1. General Seismic / separation joints shall be provided where shown on the drawings. They shall be constructed with in gap between the adjoining parts for the works of the width specified in the drawings.
2. The contractor shall ensure that no debris is allowed to enter and be lodged in seismic and separation joints.
3. Seismic or separation joints shall be provided with approved 50mm thickness of compressible filler board, backer rod and polysulphide sealant compound etc.,
4. Board to be used in expansion joint shall be of best approved quality and shall be got approved before use. It shall have minimum density of 95 kg/cum, Non staining with less than 1% water absorption and compression recovery of 93% minimum as per the specifications.

5. Method of Application:

- 5.1. expansion board having sufficient width and thickness directed by Engineer in charge shall be provided in expansion joint before filling and finishing the expansion joint with sealant.
- 5.2. The expansion joint shall be cleaned and made dry completely. All loose materials shall also be removed. The joints gap shall be made uniform in width and depth after cleaning the joints. The backup materials of best quality shall be provided in position in order to produce the size of joint i.e. width and depth. The primer part of I and II shall be mixed thoroughly together in required proportion as prescribed by manufacture specification, so that a uniform mixture obtained. The mixed solution shall

be applied to two sides of the joint that it covers the sides complete.

- 5.3. Disturbed edges of RCC members near expansion joints shall be finished with rich mortar without any extra work includes providing required width of expansion board in the joints and measurement of expansion board only shall be taken.

6. **Sampling criteria:**

- 6.1. Following test carried out at every 100 sqm:

- a) Density
- b) Water absorption
- c) Compression recovery

SPECIAL CONDITIONS FOR WATERPROOFING WORKS

1. The work shall be got executed as per CPWD Specifications and as per the manufacturer's specification through specialized agency as approved by the Engineer in charge.
2. The contractor shall furnish the following particulars immediately after the issue of letter of acceptance by the department.
 - a) The name of the specialized firm
 - b) The trade names of the product, which would be used
 - c) List of works where the treatment has been used
 - d) Quantity of chlorides and sulphides used in the product
3. The main contractor shall submit the credential of specialized agency well in advance as per the direction of Engineer in charge. After verification of the same, written approval will be conveyed to main contractor in this regard. The quantum of credentials will be broadly in line with CPWD guidelines. The main contractor shall not change the specialized agency. However, if the change is warranted, he may do so, with permission of Engineer in charge. However, before making any such change, he has to enter into similar agreement as with previous agency & submit the same to Engineer in charge for approval. This shall however be without any change in the accepted rates of the contract agreement and without any cost implications to the Department.
4. It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main contractor shall be solely responsible for settling any dispute / litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation / dispute between him and the specialized agencies / sub- contractor(s). No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim what so ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection / rejection of the Specialized Agencies or any dispute amongst them.
5. 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.
6. Specialized labour shall prepare a mock up sample to demonstrate to engineer-in- charge the success of water proofing treatment.
7. The finished surface after water proofing treatment shall have adequate smooth slope as per the direction of the Engineer-in-charge.
8. 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 eased and rounded off properly for easy flow of water.

9. The contractor shall get water proofing work done checked by engineer-in-charge or his authorized representative by flooding of water for sufficient duration as directed by Engineer- in-charge. However, this approval shall not exempt the contractor from responsibility for success of water proofing treatment done by him.
10. Guarantee for water proofing treatment
 - 10.1. The contractor shall be fully responsible for and shall guarantee proper performance of the entire water proofing system for a period of 10(Ten) years from the final completion of works. In addition, specific 10 years written guarantee (to be furnished in an on-judicial stamp paper of value not less than Rs.200/-) in approved proforma (***GUARANTEE TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION OF WORK IN RESPECT OF WATER PROOFING WORKS (APPENDIX-B2)***) shall be submitted for the performance of the system, before final payment and shall not in any way limit any other rights the Employer may have under the contract. Guarantee for water proofing shall comprises of all the items described above in particular specification.
 - 10.2. All water-proofing work shall be carried out through approved specialist agency as per method of working approved by the Engineer in charge. However, the contractor shall be solely responsible for waterproofing treatment until the expiry of the above guarantee period.
 - 10.3. Ten years guarantee in prescribed proforma attached (***GUARANTEE TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION OF WORK IN RESPECT OF WATER PROOFING WORKS (APPENDIX-B2)***) shall be given by the contractor for the waterproofing treatment. Towards that **10% (ten percent) of the cost of these items of water proofing under this sub head worked out on quoted rate** shall be retained as guarantee to watch the performance of the work executed. However, half of this amount (withheld) would be released after five years from the date of completion of the work, if the performance of the water proofing works is satisfactory. The remaining withheld amount shall be released after completion of ten years from the date of completion of work, if the performance of the waterproofing work is satisfactory. If any defect is noticed during the guarantee period, it should be rectified by the contractor within seven days of issuing of notice by the Engineer in charge and, if not attended to, the same shall be got done through other agency at the risk and cost of the contractor and recovery shall be effected from the amount retained towards guarantee. In any case, the contractor and the specialist agency, during the guarantee period, shall inspect and examine the treatment once in every year and make good any defect observed and confirm the same in writing. The security deposit can be released in full, if bank guarantee of equivalent amount, valid for the duration of guarantee period, is produced and deposited with the department.
 - 10.4. The security deposit against this item of work shall be in addition to the security deposit mentioned elsewhere in contract form.

APPENDICES OF FORMS FOR (PART-B)

PROFORMA FOR MANDATORY TESTS TO BE ATTACHED WITH RUNNING BILLS (APPENDIX-B1)

Name of the work: Name of Contractor.....
 Agreement no. and date R/A Bill No.....

	Sl. No.	
	Item	
	Quantities as per agreement	
	Frequency as per specification	
	No. of tests required	
	Upto date Quantity	
	No. of tests required	
	No. of tests actually done	
	Remarks	

**GUARANTEE TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS
AFTER COMPLETION OF WORK IN RESPECT OF WATER PROOFING WORKS
(APPENDIX-B2)**

This agreement made this.....day oftwo thousand.....and between (Name of the contractor), (herein after call Guarantor of the one part) and the PRESIDENT OF INDIA (here in after called the Government of the other part).

WHEREAS this agreement is supplementary to a contract (herein after called the Contract) dated.....and made between the GUARANTOR of the one part and the GOVERNMENT of the other part where by the Contractor inter alia, undertook to render the buildings 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 structures will remain water/leak proof for ten years from the date of completion of work.

NOW THE GUARANTOR here by guarantees that waterproofing treatment given by him will render the structures completely leak proof and the minimum life of such waterproofing treatment shall be ten years to be reckoned from the date completion of work.

Provided that the Guarantor will not be responsible for leakage caused by earth quakes or structural defects or misuse of roof or alterations and for such purpose.

Misuse of roof shall mean by operation, which will damage roofing treatment, like chopping of fire wood and things of the same nature, which might cause damage to thereof.

Alteration shall mean construction of an additional storey or a part of roof or construction adjoining to existing roof, where by roofing treatment is removed in parts.

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

During this period of guarantee, the Guarantor shall make good all defects and incase of any defects being found, render the building water proof at his own cost, to the satisfaction of the Engineer in charge 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 Department through 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 GUARANTOR fails to execute the necessary rectification or commits breach there under then the Guarantor will indemnify the principal and his successors against all loss, damage, cost expense or otherwise which may be incurred by him by reasons of any default on the part of 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 the parties.

IN WITNESS WHERE OF these presents has been executed by the Obligatorand..... by.....and for and on behalf of the PRESIDENT OF INDIA on the day month and year first above written.

Signed, sealed and delivered by (OBLIGOR) in the presence of:

1.

2.

Signed for and on behalf of THE PRESIDENT OF INDIA BY _____ in the presence of:

1.

2.

(Guarantee to be signed and delivered on a Non-Judicial stamp paper worth not less than Rs.200/-)

LIST OF PREFERRED MAKES (CIVIL)

1. The contractor shall obtain prior written approval of the specific make, model, grade and source before procurement. Listing of a make does not constitute blanket approval of every product manufactured or marketed under that make.
2. All materials shall comply with the Schedule of Quantities, drawings, applicable CPWD Specifications, relevant BIS standards, statutory requirements and specified performance criteria. The more stringent express requirement of the contract shall govern.
3. The contractor shall submit the manufacturer's technical data, BIS licence/marketing where applicable, test certificates, warranty, samples, shade/finish details, country of origin and authorised-dealer/OEM documents required for approval.
4. In general, all materials to be used in the work shall bear the BIS Standard Mark wherever applicable. Where BIS certification is not available for a particular material or product, such material or product may be used only if it conforms to the applicable CPWD Specifications and relevant BIS Standards. Prior written approval of the Engineer-in-Charge shall be obtained before its use in the work.
 - 4.1. Where no applicable BIS Standard is available, the Engineer-in-Charge may require the material or product to be tested in accordance with the relevant ASTM, EN, IEC, BS or other internationally recognised standards. Such material or product shall be permitted for use only after the Engineer-in-Charge is satisfied with the test results and its suitability for the intended application.
 - 4.2. All costs and charges associated with sampling, transportation, testing, retesting, and submission of test reports shall be borne by the contractor, and nothing extra shall be payable on this account.
5. For proprietary systems, the complete system, including primers, adhesives, accessories, seals, fasteners, hardware and application procedure, shall be from the same OEM or shall be certified by the principal OEM as compatible. Fire-rated and performance-tested assemblies shall be supplied as complete tested systems.
6. An alternative make may be considered only where the listed makes are unavailable in adequate competition.
 - 6.1. The alternative make shall be equal or superior in specified performance and shall require prior approval of the competent authority.
 - 6.2. Where the prevailing market rate of the substituted make is lower than that of the specified make, the corresponding difference in cost shall be recovered from the contractor. No additional payment or cost adjustment shall be admissible where the substituted brand is costlier than the specified brand.

7. No material shall be ordered or incorporated merely on the basis of brand name. The contractor remains responsible for conformity, durability, suitability and performance notwithstanding approval of the make or sample.
8. Procurement shall comply with the Public Procurement (Preference to Make in India) Order, restrictions relating to bidders/manufacturers from countries sharing a land border with India, and other Government instructions applicable on the last date of submission of the tender.

I) CEMENT, CONCRETE, MASONRY AND STEEL

S.N.	Material / Product	Approved Makes / Requirement
1	Anti-termite treatment chemical	Dursban TC; Premise; Pyramid; Noban; Hilban; Sarup's Pest Control
2	OPC/PPC cement of specified type and grade	ACC; UltraTech; Coromandel; Birla; Chettinad; Bharathi; Dalmia; Zuari; JSW Cement; Jaypee Cement; Maha Cement; JK Cement; Ambuja Cement; Penna Cement; Konark Cement; Century Cement/Birla Gold; Shree Cement; Ramco Cement; Sagar Cement; Emami Cement
3	White cement	Birla White; JK White
4	TMT reinforcement bars	SAIL; Tata Steel; RINL/Vizag Steel; JSW Steel; Jindal Steel & Power - subject to the latest applicable CPWD Bar Set-II instructions
5	Structural steel sections and plates	SAIL; Tata Steel; RINL/Vizag Steel; JSW Steel
6	MS/ERW structural pipes and tubes	SAIL; Tata Steel; METPRO; R.K. Steel; APL Apollo; Kalinga; Jindal Pipes/Jindal (India); Nezone
7	Stainless-steel sheets, pipes, tubes and sections	Jindal Stainless; SAIL; Kingston; Connect
8	Ready-mixed concrete	UltraTech Concrete; ACC; RMC India; Lafarge; Bharat Ready Mix; Yagappa Ready Mix
9	AAC blocks	UltraTech Xtralite; HIL Aerocon; Siporex; Nucon; Renacon
10	AAC block adhesive / factory-made dry mortar	UltraTech; Ardex Endura; Ferrous Crete; Asian Paints SmartCare; Berger Tile Adhesive
11	Concrete plasticiser / superplasticiser	MC-Bauchemie (Contrament/Powerflow); Sunanda; Sika; Fosroc; Chryso; MYK Schomburg; BASF; CICO; Asian Paints SmartCare; KCPL

S.N.	Material / Product	Approved Makes / Requirement
12	Non-shrink cementitious grout	Fosroc GP2; Mapei Mapefill GP IN; Sika; BASF; Ardex Endura; MYK Schomburg; Ferrous Crete; Asian Paints SmartCare; KCPL; Pidilite Dr. Fixit; Saint-Gobain Weber
13	Epoxy grout / resin grout	Ardex Endura; MYK Laticrete (Latapoxy); Kerakoll (Fugabella/Porcelana); Mapei (Kerapoxy); Pidilite Dr. Fixit
14	Polymer repair mortar / micro-concrete	Mapei; Pidilite Dr. Fixit; Ferrous Crete; Fosroc; CICO; Sika; BASF; MYK Schomburg; Asian Paints SmartCare; Sunanda; KCPL
15	Chemical anchoring system	Hilti; Fischer; Wurth; Bosch; Nutech; Helfen; Anchor; Kundan; Cannon; Trixel
16	Mechanical reinforcement couplers	Dextra; Sanfield
17	Post-tensioning system, where specified	CRUX; VSL; Ultracon; BBR
18	Prestressing strands, where specified	DP Wires; Tata Wiron; Usha Martin
19	Bitumen-impregnated expansion-joint filler board	Supreme (Dura Board HD100/Durafill); STP (Shalitex)
20	PVC/rubber/hydrophilic waterstops	Hydrotite; Hydrowell; BASF; Pidilite Dr. Fixit; Ardex Endura; Ferrous Crete; Asian Paints SmartCare

II) WATERPROOFING, CONSTRUCTION CHEMICALS AND SEALANTS

S.N.	Material / Product	Approved Makes / Requirement
1	Integral waterproofing compound	Fosroc; Sika; Pidilite Dr. Fixit; CICO; Impermo; Accoproof; Ardex Endura; Alchemica; Ferrous Crete; MYK Schomburg; Penetron; Asian Paints SmartCare; Berger Cementmix; STP Shalplast LW+; Mapei Mapecure; KCPL
2	Cementitious waterproofing system	BASF; MC-Bauchemie; Sika; Sunanda; Perma; Fosroc; Pidilite Dr. Fixit; Ferrous Crete; Asian Paints SmartCare; Berger Latexshield/Tankshield; KCPL; Ardex Endura; Mapei

