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Central Public Works Department

NIT NO: - 144/AE-IV/EE/MUMBAI-IV/2026-27

PART A

**ASSISTANT ENGINEER-IV, MUMBAI-IV
CENTRAL PUBLIC WORKS DEPARTMENT**

Press notice
CENTRAL PUBLIC WORKS DEPARTMENT
(166 YEARS OF Engineering Excellence)
NOTICE INVITING e-TENDERS

- **The Assistant Engineer-IV, Mumbai-IV, CPWD, Mumbai-37** invites on behalf of President of India on line percentage rate bids on **single bid system** from approved and eligible contractors of composite/building category of CPWD for the following work :

- **NIT NO:- 144/AE-IV/EE/MUMBAI-IV/2026-27**

Name of Work: - Repair and refixing of damaged paver block in sector I to IV, Antop Hill, Mumbai-37.

Estimated Cost	Rs. 5,46,193/-	
Earnest money	Rs. 10,924/-	
Time of completion	Two (02) Months	

Last time & date of submission of Bid at 05:00 P.M. **on 19-08-2026**

The tender forms and other details can be obtained from the website www.etender.cpwd.gov.in The Press Notice is also available on www.eprocure.gov.in

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

The Assistant Engineer-IV, Mumbai-IV, CPWD, 2nd floor, Nirman Sadan, Sector-1, Kane Nagar, Antop Hill, Mumbai-37 on behalf of the President of India invites online percentage rate bids on single bid system from approved and eligible contractors of composite/building category of CPWD for the following work:-

Sl. No	NIT No	Name of Work & location	Estimated cost put to bid	Earnest Money	Stipulated Period of Completion of work (in months)	Last date of online submission of bid, <i>Earnest Money Deposit Declaration</i> and other documents as specified in the bid document	Date and Time of opening of bid
1	144/AE-IV/EE/MUMBAI-IV/2026-27	Repair and refixing of damaged paver block in sector I to IV, Antop Hill, Mumbai-37.	Rs 5,46,193/-	Rs 10,924/-	Two (02) Months.	UPTO 05:00 P.M. on 19-08-2026	AT 05:30P.M. on 19-08-2026

1. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and 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 www.etender.cpwd.gov.in 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 Demand Draft or Pay order or Banker's Cheque or Deposit at call receipt or Fixed Deposit Receipts and Bank Guarantee of any Scheduled Bank towards EMD in favour of **Executive Engineer MCD-II, Mumbai** receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE/AE), CPWD and other documents as specified.
5. Those contractors not registered on the website mentioned above, are required to get registered beforehand. If needed they can be imparted training on online bidding process as per details available on the website.
6. The intending bidder must have valid class-III digital signature to submit the bid.
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 prescribed column(s) meant for quoting rate in figures appears in pink colour and the moment rate is entered, it turns sky blue.

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

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

10. SC/ST contractors enlisted under class V category are exempted from processing fee payable to ITI limited.

11. **List of Documents to be scanned and uploaded within the period of tender submission:**

- i. Treasury Challan/Demand Draft/Pay order or Banker`s Cheque/Deposit at Call Receipt/FDR/ Bank Guarantee of any Scheduled Bank against EMD.
- ii. Enlistment Order of the Contractor.
- iii. 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 an undertaking on his letter head as below:-
"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."
- iv. ~~Valid electrical license or an undertaking that "I/we will either obtain valid electrical license at the time of execution of electrical work or associate contractors having valid electrical license of eligible class."~~
- v. Copy of receipt for deposition of original EMD to division office or any Assistant Engineer (including NIT issuing AE), CPWD.
- vi. Contractor is required to submit ERP (Enterprise Resource Planning) Training-Certificate (As per DG/Enlist Rules-2023/10 dated 22.04.2024) in the name of the-proprietor / agency / authorized representative issued from CPWD Regional Training-Institute / Competent Authority of CPWD

**NOTICE INVITING TENDER
GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT
CPWD-6 FOR E-TENDERING**

1. Percentage rate tenders are invited on behalf of President of India from approved and eligible contractors of CPWD for the following work:

Name of Work: Repair of Bathroom and W.C. tiles of quarter of urgent nature for sector-I to IV, Antop Hill, Mumbai-37.

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

1.1 The work is estimated to cost Rs. 5,46,193/-

This estimate, however, is given merely as a rough guide.

2. Agreement shall be drawn with the successful tenderer on prescribed Form No. **CPWD 7** (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 **Two (02) Months** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
4. (i) The site for the work is available.

(ii) ~~The architectural and structural drawings shall be made available~~
or
~~The architectural and structural drawings shall be made available in phased manner, as per requirement of the same as per approved programme of completion submitted by the contractor after award of work.~~
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 from the web Site www.etender.cpwd.gov.in free of cost.
6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of tender as notified.
7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the components) but before last time and date of submission of tender as notified.

8. When bids 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 bid submitted earlier shall become invalid.
9. Earnest Money in the form of Treasury challan or Demand draft or pay order or Bankers cheque or Deposit at call receipt or fixed deposit Receipt(drawn in favour of Executive Engineer MCD-II, CPWD, Mumbai shall be scanned and uploaded to 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 prescribes format (enclosed) uploaded by tender inviting EE in the NIT.

The receipt shall also be uploaded to the e tendering website by the intending bidder upto the specified bid submission date and time.

A part of earnest money is acceptable in the form of bank guarantee .In such case, minimum 50% of earnest money or Rs 20 lakh, whichever is less, shall have to be deposited in shape prescribed above and balance may be deposited in shape of bank Guarantee of any schedule bank having validity of 90 days or more the last date of receipt of bids/tenders which is to be scanned and uploaded by the intending bidders/tenders.

Copy of Enlistment Order and Certificate of work experience and other documents as specified in the press notice / bid document shall be scanned and uploaded to the e-tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in press notice / bid document shall have to be submitted by the lowest bidder only along with Earnest Money Deposit within a week physically in the office of tender opening authority.

Online bid documents submitted by intending bidders shall be opened only of those bidders, whose Earnest Money Deposit and other documents scanned and uploaded are found in order.

The bid submitted shall be opened at 05:30PM on 19-08-2026

10. The bid submitted shall become invalid and e-Tender processing fee shall not be refunded if:
 - (i) The bidder is found ineligible
 - (ii) The bidder does not upload scanned copies of all the documents (including Certificate of Registration for GST/Provisional registration for GST/ Acknowledgement for filing of application for registration of GST) as stipulated in the bid document including Earnest Money Deposit and copy of receipt for deposition of original EMD instrument.
 - (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 does not quote any percentage above/below on the total amount of the tender or any section/subhead in percentage rate tender,

the tender shall be treated as invalid and will not be considered as lowest tender.

11. *The contractor whose bid is accepted will be required to furnish performance guarantee of 5% (Five Percent) of the bid amount within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10000/-) or Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/ demand Draft of any scheduled bank/Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India 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 contractor shall be suspended for one year and shall not be eligible to bid for CPWD tender from date of issue of suspension order. (As per OM NO. DG/CON/Misc./13 dt.23.11.2020)*

The contractor whose bid is accepted will also be required to furnish either copy of applicable license / registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code number if applicable and also ensure the compliance of aforesaid provisions by the sub-contractor if any engaged by the contractor for the said work within the period specified in Schedule 'F'.

12. The description of the work is as follows:

Repair and refixing of damaged paver block in sector I to IV, Antop Hill, Mumbai-37.