S.N.	Material / Product	Approved Makes / Requirement
3	Liquid-applied acrylic / polyurethane waterproofing membrane	BASF; STP; Texsa; W.R. Grace; Pidilite Dr. Fixit; Alchemica; Hydrotech; Ferrous Crete; MYK Schomburg; Asian Paints SmartCare; Ardex Endura; Mapei; Sunanda; KCPL; Berger; Sika; Fosroc
4	APP/SBS modified bituminous membrane	STP; Ferrous Crete; Bitumat; Pidilite; Ardex Endura; Hydrotech; Asian Paints SmartCare; Berger Proshield; IWL
5	Crystalline waterproofing system	Penetron
6	PU/epoxy injection grout for cracks and joints	Fosroc; STP (Shalibond); CICO Poxy; Ardex Endura; Ferrous Crete; Asian Paints; Huntsman; Pidilite
7	Polysulphide / polyurethane joint sealant	Pidilite Dr. Fixit; BASF; Fosroc; Techseal/Choksey; Tuffseal/Bondit; Ferrous Crete; MYK Schomburg; STP; Asian Paints SmartCare
8	Weather / structural silicone sealant	Dow Corning (DOWSIL); Wacker; GE/Momentive; Fosroc; BASF; STP; Asian Paints SmartCare
9	Polyethylene backer rod	Supreme
10	Tile/stone adhesive and joint grout	Dunlop; Vam Organic; Sika; Pidilite/Fevicol; Fosroc; CICO; Mapei; Asian Paints SmartCare; Ardex Endura; MYK Laticrete; Kerakoll; Saint-Gobain Weber; Ferrous Crete; BASF; MYK Schomburg; KCPL

III) WOODWORK, DOORS, WINDOWS AND ARCHITECTURAL HARDWARE

S.N.	Material / Product	Approved Makes / Requirement
1	BWP/BWR plywood and blockboard	Jayna Ply; Greenpanel; Archidply; Kitply; Duro; CenturyPly; Wuudply
2	Factory-made flush doors	Jayna Ply; Raavela; Kailash; Shakti; Greenlam; Mayur; MP Wood Products; Archidply; DEC; Greenpanel; Jain Doors; Indian Timber Products; Kitply; Duro; Kenwood; Century
3	MDF/HDF/HDHMR/particle board	Novopan; Merino; Kitlam/Kitply; Ecoboard; Associate Decor; Archidply; Action TESA; Century MDF; Greenlam; Greenpanel; Pergo; Armstrong; Greenply

S.N.	Material / Product	Approved Makes / Requirement
4	Decorative laminates	Greenlam; Century; Merino; Royale Touche; Kitmica; Formica; Decolam; Archidply; Sonear; Sunmica; Vidya Ply
5	Natural decorative veneers	Greenpanel; Century
6	FRP door shutters and frames	Jain Doors; Signum; Meena Fibre Glass; Duroplast; Cactus; Polyline
7	Fire-rated steel doorsets	Shakti Hormann; Promat; Godrej; Signum Fire; MPP Schoders; Navair; Sukri; Kenwood
8	Fire-rated timber/composite doorsets	Navair; Promat; Godrej; Kenwood
9	uPVC door and window systems	Fenesta; Qute; LG Hausys; Kommerling; Duroplast; Polyline; Aparna Venster; AMD; Rajshri; NCL VEKA; Prominace; Marcolini; Akshara Polymers; Encraft; REHAU; Aluplast; Shirke
10	System aluminium doors and windows	Hindalco; Jindal Aluminium; Bhoruka; Indal; Padmavathi Extrusion; Hydro; Omalco; Define; Schuco; Kawneer; Hardima; Everite; Sigma; Jyothi
11	General architectural door and window hardware	Dorma/dormakaba; Kich; Hafele; Ozone; GEZE; Dorset
12	Hydraulic door closers and floor springs	Dorma/dormakaba; Kich; Dorset; Hafele
13	Locks, latches and cylinders	Dorset; Kich; Dorma/dormakaba; Hafele
14	Panic exit devices / fire-door hardware	Dorma/dormakaba; Ingersoll Rand; GEZE; Dorset; D.P. Garg; Backers FS
15	Stainless-steel fasteners and screws	Kundan; Pooja; Atul; Alloy; GKW; Nettlefold

IV) FLOORING, CEILINGS, ROOFING AND INSULATION

S.N.	Material / Product	Approved Makes / Requirement
1	Ceramic, glazed and vitrified tiles	Asian Granito (AGL); NITCO; RAK; Restile; Kajaria; Somany; H&R Johnson; Orientbell; Varmora; Oasis; Naveen/Murudeshwar; Anuj/Aravind Ceramic; Asttra; Vitero/Aparna
2	Cement concrete / terrazzo tiles	NITCO; Poddar; Eurocon; Dazzle; Ultra; Anuj; Asttra; NTC; Hindustan Tiles

S.N.	Material / Product	Approved Makes / Requirement
3	Interlocking concrete pavers / kerbs / tactile tiles	Dazzle; Ultra; Shree Bharat; Hindustan Tiles; Vyara; Basant Betons; Asttra; NITCO (Rockard); Bharat (Nilsan); Regency
4	Homogeneous PVC / vinyl flooring	LG Hausys; Gerflor; Armstrong
5	Linoleum / rubber flooring	Armstrong; Forbo; Gerflor
6	Engineered wood / laminate flooring	Armstrong; Werner; Pergo; Mikasa; New Wood
7	Carpet tiles, where specified	TOLI; Hollitex; Standard Carpets
8	Raised access flooring	Hewetson; Unifloor; Unitile; Kebao; Access Floor System; Pinnacle
9	Indoor/outdoor sports flooring, where specified	Armstrong; LG Hausys; Wonderfloor/RMG Polyvinyl; Forbo; Gerflor
10	Gypsum plasterboards and drywall systems	Saint-Gobain Gyproc; Lafarge; USG Boral; Armstrong
11	Fibre-cement / calcium-silicate boards	HIL (Aerocon/Charminar Fortune)
12	Mineral-fibre / glass-wool acoustic ceiling tiles	Aerolite; Anutone; Armstrong; Ramco; Knauf; Himalayan Acoustics; Saint-Gobain Gyproc; Grid Square; USG Boral; Hunter Douglas
13	Metal ceiling systems	Armstrong; Hunter Douglas; Grid Square; Aerolite; Anutone
14	GI ceiling/partition suspension and framing system	Armstrong; Gypframe/British Gypsum; Knauf; Saint-Gobain Gyproc; Aerolite; Grid Square; Hunter Douglas
15	Rock-wool / glass-wool insulation	ROCKWOOL India; U.P. Twiga; Lloyd Insulation; Saint-Gobain Gyproc; Himalayan Acoustics; Knauf; Anutone
16	Closed-cell elastomeric/nitrile insulation	Armacell; K-Flex; Aeroflex; Supreme
17	PUF/PIR insulated sandwich panels	Lloyd Insulation; Jindal Mectec
18	Multiwall/polycarbonate roofing and cladding	Danpalon; Alcox; Polygal; MG Polyplast; GE Lexan
19	Pre-painted GI/GL roofing and cladding sheets	Lloyd Metal Craft; Tata BlueScope; Bhushan Steel; JSW; Essar

V) PAINTS AND PROTECTIVE COATINGS

S.N.	Material / Product	Approved Makes / Requirement
1	Interior/exterior decorative paints, primers, enamels and wood finishes	Asian Paints; Dulux/AkzoNobel; Kansai Nerolac; Berger; Nippon; Surfa Coats; Snowcem; Shalimar
2	Cement-based wall putty	JK Wall Putty; Birla White; Asian Paints; NCL Altek; HIL; Berger; Ardex Endura; Ferrous Crete
3	Textured / elastomeric exterior coating	Asian Paints; Spectrum; Heritage; Kansai Nerolac; Berger; Nippon; Surfa Coats; Snowcem; SKK; AkzoNobel
4	Epoxy / polyurethane protective coating for steel and concrete	Asian Paints; Berger; Shalimar; STP; Ardex Endura; Mapei; Kansai Nerolac; Sunanda; BASF; Fosroc; MYK Laticrete; Ferrous Crete; SKK; AkzoNobel; MRF
5	Intumescent / fire-retardant coating, where specified	Jotun; Hilti; AkzoNobel; Asian Paints; STP
6	Industrial resinous floor coating	BASF; Fosroc; MYK Laticrete; Ardex Endura; Mapei; Asian Paints; Ferrous Crete; Sunanda

VI) SANITARY, WATER SUPPLY AND DRAINAGE

S.N.	Material / Product	Approved Makes / Requirement
1	Vitreous-china sanitary ware	Roca; Kohler; Jaquar
2	CP brass faucets and bathroom fittings	Roca; Kohler; Jaquar
3	Concealed cisterns / flush valves / carriers	Roca; Kohler; Jaquar
4	Stainless-steel kitchen sinks	Johnson; Diamond; Jindal; Kingston; Nirali; Hindware; Silver Shine; Prayag; Navkar; Futura; Cera; Neelkanth; Jayna; Franke
5	uPVC/SWR soil, waste and rainwater pipes and fittings	Supreme; Astral; Finolex; Ajay; Vectus; Prince; Prayag; Sentini; HIL; Ashirvad; Truflo
6	CPVC hot and cold water pipes and fittings	Supreme; Finolex; Astral; Prince; Ajay; Prayag; Vectus; Truflo; Anil; HIL; Ashirvad; Sentini
7	PPR/PPR-C pipes and fittings	Supreme; Astral; Ashirvad; Prince; APL Apollo

S.N.	Material / Product	Approved Makes / Requirement
8	HDPE pipes and fittings	Finolex; Astral; Prince; HIL; Ashirvad; DEC
9	GI pipes	Tata; Zenith; Jindal Pipes; R.K. Steel; Hissar; APL Apollo
10	DI pressure pipes and fittings	Electrosteel; Jindal SAW; Kesoram; Lanco
11	Bronze/gunmetal water-supply valves	Zoloto; Leader; Sant; Audco
12	CI/DI sluice, butterfly and non-return valves	Kirloskar; RBM/AFS; Kartar; IVS; Zoloto; Leader; Burn; Fluidtech
13	Rotational-moulded water-storage tanks	Sintex; Vectus; Supreme
14	Stainless-steel floor drains / linear drainage channels	ACO; Viega; Jaquar; Zurn; Hindware
15	SFRC/ductile-iron/composite manhole covers and gratings	Neco; BIC; DEC; HEPCO; KK; Advent; Nu-TEC; Kutty; Jagannath; Kapilansh; SKF/Singhal
16	RCC pipes	Indian Hume Pipe; Jain & Co.; Lakshmi Sood & Sood ; Vikas spun pipe works
17	Plastic Encapsulated Foot Rest	KK Manhole and gratings Co Pvt Ltd., KGM Exports, Accurate Buildcon compnay.

VII) ALUMINIUM, GLAZING AND FAÇADE

S.N.	Material / Product	Approved Makes / Requirement
1	Aluminium extrusions	Hindalco; Jindal Aluminium; Bhoruka; Indal; Padmavathi Extrusion; Hydro; Omalco
2	Float, toughened, laminated and insulated glass	Saint-Gobain; Asahi; Pilkington; Modiguard/Guardian; FUSO; Gurind; Impact Safety; Glaverbel
3	Fire-rated glass and framing system	Contraflam/Pyroswiss by Saint-Gobain; PYRAN by SCHOTT; Pilkington; Promat
4	Aluminium composite panels	Alucobond; Eurobond; Aludecor; Reynobond; Alpolic; Alstrong; Hynadecor; Alstone
5	Spider/patch fittings and glass-door hardware	Dorma/dormakaba; Sevox; Kich; Ozone; Hafele
6	EPDM/TPE glazing gaskets	Anand; Roop; Bohra; Hanu; Amee Rubber; Sree Gaurav
7	Masking/protection tapes for aluminium and glass	3M; Sun; Wonder Polymer; Roop

S.N.	Material / Product	Approved Makes / Requirement
8	Float Glass, Reflective Glass, Tinted Glass and Mirror Frosted Lacquered Glass	Gold Plus - GOLD PLUS GLASS INDUSTRY LIMITED

VIII) EXTERNAL WORKS AND OPTIONAL SPECIALISED ITEMS

S.N.	Material / Product	Approved Makes / Requirement
1	Thermoplastic / cold-plastic road-marking material	Geveko; SWARCO; Asian Paints PPG; Berger; 3M
2	Reflective road studs / delineators	3M; Avery Dennison; Nikkalite
3	Geotextiles / geogrids / geocomposites	TechFab India; Garware Technical Fibres; Strata Geosystems; Maccaferri
4	Grass pavers / drainage cells	Unistone; Ultra
5	GRC/precast architectural elements	Terrafirma; Ecovision; Mahesh GRC
6	WPC door frames, shutters and boards	Alstone; Ecoste; Echon; Rajasree; Qute; Prominace; Magma (SMP Impex)

PART-C (E&M)

PROFORMA OF SCHEDULES FOR MINOR COMPONENT (E&M)

(Separate Performa for Civil, Elect. & ~~Hort.~~ Works in case of Composite Tenders)

SCHEDULE 'A'

Schedule of quantities (as per PWD-3): **PART-D,**

SCHEDULE 'D'

Extra schedule for specific requirements/ document for the work, if any: **PART-A, PART-C (E&M).**

SCHEDULE 'E'

Reference to General Conditions of contract: **As per Part A**

Name of Work: **Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.**

Estimated cost of work: **As per Part A**

(i) Earnest money deposit: **As per Part A**

(ii) Performance Guarantee: **As per Part A**

(iii) Security Deposit: **As per Part A**

SCHEDULE 'F'**GENERAL RULES & DIRECTIONS:**

Officer inviting tender: **As per Part A**

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**

Definitions:

- 2(v) Engineer-in-Charge: Executive Engineer (E&M) (Trichy), CPWD, Trichy - 620 015 or his successor thereof.
- 2(viii) Accepting Authority: Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.
- 2(x) Percentage on cost of materials and Labour to cover all 15% overheads and profits:
- 2(xi) Standard Schedule of Rates: a) DSR-2023 as modified and corrected upto the previous day of last date of submission of tender multiplied by a correction factor of 0.973 enhanced by Cost Index.
b) DSR (E&M) 2025 as modified and corrected upto the previous day of last date of submission of tender enhanced by Cost Index.
- 2(xii) Department: CPWD
- 9(ii) Standard CPWD Contract Form: As per Part A

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 or proof of applying there of from the date of issue of letter of acceptance As per Part A
- (ii) Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount As per Part A beyond the period provided in (i) above

Clause 2

Authority for fixing Superintending Engineer (Trichy), CPWD, NIT

compensation under clause 2: **Campus, Trichy - 620 015 or his successor thereof.**

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start Mile stone(s) as **As per Part A** per table given below:-

Sl.No	Description of Milestone (Physical)	Time allowed in days (from date of start)	Amount to be withheld in case of non achievement of mile stone
As per Part - A			

Time allowed for execution of work: **06 (Six) months**

- (i) Authority to convey decision of shifting of milestone and extension of time: **As per Part A**
- (ii) Authority to decide rescheduling of milestone and extension of time: **As per Part A**
- (iii) Shifting of date of start in case of delay in handing over of site: **As per Part A**

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	As per Part A	As per Part A
Part B	Portions with encumbrances	As per Part A	As per Part A
Part C	Portions dependent on work of other agencies	As per Part A	As per Part A

Clause 5.1(iv)

- (i) Time and progress chart and **As per Part A**

progress report – Mutually agreed
Software:

- (ii) Rate of recovery for non- As per Part A
submission of monthly Time and
Progress Chart and progress
report:

Clause 5.2

Nature of Hindrance Register: As per Part A

Clause 5.4

- (i) The form of application by the As per Part A
contractor for seeking rescheduling
of milestones or seeking extension
of time:
- (ii) Rate of recovery for delay in As per Part A
submission of revised programme:

Clause 6

Computerised Measure Book (CMB) / Electronic Measurement Book (EMB)

Mode of measurement: Electronic Measurement Book (EMB)

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 Rs. 3,80,000/-
interim payment:

Clause 7A

Whether clause 7A shall be Yes
applicable

Clause 8

Competent Authorities to Executive Engineer (E&M) (Trichy), CPWD,

inspect and issue part/ final
completion certificate

Trichy - 620 015 or his successor thereof.