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 bidder 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 bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidder shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
15. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
16. The contractor shall not be permitted to bid for works in the CPWD Circle (Division in case of contractors of Horticulture / Nursery category) responsible for award and execution of contracts, in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of 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 gazetted officer in the Central Public Works Department or in the Ministry of Urban Development. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
17. No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as afore said before submission of the tender or engagement in the contractor's service.
18. The bids for the work shall remain open for acceptance for a period of **30 (thirty) days** from the date of opening of bids in case of single bid system and 75 (seventy five) days from the date of opening of technical bids in case bids are invited in 2 or 3 bid system. Further
 - i) *If any bidder withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier or make any modification in the terms and condition of the bid which is not acceptable to the department within 7 days after last date of submission of bids, then the government shall without prejudice to any other right or remedy, be at liberty to forfeit 50% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.*
 - ii) *If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department after expiry date of 7 days of to last date of submission of bids, then the Govt 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 issued or not.

iii) In case of forfeiture of earnest money as prescribed in para (i) and (ii) above the bidders shall not be allowed to participate in the rebidding process of the same work.

19. This notice inviting bid shall form a part of the contract document. The successful bidder /contractor, on acceptance of his bid by the Accepting Authority shall within 7 days from the stipulated date of start of the work, sign the contract consisting of:-

- a) The Notice Inviting bid, all the documents including additional conditions, specifications and drawings, if any, forming 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.
- b) Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as applicable.

Prescribed format of receipt of Original receipt of deposition of original EMD

Receipt of Original receipt of deposition of original EMD (Receipt NO _____ Date _____)

1. Name of work: Repair and refixing of damaged paver block in sector I to IV, Antop Hill, Mumbai-37.

2.NIT NO:- 144/AE-IV/EE/MUMBAI-IV/2026-27

3 Estimate cost: - Rs. 5,46,193/-

4. Amount of Earnest Money Deposit: - Rs. 10,924/-

5. Last date of submission of bid. 19-08-2026.

Receipt of deposition of original EMD (Receipt No. _____ Date _____)

1. Name of contractor : _____

2. Form of EMD : _____

3. Amount of EMD Rs. _____

4. Date of submission of EMD: _____

Signature ,Name and designation of EMD
receiving officer (EE/AE(P)/AAO)along with office stamp

On non-judicial stamp paper on minimum Rs.100/-

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

**Form of Bank Guarantee for Earnest Money Deposit/ Performance
Guarantee/ Security Deposit/ Mobilization Advance**

1. Whereas the Executive Engineer.....(name of division).....CPWD on behalf of the President of India (hereinafter called "The Government") has entered into an agreement bearing number.....with(name and address of the contractor).....(hereinafter called "the Contractor") for execution of work(name of work) The Government has further agreed to accept an irrevocable Bank Guarantee for Rs.....(Rupees..... Only) valid upto(date)..... as **performance Guarantee / Security Deposit / Mobilization Advance** from the said Contractor for compliance of his obligations in accordance with the terms and conditions of the agreement.
1. We,(indicate the name of the bank).....(herein after referred to as "the Bank"), hereby undertake to pay to the Government a amount not exceeding Rs. (Rupees.....only) on demand by the Government within 10 days of the demand.
2. 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)
3. 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.
4. 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.

5. 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.
6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
7. We,(indicate the name of the Bank), undertake not to revoke this guarantee except with the consent of the Government in writing.
8. This Bank Guarantee shall be valid up tounless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees.....only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date

Witnesses:

- | | | |
|----|------------------|--|
| 1. | Signature | Authorized signatory |
| | Name and address | Name
Designation
Staff code no.
Bank seal |
| 2. | Signature | |
| | Name and address | |

CPWD-7

**GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT**

State: Maharashtra
Branch: B & R
ZONE: --

Division: Mumbai IV
Sub Division: IV

PERCENTAGE RATE TENDER & CONTRACT FOR WORKS

Tender for the work of: Repair and refixing of damaged paver block in sector I to IV, Antop Hill, Mumbai-37.

To be submitted by/uploaded by **05:00** p.m. on **19-08-2026** at www.etender.cpwd.gov.in

- (i) To be opened in presence of tenderers who may be present at **05:30** p.m. on **19-08-2026** in the office of Assistant Engineer-IV, Mumbai IV, CPWD, Mumbai-37.

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 opening in case of single bid system / seventy five (75) days from the date of opening of Technical BID incase tenders are invited on 2/3 bid system for specialized work and not to make any modification in its terms and conditions.

A sum of Rs. 10,924/- is hereby forwarded in cash/receipt treasury challan /deposit at call receipt of schedule bond /fixed deposit receipt of schedule bank demand draft of scheduled bank and bank guarantee issued by a scheduled as earnest money .A copy of earnest money in receipt treasury challan /deposit at call receipt of scheduled bank/fixed deposit receipt of scheduled/demand draft of of a scheduled bank/bank guarantee issued by schedule bank is scanned and uploaded.

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 the 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 or 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 there from 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.....	X	Signature of Contractor.....	X
Witness:-	X	Postal Address:-	X
Address:-	X		
Occupation:-	X		
Telephone No.....	X	Fax:-	X
		E-Mail:-	X

X To be filled by contractor.

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).....*

For & on behalf of the President of India

Signature.....

Designation.....

Dated:

PROFORMA OF SCHEDULES (FOR CIVIL COMPONENT)**SCHEDULE "A"**

Schedule of quantities for Civil Works as per attached pages	:	Page: 64 to 65
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SCHEDULE 'D'

Extra schedule for specific requirement/ document for the work, if any	:	Enclosed
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SCHEDULE 'E'

Reference to General Conditions of contract.	:	General Conditions of Contract 2023 Maintenance works with amendments issued upto last date of receipt of tender
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Name of Work: - **Repair and refixing of damaged paver block in sector I to IV, Antop Hill, Mumbai-37.**

Estimated cost of work	:	Rs. 5,46,193/-
Earnest money	:	Rs. 10,924/-
Performance Guarantee	:	5% of tendered value
Security Deposit	:	2.5% of tendered amount Or 2.5% of tendered value plus 50% of PG for contracts involving maintenance of the building and services/ other work after construction of same building and services/ other work.

SCHEDULE "F" (GENERAL RULES & DIRECTIONS)

Officer inviting tender	:	Assistant Engineer-IV, Mumbai-IV, CPWD, Mumbai-400 037.
Maximum percentage for quantity of items of work to be executed beyond	:	See below

which rates are to be determined in accordance with Clauses 12.2 & 12.3	
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Definitions:

2(vi)	Engineer-in-Charge	Assistant Engineer-IV, Mumbai-IV, CPWD, Mumbai-400 037 or successor thereof (for Civil component)
2(vii)	Director General/ CPWD Directorate	CPWD Directorate includes Director General/Special Director General/ Additional Director General/CPM/CA/ Chief Engineer/CE-ED/PM/SE/SE-PD/ Director (Horticulture)
	Successor	Any authority as notified by the CPWD Directorate before, during and after execution of work/ agreement.
2(viii)	Accepting Authority	Authority as decided by CPWD
2(x)	Percentage rate on cost of materials and labour to cover all overheads and profits.	15%
2(x)	Standard Schedule of Rates	DSR 2023
2(xi)	Department	Central Public Works Department (CPWD)
9(ii)	Standard CPWD Contract forms GCC 2023, CPWD Form 7 /8 as modified & corrected upto	As mentioned in schedule E

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 thereof from the date of issue of letter of acceptance	7 (Seven) days
(ii)	Maximum allowable extension with late fee @0.1% per day of Performance Guarantee amount beyond the period provided in (i) above	3 (Three) days

Clause 2

Authority for fixing compensation under	:	Chief Engineer or any other Authority
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clause 2	as decided by CPWD Directorate
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Clause 2A

Whether Clause 2A shall be applicable	:	No
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Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start	:	7 (Seven) days from Letter of award or date of handing over of site whichever is later
---	---	--

Mile stone(s) as per Table given below:

S. No.	Description of Milestone (Physical)	Time allowed in days (from date of start)	Amount to be with-held in case of non-achievement of Milestone.
1	1/8 th (of the whole work)	1/4 th (of the whole work)	In the event of not achieving the necessary progress as assessed from the running payment 1.25% of the tender value of work will be withheld for failure of each mile stone.
2	3/8 th (of the whole work)	1/2 th (of the whole work)	
3	3/4 th (of the whole work)	3/4 th (of the whole work)	
4	Full	Full	

Authority to decide:		
(i)	Extension of time	: Chief Engineer or any other Authority as decided by CPWD Directorate
(ii)	Rescheduling of mile stones	: Chief Engineer or any other Authority as decided by CPWD Directorate
(iii)	Shifting of date of start in case of delay in handing over of site	: Chief Engineer or any other Authority as decided by CPWD Directorate

PROFORMA OF SCHEDULES Clause 5 schedule of handing over of site.

Part	Portion of site	Description	Time period for handing over reckoned from date of issue of letter of intent.
Part A	Portion without any hindrance	Full site for the work is available	
Part B	Portions with encumbrances		
Part C	Portions dependent on work of other agencies		

Clause 5

Applicable Clause 5/ Clause 5A	:	Clause 5A
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Clause 5.4**Schedule of rate of recovery for delay in submission of the modified programme in terms of delay days**

Sl. No.	Contract Value	Recovery Rs.
i	Less than or equal to Rs.1 Crore	500
ii	More than Rs.1 Crore but less than or equal to Rs.5 Crore	1000
Iii	More than Rs.5 Crore but less than or equal to Rs.20 Crores	2500
iv	More than Rs.20 Crores	5000

Clause 7

Gross work to be done together with net Payment/ adjustment of advances for Material collected, if any, since the last such payment for being eligible to Interim payment.	:	Rs. 5 Lakhs for Civil work and part thereof as per discretion of Engineer-in-Charge
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Clause 7A

Whether Clause 7A shall be applicable	:	Yes No running account bill shall be paid for the work till the applicable labour licenses, registration with EPFO. ESIC and BOCW welfare board, whatever applicable are submitted by the contractor to the Engineer-in-charge.
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Clause 10 A

List of testing equipment to be provided by the contractor at site lab	:	As per Annexure-I attached
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Clause 10B(ii)

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

Component of labour expressed as percent of value of work	:	25% (percentage of labour component shall be calculated on 85% of the value of work done during the period under consideration).
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Clause 10CC

Applicable / Not Applicable	:	Not Applicable
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Clause – 11

Specifications to be followed for execution of work	:	CPWD Specifications 2019 volume- I & II with up to date corrections slips
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Clause 12

Authority to decide deviation beyond	:	Chief Engineer or any other Authority
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1.25 times upto 1.5 times of tender amount	as decided by CPWD Directorate
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12.2 & 12.3	Deviation limit beyond which clauses 12.2 & 12.3 shall apply for building work	No limit
12.5	i) Deviation limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except items mentioned in earthwork sub head in DSR & related items) ii) Deviation Limit for items mentioned in earth work subhead of DSR or related items	No limit

Clause 16

Competent Authority for deciding reduced rates.	:	Chief Engineer or any other Authority as decided by CPWD Directorate
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Clause 18

List of mandatory machinery, tools & plants to be deployed by the contractor at site	:	As per Annexure-II attached
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Clause 19 C, 19 D, 19 G, and 19 K

Authority to decide penalty for each default	:	Chief Engineer or any other Authority as decided by CPWD Directorate
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Clause 25

Constitution of Dispute Redressal Committee:

Constitution	For all Claims
Conciliator	Special Director General, Mumbai, CPWD
Arbitrator Appointing Authority	Chief Engineer (Mumbai-II), CPWD, Mumbai or his successor
Place of Arbitration	Mumbai or as decided by Learner Arbitrator and the parties.

Clause 32

Requirement of technical representative & recovery rate

Sr. No.	Qualification	Number (of Major + Minor Component)	Minimum Experience in years	Designation	Rate of which recovery shall be made from the contractor in the event of not fulfilling
1	Graduate Engineer Or Diploma Engineer	1	2 years or 5 years respectively	Project Manager cum planning/ quality/Site/ Billing Engineer	Rs.15,000/- Per month per person

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

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

Clause 38

(i)	(a)	Schedule /statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates	DSR 2023
(ii)	(ii)	Variations permissible on theoretical quantities:	
	(a)	Cement	
	i	For works with estimated cost put to tender not more than Rs. 25 lakh	3% (Three percent) plus / minus
	ii	For works with estimated cost put to tender more than Rs. 25 lakh	2% (Two percent) plus / minus
	(b)	Bitumen for all works	2.5% (Two point five percent) plus only and nil on minus side
	(c)	Steel Reinforcement and structural steel sections for each diameter, section and category	2% (Two percent) plus/minus
	(d)	All other materials	Nil

ANNEXURE –I**Equipments for Testing of Materials & Concrete at Site Laboratory**

Equipments for conducting necessary tests shall be provided and installed at site in the well-furnished site laboratory by the agency at his own cost. The following list is only indicative and not exhaustive. The Bidder may be required to deploy more T & P as per requirement of work. Nothing extra shall be payable.

Sl. No	Equipment	Numbers (Minimum)
1	Balances – i) 7 kg to 10 kg capacity semi-self indicating type – accuracy 10 gram. ii) 500 Gram capacity semi-self indicating type – accuracy 1 gram iii) Pan balance -5 kg capacity – accuracy 10 grams	1
2	Ovens- electrically operated Thermostatically controlled upto 110 degree C – Sensitivity 1 degree	1
3	Sieves as per IS 460-1962 i) I.S. sieves - 450mm internal dia of sizes [100mm, 80mm, 63mm, 50mm, 40mm, 25mm, 20mm, 12.5mm, 10mm, 6.3mm, 4.75mm complete with lid and pan] ii) I.S. Sieves - 200mm internal dia (brass frame) consisting of 2.36mm, 1.18mm, 600 microns, 425 microns, 300 microns, 212 microns, & 150 micron, 90 microns, 75microns, with lid and pan]	1 1
4	Sieve shaker capable of 200mm and 300mm dia sieves, manually operated with timing switch assembly	1
5	Equipment for slump test-Slump cone, steel plate, tamping rod, steel scale, scoop.	2
6	Dial gauges 25mm travel- 0.01 mm/division least count – 2 nos.	1
7	100 tonnes compression testing machine, electrical-cum-manually operated	1
8	Graduated measuring cylinders 200 ML capacity	3
9	Enamel trays (for efflorescence test for bricks) i) 300 mm x 250mm x 40mm ii) Circular plate of 250mm dia	2 4
10	Slump cone, steel plate, tamping rod, steel scale, scoop	1 (each)