Clause 8A

Compensation for non
submission of completion
plans:

Rs. 50,000/-

Authority to decide
compensation for non
submission of completion
plans:

Superintending Engineer (Trichy), CPWD, NIT
Campus, Trichy - 620 015 or his successor
thereof.

Clause 10A

List of testing equipment to be
provided by the contractor at
site lab.

As per LIST OF FIELD TESTING EQUIPMENT (E&M)

Clause 10B (ii & iii)

Whether Clause 10 B (ii) shall be applicable:

As per Part A

Clause 10C

Whether Clause 10C shall be
applicable:

Applicable for construction works alone.

Not applicable for Operation & Maintenance
during and after defect liability period.

Component of labour expressed
as percent of value of work:

20 %

Clause 10CC

As per Part A

Clause 11

Building information model (BIM) is applicable
and BIM professional to be deployed by
contractor

As per Part A

Specifications to be followed for the execution of work:

Specifications specified in contract documents for both civil & electrical works: Detailed Specifications, Particular Specifications, Technical Specifications etc. included in this Bid document under PART-C (E&M) and PART-A.

CPWD specifications for Electrical works: As per following specifications as modified & corrected up to date.
 1. CPWD General Specifications for Electrical Works Part-I Internal – 2023.
 2. CPWD General Specifications for Electrical Works Part-II External – 2023.

Other specifications: All relevant BIS codes of practice, National Building Construction Standards 2026 (NBCS 2026), Energy Conservation sustainable Building Code (ECSBC), National Electrical Code (NEC), Structural & Non-structural elements for Fire safety, Harmonized Guidelines and Standards for Universal Accessibility in India, The Indian Electricity Act, Central Electricity Authority rules, Local Bodies Norms, Statutory bodies Norms and other relevant Codes, Guidelines, Regulations, Recommendations, Norms, Specifications etc.

Note: Latest version and all volumes of all above Codes, Guidelines, Regulations, Recommendations, Norms, specifications etc. shall be applicable along with all amendments issued upto the previous day of the last date of submission / uploading of Bid.

Clause 12

12.2. & 12.3 Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for items of work No limit%

Clause 16

Competent Authority for deciding reduced rates: Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.

Clause 18

List of mandatory machinery, tools & plants to be deployed by the contractor at site:- **As per LIST OF MANDATORY MACHINERY, TOOLS & PLANTS TO BE DEPLOYED BY THE CONTRACTOR AT SITE (E&M)**

Clause 19C/ 19D/ 19G/ 19K

Authority to decide penalty for each default: **Executive Engineer (E&M) (Trichy), CPWD, Trichy - 620 015 or his successor thereof.**

Clause 19J

Authority to decide levy for delay: **Superintending Engineer (Trichy), CPWD, NIT Campus, Trichy - 620 015 or his successor thereof.**

Clause 25

Conciliator: **As per Part A**

Arbitrator Appointing Authority: **As per Part A**

Place of Arbitration **As per Part A**

Clause 32

Requirement of Technical Representative(s) and recovery rate:

Sl. No.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical/ Technical Representative)	Minimum Experience (Years)	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 32 (i)
As per Part A						

Clause 38

(I)(a) Schedule/statement for **On the basis of Delhi Schedule of Rates 2023 printed by C.P.W.D.**

determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates printed by C.P.W.D.

- (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) Bitumen All Works **2.5% plus only & nil on minus side.**
- (c) Steel Reinforcement and structural steel sections for each diameter, section and category **2% plus/minus**
- (d) All other materials. **Nil**

Executive Engineer (E&M) (Trichy)
CPWD, NIT Campus, Trichy - 620 015

LIST OF FIELD TESTING EQUIPMENT (E&M)

1. Equipment for conducting necessary tests as per applicable specifications shall be provided and installed at site in the well-furnished site laboratory by the contractor at his own cost. The following laboratory equipments should be in general or as and when required be set up at site laboratory.
2. The list is only indicative and not exhaustive. The Bidder may be required to deploy more equipment as per requirement of work as decided by the Engineer in charge. Nothing extra shall be payable on this account.
3. In case any equipment is not required in the work as per decision of Engineer in charge, the same shall be considered as deleted from list.
4. The decision of Engineer in charge shall be final and binding regarding deployment of testing equipment and all matters pertaining to it.
5. Measuring and testing instruments common to more than one E&M discipline need not be separately deployed for each discipline, provided adequate numbers are continuously available at site to meet the work programme and simultaneous testing requirements. All instruments shall be maintained in safe and serviceable condition throughout the period of their requirement at site.
6. All measuring and testing instruments shall be of suitable range, accuracy and rating for the intended tests. Instruments requiring calibration shall have valid calibration certificates traceable to NABL-accredited laboratories or other approved calibration facilities and shall be maintained at site in serviceable condition for the duration required for testing and commissioning.

Table 2: List of field testing equipment for GENERAL ELECTRICAL WORKS

S.N.	EQUIPMENT / DEVICE	NUMBER TO BE DEPLOYED
1	Digital Insulation Resistance Tester, 250/500/1000 V	1 No.
2	Digital Earth Resistance Tester complete with test leads, auxiliary electrodes and accessories	1 No.
3	True RMS Digital Multimeter	2 Nos.
4	Digital Clamp Meter suitable for AC/DC current measurement	2 Nos.
5	Earth Leakage Clamp Meter with mA resolution	1 No.
6	Phase Sequence Indicator	1 No.
7	RCD/RCBO Tester for measurement of trip current and	1 No.

S.N.	EQUIPMENT / DEVICE	NUMBER TO BE DEPLOYED
	operating time	
8	Loop Impedance and Prospective Short-Circuit Current Tester	1 No.
9	Low-Resistance Continuity Tester suitable for testing protective and bonding conductors	1 No.
10	Digital Lux Meter	1 No.
11	Infrared Thermometer	1 No.
12	Digital Tachometer	1 No.
13	Digital Anemometer	1 No.
14	Digital Thermo-Hygrometer	1 No.
15	Digital Sound Level Meter	1 No.

**LIST OF MANDATORY MACHINERY, TOOLS & PLANTS TO BE DEPLOYED BY THE
CONTRACTOR AT SITE (E&M)**

1. The list is only indicative and not exhaustive. The Bidder may be required to deploy more equipment as per requirement of work as decided by the Engineer in charge. Nothing extra shall be payable on this account.
2. In case any equipment is not required in the work as per decision of Engineer in charge, the same shall be considered as deleted from list.
3. The decision of Engineer in charge shall be final and binding regarding deployment of plant/ machinery and all matters pertaining to it.
4. Machinery, tools and plants common to more than one E&M discipline need not be separately deployed for each discipline, provided adequate numbers are continuously available at site to meet the work programme and simultaneous work requirements. All machinery, tools and plants shall be maintained in safe and serviceable condition throughout the period of their requirement at site.

Table 3: Mandatory machinery, tools & plants for GENERAL ELECTRICAL WORKS

S. N.	EQUIPMENT / DEVICE	NUMBER TO BE DEPLOYED
1	Hydraulic Cable Crimping Tool with complete set of dies suitable for cable sizes used in the work	1 Set
2	Ratchet Type Cable Cutter suitable for LT power cables	1 No.
3	Conduit Bending Machine suitable for GI/MS conduits	2 Nos.
4	Electric Pipe Threading Machine with dies	2 Nos.
5	Rotary Hammer/Combination Drilling Machine	2 Nos.
6	Cordless Drilling and Screwdriver Machine	4 Nos.
7	Angle Grinder/Cutting Machine	4 Nos.
8	Portable Welding Machine complete with accessories	1 No.
9	Calibrated Torque Wrench with suitable range and sockets	1 Set
10	Electrician Hand Tool Kits complete with insulated tools	4 Set
11	Cable Pulling and Drawing Accessories including Fish Tape/Draw Wire	2 Sets

PARTICULAR SPECIFICATIONS AND SPECIAL CONDITIONS (E&M)

I) GENERAL

1. The tenderer should in his own interest visit the sites and familiarise himself with the site conditions before tendering.
2. No T&P shall be issued by the department and nothing extra shall be paid on account of this.
3. Care shall be taken, while handling / installing / maintaining the equipment/ carrying out the work, to avoid damage to the building/ premises. The Contractor shall arrange to repair all damages to the building caused by him so as to bring to the original condition. He shall also arrange to remove all unwanted waste materials from site, arising out of his work.
4. The Contractor shall carry out the work in such a manner so as not to interfere or affect or disturb other works being executed by other agencies if any. No claim in the matter shall be entertained.

II) RATES TAXES AND DUTIES:

1. The work shall be treated as on works contract basis and the rates tendered shall be for complete items of works inclusive of all taxes (including works contract tax), duties, and levies etc. and all charges for items contingent to the work, such as packing, forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site i/c temporary constructional storage, risk, overhead charges, general liabilities/ obligations etc.
2. Being an indivisible works contract, sales tax, octroi, excise duty etc. are not payable separately.
3. GST for the work shall be included within the quoted rates for the various items.
4. All statutory deductions like GST, Building and other construction workers welfare cess etc at applicable rates will be made from the Contractors bill.

III) COMPLIANCE WITH REGULATIONS

1. The work shall comply in all respects with this specification and:
 - 1.1. The Building Regulations applying to the project including requirements of the National Building Construction Standards 2026 (NBCS 2026).
 - 1.2. Wiring rules and regulations including requirements of Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2023, National Electrical Code of India 2023, the local electricity supply authority and electrical inspectorate.

- 1.3. Any other regulations that apply directly or indirectly to such installations in the location. Where conflict arise between this specification and any of the applicable acts, codes or standards the highest standard of materials and workmanship shall prevail.
2. If the contractor proposes to supply finished goods procured directly or indirectly from vendors, from the countries sharing land border with India, such vendor will be required to be registered with the competent authority under Government of India. Such procurement shall be accepted only on furnishing the details of such registration.
 3. For materials to be used in work for which Government of India has notified minimum percentage of local content under, Public Procurement (Preference to Make in India) Order 2017 (Amended up to date), it shall be mandatory to supply materials meeting such stipulation.
 4. Prior to commencement of work, all applicable statutory clearances required for taking up the work shall be obtained by the contractor.
 5. After completion of the work, the completed installation shall be offered for inspection to inspectors of the relevant statutory authorities. The contractor shall prepare and submit necessary drawings, test certificates, other documents etc. for submission to these bodies. It shall be the responsibility of the contractor to liaison with/ coordinate with such inspecting authorities for obtaining the approval for the installation. The rectifications required by such statutory authorities shall be carried out by the contractor. Nothing extra shall be payable to the Contractor on this account. The installation shall be commissioned only after obtaining all applicable statutory clearances.
 6. It shall be the responsibility of the contractor to liaison with/ coordinate with the electricity supplier for availing power supply and energizing the installation.
 7. Statutory fees if any for obtaining statutory clearances/ availing power supply shall be paid by the contractor and the same shall be reimbursed on production of evidentiary proof to the department.

IV) TERMS OF PAYMENT

1. Payment will be made against completion of specific stages of work. The percentage of contract rates payable against various stages of work is given below. The decision of the engineer-in-charge regarding completion of/ partial completion of the stage of work shall be final and binding.

- 1.1. For fans, light Fittings, Dbs, switch sockets, wiring accessories:

S.	Stage of Work	Payment
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N.		terms in %
1	Supply of items	70%
2	Installation and termination	85%
3	Testing & commissioning including labelling	95%
4	Handing Over	100%

- 1.2. For any other component of work, part rates assessed by the Engineer-in-charge shall be final and binding.
2. No claim for payment shall accrue to the contractor for incomplete stages.
3. The department may at its discretion, allow part payments on written request from the contractor, on account of compelling reasons to be brought on record. In such event, the part rates assessed by the engineer-in-charge will be final and binding.

V) ASSOCIATION OF OTHER AGENCY(S) FOR EXECUTION OF SPECIALIZED E&M WORKS BY THE BUILDING CATEGORY CONTRACTOR:

1. If the agency is not possessing a valid electrical license of appropriate class in his name, he shall associate with another agency registered with CPWD in the appropriate class possessing such license for the execution of all electrical works.
2. The building contractor shall associate with other agency(s) for execution of each of the work(s) listed hereunder, who fulfills the following eligibility criteria:

Sl. No.	Sub head of work	Eligibility criteria -The agency should have successfully completed, works as mentioned during last seven years ending on the last day of the month previous to the one in which the tenders are invited.			Definition of similar work
		One similar works each of value not less than (Rs.) (80% of ECPT)	Two similar works each of value not less than (Rs.) (60% of ECPT)	Three similar work each of value not less than (Rs.) (40% of ECPT)	
1	IEI works	NOT APPLICABLE, Only CPWD enlisted agency of appropriate class with valid Electrical license issued by competent authority			

All amounts rounded off to a nearest convenient figure.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to previous day of last day of submission of bid.

3. The building category contractor may carry out himself/herself any or all of the 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 specialized agency as per criteria mentioned in the NIT.
4. The building contractor and the associated specialized agencies shall submit to the Engineer-in-charge the following documents to confirm their association:
 - 4.1. MoU between main contractor and associated specialized agencies as per attached format.
 - 4.2. In support of the eligibility conditions of the associated specialized agency, copy of their registration/ eligibility documents, electrical contractor's license where package involves electrical works, GST Documents duly attested by the main contractor shall be submitted to the engineer-in-charge. Such electrical contractor shall also certify that they are not debarred/ blacklisted by any central/ state government department/ autonomous body/ PSU.
 - 4.3. In case of unsatisfactory performance or failure of the associated specialized agency to complete the E&M works, the main contractor shall, on written direction of the Department, replace such associated specialized agency without delay or any additional cost to the Department. The proposed replacement agency shall fulfill the eligibility conditions and complete all association requirements specified in the NIT.

The replacement associated specialized agency shall assume responsibility for completing the balance E&M works and for all guarantees and warranties relating to equipment already supplied and paid for, wholly or partly, by the Department. If any such equipment becomes unusable or unsuitable for installation, commissioning or beneficial use due to the change of agency, the main contractor shall replace it at no additional cost to the Department.
 - 4.4. No change of E&M associate/sub-contractor shall be permitted without prior written approval of the Department.
 - 4.5. The associated specialized agency shall attend the inspection of the work by departmental officials as and when required.

VI) ADDITIONAL CONDITIONS AND TECHNICAL SPECIFICATIONS

1. Compliance With Codes & Regulations:

- 1.1. The work shall be carried out in accordance with the latest editions (including amendments up to the last date of submission of bid) of the following, unless otherwise specified:
- a) Particular Specifications and Special Conditions forming part of this tender.
 - b) Approved drawings and approved shop drawings.
 - c) CPWD General Specifications for Electrical Works.
 - d) National Electrical Code of India (NEC) 2023.
 - e) National Building Construction Standards of India (NBCS) 2026.
 - f) Relevant BIS/IS Codes.
 - g) Applicable Energy Conservation Building Code (ECBC), wherever applicable.
 - h) Applicable IEC, ASHRAE, SMACNA, NFPA, TIA, ISO, ITU, AVIXA and other international standards.

2. Materials Used In Work:

- 2.1. The contractor shall, on demand by the engineer-in-charge, furnish proof to the satisfaction of the engineer-in-charge regarding purchase of materials and equipment from the manufacturer/ manufacturer's authorized outlets.
- 2.2. Materials to be used in work are to be ISI marked where available. Prior approval of the engineer-in-charge shall be taken for all the materials required to be used on works. Non-standard quality materials will not be accepted. The engineer-in-charge reserves the right to instruct the contractor to remove any material which, in his opinion, is not acceptable and the same shall be removed from the site of work by the contractor at his cost.
- 2.3. All materials used in work shall be supplied with manufacturers test certificates. Samples will be drawn from the supplied materials as per acceptance criterion specified in relevant codes and the same will be got tested through approved third party testing laboratories. The contractor shall make all necessary arrangements and bear all costs towards testing of samples including preparation of samples, packaging, sealing, transportation, loading, unloading, etc. No additional payment will be admissible towards this.
- 2.4. The contractor shall procure only such quantities as are reasonably required for execution of the work. No claim shall be entertained for excess procurement, wastage or unused materials. All surplus materials

shall remain the property of the contractor and shall be removed from site after completion of the work. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

- 2.5. The materials of construction used for various items of work shall be suitable for the environment and intended use of the component. Following general guidelines shall be followed.
- a) Equipment & wiring enclosures, raceways etc used indoor shall be with epoxy powder coated/ hot dipped galvanized finish.
 - b) Support structures, fasteners, raceways etc used outdoor shall be of hot dipped galvanized steel or stainless steel (SS 304/316).
 - c) Paint finish for pipelines used outdoor shall be two coats of epoxy primer with two coats of PU finish. Paint finish for pipelines used indoor shall be two coats of zinc chromate primer with two coats of enamel over coat.
 - d) Only UV stabilised SMC/ die-cast aluminium/ GI powder coated enclosures with minimum ingress protection of IP65 shall be used outdoor.
- 2.6. Materials once rejected by the Engineer-in-Charge shall be removed from the site within 48 hours or within such time as directed by the Engineer-in-Charge, failing which the Department may remove the same at the risk and cost of the contractor.
- 2.7. The materials used in the work shall be as per the List of approved makes of materials.

3. Works to be Executed by the Contractor:

- 3.1. Unless otherwise specifically provided elsewhere in the contract, the rates quoted by the contractor shall be deemed to include the cost of all incidental works necessary for the complete execution, testing, commissioning and satisfactory operation of the E&M installations, whether or not specifically indicated in the Schedule of Quantities.
- 3.2. The contractor shall, at no extra cost to the Department, execute the following works:
- a) Construction of foundations, pedestals and supporting structures for all equipment, pumps, tanks, panels, generators, transformers, HVAC equipment and other installations, including vibration isolation pads, springs, inertia blocks, anchor bolts and grouting wherever required.
 - b) All minor civil works necessary for installation of E&M services, including:
 - Cutting and making openings in RCC walls, floors and slabs;
 - Chasing in masonry or concrete;
 - Trenches for cables, pipes and fuel lines;

- Sleeves, inserts and block-outs;
 - Grouting, sealing, fire seals; and
 - Restoration of the affected portions to their original line, level and finish.
- c) Dismantling and reconstruction of masonry, partitions, false ceilings or similar works, wherever required for installation of equipment, ducts, cable trays, conduits, piping or other services, including complete restoration.
 - d) Making good all damages caused during execution of the work and restoring the building and finishes to the satisfaction of the Engineer-in-Charge.
 - e) Supply, fabrication, painting and installation of all supports, hangers, channels, angles, brackets, frames, inserts, clamps, base plates, anchor fasteners and structural members required for supporting E&M services, whether specifically shown on drawings or otherwise required for proper installation.
 - f) Supply and installation of all accessories, consumables and miscellaneous materials required for complete functioning of the installation, irrespective of whether specifically mentioned in the Schedule of Quantities.
 - g) Provision, maintenance and removal of all scaffolding, staging, lifting arrangements, temporary platforms and safety arrangements required for execution of the work.
 - h) Protection, safe custody and watch & ward of all materials, equipment and completed installations against theft, vandalism, weather damage and deterioration until handing over to the Department.
 - i) Painting, touch-up painting and corrosion protection of all exposed metal surfaces, supports and fabricated steelwork with approved paint systems wherever factory finish is damaged or painting is otherwise required.
 - j) All electrical interconnections, internal wiring, control wiring, earthing, bonding, glands, lugs, ferrules, identification tags and accessories necessary for complete operation of the installations.
 - k) Sealing of all cable, conduit, pipe and duct penetrations through walls, floors and shafts against water ingress, vermin, rodents, insects, dust and fire using approved materials wherever applicable.
 - l) Testing, pre-commissioning, commissioning, trial run, balancing, calibration and performance testing of all E&M systems as specified.
 - m) Submission of all statutory test certificates, calibration certificates, manufacturer's certificates, commissioning reports, as-built drawings, operation manuals and maintenance manuals before completion.
 - n) All works associated with obtaining all statutory approvals and clearances

from the concerned authorities wherever required including preparation of application forms, technical documentation, drawings, calculations, liaison and assistance required for obtaining such approvals etc.

- o) Any other incidental work necessary for completing the installation in all respects and making the system fully functional, safe and ready for intended operation.
- 3.3. The contractor shall prepare and submit coordinated shop drawings, coordinated service drawings, fabrication drawings, layout drawings, sections, GA drawings, method statements, load calculations, cable schedules, piping schedules, equipment foundation drawings and any other drawings necessary for execution; based on the scope of work, in consideration with BOQ, inventory etc for various items of work and submit the same to the Engineer-in Charge for approval.
- No work shall be initiated without getting shop drawings and work method statement approved by the Engineer-in-Charge. Work shall be executed only as per the approved shop drawings and work method statement.
- 3.4. The contractor has to make his own arrangement at his own cost for all the general and special T&P required for this work.
- 3.5. The contractor shall make his own arrangements for temporary electricity, water, lighting, communication facilities and sanitation required for execution of the work unless otherwise specified.
- 3.6. The contractor shall maintain the work site in a clean and orderly condition throughout the execution of the work. Debris and surplus materials shall be removed regularly. Final cleaning of all equipment and installations shall be completed before handing over.
- 3.7. Any work not conforming to the specifications, approved drawings or good engineering practice shall be rejected and shall be dismantled and reconstructed by the contractor at his own cost.
- 3.8. All repairs and patch works shall be neatly carried out to match with the original finish and to the full satisfaction of the engineer-in-charge.
- 3.9. Existing services shall be adequately protected during execution. Any damage shall be rectified by the contractor at his own cost.

4. Commissioning, Training and Handing Over:

- 4.1. On completion of the installation, the contractor shall arrange for conducting pre-commissioning tests as required by the applicable codes. A report of such tests shall be compiled and submitted to the engineer-in-charge for his approval. Such tests shall commence only on the approval of this report by the engineer-in-charge and shall be carried out by those authorized, skilled, experienced and certified permit holders of the supervisor category.

- a) All testing and commissioning shall be carried out by competent personnel authorized by the manufacturer wherever required and in the presence of the Engineer-in-Charge.
 - b) The E&M installations shall be deemed ready for taking over only after:
 - Completion of all works under the contract;
 - Successful testing, commissioning and trial run of all systems;
 - Satisfactory integrated operation of all E&M services;
 - Submission of all statutory approvals, test certificates, O&M manuals and as-built drawings; and
 - Rectification of all deficiencies pointed out by the Engineer-in-Charge.
- 4.2. The contractor shall provide **comprehensive training** to the personnel nominated by the Department for the operation, routine maintenance and troubleshooting of all E&M installations.
- a) The training shall be conducted after successful commissioning and before handing over of the installation and shall include, wherever applicable:
 - System overview and operating philosophy.
 - Normal operating procedures.
 - Start-up and shutdown procedures.
 - Safety precautions.
 - Routine inspection and preventive maintenance.
 - Fault identification and troubleshooting.
 - Emergency operating procedures.
 - Demonstration of all control functions, alarms and interlocks.
 - Routine replacement of consumables.
 - Maintenance of records and log books.
 - b) The training shall be conducted by qualified personnel of the contractor and/or the Original Equipment Manufacturer (OEM), wherever specified.
 - c) The contractor shall provide training material, operating instructions and maintenance checklists to all participants.
 - d) Training shall be considered complete only after the Engineer-in-Charge is satisfied that the nominated departmental personnel are adequately familiar with the operation and maintenance of the installed systems. No separate payment shall be made on this account, and the cost thereof shall be deemed to be included in the tendered rates.
- 4.3. The date of taking over shall be the date on which the complete building,

together with all E&M installations, is taken over by the Department.

5. Documentation:

5.1. The contractor shall, at no extra cost to the Department, furnish all documentation necessary for the proper operation, maintenance and future modification of the E&M installations. Submission of the following documents shall be a prerequisite for handing over of the work and release of final payment.

5.2. The contractor shall prepare and submit complete **As-Built Drawings** for all E&M installations after completion of the work and before handing over of the installation.

The As-Built Drawings shall accurately indicate the final executed work, including all deviations from the approved shop drawings, and shall include, wherever applicable:

- a) Equipment layouts and General Arrangement (GA) drawings.
- b) Single Line Diagrams (SLDs) and control schematics.
- c) Cable routing layouts and cable schedules.
- d) Conduit, cable tray and trunking layouts.
- e) Earthing layouts.
- f) Lighting, power, fire alarm, ELV and HVAC layouts.
- g) Piping layouts and isometric drawings.
- h) Valve schedules and equipment identification.
- i) Any other drawings necessary for operation and maintenance of the installation.

5.3. The contractor shall submit comprehensive **Operation & Maintenance (O&M) Manuals** for all E&M systems before handing over the installation.

The manuals shall, as applicable, include:

- a) Description of the system and its operation.
- b) Technical specifications of all equipment.
- c) Approved equipment data sheets and catalogues.
- d) Manufacturer's installation, operation and maintenance instructions.
- e) Preventive maintenance schedules.
- f) Troubleshooting guides and fault diagnosis procedures.
- g) Recommended maintenance procedures.
- h) Lubrication schedules.

- i) Calibration procedures, wherever applicable.
 - j) Spare parts catalogue with part numbers.
 - k) List of recommended consumables.
 - l) Warranty certificates.
 - m) Test certificates.
 - n) Commissioning reports.
 - o) Contact details of OEMs, authorised service centres and local representatives.
- 5.4. All drawings shall be prepared in AutoCAD (latest compatible version) or other approved CAD software.
- 5.5. The contractor shall submit:
- a) Three (3) hard copies (A1/A3 size as applicable), duly signed.
 - b) One searchable PDF copy.
 - c) One editable soft copy in native CAD format.

6. Defect Liability Period:

- 6.1. All equipment 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 the Engineer-in-Charge during this period. In case it is felt by the department that undue delay is being caused by the contractor in carrying out these works, 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.

7. Warranty:

- 7.1. OEM warranty shall be availed by the contractor for certain specific components of work as listed below. A letter/ undertaking from the OEM shall be submitted in support of this.

S. N.	Sub head of work	Stage of Work	Period	Provided by
1.	IEI works	BLDC Fans/Flame proof exhaust Fans	Minimum 2 Years	OEM/ OEM authorised service partner
		LED Fittings/Flame proof Fittings	Minimum 5 Years	OEM/ OEM authorised service partner

		LED Bulbs / Polycarbonate T8 fitting	Minimum 2 Years	OEM/ OEM authorised service partner
		Split AC	Minimum 1 Year for Equipment	OEM/ OEM authorised service partner

7.2. The warranty period shall commence from the date of successful completion and handing over of the installation.

7.3. During the warranty period:

- a) Any defect arising due to defective materials, manufacturing defects, poor workmanship or improper installation shall be rectified or the defective item replaced by the contractor entirely at his own cost;
- b) Replacement shall include all labour, transportation, dismantling, reinstallation, testing and commissioning;
- c) Consequential damages to the equipment arising from such defects shall also be made good by the contractor;
- d) Repairs and replacements shall be carried out promptly within the time specified by the Engineer-in-Charge.

7.4. In case the contractor fails to attend or rectify the defects within the stipulated period, the Department shall be at liberty to carry out the repairs or replacement through any other agency at the risk and cost of the contractor, without prejudice to any other contractual rights available to the Department.

The decision of the Engineer-in-Charge in this regard shall be final and binding.

7.5. In the event of failure to furnish the required OEM warranty documents, the Engineer-in-Charge may withhold an amount equivalent to 5% of the value of the concerned equipment from the contractor's dues or Security Deposit until submission of the required warranty documents.

8. TANGEDCO Approval:

The scope of the work includes getting approval from the TANGEDCO for metering facility including liasoning. However, the statutory fees to be paid to the TANGEDCO can be reimbursed by the agency upon receipt.

Executive Engineer (E&M) (Trichy)
CPWD, NIT Campus, Trichy - 620 015

ADDITIONAL CONDITIONS FOR ELECTRICAL WORKS

I) WIRING SYSTEM

1. GENERAL:

1.1. The wiring system shall be complete with all necessary conduit bushes, locknuts, adaptors, glands, clamps, connectors, crimping lugs, terminal ends, bootlace ferrules, identification ferrules, insulating sleeves and other termination accessories required for a complete and safe installation. All such accessories shall be suitable for the conductor, conduit, cable and equipment terminal concerned. Nothing extra shall be payable on this account.

1.2. All copper wires used for fixed wiring shall be Class 2 copper conductor satisfying the resistance requirements of NEC 2023 Part 1 Section 17, Annex B.

1.3. All copper wires used shall be with FR-LSH PVC insulation.

2. CONDUIT TERMINATIONS, BUSHES AND ADAPTORS

2.1. All conduit entries into junction boxes, switch boxes, distribution boards, panels, cable trunking and other enclosures shall be properly terminated using suitable threaded bushes, locknuts and adaptors, as applicable.