11	Pumps and pressure gauges for hydraulic testing of pipes	1
12	Cube moulds size 70mmx70mmx70mm	6
13	Cube moulds size 150mmx150mmx150mm	20
14	Dial gauge, 25 mm dial-0.01mm/ division least count	2
15	Spatula 100mm & 200mm with long blade wooden handle	1 each
16	Vernier calipers 12" & 6" sizes	1 each
17	Digital Micrometer least count 0.01mm	1
18	Digital paint thickness meter for steel 500 micron range	-
19	GI tray 600x450x50mm, 450x300x40mm, 300x250x40mm	2 each
20	Electric Motor mixer 0.25 cum capacity	-
21	Screw gauge 0.1mm-10mm, least count 0.05	1
22	Pruning Rods 2 Kg weight length 40 cm and ramming face 25 mm ²	2
23	Extra Bottom plates for 15 cm cube mould	10
24	Iron Weight of 5 kg, 2 kg, 1 kg, 500 gm, 200 gm, 100 gm	1 each
25	Brass Weight of 50 gm, 20 gm, 10 gm, 5 gm, 2 gm, 1 gm	1 each
26	Measuring cylinder TPX or Poly propylene capacity 100 ml, 500ml, 250 ml	1 each
27	Wash Bottles capacity 500 ml	3
28	Hammer 1lb & 2lb	2 each
29	Hacksaw with 6 blades	2
30	Plastic or G.I. Buckets 15 ltr, 10 ltr, 5 ltr	1 each
31	Wheel Barrow	3
32	Any other equipment for site tests as outlined in BIS codes and as directed by the Engineer-in-charge.	1
33	Steel tape a) 30 Mtrs b) 3 Mtrs	1 2
34	Wire gauge (circular type) disc	1
35	Foot Rule	1
36	Long Nylon Thread	1
37	Rebound hammer for testing concrete	1
38	Dynamic penetrometer	1
39	Magnifying glass	1

40	Screw driver 30 cms long	1
41	Ball pin Hammer 100 gms	1
42	Plastic bags for taking samples	1 Packet
43	Moister meter for timber	1
44	A good quality plumb bob	1
45	Spirit level, minimum 30 cms long with 3 bubbles for horizontal/ vertical	1
46	Hydrometer	1

ANNEXURE-II**Plant & Equipment required be owning / taking on lease by the Contractor**

All the plants & machinery mentioned below are to be deployed as and when required or as directed by Engineer-in-Charge. The below list is only indicative and not exhaustive. The Bidder may be required to deploy more plants & machinery as per requirement of work. Nothing extra shall be payable.

Sl. No.	Equipment	Number (Minimum)
1	Tower Crane upto 40 m boom length and of required capacity	-
2	Hoist Lift	-
3	Excavator cum loader (JCB 3D model or equivalent).	-
4	Needle Vibrators.	1
5	Plate Vibrators.	1
6	Dumper. (As & when required)	1
7	Reinforcement bending machine.	1
8	Reinforcement cutting machine.	1
9	Power driven earth rammer (Soil compactor).	-
10	Total station.	-
11	Auto level & staff.	-
12	Welding machine 400 Ampere	1
13	Screener for coarse sand and fine sand	1
14	Centrifugal mono block water pump minimum capacity 2 HP	1
15	Any other machinery required for completion of the work as per decision of Engineer-in-charge.	As per Actual requirement

Central Public Works Department

NIT NO: -144/AE-IV/EE/MUMBAI-IV/2026-27

PART B

CIVIL

**O/O ASSISTANT ENGINEER-IV, MUMBAI-IV
CENTRAL PUBLIC WORKS DEPARTMENT**

ADDITIONAL CONDITIONS FOR CIVIL WORK

1.0 GENERAL

- 1.1 Except for the items, for which particular specifications are given or where it is specifically mentioned otherwise in the description of the items, the work shall generally be carried out in accordance with the "CPWD Specifications with upto date corrections slips. Wherever CPWD Specifications are silent, the latest IS Codes/Specifications, NBC 2016 guidelines, MORTH specification or any other specification as approved by Engineer- in- charge shall be followed.

The order of precedence in case of any confusion/dispute will be as follows :

- a. Description of item in schedule of quantities
 - b. Particular Specifications
 - c. Special Conditions
 - d. Additional conditions
 - e. CPWD Specifications with upto-date correction slips.
 - f. Relevant Indian Standard specifications of B.I.S.
 - g. Directions of Engineer-in-charge shall be applicable where none of the above is to be applied.
- 1.2 The work shall be carried out in accordance with the Architectural drawings and structural drawings, to be issued from time to time, by the Engineer-in-Charge. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work and satisfy himself that the information available there from is complete and unambiguous. The discrepancy, if any, shall be brought to the notice of the Engineer-In-Charge before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and or incomplete information.
- 1.3 Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor, at his own expense, for which nothing is payable. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.
- 1.4 The contractor shall be responsible for the watch and ward / guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.
- 1.5 ~~The entire work up to the plinth level, as required for obtaining approval of the plinth from the local authority, shall be completed by the Contractor at the same time. Work above plinth shall be allowed to be carried out only after obtaining approval from the local body. No delay shall be allowed on this ground and also no claim whatsoever on account of any delay in approval at plinth level by the local body shall be entertained from the Contractor. Nothing extra shall be payable on this account.~~

- 1.6 The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, preparatory works, working during monsoon, working at all depths, height, lead, lift and location etc. and any other incidental works required to complete this work. Nothing extra shall be payable on this account.
- 1.7 For works below ground level the contractor shall keep that area free from water. If dewatering or bailing out of water is required the contractor shall do it and nothing extra shall be paid except otherwise provided in the items of schedule of quantities.
- 1.8 ~~Results of sub surface investigations conducted at site are indicated in extracts of the report attached. This information about the soil and sub soil water conditions is being made available to the Contractor, in good faith, for guidance only and the Contractor is advised to obtain details directly as may be considered necessary by him before quoting rates in the tender. No claim whatsoever on account of any discrepancy between the sub surface strata conditions that may be actually encountered at the time of execution of the work and those given in these tender documents, in accuracy or interpretation thereof shall be entertained from the Contractor under any circumstances. The ground water table is a variable condition and the information given in the report is only indicative and it may vary from time to time.~~
- 1.9 Any legal or financial implications resulting out of disposal of earth shall be sole responsibility of the contractor. Nothing extra over the schedule shall be paid on this account.
- 1.10 The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by local body and any other statutory bodies shall be adhered by the contractor, during the execution of work. The Contractor shall also adhere to all traffic restrictions notified by the local authorities.
- 1.11 The cost of water for construction and labours (for municipal water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for the drinking purposes from the municipal authorities or any other statutory body, the consequent charges shall be borne by the contractor. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and/ or any other charges) payable to such authorities for carrying out the work, shall be borne by the Contractor.
- 1.12 The Contractor shall arrange to give all notices as required by any statutory / regulatory authority for labour licenses, registration with EPFO, ESIC and BOCW Welfare Board etc. and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the Department and its officials & employees against any claim and/ or liability arising out of violations of any such laws, ordinances, orders, decrees, by

himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts.