2.2. Conduits shall not be left loosely inserted into boxes, panels or enclosures. All conduit terminations shall be mechanically secure and arranged so that no mechanical stress is transferred to the internal wiring.

2.3. Where the conduit entry size does not match the enclosure opening, suitable reducers, enlargers or adaptors shall be used. Improvised packing, oversized holes, welding of conduit ends to enclosures or filling of annular gaps using cement mortar or similar materials shall not be permitted.

2.4. Metallic conduit systems shall maintain electrical continuity across all joints, fittings, flexible connections and terminations. Where continuity cannot be reliably ensured through the mechanical connection, suitable bonding conductors or bonding jumpers shall be provided.

2.5. Flexible metallic conduits shall be terminated at both ends using suitable glands or connectors appropriate to the conduit type and shall not be terminated by simple insertion, taping or clamping.

2.6. All conduit bushes, locknuts, adaptors, glands and connectors shall be compatible with the conduit and enclosure material and suitable for the environmental and ingress-protection requirements of the installation.

3. WIRE LUGS, TERMINAL ENDS AND FERRULES

3.1. All stranded copper and aluminium conductors shall be terminated using suitable crimping lugs, terminal ends or bootlace ferrules appropriate to

the conductor material, size and terminal type.

- 3.2. All joints in the wiring system shall be made only at accessible junction boxes, enclosures or terminal locations using suitable crimped connectors or terminal blocks providing adequate mechanical security and insulation. Twisted and taped joints shall not be permitted.
- 3.3. Direct termination of stranded conductors under screws or clamps without suitable terminal ends or ferrules shall not be permitted, except where the terminal is specifically designed and certified by the equipment manufacturer for direct termination of the conductor concerned.
- 3.4. Pin-type, fork-type, ring-type or tubular terminal ends shall be selected to suit the terminal arrangement. Bootlace ferrules shall be used for stranded control and internal wiring terminated in screw-clamp terminals.
- 3.5. Lugs and ferrules shall be of the correct size for the conductor and shall be crimped using approved calibrated crimping tools and dies recommended for the particular type and size of lug or ferrule.
- 3.6. Cutting of conductor strands to enable insertion into an undersized lug, ferrule or terminal shall not be permitted.
- 3.7. Soldering of conductor ends in place of proper crimped termination shall not be permitted for power and control wiring unless specifically required by the equipment manufacturer.
- 3.8. Copper conductors shall be terminated using suitable copper or tinned-copper lugs. Aluminium conductors shall be terminated using aluminium compression lugs where connected to aluminium terminals or busbars, and Cu-Al bimetallic compression lugs where connected to copper terminals or busbars. Direct termination of aluminium conductors shall be permitted only where the equipment terminal is specifically designed and rated for such connection.
- 3.9. All bolted lug connections shall be complete with suitable bolts, nuts and washers. Conical spring washers shall be used where termination involves dissimilar materials to maintain adequate contact pressure under thermal cycling. All bolted connections shall be tightened to the torque recommended by the equipment or connector manufacturer.
- 3.10. Contact surfaces shall be properly cleaned before assembly. Copper contact surfaces shall be tinned or tin-plated where required for protection against corrosion or for connection to dissimilar metals. Aluminium contact surfaces shall be cleaned to remove oxide immediately before jointing and coated with approved oxide-inhibiting jointing compound.
- 3.11. No more than one conductor shall be terminated in a lug or ferrule unless the connector is specifically designed and rated for multiple conductors.
- 3.12. Not more than two conductors shall be connected to a single terminal unless the terminal is specifically designed and rated for such connection.

4. CONDUITS/ RACEWAYS:

- 4.1. Recessed/ slab wiring shall be done using medium class PVC conduits (except for fire alarm wiring & data cabling for which specifications for open wiring shall be followed).
- 4.2. Open wiring shall be done using hot dipped GI conduits.
 - a) Surface conduits shall be supported using spacer bar saddles.
 - b) Suspended conduit runs shall be supported using hot dipped GI strut channel support system.
 - c) Final connections to equipment from the rigid conduit system may be made using GI flexible conduits. In such cases metallic glands suitable for GI flexible conduits shall be used at both ends.
 - d) All sections of metallic conduits shall be effectively bonded to the earthing system.
- 4.3. Perforated/ ladder/ wire mesh cable trays shall be used for horizontal and vertical distribution of cables.
 - a) Cable trays shall be hot dipped galvanized including all connection/ support accessories.
 - b) All cable tray systems shall be complete with factory made bends, tees, reducers etc and other accessories like connectors, earth clamps, support channels & suspenders, stainless steel cable ties etc.
 - c) Ladder type cable trays shall be used for large size armored power cables.
 - d) Perforated cable trays shall be used for small size armored power cables.
 - e) Perforated cable trays with top cover shall be used for all service distribution on terrace; for routing un-armoured power, control or ELV cables and in situations where rodent protection is required.
 - f) Wire mesh cable trays may be used for ELV cables where rodent protection is not needed since the cable tray is routed through a sealed plenum/ false floor.
- 4.4. Wherever light fittings/ fire detectors/ response indicators are proposed to be provided on the false ceiling, the respective wiring shall be brought upto the terminal of the light fittings/ fire detectors/ response indicators.
 - a) Steel wire reinforced PVC flexible metal conduits with PVC conduit glands at both ends shall be used for drawing wires from junction boxes on ceiling to fittings on false ceiling.
 - b) Where provision for terminating flexible conduit or enclosed terminals for loop wiring is not available for any false ceiling fixture, suitable junction boxes shall be provided for termination and looping.

5. CABLE LAYING:

- 5.1. Power cables run under ground shall be laid direct in ground with protection tiles as per IS 5820. Only armored cables shall be used for this application.
- 5.2. Light power/ control cables shall be run inside PE80, SDR11, HDPE protection pipes.
- 5.3. Un-armoured copper conductor cables shall be used for street lighting circuits inside PE80, SDR11, HDPE protection pipe.
- 5.4. Entry of cables into the building shall be through suitable sleeves which shall be sealed after the drawing of cables using waterproof sealing compound/ foam.
- 5.5. Wherever cables, conduits, cable trays or other electrical services pass through fire-rated walls, floors, shafts or other fire-rated barriers, the openings shall be sealed after installation using approved fire-rated sealing/fire-stopping materials of rating not less than that of the penetrated barrier.

II) LABELLING

1. GENERAL:

- 1.1. Labelling scheme including sample labels for various equipments forming part of the installation shall be prepared by the contractor and submitted to the engineer-in-charge for his approval. Labelling activities shall be taken up only on the approval of this plan by the engineer-in-charge.

2. CABLES:

- 2.1. All cables shall be labelled showing the fed from/ fed to locations, size of cable and number of runs.
- 2.2. Stamped/ engraved aluminium labels shall be used for labelling outdoor enclosures.
- 2.3. Engraved acrylic sheets shall be used for labelling indoor enclosures.
- 2.4. Labels shall be connected to the cable/ conduit/ bunched wires using black nylon straps.
- 2.5. Fed to labels shall be used near feeding end.
- 2.6. Fed from label shall be used near fed end.
- 2.7. Both labels shall be used at intermediate locations inside man holes, across openings in walls etc.

3. PANELS:

- 3.1. All panels shall be provided with labels on the front indicating the switch gear designation, feeding cable size & runs and destination.
- 3.2. Engraved PVC labels shall be used for switch gear designation.
- 3.3. Painting shall be used for remaining labelling.

4. **DISTRIBUTION BOARDS:**

- 4.1. All DBs shall be provided with labels indicating the fed to location of loads & circuit sizes, fed from location & feeder size.
- 4.2. The DB labelling sheets must be computer printed in suitable size paper, laminated and pasted to the inside of the DB door using suitable industrial adhesive.

5. **SWITCH BOARDS:**

- 5.1. All switch boards shall be provided with 9mm acid proof labels indicating the DB and circuit designation.
- 5.2. All circuits shall be provided with ferrules on both sides including all loops indicating the circuit, loop and DB designations.

6. **WARNING LABELS:**

- 6.1. Approved acid proof graphic labels shall be provided at the following locations.
 - a) Near lightning down conductor locations indicating that a minimum safety distance of 3m is to be maintained from the exposed down conductor in the event of lightning.
 - b) In front of panels and DBs warning to keep the area in front of the panel/ DB clear for 1m.
 - c) In front of panel incomers warning of the presence of multiple sources of power for panels fed from multiple feeders.
 - d) Near earthing points of enclosures and earth buses warning against disconnection of safety earth.

III) **ELECTRICAL PANELS**

1. **GENERAL CONSTRUCTIONAL FEATURES:**

- 1.1. Panels shall be:
 - a) Panel separation as per Form 3b construction.
 - b) Dust and vermin proof construction with minimum IP42 ingress protection for indoor panels and IP54 ingress protection for outdoor panels.
 - c) Extendable on both sides.

- 1.2. Panel boards which are free floor standing should be erected on suitable M.S. channels across cable trench if the cable entry to the panel is from bottom and ready made cable trenches exist. Panels should be erected on a M.S. angle iron frame if ready made cable trenches do not exist and if the cable entry to the panel is from the bottom. All mountings in flooring / wall etc should be using anchor fasteners and G.I. hardware.
- 1.3. No equipment needing manual operation shall be located less than 250 mm above floor level. Operating levers, handles etc of highest unit shall not be higher than 1700mm.
- 1.4. Cable alleys shall be provided with suitable hinged doors. Adequate number of slotted cable support arms shall be provided for supporting the cables.
- 1.5. Metallic partitions shall be provided between adjacent cubicles, between feeder compartments, between busbar chambers and other compartments.
- 1.6. Panel shall be divided into suitable sections for convenience during shipment.
- 1.7. All doors shall have folded edges. All covers and doors shall be provided with neoprene gaskets and quarter turn metallic locks (triangular/ square).
- 1.8. Provision shall be made for shrouding the outgoing terminals for protection against accidental touch. All exposed live parts shall be totally covered by shrouds. If spreader bars are required, they shall be separated by phase barriers.
- 1.9. Wherever more than one cable has to be terminated on any incoming/ outgoing feeder the respective incoming/ outgoing terminals shall be designed in such way as to receive the required number of cables.
- 1.10. Bus bars and cable alleys shall be shrouded with FRP sheet for all connections to neighbouring bays.
- 1.11. Cable entry shall be provided on top and bottom as per site requirement. All gland plates shall be made out of 3mm thick galvanised iron sheet and shall be bonded to the earth bar using flexible/ braided copper conductor with minimum cross section as given below.
 - a) For all panels except transformer main panels:
 - SC level $\leq$ 16 kA: 16 sq.mm
 - SC level $>$ 16 kA & $\leq$ 25 kA: 25 sq.mm
 - SC level $>$ 25 kA & $\leq$ 50 kA: 50 sq.mm
 - SC level $>$ 50 kA: As per calculation
 - b) For transformer main panels:

- SC level ≤ 25 kA and upstream breaker instantaneous trip time ≤ 0.1 s: 50 sq.mm
- SC level > 25 kA & ≤ 50 kA and upstream breaker instantaneous trip time ≤ 0.1 s: 100 sq.mm
- SC level > 50 kA or upstream breaker instantaneous trip time > 0.1 s: As per calculation

2. SHEET METAL WORK:

- 2.1. The panel board shall be fabricated using suitable mild steel structural sections or pressed and shaped cold rolled sheet steel of thickness not less than 2 mm. Stiffeners shall be provided wherever necessary.
- 2.2. All panel edges and door edges shall be reinforced against distortion by rolling, bending or by the addition of welded reinforced members. Cut-outs shall be true in shape and devoid of sharp edges. The complete structure shall be rigid, self-supporting and free from vibration, twists and bends.

3. PAINTING:

- 3.1. All sheet steel work shall be phosphated as per applicable standards. All metal works shall be chemically treated with 7 tank process for degreasing, derusting, phosphating and applied with two coats of Epoxy powder coating.

4. BUSBARS:

- 4.1. Bus bars shall be of sufficient cross-section so that a current density of 130A/sq.cm is not exceeded at nominal current rating for aluminium bus bars, and 160A/sq.cm for copper bus bars.
- 4.2. The panel shall be provided with three phase and neutral busbar. Busbar shall be of uniform cross section throughout the length of the bus bar section.
- 4.3. All bus bar and bus-taps shall be insulated with colour-coded heat shrinkable PVC insulation sleeves.
- 4.4. Busbar shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents. Busbar supports shall be made of fibre reinforced moulded plastic material, or cast resin.

5. CONTROL WIRING:

- 5.1. The control wiring shall be carried out in single core 1.1 KV grade PVC insulated control cables with stranded copper conductors of minimum cross section 1.5 sq.mm (2.5 sq.mm for CT wiring).
- 5.2. Runs of control wires within the switch-board shall be neatly

bunched and suitably supported/ clamped. Ferrules shall be provided for easy identification of the control wires.

- 5.3. Control wiring shall correspond to the circuits/ sequence of operations and interlocks agreed to with the Engineer-in-Charge.
- 5.4. Not more than two connections shall be made at any one terminal.
- 5.5. The wiring shall be arranged and supported in such a manner that there will be no strain on termination.

6. LABELLING:

- 6.1. All panels shall be provided with labels on the front indicating the switch gear designation, feeding cable size & runs and destination.
- 6.2. Engraved acrylic labels shall be used for switch gear designation.
- 6.3. Painting shall be used for remaining labelling.

7. EARTHING/ BONDING:

- 7.1. Panel shall be provided with a set of inter connected earth bus bar running along the entire length of the board at top (where cable entry is from the top) and bottom. At either end of the earth bus, one clamp type terminal with nuts, bolts and washers shall be provided for bolting the earthing conductor.
- 7.2. The earth bus shall be of tinned copper and with minimum cross section equal to half the cross section of the phase bus bar (size of copper earth bus may be further reduced by 60% for panels with aluminium bus bars).
- 7.3. Earth bus bars shall be supported at suitable intervals. Positive connection between all the metal frames of equipment mounted in the switchboard and earth bus bar shall be provided.
- 7.4. All instrument cases shall be connected to the earth using 1100V grade, single core 2.5 sq.mm stranded, copper conductor cable.
- 7.5. All metal hinged doors shall be bonded to the panel using 1100V grade, flexible/ braided copper conductor of following minimum size:
 - a) SC level $\leq$ 16 kA: 16 sq.mm
 - b) SC level $>$ 16 kA & $\leq$ 25 kA: 25 sq.mm
 - c) SC level $>$ 25 kA & $\leq$ 50 kA: 50 sq.mm
 - d) SC level $>$ 50 kA: As per calculation
- 7.6. All shielded cables used inside panels shall be bonded at both ends to the metallic case/ DIN rails using suitable bonding clamps.

8. TESTING:

8.1. All panels shall be offered for inspection at the factory. All defects and deviations pointed out in the inspection report shall be rectified at the factory before dispatch to site. However, the Engineer-in-Charge may exercise discretion for waiving factory inspection in lieu of proper test certificates.