- 1.13 The statutory payments or fees payable to Government/ Local Body for obtaining the various permissions/ all Approvals, ETA clearance, commencement certificate, CFO approvals, tree cutting authority, plinth level approval, all permanent civil and E & M service connections and Occupancy Certificate for the building shall be reimbursed to the Contractor by CPWD. The contractor shall obtain written prior permission from the Engineer in charge before making any payments.
- 1.14 Royalty at the prevalent rates shall be paid by the Contractor or the RMC supplier as per the terms of supply between them on all materials such as boulders, metals, sand and bajri etc. collected by him for the execution of the work, directly to the revenue authority of the state government concerned. Nothing extra shall be payable on this account.
- 1.15 The Contractor shall conduct his work so as not to interfere with or hinder the progress of the work being performed by other Contractors or by the Engineer-in-Charge. As far as possible, he shall arrange his work and place, so as not to interfere with the operations of other Contractors or shall arrange his work with that of the others, in an acceptable and coordinated manner and shall perform it in proper sequence
- 1.16 The Contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the Department from any and all damages and claims that may arise on any account. The Contractor shall indemnify the Department against all claims in respect of patent rights, royalties, design, trademarks of name or other protected rights, damages to adjacent buildings, roads or members of public, in course of execution of work or any other reasons whatsoever, and shall himself defend all actions arising from such claims and shall indemnify the Department in all respect from such actions, costs and expenses. Nothing extra shall be payable on this account.
- 1.17 The Contractor shall make all necessary arrangements for protecting from rains, the work already executed and for carrying out the further work, during monsoon including providing and fixing temporary shelters, protections etc. Nothing extra shall be payable on this account. Also, no claims for hindrance shall be entertained on this account.
- 1.18 The Contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupants of the property, adjacent properties and to the public in general. The Contractor shall take all care, as not to damage any other adjacent property or other services running adjacent to the plot. If any damage is done, the same shall be made good by the Contractor at his own cost and to the entire satisfaction of the Engineer-in-Charge. The Contractor shall use such methodology and equipments for execution of the work, so as to cause minimum environmental pollution of any kind during construction, to have minimum construction time and minimum inconvenience to road users and to the occupants of the buildings on the adjacent plot and public in general, etc. He shall make good at his own cost and to the entire satisfaction of the Engineer in Charge any damage to roads, paths,

cross drainage works or public or private property whatsoever caused, due to the execution of the work or by traffic brought thereon, by the Contractor. Further, the Contractor shall take all precautions to prevent any pollution of streams and waterways. All waste or superfluous materials shall be carted away by the Contractor, entirely to the satisfaction of the Engineer-in-Charge. Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the occupants / users of adjoining buildings. No claim whatsoever on account of site constraints mentioned above or any other site constraints not specifically stated here, shall be entertained from the Contractor. Therefore, the Contractors are advised to visit site and get first hand information of site constraints. Accordingly, they should quote their tenders. Nothing extra shall be payable on this account.

- 1.19 The Contractor shall make his own arrangements to provide such accommodation as per the rules of the local bodies. He shall make his own arrangements for stores, field office etc. Before tendering, he shall visit the site and assess the manner in which he is able to arrange the above facilities. The Engineer-in-Charge shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained. Nothing extra shall be payable on this account.
- 1.20 All ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, protection works, testing facilities / laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts.
- 1.21 The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc under various labour laws and other regulations applicable to the works, at his site office.
- 1.22 No tools and plants including any special T&P etc. shall be supplied by the Department and the Contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.

The Contractor shall cooperate with and provide the facilities to the sub-Contractors and other agencies working at site for smooth execution of the work. The Contractor shall

- (a) Properly co-ordinate their work with the work of other Contractors.
- (b) Provide control lines and benchmarks to his Sub-Contractors and the other Contractors.
- (c) Provide electricity and water at mutually agreed rates.

- (d) Co-ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.
- (e) Adjust work schedule and site activities in consultation with the Engineer-in-Charge and other Contractors to suit the overall schedule completion.
- (f) Resolve the disputes with other Contractor amicably and the Engineer-in-Charge shall not be made intermediary or arbitrator. The contractor shall indemnify the Department against any claim(s) arising out of such disputes.

1.23 On completion of work, the contractor shall submit four prints of "as built" drawings to the Engineer-In-Charge. These drawings shall have the following information:

- a) Run off for all piping and their diameters including soil, waste pipes and vertical stacks.
- b) Ground and invert level of all drainage pipes together with locations of all manholes and connections, up to outfall.
- c) Run off for all water supply lines with diameters location of control valves, access panels etc.

The security deposit shall not be released to the contractor until the aforesaid drawings are submitted to the Engineer-in-Charge.

1.24 Malaba obtained from dismantlement is to be disposed off at approved dumping ground of the local body/ Municipal Corporation and receipt of the same is to be produced as documentary evidence. Nothing extra shall be paid on this account.

2.0 PROGRAM /SCHEDULE

2.1 For completing the work in time, the Contractor might be required to work in two or more shifts (including night shifts). No claim whatsoever shall be entertained on this account, not with-standing the fact that the Contractor may have to pay extra amounts for any reason, to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the Contractor with them.

2.2 The work should be planned in a systematic manner so as to ensure proper co-ordination of various disciplines viz. sanitary & water supply, electrical, fire fighting and any other services.

2.3 Other agencies will also simultaneously execute and install the sub-works in the main work and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings trenches etc. as may be required for such related works (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be supplied free of cost by the department unless otherwise specifically mentioned) and the contractor shall fix the same at time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

- 2.4 The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-In-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and in a proper co-ordination manner and shall perform it in proper sequence to the complete satisfaction of others.
- 2.5 The Contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the plot so as to achieve early completion. The agency may deploy adequate equipment, machinery and labour as required for the completion of the entire work within the stipulated period specified. Also ancillary facilities shall be provided commensurate with requirement to complete the entire work within the stipulated period. Nothing extra shall be payable on this account. Adequate number/sets of equipment in working condition, along with adequate stand-by arrangements, shall be deployed during entire construction period. It shall be ensured by the Contractor that all the equipment, Tools & Plants, machineries etc. provided by him are maintained in proper working conditions at all times during the progress of the work and till the completion of the work.
- 2.6 To avoid delay, contractor should submit samples as stated above well in advance so as to give timely orders for procurement.
- 2.7 All material shall only be brought at site as per program finalized with the Engineer-in-Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.
- 3.0 QUALITY ASSURANCE
- 3.1 Contractor shall have to engage well-experienced skilled labour and deploy modern T&P and other equipment to execute the work. Many items like structural glazing, other specialized flooring work, Polysulphide sealant & other chemical treatment will specially require engagement of skilled workers having experience particularly in execution of such items.
- 3.2 The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/ work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-charge & contractor shall be bound to replace / remove such sub-standard / defective work immediately. If any material, even though approved by Engineer-In-Charge is found defective or not conforming to specifications shall be replaced/ removed by the contractor at his own risk & cost.
- 3.3 The Contractor shall submit, immediately after the award of work, a detailed and complete method statement for the execution, testing and Quality Assurance, of such items of works, as directed by the Engineer-in-Charge. All the materials to be used in the work, to give the finished work complete in all respects, shall comply with the requirements of the specifications and shall pass all the tests required as per specifications as applicable or such specifications / standards as directed by the Engineer-in-Charge. However, keeping the Quality Assurance in mind, the Contractor shall submit, on request

from the Engineer-in-Charge, his own Quality Assurance procedures for basic materials and such items, to be followed during the execution of the work, for approval of the Engineer-in-Charge.

- 3.4 All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-charge which shall be preserved till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-In-Charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per suggested list of brand names given in the tender document / particular specifications for approval of Engineer-In-Charge. For all other items, materials and fittings of ISI Marked shall be used with the approval of Engineer-In-Charge. Wherever ISI Marked material/ fittings are not available, the contractor shall submit samples of materials/ fittings manufactured by firms of repute conforming to relevant specifications or IS codes and use the same only after getting the approval of Engineer-In-Charge.
- 3.5 The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the list attached with the tender documents, as per the item description and particular specifications for the work. The equivalent brand for any item shall be permitted to be used in the work, only when the specified make is not available. This is, however, subject to documentary evidence produced by the contractor for non availability of the brand specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, the decision of Engineer-in-Charge as regards equivalent make of the material shall be final and binding on the Contractor. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Nothing extra shall be payable on this account. Also, the material shall be procured only after written approval of the Engineer-in-Charge.
- 3.6 All materials whether obtained from Govt. stores or otherwise shall be got checked by the Engineer-in-Charge or his authorized supervisory staff on receipt of the same at site before use.
- 3.7 The tests, as necessary, shall be conducted in the laboratory approved by the Engineer-in-Charge. The samples shall be taken for carrying out all or any of the tests stipulated in the particular specifications and as directed by the Engineer-in-Charge or his authorized representative.
- 3.8 The Contractor shall at his own risk and cost make all arrangements and shall provide all such facilities including material and labour, the Engineer-in-Charge may require for collecting, preparing, forwarding the required number of samples for testing as per the frequency of test stipulated in the contract specifications or as considered necessary by the Engineer-in-Charge, at such time and to such places, as directed by the Engineer-in-Charge. Nothing extra shall be payable for the above.
- 3.9 The Contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case he or his authorized representative is not present or does not associate him, the result of

such tests and consequences thereon shall be binding on the Contractor .The Contractor or his authorized representative shall remain in contact with the Engineer-in-Charge or his authorized representative associated for all such operations. No claim of payment or claim of any other kind, whatsoever, shall be entertained from the Contractor.

- 3.10 Samples of all materials required for testing is included in the cost of work. Similarly all testing in house or through external lab shall be borne by the contractor. Nothing extra shall be payable for samples of materials and testing charges.
- 3.11 In case there is any discrepancy in frequency of testing as given in list of mandatory tests and that in individual sub-heads of work as per CPWD Specifications, higher of the two frequencies of testing shall be followed and nothing extra shall be payable on this account.
- 3.12 The contractor has to establish field laboratory at site including all necessary equipment for field tests as specified in schedule 'F' at his own cost.
- 3.13 All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions before concealing.
- 3.14 Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to byelaws and municipal body / corporation where CPWD Specifications are not available. The contractor should engage licensed plumbers for the work and get the materials (fixtures/fittings) tested by the Municipal Body/Corporation authorities wherever required at his own cost.
- 3.15 The contractor shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.
- 3.16 The contractor shall have to execute guarantee bonds in respect of stone work/tile work, water supply/sanitary installation/drainage works and water proofing works as per Performa enclosed.
- 3.17 The Contractor shall depute Site Engineer & skilled workers as required for the work. He shall submit organization chart along with details of Engineers and supervisory staff. It shall be ensured that all decision making powers shall be available to the representatives of the Contractor at Mumbai itself to avoid any likely delays on this account. The Contractor shall also furnish list of persons for specialized works to be executed for various items of work. The Contractor shall identify and deploy key persons having qualifications and experience in the similar and other major works, as per the field of their expertise. If during the course of execution of work, the Engineer-in-Charge is of the opinion that the deployed staff is not sufficient or not well experienced; the Contractor shall deploy more staff or better-experienced staff at site to complete the work with quality and in stipulated time limit.
- 3.18 The Contractor shall maintain all the work in good condition till the completion of entire work. The Contractor shall be responsible for and shall make good, all damages and repairs, rendered necessary due to fire, rain, traffic, floods or any

other causes. The Engineer-in-Charge shall not be responsible for any claims for injuries to person/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the Contractor or of any other of his representatives, in his employment during the execution of the work. The compensation, if any, shall be paid directly to the Department / authority / persons concerned, by the Contractor at his own cost.

4.0 SAFETY MEASURES

4.1 Temporary Barricading

- (a) Proper temporary barricading by fencing with G.I. sheets, shall be carried out by the Contractor at the start of work to physically define the boundaries of the plot for restricted entry to only those involved in the work and also to prevent any accidents, at the same time without causing any inconvenience to the traffic and the users of the buildings in the adjacent plots. It shall be done by providing, erecting, maintaining temporary protective barricading, 2.5 meters in height, made in panels, with each panel having MS frames / MS scaffolding pipes of suitable size and stiffness, with 24 gauge thick GI corrugated sheet or suitably stiffened plain GI sheet fixed on frames. Such panels shall be suitably connected to each other for stability with nuts and bolts, hooks, clamps etc. and fixed firmly to the ground at about 2 meters spacing, for the entire duration till completion of the work. He shall also provide and erect temporary protective barricades within the plot, if required, to prevent any accident. Temporary protective roofing near the Entrance to the building, under construction, shall be made to protect the visiting officials from getting hurt by falling debris etc. Also, one or more coat of enamel paint of shade as approved and directed by the Engineer-in-Charge shall be applied on the panels and "CPWD" shall be painted over that in suitable sizes, shapes and numbers as directed by the Engineer-in-Charge. It shall be dismantled and taken away by the Contractor after the completion of work at his own cost with the approval of the Engineer-in- Charge.
- (b) Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at his own cost.

4.2 Warning / Caution Boards

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

4.3 Sign Boards

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

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

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

5.0 TEMPORARY WATER / ELECTRICITY / TELEPHONE CONNECTION

Arrangement of temporary telephone connection, water and electricity required by him, shall be made by the Contractor at his own cost and also necessary permissions shall be obtained by him directly from concerned authorities, under intimation to the Department. Also, all initial cost and running charges, and security deposit, if any, in this regard shall be borne by him. The Contractor shall abide by all the rules/ bye laws applicable in this regard and he shall be solely responsible for any penalty on account of violation of any of the rules / byelaws in this regard. Nothing extra shall be payable on this account.

(a) The Contractor shall be responsible for maintenance and watch and ward of the complete installation and water / electricity meter and shall also be responsible for any pilferage, theft, damage, penalty etc. in this regard. The Contractor shall indemnify the Department against any claim arising out of pilferage, theft, damage, penalty etc. whatsoever on this account. Security deposit for the work shall be released only after No Dues Certificates are obtained from the local Authorities from whom temporary electric/ water / telephone connection have been obtained by the Contractor. Nothing extra shall be payable on this account.

(b) The Department shall in no way be responsible for either any delay in getting electric and/or water and/or telephone connections for carrying out the work or not getting connections at all. No claim of delay or any other kind, whatsoever, on this account shall be entertained from the Contractor. Also contingency arrangement of stand-by water & electric supply shall be made by the Contractor for commencement and smooth progress of the work so that work does not suffer on account of power failure or disconnection or not getting connection at all. No claim of any

kind whatsoever shall be entertained on this account from the Contractor. Nothing extra shall be payable on this account.

- (c) The Contractor shall arrange electricity at his own cost for testing of the various electrical installations as directed by Engineer-in-Charge and for the consumption by the contractor for executing the work. Also all the water required for testing various electrical installations, fire pumps, wet riser / fire fighting equipments, fire sprinklers etc. and also testing water supply, sanitary and drainage lines, water proofing of underground sump, over head tanks, water proofing treatment etc. shall be arranged by the contractor at his own cost. Nothing extra shall be payable on this account.