8.2. Panel shall be subjected to following tests as per relevant standards:

- a) Mechanical Operational tests for all movable parts of switch gears, breakers, tripping devices etc.
- b) Testing of interlocks, control circuit operation including timing and sequencing.
- c) Insulation resistance test.
- d) Power-frequency withstand voltage test.

IV) LED LUMINAIRES

1. ANSI/IES LM79, ANSI/IES LM-80 & ANSI/IES TM-21 test reports, IES file and datasheets shall be submitted for all luminaires. Only test reports conducted in NABL/ILAC accredited laboratories will be accepted.
2. All luminaires supplied shall have serial numbers or batch code.
3. Luminaires shall be ISI marked as per IS 10322 and conform to IS 16101 to 16108 amended upto date.
4. LEDs shall be of the following makes only – Cree, Nichia, Osram, Philips, Bridgelux, Lumileds or manufactured by the OEM in the list of approved makes.
5. Luminaire system efficacy shall not be less than the following:
 - a) Panel light, Downlighter, Streetlights: 120 lm/W
 - b) Batten, Industrial fittings, Flood light: 100 lm/W
 - c) Other: 80 lm/W
6. Minimum Colour Rendering Index (Ra) should be
 - a) 70 for streetlights, flood lights, industrial lights and outdoor lights.
 - b) 80 for all indoor lights.
7. Correlated Color Temperature (CCT) shall be 5700 K unless otherwise mentioned.
8. The L70B50 life of LED package as per TM-21 report shall be not less than 50,000 hours.
9. Light fittings used for outdoor and industrial use shall have minimum IP65 ingress protection, IK08 mechanical impact protection and 4 kV surge protection.

10. OEM accessories and supports shall be used for mounting and suspension of luminaires.

V) SPLIT AIR CONDITIONERS

1. DESIGN & SPECIFICATIONS:

- 1.1. Air conditioners shall be suitable for 240V, 50 Hz single phase AC supply, capable of performing the functions of cooling, dehumidifying, air circulation and filtering. Overall power factor of the unit shall be >0.9 at all operating conditions. Automatic temperature control should be provided for a temperature range of 18°C to 30°C with temperature differential lower than $\pm 1^\circ\text{C}$. Removable and washable filter pads shall be provided for filtration of air passing through the unit. Remote control (Cordless) with LCD Display shall be provided with one On/Off timer, selecting Fan speed (Three speeds) and setting of temperature.
- 1.2. The air conditioners shall be fitted with discharge cooled variable speed rotary compressor unit operating on refrigerant R32 with suitable rated electric motor. It shall be equipped with overload protection. These shall be mounted on vibration isolation mountings for quiet operation. The compressor shall conform to IS: 10617 as amended upto date.
- 1.3. Evaporator and condenser shall be with copper refrigerant tubes and aluminium fins with corrosion protection.

2. PIPING, INSULATION AND CABLES:

- 2.1. Size of Suction line & Liquid line shall be as per OEM standard.
- 2.2. Expanded polyethylene foam insulation tubing shall be used for insulation of suction and discharge lines (Glass cloth / UV-resistant protective covering for outdoor installation).
- 2.3. Drain pipe extension using 20mm dia. UPVC pipe shall be provided to the nearest drain point. Water trap with minimum seal of 50 mm shall be provided before the drain point.
- 2.4. 3 core PVC insulated copper cable of minimum cross section 2.5 sq.mm shall be used to electrically connect indoor and outdoor units with each other.

3. INSTALLATION:

- 3.1. The installation shall be done through OEM-authorized service agency/technician only. The installation at site shall comprise of the following:
- a) Mounting/Fitting indoor & outdoor units at the respective locations.
 - b) Laying refrigerant piping of standard length and connecting both the units after drilling hole/holes in the wall, if required.
 - c) Insulating the suction pipe with expanded polyethylene foam tubing.

- d) Laying drain pipe to discharge condensate water from indoor unit to the nearest drain point.
- e) Leak testing the entire system.
- f) Evacuation/vacuuming and refrigerant charging/top-up, if required, as per OEM procedure.
- g) Suitable electric wiring between indoor and outdoor units.

4. SERVICING:

- 4.1. Free servicing shall be provided by the manufacturer/ authorised agent for 12 months from the date of installation of air conditioner. Firm is also required to carryout three preventive maintenance visits during warranty period and also attend all breakdown calls during the warranty period within the prices quoted.

5. WARRANTY:

- 5.1. Compressor shall have minimum 5-year manufacturer's warranty.

MEMORANDUM OF UNDERSTANDING (MOU) FOR ASSOCIATED CONTRACTOR (APPENDIX-C1)

(To be submitted individually for each package of work for which main agency is not having the prescribed eligibility as per NIT)

(On Non Judicial Stamp Paper of Rs.100)

M/s. (Name of the firm with full address)
(Henceforth called the Main Contractor)

And

M/s. (Name of the firm with full address)
(Henceforth, called the Associated Contractor)

Name of work: **Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.**

NIT No: **33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27**

This Memorandum of Understanding (MOU) is made at
on **Between** (herewith
called the main contractor) having its registered office at
which expression shall unless repugnant to the subject or context include its
administrators, successors and assigns.

and

..... (herewith called the
Associated contractor) having its registered office at which
expression shall unless repugnant to the subject or context include its
administrators, successors and assigns.

Whereas the main contractor has agreed to entrust the
(NAME OF THE PACKAGE) only to the associated contractor.

We state that MoU between us will be treated as an agreement and has legality
as per Indian Contract Act (amended up to date) and the department (CPWD) can
enforce all the terms and conditions of this agreement for execution of
the (NAME OF THE PACKAGE) only in respect of above work.
Both of us shall be responsible for the execution of (NAME
OF THE PACKAGE) as per the agreement to the extent this MoU allows. In case of
any delay in the payment by the main contractor, the associated contractor can
apply to the CPWD to release the payment under Clause 7 and deduct the same
from the bills of the main contractor. In case of any dispute, either of us will
go for mediation by the CE or SE (as the case may be) and his decision shall be

final and binding on both of us.

We have further agreed as under:

1. The Associated Contactor will execute (NAME OF THE PACKAGE) works as per terms and conditions of this agreement.
2. All the machinery and equipment, tools and tackles required for execution of the (NAME OF THE PACKAGE) works, as per this MoU, shall be the responsibility of the Associated Contractor.
3. The site staff required for the execution of (NAME OF THE PACKAGE) work shall be arranged by the Associated Contractor as per terms and conditions of this MoU.
4. All the correspondence regarding execution of the (NAME OF THE PACKAGE) work shall be done by the department with the main contractor. In case of non-compliance of the provisions of agreement of the work by the associated contractor, the main contractor shall be held responsible and action will be taken against him as per agreement provisions.
5. In case of non-performance, associated contractor will be debarred from participation or association in the CPWD tenders by the CPWD.

(Authorized Signatory)

SIGNATURE OF THE MAIN CONTRACTOR

Date :

Place :

1. Witness with address

(From main contractor side)

(Authorized Signatory)

SIGNATURE OF ASSOCIATED CONTRACTOR

Date :

Place :

1. Witness with address

(From associated contractor side)

LIST OF PREFERRED MAKES (E&M)

1. The Contractor shall obtain prior approval from the Engineer-in-charge before placing order for any specific material/ brand/ make.
2. A list of preferred brand names of various materials/products are shown below for usage in execution of work. However, in case it is established that at least three brands specified below are not available in the market, equivalent material of any other brand may also be used, subject to approval of the alternate brand by the Engineer in Charge.
3. For materials to be used in work for which there is sufficient local capacity and competition as per notification issued by Government of India under Public Procurement (Preference to Make in India) Order 2017 (Amended up to date); in case it is established that at least three brands specified below are not manufactured in India, equivalent materials from Class I/ Class II local suppliers under PPP-MII order can be used subject to approval of the alternate brand by the Engineer in Charge and furnishing of declaration under PPP-MII order for such suppliers. However the supplied product shall comply with all the technical specifications and terms and conditions stipulated in the tender document.
4. In general, all materials to be used in the work shall bear the BIS Standard Mark wherever applicable. Where BIS certification is not available for a particular material or product, such material or product may be used only if it conforms to the applicable CPWD Specifications and relevant BIS Standards. Prior written approval of the Engineer-in-Charge shall be obtained before its use in the work.
 - 4.1. Where no applicable BIS Standard is available, the Engineer-in-Charge may require the material or product to be tested in accordance with the relevant ASTM, EN, IEC, BS or other internationally recognised standards. Such material or product shall be permitted for use only after the Engineer-in-Charge is satisfied with the test results and its suitability for the intended application.
 - 4.2. All costs and charges associated with sampling, transportation, testing, retesting, and submission of test reports shall be borne by the contractor, and nothing extra shall be payable on this account.
5. If an equivalent brand is proposed in lieu of any of the brands specified below, its use shall be subject to approval and cost adjustment. Where

the prevailing market rate of the substituted brand is lower than that of the specified brand, the corresponding difference in cost shall be recovered from the contractor. No additional payment or cost adjustment shall be admissible where the substituted brand is costlier than the specified brand.

6. The list given below does not absolve the executing agency from their responsibility for using quality products. It is only after, they are satisfied about the quality and performance, the products shall be used. To achieve this, proper check on the quality of the product, actually to be used, should be exercised.

GENERAL E&M WORKS

Table 4: Preferred Makes for WIRING SYSTEM

Sl. No.	Item	Approved Makes
1	FRLS Copper PVC Insulated Wires	Havells, RR Kabel, KEI, Polycab
2	XLPE LT Power Cables	Havells, KEI, RR Kabel, Polycab
3	Coaxial Cable	Havells, RR Kabel, Finolex, Polycab
4	Cat 6 / Cat 6A Cable	Molex, CommScope, Legrand
5	Cable Glands & Lugs	Jainsons, Comet, Dowells, Cosmos
6	Connector / Terminal Blocks	Elmex, Connectwell, Essen

Table 5: Preferred Makes for CONDUITS, PIPES & CABLE MANAGEMENT

Sl. No.	Item	Approved Makes
1	PVC Conduit (ISI Marked)	Avonplast, AKG, Precision, Modi, Polycab
2	Metallic Conduit & Accessories	AKG, BEC, RMCON, Gupta, Javeri, Precision
3	DWC / HDPE Pipe	Gemini, Rex, Duraline, Prince, Supreme
4	GI Pipe	Jindal, Tata, SAIL

Sl. No.	Item	Approved Makes
5	Cable Tray	RMCON, Profab Engineers, MBM, OBO Bettermann, Legrand
6	Raceway	Schneider, Legrand, Cooper
7	uPVC Cable Trunking / Cable Management System	Legrand, OBO Bettermann, MK, Schneider

Table 6: Preferred Makes for WIRING ACCESSORIES

Sl. No.	Item	Approved Makes
1	Modular Switches, Sockets, Fan Regulators, RJ-45 Data Sockets, TV/Telephone Sockets, GI Boxes, Cover Plates & Accessories	Legrand (Myrius/Arteor), Schneider (Opale), Crabtree (Athena), Panasonic (Vision), Northwest - Artisa
2	Flame proof Switches and sockets	Sudhir/Bharat Flameproof
3	Outdoor Junction Boxes, Looping Boxes & SMC Boxes	Hensel, Gewiss, Rittal
4	Cable End Boxes (Loose Wire Boxes)	Legrand, Schneider, Siemens

Table 7: Preferred Makes for SWITCHGEAR & PROTECTION

Sl. No.	Item	Approved Makes
1	Isolators, MCB, RCCB, RCBO, Distribution Boards, Industrial Sockets	Legrand, Siemens, Schneider
2	Changeover Switches, SFU, SDFU	C&S, Siemens, Schneider, Legrand, LK, ABB
3	MCCB / MPCB	Legrand, Siemens, Schneider, LK, ABB
4	Air Circuit Breakers (ACB)	Legrand, Siemens, Schneider, LK
5	Surge Protection Devices (SPD)	OBO Bettermann, Dehn, Legrand,

Sl. No.	Item	Approved Makes
		Schneider, Havells
6	Relays	Siemens, Schneider, LK, Legrand

Table 8: Preferred Makes for LIGHTING FIXTURES

Sl. No.	Item	Approved Makes
1	Indoor LED Luminaires	Philips (Signify), Crompton, Wipro, Havells, Lighting Technologies
2	Outdoor LED Luminaires	Philips, Crompton, Wipro, Havells, Lighting Technologies
3	Flame proof LED fittings	Sudhir/ Bharat Flameproof/ Wipro/Crompton/Bajaj
4	Bollard/ Post Top Lanterns	K-Lite, Philips, Wipro, Havells

Table 9: Preferred Makes for FANS

Sl. No.	Item	Approved Makes
1	BLDC Ceiling Fans	Atomberg, Havells, Crompton, Orient
2	Exhaust Fans, Wall Fans & Pedestal Fans	Crompton, Orient, Havells, Almonard
3	Flame proof fans	Sudhir/Bharat Flameproof/ Crompton/Wipro/Bajaj

PART-D

SCHEDULE OF QUANTITIES FOR CIVIL WORKS

S.No	Description	Qty	Unit	Rate	Amount
1	Disposal of sand or similar material by mechanical transport or manual means including loading, transporting, unloading from inside 100 m shooting range tunnel to earmarked site inside the campus for lead upto 2 km for all lifts etc., complete as per Directions of Engineer-in-charge.				
1.1	All kinds of soil	365.00	cum	447.12	163,199.00
2	Refilling of available sand or similar material by mechanical transport or manual means including loading, transporting, unloading from earlier dumped site (earmarked site) to inside 100 m shooting range tunnel building for lead upto 2 km for all lifts etc., complete as per Directions of Engineer-in-charge.				
2.1	All kinds of soil	365.00	cum	447.12	163,199.00
3	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth up to 30 cm measured at a height of 1 m above ground level and removal of rubbish up to a distance of 50m outside	450.00	sqm	21.06	9,479.00

	the periphery of the area cleared.				
4	Centering and shuttering including strutting, propping etc. and removal of form for				
4.1	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	140.00	sqm	1,008.30	141,161.00
5	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.				
5.1	Thermo-Mechanically Treated bars of grade Fe-550D or more.	14,250.00	Kg	129.07	1,839,302.00
6	Smooth finishing of the exposed surface of R.C.C. work with 6 mm thick cement mortar 1:3 (1 Cement : 3 fine sand).	130.00	sqm	359.58	46,745.00
7	Add for using extra cement in the items of design mix over and above the specified cement content therein.	29.00	Qtl.	877.85	25,458.00
8	Providing and fixing in position Stainless steel Grade 304 plate-1.0 mm thick as per design for expansion joints.				
8.1	200 mm wide.	220.00	metre	1,028.94	226,367.00
9	Brick work with non				

	modular fly ash bricks conforming to IS:12894, class designation 10 average compressive strength in super structure above plinth level up to floor V level in :				
9.1	Cement mortar 1:6 (1 cement : 6 Coarse sand)	1.00	Cum	10,474.96	10,475.00
10	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	2.00	each	145.59	291.00
11	Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 36 kg to 80 kg and door width from 701 mm to 1000 mm), with double speed adjustment with necessary accessories and screws etc. complete.	2.00	each	1,176.62	2,353.00
12	Welding by gas or electric plant including transportation of plant at site etc. complete.	150,000.00	cm	4.43	664,218.00
13	15 mm cement plaster on the rough side of single or half brick wall of mix :				
13.1	1:6 (1 cement: 6 fine sand)	50.00	sqm	458.37	22,919.00
14	Finishing walls with Acrylic Smooth exterior				

	paint of required shade :				
14.1	New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 0.90 litre/10 sqm)	100.00	sqm	192.20	19,220.00
15	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, sanding, preparation of surface, etc. complete.				
15.1	On steel work	500.00	sqm	289.32	144,662.00
16	Distempering with 1st quality acrylic distemper (ready mixed) having VOC (Volatile Organic Compound) content less than 50 gram/ litre, of approved brand and manufacturer including applying additional coats wherever required to achieve even shade and colour .				
16.1	Old work (one or more coats)	1,870.00	sqm	75.04	140,322.00
17	Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and				

	colour.				
17.1	Two coats	625.00	sqm	164.50	102,812.00
18	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :				
18.1	One or more coats on old work	170.00	sqm	123.03	20,915.00
19	Finishing walls with Acrylic Smooth exterior paint of required shade :				
19.1	Old work (Two or more coat applied @ 1.67 ltr/ 10 sqm) on existing cement paint surface).	2,700.00	sqm	144.51	390,183.00
20	Repairs to plaster of thickness 12 mm to 20 mm in patches of area 2.5 sq.meters and under, including cutting the patch in proper shape, raking out joints and preparing and plastering the surface of the walls complete, including disposal of rubbish to the dumping ground, all complete as per direction of Engineer-in-charge.				
20.1	With cement mortar 1:4 (1 cement : 4 fine sand).	50.00	sqm	655.12	32,756.00
21	Renewing glass panes, with putty and nails wherever necessary including racking out the old putty:				
21.1	Float glass panes of	10.00	sqm	1,305.28	13,053.00

	nominal thickness 4 mm (weight not less than 10kg/sqm).				
22	Providing and laying APP (Atactic Polypropylene Polymer) modified prefabricated five layer 3 mm thick water proofing membrane, black finished reinforced with non-woven polyester matt consisting of a coat of bitumen primer for bitumen membrane @ 0.40 litre/sqm by the same membrane manufacture of density at 25°C, 0.87-0.89 kg/ litre and viscosity 70-160 cps. Over the primer coat the layer of membrane shall be laid using Butane Torch and sealing all joints etc, and preparing the surface complete.				
	The vital physical and chemical parameters of the membrane shall be as under : Joint strength in longitudinal and transverse direction at 23°C as 650/ 450N/ 5cm. Tear strength in longitudinal and transverse direction as 300/250N. Softening point of membrane not less than 150°C. Cold flexibility shall be upto -2°C when tested in accordance with ASTM, D - 5147. The laying of membrane shall be got done through the authorised applicator of				

	the manufacturer of membrane :				
22.1	3 mm thick	120.00	sqm	671.34	80,561.00
23	Dismantling wooden boardings in lining of walls and partitions, excluding supporting members but including stacking within 50metres lead :				
23.1	Thickness above 10 mm up to 25 mm	490.00	sqm	93.05	45,595.00
24	Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground within 50 metres lead.	35.00	sqm	65.40	2,289.00
25	Demolishing R.C.C. work by mechanical means and stockpiling at designated locations and disposal of dismantled materials up to a lead of 1 kilometre, stacking serviceable and unserviceable material separately including cutting reinforcement bars.	90.00	cum	3,373.63	303,627.00
26	Disposal of building rubbish / malba / similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge, beyond 50 m	90.00	cum	315.89	28,430.00

	initial lead, for all leads including all lifts involved.				
27	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.				
27.1	Flexible pipe				
27.1.1	40 mm dia	2.00	each	143.08	286.00
28	Providing and fixing PTMT grating of approved quality and colour.				
28.1	Circular type.				
28.1.1	100 mm nominal dia.	2.00	each	45.00	90.00
29	Grading roof for water proofing treatment with				
29.1	Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size)	10.00	cum	9,624.94	96,249.00
30	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & water treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry : 2 parts water) for vertical surfaces and 3 :				

	1 (3 parts integral crystalline slurry : 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush.				
	The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineer-in-charge. The product performance shall carry guarantee for 10 years against any leakage.				
30.1	For horizontal surface one coat @1.10 kg per sqm.	110.00	Sqm	434.20	47,761.00
31	Providing and fixing double scaffolding system (cup lock type) on the exterior side of building/structure, upto 25 metre height, above ground level, including additional rows of scaffolding in stepped manner as per	600.00	sqm	404.81	242,889.00

	requirement of site, made with 40mm dia M.S. tube, placed 1.5 metre centre to centre, horizontal & vertical tubes joint with cup & lock system with M.S. Tubes, M.S. tube chalis, M.S. clamps and staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for execution of work of cleaning and/ or pointing and/ or applying chemical and removing it thereafter.				
	The scaffolding system shall be stiffened with bracings, runners, connecting with the building etc, wherever required, if feasible, for inspection of work at required locations with essential safety features for the workmen etc., complete as per directions and approval of Engineer-in-charge. Note:- (1) The elevational area of the scaffolding shall be measured for payment purpose. (2)The payment will be made once only for execution of all items for such works.				
32	Providing and fixing false ceiling at all heights with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size				

	595x595mm of approved texture, design and patterns as per CPWD Specification 2019, to be laid in true horizontal level suspended on inter-locking metal T-Grid of hot dipped galvanised iron section of 0.33mm thick (galvanized @ 120 grams per sqm including both sides) comprising of main-T runners of size 24x38 mm of length 3000 mm, cross - T of size 24x32 mm of length 1200 mm and secondary intermediate cross-T of size 24x32 mm of length 600mm to form grid module of size 600 x 600 mm,				
	suspended from ceiling using galvanised mild steel items (galvanizing @ 80 grams per sqm) i.e. 12x50 mm long dash fasteners, 6 mm dia fully threaded hanger rod upto 1000 mm length and L-shape level adjuster of size 76x25x25x1.6 mm fixed with grid and Z cleat of size 25x37x25x1.6mm thick with precut hole on both 25mm flange to pierce into 12x50mm or even bigger size dash fastener if require, fixed with Galvanised iron perimeter wall angle or size 24x24x0.40 mm of length 3000 mm to be fixed on periphery wall / partition with the help of				

	plastic rawl plugs at 450mm center to center and 40 mm long dry wall S.S screws. The work shall be carried out as per specifications, drawing and as per directions of the Engineer-in-Charge.				
32.1	With 15 mm thick Tegular edged light weight calcium slicate false ceiling tiles	25.00	sqm	2,641.32	66,033.00
33	Chipping of unsound/weak concrete material from slabs, beams, columns etc. with manual Chisel and/ or by standard power driven percussion type or of approved make including tapering of all edges, making square shoulders of cavities including cleaning the exposed concrete surface and reinforcement with wire brushes etc. and disposal of debris for all lead and lifts all complete as per direction of Engineer-In-Charge.				
33.1	25 mm average thickness	40.00	metre	151.69	6,068.00
34	Cleaning of reinforcement from rust from the reinforcing bars to give it a total rust free steel surface by using alkaline chemical rust remover of approved make with paint brush and removing loose particles after 24 hours of its application with wire brush and thoroughly washing with water and				

	allowing it to dry, all complete as per direction of Engineer-In-Charge.				
34.1	Bars above 12 mm diameter	1,160.00	metre	19.69	22,837.00
35	Providing, mixing and applying bonding coat of approved adhesive on chipped portion of RCC as per specifications and direction of Engineer-In-charge complete in all respect.				
35.1	SBR Polymer / Acrylic Polymer (@10% of cement weight) modified cementitious bond coat @ 2.2 kg cement per sqm of surface area mixed with specified proportion of approved polymer	150.00	sqm	168.99	25,348.00
36	Providing, mixing and applying SBR polymer/ Acrylic Polymer (of approved make) modified Cement mortar in proportion of 1:4 (1 cement: 4 graded coarse sand with polymer minimum 2% by wt. of cement used) as per specifications and directions of Engineer-in-charge.				
	Note: Measurement and payment: The pre-measurement of thickness shall be done just after the surface preparation is completed and Payment under this item shall be				

	made only after proper wet curing has been done and surface has been satisfactorily evaluated by sounding / tapping with a blunt metal instrument and/or the 75mm size cube crushing strength at the end of 28 days to be not less than 30 N/Sqmm2).				
36.1	25 mm average thickness. in 2 layers	25.00	sqm	702.93	17,573.00
37	Shotcreting R.C.C. columns, beams and slabs etc. in layers with approved design mix concrete having the specified minimum characteristic compressive strength [with ordinary portland cement, coarse sand and graded stone aggregate of 10 mm maximum size in proportion as per design criteria] including the cost of centering and shuttering at edges and corners etc. as directed by Engineer- in-Charge				
	Note: Rates shall include the providing necessary ground wires etc. The levelling gauges, if used, shall be paid for separately. Payment under this item shall be made only after proper wet curing has been done and surface has been satisfactorily evaluated by sounding/tapping with a				

	blunt metal instrument.				
37.1	75 mm thick in Grade M 25 with cement content not less than 330 kg per cum	115.00	sqm	1,949.39	224,180.00
38	Providing and fixing hard drawn steel wire fabric of size 75 x25 mm mesh or other suitable size wire mesh to be fixed & firmly anchored to the concrete/ steel surface by means of "L" shaped mild steel shear key welded with existing reinforcement including the cost of materials, labour, tool & plants as approved by Engineer-in-charge.	130.00	sqm	1,080.16	140,421.00
39	Providing and laying in position ready mixed design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, portland pozzolana / ordinary portland /portland Slag cement, GGBS proportions as per mix design, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all				

	leads; but excluding the cost of centering, shuttering, finishing				
	and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
39.1	All works above plinth level upto floor V level				
39.1.1	Self Compacting Concrete of M50 grade with cement content of 450 kg /cum	95.00	cum	13,266.15	1,260,284.00
40	Preparing the expansion joint edges to required width and depth wherever necessary and providing masking tape to sides of expansion joint, priming the joint on both sides and filling with backer rod and FOSROC POLYSULPHIDE sealant for 25mm width and 20mmdepth and apply both side epoxy adhesive and immediately have to lay the TPE tape on the surface and pressed by the roller or any suitable	235.00	metre	680.40	159,894.00

	tools etc complete as per the direction of Engineer-In-Charge.				
41	Providing, fabricating and fixing shear connectors of 25mm dia & 100mm length Mild steel STUD of proper shape & size etc complete as per the structural design and Direction of Engineer-in-charge				
41.1	Mild steel bar 25 mm dia.& 100 mm length	550.00	each	123.55	67,953.00
42	Providing and fixing tie rod along with nut at bottom to be welded on top of AR 500 plate and top to be bolted on above the E 350 grade plates etc.complete as per the structural design and Direction of Engineer-in-charge.				
42.1	Mild steel bar 25 mm dia. & 600 mm length	450.00	each	397.00	178,650.00
43	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position, fabricating, sanding and applying a priming coat of approved steel primer using structural steel etc.complete as per the Structural design and as per the Direction of Engineer - in-charge. as required.				
43.1	30mm thick E 350 grade plate wherever required.	37,400.00	kg	140.45	5,252,830.00

	(Size of plate shall be finalised by Engineer in charge)				
43.2	30mm thick AR 500 grade plate wherever required. (Size of plate shall be finalised by Engineer in charge)	31,200.00	kg	219.65	6,853,080.00
44	Labour for cutting MS plates & section for concrete pumping ports as per the site condition, drawing including refixing , fabricating the MS plates its position after completing of concrete etc., as Directed by Engineer-in-charge.				
44.1	150 mm diameter or 150x150mm size holes.	32.00	Each	353.75	11,320.00
45	Providing and applying ready mixed crack filler in cracked plastered surface including making grooves of 3mm average width and 5mm deep and applying crack filler @ 0.03 kgs per metre with spatula or putty blade including sand papering to make the surface in level with existing plaster etc., complete all as per the direction of the Engineer-in-charge and as per manufacturers specifications. The grooves shall be cleared off from all dust and dirt with brushes and cleaned with water before applying crack filler. Care	230.00	metre	36.80	8,464.00

	must be taken to avoid formation of cavities or bubbles during application.				
46	Providing and fixing suspended acoustic false ceiling using magnesite/cement bonded wood-wool (pine wood fibre) acoustic panels, square edge, factory finished in natural/primer finish, of size 600 × 1200 mm and 20 mm thick, having density approximately 400 kg/m³, conforming to the following minimum performance requirements: •Fire performance: Class 1 for surface spread of flame when tested as per BS 476 Part 7. •Ignitability/fire propagation performance complying with the relevant provisions of BS 476. •Noise Reduction Coefficient (NRC): minimum 0.80.				
	•Sound Absorption Average (SAA): minimum 0.80. •Weighted sound absorption coefficient α_w: minimum 0.90. •Thermal conductivity: not exceeding 0.075 W/mK. •Suitable for use at relative humidity up to 95% at 50°C without sagging, warping or				

	delamination. •Light reflectance: minimum 75% for finished exposed surface, wherever applicable. •Panels shall be resistant to termite/fungal attack and shall have low VOC emission and minimum 30% recycled content, supported by test certificates from recognised/accredited laboratories.				
	The panels shall be fixed to a complete GI supporting/suspension framework system consisting of suitably sized main runners/channels, cross channels/battens, perimeter channels /angles, hangers, cleats, fasteners, screws and other accessories, manufactured from galvanized steel of minimum 0.45 mm thickness, designed to maintain the required panel module and rigidity. The supporting members shall generally be spaced at maximum 600 mm centres, or at closer spacing wherever required by the panel manufacturer's structural requirements.				
	Panels shall be securely screw-fixed to the framework with joints true to line and level,				

	with short-edge joints staggered wherever required. The system shall include 50 mm thick acoustic infill of polyester fibre or mineral wool, having density not less than 24 kg/m ³ for polyester fibre and 48 kg/m ³ for mineral wool, as applicable, with suitable fire-retardant properties, low VOC emission, resistance to moisture and fungal growth, and conforming to the specified acoustic performance of the complete ceiling system. The acoustic infill shall be securely laid/fixed above the panels without gaps, sagging or displacement.				
	The rate shall include all materials, suspension/supporting framework, perimeter sections, acoustic infill, hangers, fasteners, screws, adhesives wherever required, cutting, wastage, making necessary openings/cut-outs for light fittings, diffusers, sprinklers and other services, working at all heights and levels, and completing the ceiling true to line, level and pattern, complete as per drawings, specifications and direction of Engineer-in-Charge.	90.00	sqm	5,935.80	534,222.00

47	Providing and fixing acoustic wall panelling using magnesite/cement bonded wood-wool (pine wood fibre) panels, square edge, factory finished in natural/primer finish, of size 600 × 1200 mm and 20 mm thick, having density approximately 400 kg/m³, conforming to the following minimum performance requirements: •Fire performance: Class 1 for surface spread of flame when tested as per BS 476 Part 7. •Ignitability/fire performance complying with relevant provisions of BS 476. •Noise Reduction Coefficient (NRC): minimum 0.80.				
	•Sound Absorption Average (SAA): minimum 0.80. •Weighted sound absorption coefficient: minimum 0.90. •Thermal conductivity: not exceeding 0.075 W/mK. •Suitable for use at relative humidity up to 95% at 50°C without warping, delamination or deterioration. •Panels shall be resistant to termite and fungal attack and shall have low VOC emission and minimum 30% recycled content, supported by test				

	certificates from recognised/accredited laboratories. The panels shall be fixed over a complete GI framework system consisting of suitably sized horizontal/vertical channels,				
	battens, perimeter members, cleats, fasteners, screws and other accessories, fabricated from galvanized steel of minimum 0.45 mm thickness. The supporting framework shall generally be provided at maximum 600 mm centres, or at closer spacing as required by the panel manufacturer's structural requirements. Panels shall be securely screw-fixed to the framework, true to line, level and plumb, with joints properly aligned and short-edge joints staggered wherever required.				
	The system shall include 50 mm thick acoustic infill of polyester fibre or mineral wool, having density not less than 24 kg/m ³ for polyester fibre and 48 kg/m ³ for mineral wool, as applicable, with suitable fire-retardant properties, low VOC emission and resistance to moisture and fungal growth. The acoustic				

	infill shall be securely fixed behind the panels without gaps, sagging or displacement so as to achieve the specified acoustic performance of the complete wall-panelling system.				
	The rate shall include all panels, GI framework, perimeter members, acoustic infill, cleats, anchors, fasteners, screws, adhesives wherever required, cutting, wastage, forming necessary openings/cut-outs for electrical fittings, switches, sockets and other services, finishing around openings and junctions, and completing the wall panelling true to line, level and plumb, complete as per drawings, specifications and direction of Engineer-in-Charge.	355.00	sqm	5,935.80	2,107,209.00
48	Supplying, laying and finishing of 3mm thick Epoxy Flooring over the existing Cement concrete flooring with all suitable bonding coat complete of approved materials etc., as per direction of Engineer-in-charge.	25.00	sqm	1,340.50	33,513.00
49	Providing Fibre Mesh of 5mm square aperture and 145 GSM at the junction of two dissimilar surfaces like RCC and masonry with	35.00	sqm	58.15	2,035.00

	necessary Cement paste and fixing to the Wall surface with Cement mortar 1:1(1 cement: 1 fine sand) etc., complete at all levels and all height as per direction of engineer-in-charge.				
50	Credit for taking away the materials received from the dismantling. The material received shall be the property of contractor after dismantling duly weighed/measured before removing from the site all complete in the presence of Engineer-in-charge or his representative .				
50.1	Dismantled TMTbar/Stuctural steel	3,600.00	kg	-30.00	-108,000.00
51	Designing, fabricating, supplying, erecting and fixing structural steel formwork for 500 mm thick RCC roof slab at a height of 5.50 m above floor level, comprising 30 mm thick MS steel plates at the top and bottom of the 500 mm thick RCC slab. The 30 mm thick MS steel plates at the top and bottom shall remain permanently incorporated in the RCC slab.				
	The structural steel formwork shall be designed by the Agency through Structural Engineer to safely				

	withstand all applicable loads, including self-weight of the permanent steel plates and supporting steelwork, weight of fresh concrete, reinforcement, construction loads and other relevant loads during concreting, in accordance with the approved structural design, drawings and specifications. The structural design, analysis, detailing and preparation of design drawings for the formwork, including all necessary calculations and submission for approval, shall be entirely within the scope and responsibility of the Agency.				
	The work shall include cutting, straightening, edge preparation, drilling, welding, fabrication and fixing of steel girders/joists, stiffeners, ribs, cleats and other connection arrangements, lifting, handling, temporary supports, alignment, levelling, checking and fixing in position, including all labour, materials, tools, tackles, plant and equipment required for erection, dismantling and removal of temporary formwork, staging and supporting				

	arrangements. The item shall be complete in all respects as per the structural design, drawings and specifications prepared by the Agency through structural Engineer and duly approved by the Engineer-in-Charge.				
	Note: Payment shall be made based on the plan area of the RCC roof slab, measured in square metres (m ²). The quoted rate shall include the cost of formwork comprising all steel girders/joists, stiffeners, ribs, cleats, connection arrangements, temporary supports, staging, erection, dismantling, labour, materials, plant, tools and tackles, and all other incidental works required for complete execution of the item.	105.00	Sqm	3,692.33	387,695.00
	Total				22,278,475.00

Executive Engineer (Trichy) - I
CPWD, NIT Campus, Trichy - 620 015

SCHEDULE OF QUANTITIES FOR ELECTRICAL WORKS

Sl.No.	Description	Qty	Unit	Rate	Amount
1	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 volts, TPN MCCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 amps tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCB's (but without MCB's and incomer) as required . (Note : Vertical type MCCB TPDB is normally used where 3 phase outlets are required.)				
1.1	6 way Double Door	1	Each	21,742.00	21,742.00
2	Providing and fixing following rating and breaking capacity and pole MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required.				
2.1	125 A,36KA,FPMCCB	1	Each	10,632.00	10,632.00
3	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 volts, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				

3.1	8 way (4 + 24), Double door	2	Each	7,795.00	15,590.00
4	Supplying and fixing 40 Amps rating, four pole, 415 volts, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.	2	Each	1,290.00	2,580.00
5	Supplying and fixing 40 Amps rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current upto 300 milliamperes in the existing MCB DB complete with connections, testing and commissioning etc. as required.	2	Each	4,246.00	8,492.00
6	Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
6.1	Single pole	48	Each	351.00	16,848.00
6.2	Triple pole	6	Each	1,316.00	7,896.00
7	Supplying and drawing following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in the existing surface/recessed steel/PVC conduit/flexible GI conduits as required.				

7.1	3 x 1.5 sq. mm	300	Meter	128.00	38,400.00
7.2	3 x 4 sq. mm	300	Meter	273.00	81,900.00
8	Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess etc as required.				
8.1	1 or 2 Module (75mmX75mm)	3	Each	435.00	1,305.00
8.2	4 Module (125mmX75mm)	3	Each	493.00	1,479.00
8.3	6 Module (200mmX75mm)	3	Each	568.00	1,704.00
9	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
9.1	5/6 amps switch	15	Each	149.00	2,235.00
9.2	3 pin 5/6 amp socket outlet	6	Each	167.00	1,002.00
9.3	15/16 amp switch	3	Each	216.00	648.00
9.4	6 pin 15/16 amp socket outlet	3	Each	269.00	807.00
9.5	RJ 45 Socket outlet	3	Each	1,087.00	3,261.00
10	Supplying and fixing of following sizes of Hot dipped GI steel conduit along with accessories in surface/recess including painting in case of surface				

	conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
10.1	25 mm	600	Meter	355.00	213,000.00
11	Supplying and fixing of 20 mm dia PVC Coated G.I. flexible conduit of suitable length, complete with G.I. accessories, including providing connections etc. as required at site.	100	Meter	53.00	5,300.00
12	Supplying and making end termination with 20mm dia Flame proof brass compression gland and aluminium lugs for 3 x 1.5/4 sqmm for armoured fire survival cable etc as required.	80	Each	334.00	26,720.00
13	Supplying & Laying on wall surface following size one number XLPE insulated and PVC sheathed armoured copper conductor power cable of 1.1 KV grade conforming to IS 7098 (Part 1) 1988 as required.				
13.1	3 x 1.5 sq. mm	700	Meter	271.00	189,700.00
13.2	3 x 4 sq. mm	400	Meter	549.00	219,600.00
14	Design, fabrication, supply, installation testing and commissioning of outdoor MV panel board fabricated out of 2mm thick MS sheet steel, totally enclosed dust and vermin proof, suitable for operation on 3 phase 415 V, 4 wire AC supply system, having suitable cable entry arrangement with detachable gland plate, duly powder coated, including supply and fixing the following switch				

	gear, interconnection with suitable size din rail arrangement, aluminium strips / bars connections, earthing labelling etc with cable chamber, aluminium busbar chamber conforming to section 4 of CPWD specification for Electrical works Part - IV substation 2013 etc complete as required. (Panel II)				
	A. Incoming				
	a) 40 A, 4 pole Isolator- 1 Nos.				
	b) 40 A ,4 pole RCCB- 1 no				
	B. Outgoing				
	a) 6-32 Amps Single pole MCB-16 Nos				
	b) 40 Amps TPN MCB - 2 Nos				
	C) Danger notice plate-1 no	2	Job	52,212.00	104,424.00
15	SITC of industrial type 16 Amps flameproof rotary switch made of Cast Iron construction, complete with necessary accessories, internal wiring connections, earthing arrangement, complete as required at site.	20	Each	6,644.00	132,880.00
16	SITC of industrial type, 3 pin, 16 Amps flameproof socket outlet with plug top, made of Stainless Steel / Cast Iron/ Cast Aluminium Alloy construction, complete with necessary	5	Each	8,526.00	42,630.00

	accessories, internal wiring connections, earthing arrangement, complete as required at site.				
17	SITC of following sweep heavy duty flame proof exhaust fan with robust metallic body, copper wound flame proof motor suitable for continuous duty operation, complete with 3 nos. metal blades, 900 RPM, suitable capacitor, pre-lubricated double ball bearing, Class 'B' insulation, IP protection suitable for industrial application, single phase, 50 Hz AC supply, including providing and fixing of louver with frame, necessary wiring connections, fastening accessories, complete as required at site.				
17.1	450 mm sweep (tunnel area)	15	Each	24,363.00	365,445.00
17.2	380 mm sweep(firing area)	10	Each	22,148.00	221,480.00
18	SITC of flame proof wall mount fan 450 mm,1440 rpm,single phase,50 Hz AC supply, including providing and fixing of louver with frame, necessary wiring connections, fastening accessories, complete as required at site.	2	Each	29,900.00	59,800.00
19	Brush Less Direct Current (BLDC) Fan without Remote Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal(Aluminium alloy) blades,				

	30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, suitable for operation with regulator for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as req.				
19.1	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	6	Each	3,315.00	19,890.00
20	SITC of 60 Watt LED flameproof well glass fitting, suitable for installation inside rectangular recessed case, complete with necessary vibration proof mounting arrangement, fixing hardware, gasket/supports as required, making electrical connections, complete in all respects as required at site. (For shooting range, Tunnel, amunition store room)	30	Each	10,551.00	316,530.00
21	SITC of weather proof 40 W IP 66 LED batten fitting high efficiency diffuse cover, surface mounting, 1200 mm long , directly mounted on ceiling /wallwith system lumen output :4000, colour	15	Each	3,657.00	54,855.00

	temperature 5700 k burning hours > 5000 .(For corridor area and common rooms)				
22	LED Street light fixture, powder coated pressure die cast aluminium body (System lumen efficacy ≥ 105 <120 lm/Watt) Supplying, installation, Testing & Commissioning of Street light LED fixture powder coated pressure die cast aluminium body with driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -5 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%, THD < 10% as per IEC 61000-3-2, P. F. ≥ 0.95 , IP-66, IK-10, CRI ≥ 70 , under voltage and over voltage protection,				
	EMI-EMC As per CISPR -15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED, Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM- 21-11 report, CCT 3000°K/ 4000°K/ 5700°K/ 6500°K (As per ANS Bin), SDCM (Standard Deviation Colour Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c				

	external connections with 1.5 sq. mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥ 105 < 120 lm/Watt output.				
	LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				
22.1	72 watt	5	Each	2,362.00	11,810.00
23	Supply, Installation, Testing and Commissioning of Air Cooled HI Wall split type Air conditioners complete with Indoor unit (IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 3 Mtr (IDU to ODU), copper power cable upto 3.5 Mtr (IDU to ODU) i/c drain pipe R-32/R-410/ R-407 Green Refrigerant, wireless Remote control, suitable for working between 180-260V with low & high voltage cut off and 50 hz ,1 phase AC supply capable of performing cooling, dehumidification, air circulation of following capacity with Scroll /rotary compressor. The system shall be able to deliver 100% of the rated capacity upto 42				

	Degree Celsius. Min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB).				
	Must comply : Electrical cable IS694 or IS 9968 temperature sensing control IS/ International Electro technical Commission (IEC) 60730, hermetic compressor IS 10617, heat exchanger IS 11329, capacitor IS 2993 and motor IS 12615. Complete as per CPWD specification and IS :1391 Part II 2023. The system shall be able to operate up to 50 Degree C (out door ambient temperature). Inverter Type - Cooling only				
23.1	2.0 TR with 5 Star BEE Rating	1	Each	70,597.00	70,597.00
24	Dismantling of Old Light fittings, Exhaust fans, Old wiring, DB's, Cables etc at 100 tunnel building and stacking it in location as per the direction of engineer-in-charge etc as required.	1	job	6,316.00	6,316.00
	TOTAL				2,277,498.00

Executive Engineer (E&M) (Trichy)
CPWD, NIT Campus, Trichy - 620 015

FINANCIAL BID

SCHEDULE OF QUANTITIES					
FINANCIAL BID- PERCENTAGE RATE TENDER					
NIT No. 33/EE/TRICHY-I/08/NIT/SE (TRICHY)/CPWD/2026-27					
Name of Work: Renovation of roof & wall at target end of 100 m Tunnel Building in proof range at Ordnance Factory at Trichy.					
Name of the Contractor					
Sl. No	Name of component	Estimated cost (Rs.)	Percentage Above or Below the Estimated cost	Percentage in Figures	Total Cost
1	2	3	4	5	6
1	For items as per schedule of quantities for Civil and E&M works	2,45,55,973/-			
	Grand Total	2,45,55,973/-			
IMPORTANT NOTE:					
1	The Column No. 4 is mandatory and is to be filled by the bidders. If this column is left blank, the bid becomes invalid.				
2	The amount in figures in Column No. 6 shall appear automatically corresponding to the percentage quoted in Column No. 5.				
3	The bidder needs to quote the percentage only above or below or at par ECPT to cover the rate of all the items under the respective package.				
4	The percentage shall be quoted (written) upto 2 (two) places of decimal only.				
5	If the percentage selection in Column No. 4 is "At par", by default the percentage will be considered as "Zero" only.				
6	The amount for the payment of each item will be worked out as quantity executed & measured for that item multiplied by estimated rate of that particular item Plus or Minus tender percentage accepted for corresponding package.				
Signature of the Contractor			Executive Engineer (Trichy) - I, CPWD, NIT campus, Trichy -15.		