6.0 CLEANLINESS OF SITE

- 6.1 The Contractor shall not stack building material / malba / mud on the land or road of the local development authority or on the land owned by the others, as the case may be. So the mud, rubbish etc. shall be removed periodically as directed by the Engineer-in-Charge, from the site of work to the approved dumping grounds as per the local byelaws and regulations of the concerned authorities and all necessary permissions in this regard from the local bodies shall be obtained by the Contractor. Nothing extra shall be payable on this account. In case, the Contractor is found stacking the building material / malba as stated above, the Contractor shall be liable to pay the stacking charges / penalty as may be levied by the local body or any other authority and also to face penal action as per the rules, regulations and bye-laws of such body or authority. The Engineer-in-Charge shall be at liberty to recover, such sums due but not paid to the concerned authorities on the above counts, from any sums due to the Contractor including amount of the Security Deposit and performance guarantee in respect of this contract agreement.
- 6.2 The contractor shall take instructions from the Engineer-In-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed.
- 6.3 The site of work shall be always kept clean due to constraints of space and to avoid any nuisance to the users of buildings in the adjacent plots. The Contractor shall take all care to prevent any water- logging at site. The wastewater, slush etc. shall not be allowed to be collected at site. It may be directly pumped into the natural drain with prior approval of the concerned authorities. For discharge into public drainage system, necessary permission shall be obtained from relevant authorities after paying the necessary charges, if any, directly to the authorities. The work shall be carried out in such a way that the area is kept clean and tidy. All the fees/charges in this regard shall be borne by the Contractor. Nothing extra shall be payable on this account.

7.0 SECURITY & TRAFFIC ARRANGEMENTS

In event of any restriction being imposed by the Department, traffic or any other statutory authority having control over the project, on the working or movement of Labour, materials, etc., the Contractor shall strictly follow all such

restrictions or instructions issued regarding the same and nothing extra shall be payable to the Contractor on account of such restrictions or instructions. No delay or claims of any kind shall be entertained from the Contractor on this account. The loss of time on this account, if any, shall have to be made up by the contractor by generating and deploying additional resources etc. Nothing extra shall be payable on this account.

8.0 SETTING OUT

- 8.1 The Contractor shall carry out survey of the work area, at his own cost, setting out the layout and fixing of alignment of the pile work, building in consultation with the Engineer-in-Charge & proceed further. Any discrepancy between the architectural drawings and actual layout at site shall be brought to the notice of the Engineer-in-charge. It shall be responsibility of the Contractor to ensure correct setting out of alignment. Total station survey instruments only shall be allowed to be used for layout, fixing boundaries, centre lines, etc., along with theodolites. Nothing extra shall be payable on this account.
- 8.2 The Contractor shall establish, maintain and assume responsibility for grades, lines, levels and benchmarks. He shall report any errors or inconsistencies regarding grades, lines, levels, dimensions etc. to the Engineer-in-Charge before commencing work. Commencement of work shall be regarded as the Contractor's acceptance of such grades, lines, levels, and dimensions and no claim shall be entertained at a later date for any errors found.
- 8.3 If at any time, any error in this regard appears during the progress of the work, the Contractor shall, at his own expense rectify such error, if so required, to the satisfaction of the Engineer-in-Charge. Nothing extra shall be payable on this account.
- 8.4 Though the site levels are indicated in the drawings the Contractor shall ascertain and confirm by him, the site levels with respect to benchmark from the concerned authorities. The Contractor shall protect and maintain temporary/permanent benchmarks at the site of work throughout the execution of work. These benchmarks shall be got checked by the Engineer-in-Charge or his authorized representatives. Nothing extra shall be payable on this account.
- 8.5 The work at different stages shall be checked with reference to bench marks maintained for the said purpose. The cost of carrying out lay outs at all stages including marking of reference points, center lines of the building etc. including construction/maintenance of said bench marks shall be deemed to be included in quoted rates quoted for various items. Nothing extra shall be payable on this account.
- 8.6 The approval by the Engineer-in-Charge, of the setting out by the Contractor, shall not relieve the Contractor of any of his responsibilities and obligation to rectify the errors/ defects, if any, which may be found at any stage during the progress of the work or after the completion of the work.
- 8.7 The Contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignments, the level and correctness of every part of the

work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the Contractor at his own cost to the entire satisfaction of the Engineer-in-Charge.

- 8.8 The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, preparatory works, working during monsoon, working at all depths, height and location etc. and any other incidental works required to complete this work. Nothing extra shall be payable on this account.

8.9 Testing of Materials

All expenditure to be incurred for testing of sample e.g. packing, sealing transportation, loading, unloading etc. including testing charges shall be borne by contractor

CONDITIONS FOR CEMENT

- 1) The Contractor shall procure 43 grade (conforming to IS: 8112)/53 grade (confirming to IS:12269) ordinary Portland cement as required in the work from reputed manufacturers of cement, having a production capacity of one million tonnes per annum or more, such as approved by Ministry of Industry, Government of India, and holding license to use ISI certification mark for their product whose name shall be got approved from Engineer-in-Charge. Supply of cement shall be taken in 50 Kg bags bearing Manufacturer's name and ISI marking. Samples of cement arranged by the Contractor shall be taken by the Engineer-in-charge and got tested in accordance with provisions of relevant BIS codes. In case test results indicate that the cement arranged by the Contractor does not conform to the relevant BIS codes, the same shall stand rejected and shall be removed from the site by the Contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so.
- 2) The cement shall be brought at site in bulk supply of approximately 50 tonnes or as decided by the Engineer – In - Charge. The cement godown of the capacity to store a minimum of 2000 bags of cement or as decided by NIT approving authority in case less than 100MT cement is required for the work, shall be constructed by the contractor at site of work for which no extra payment shall be made. For small maintenance works, NIT approving authority shall decide the requirement of the storage/godown.
- 3) The contractor shall be responsible for the watch and ward and safety of the cement godown. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge at any time.
- 4) The cement shall be got tested by the Engineer-In-Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The cost of tests shall be borne by the contractor.
- 5) 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 42 of the contract and shall be governed by conditions laid therein. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made after ensuring structural soundness and stability on the basis of testing. In case of excess consumption no adjustment need to made.
- 6) The cement brought to the site and the cement remaining unused after completion of the work shall not be removed from site without the written permission of the Engineer-in charge.
- 7) The damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-In-Charge. If he does not do so within 3 days of receipt of such notice, the Engineer-In-Charge shall get it removed at the cost of the contractor.

PARTICULAR SPECIFICATIONS (GENERAL)

1. GENERAL
 - 1.1 Wherever any reference to any Indian Standards occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued thereto or revisions thereof, if any, upto the date of receipt of tenders.
 - 1.2 Unless otherwise specified in the schedule of quantities, the rates for all items of work shall be considered, as inclusive of pumping out or bailing out water, if required throughout the construction period for which no extra payment shall be made. This shall also include water encountered from any source such as rains, floods, sub soil water table being high and/or due to any other cause whatsoever.
 - 1.3 The work shall be executed and measured as per metric dimensions given in the Schedule of quantities, drawings etc. (F.P.S. units wherever indicated are for guidance only).
 - 1.4 The following modifications / additional specifications shall apply:
 - a) All stone aggregate and stone ballast shall be of hard stone variety to be obtained from approved quarries at Bhiwandi or any other source to be got approved from the Engineer-in-charge.
 - b) Coarse sand should be obtained from Vaitarna or any other source to be got approved from the Engineer-in-charge. The coarse sand shall be screened before using, if required. The same shall be clean and sharp angular grit type. If the sand brought to site is dirty, it must be washed in clean water to bring the sand to the required specifications. Nothing extra shall be payable on this account.
 - c) Fine sand should be obtained from Vaitarna or any other source to be got approved from the Engineer-in-charge. The fine sand shall be screened, if required. The same shall be clean and sharp angular grit type. If the sand brought to site is dirty, it must be washed in clean water to bring the sand to the required specifications. Nothing extra shall be payable on this account.
 - 1.5 The rates for all items of work, shall unless clearly specified otherwise, include cost of all operations and all inputs of labour, material, T & P, scaffolding, wastages, watch and ward, other inputs, all incidental charges, all taxes, cess, duties, levies etc. required for execution of the work.
 - 1.6 Embedding of pipes, conduits etc.
 - (a) The masonry work for the portions of the external wall of W.C., through which pipes are taken, shall be done after the pipes are fixed as far as practicable.
 - (b) All crossings, embedment etc. in walls and floors for water supply, drainage and sanitary pipes, fittings etc. shall be provided as per the detailed working drawings for individual walls and floors so as to avoid cuttings of masonry work and floors. All such areas shall be made good during finishing and nothing extra shall be payable on these accounts.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING OF CHEMICALS:

- (a) The contractor shall construct storage space for Chemicals materials to ensure that the storage conditions are as recommended by the manufactures.
- (b) All the materials shall be procured and delivered in sealed containers with labels legible and intact.
- (c) All the chemicals (polymers, epoxy, water proofing compound, plasticizer, chloropyrifos etc.) shall be procured in convenient packs say 20 litres (Kgs.) capacity packing only or as approved by the Engineer-in-Charge, and not in bigger capacity containers, say 200 litre (Kgs.) drums unless otherwise specifically permitted by the Engineer-in-Charge. One sample from each lot of the chemical procured by the contractor shall be tested in a laboratory as approved by the Engineer – in – Charge.
- (d) All material required for the execution of the work shall be got approved, procured and deposited with the Departmental supervisory staff. The materials shall be kept in joint custody of the contractor and the Department. The watch and ward of such material shall, however, remain to be the responsibility of the contractor and no claim, whatsoever, on this account shall be entertained. Different containers of each chemical shall be serially numbered on packing and also consumed in that order. Day-to-Day account of receipt, issue and balance shall be regulated by the Department and proper account shall be maintained at site of work in the prescribed form as per the standard practice.
- (e) All the chemicals shall be procured by the contractor directly from the manufacturer. In exceptional circumstances, the contractor may be allowed to procure the materials from the authorized dealers of the manufacturers, if specifically permitted by the Engineer-in-Charge.
- (f) The original copies of challan / cash memos towards the quantity of various chemicals procured shall be made available by the contractor at the request from the Engineer-in-Charge and a copy of the same shall be kept in record.
- (g) The Name of manufacturers, manufacturer's product identification, manufacturer's mixing instructions, warning for handling and toxicity and date of manufacturing and shelf life shall be clearly and legibly mentioned on the labels of the each container.
- (h) The contractor shall submit for the chemicals procured, manufacturer's and / or authorized dealer's certificate regarding supplying and verifying conformance to the material specifications, as specified.
- (i) All filled containers shall be handled in safe manner and in a way to avoid breaking container seals.
- (j) Empty containers of the chemicals should not be removed from site till the completion of work and shall be removed only with the written approval of the Engineer-in-Charge.

- (k) All arrangements for measuring, dosing and mixing of material / chemicals at site have to be made by the contractor.
- (l) Contractor shall suitably advise his site Engineer and all the workers as regards safe handling of chemicals. Necessary protective and safety equipments in form of hand gloves, goggles etc. shall be provided by the contractor and be also used at site.
- (m) All incidental charges of any kind including cartage, storage and wastage and safe custody of material etc. shall be borne by the contractor and no claim, whatsoever, shall be entertained on this account.
- (n)** The chemicals shall be tested in an independent laboratory as approved by the Engineer-in-Charge at the frequency as specified. If required, more samples may have to be tested as per the directions of the Engineer-in-Charge. Nothing extra shall be payable on this account

PARTICULAR SPECIFICATIONS FOR REPAIR WORK

1. Adequate care should be taken by the contractor while dismantling, chiseling, demolishing work, drilling etc. that impact/vibrations are minimum for considerations of structural safety and also for inconvenience caused to the users of the building. Perimeter of unsound concrete area shall be marked by making shallow cut on cover concrete with cutter machine to reduce the impact of chiseling. Rates shall cover cost of all inputs of material, labour; T&P etc. involved all the operations in the work.
2. Dismantling and repair work of any type like plaster, flooring, concrete, RCC, Brick work, GI/CI pipes, water proofing etc. shall be for all heights and all levels unless specifically mentioned in the item and no claim for extra cost shall be entertained on this account.
3. Sequence of strengthening work shall be as under:
 - a. Strengthening of beams of first floor and columns from top of grade Beams/foundations up to middle of second floor.
 - b. Strengthening of beams of second floor and column from middle of second floor to middle of third floor.
 - c. Strengthening of beams of third floor and columns from middle of third floor to middle of the fourth floor.
 - d. Strengthening of beams of fourth floor and terrace beams and columns from middle of the fourth floor up to terrace level.
 - e. Guniting repaired structural members shall be allowed to attain at least 7 days strength before any load is transferred to that member.
4. For removal of all type of loose / delaminated / damaged / weak cement plaster from the surface of masonry or concrete, a cut normal to the surface all along the boundaries, in regular shape shall be made not to exceed plaster thickness. Then plaster shall be removed completely to expose the parent masonry or concrete surface so as not to have any traces of such plaster left. For brick work, the joints have to be properly raked and cleaned as per CPWD specifications. The plaster should be dismantled without causing any damage to brick work.

5.0 CHIPPING/ DISMANTLING OF UNSOUND/ WEAK CONCRETE & PREPARATION OF SUBSTRATE:

- 5.1 The perimeter of unsound / weak concrete / delaminated layer of guniting shall be sawcut to a minimum depth of 12 mm in square/rectangular shape at normal (orthogonal) to the surface of member. Then concrete shall be removed by chipping with standard power driven percussion type or pneumatic chisel of standard make from the demarked area including tapering all edges, making

square shoulders of cavities etc. complete (after properly supporting the member with false works). The chipping shall be done in regular shape, with sides parallel or normal to the direction of the reinforcement and minimum 50mm beyond the perimeter of the spall for single spall, the repair area should have a minimum width of 100 mm in direction. If a number of spalls are closely located to each other, these should be included in a single area marked for repair.

5.1.1 Exposing of rusted/corroded reinforcement:

Reinforcing bar must be further exposed if the remaining concrete is debonded from the reinforcing bar. Chipping around the reinforcing bar shall be continued to completely expose it, if more than half of reinforcing bar perimeter has been exposed. Concrete shall be removed from all around reinforcement including from behind the reinforcing bars to give an average 25 mm (but not less than 15 mm clear air gap) by using standard power driven percussion type or pneumatic chisel of standard make.

- 5.2 Adequate care is to be taken not to cut the reinforcement steel and a cover meter could be used to estimate the depth of cover, for which nothing extra shall be paid.
- 5.3 Chipping should be done up to the required depth as decided by the ' Engineer-in-Charge to reach sound concrete substrate to a near uniform depth for the repair areas.
- 5.4 Dimensions of area chipped off for RCC slabs, beams, columns etc. shall be measured in centimeters after the chipping / dismantling operation is completed. The area of the chipped / exposed RCC surface shall be measured in sq. m. correct to second place of decimal.
- 5.5 For the RCC members to be completely dismantled, pre-measurement of the dimensions of RCC member to be dismantled shall be recorded before taking up the dismantling operation and volume of concrete dismantled shall be worked out in cubic meters correct to second place of decimal.
- 5.6 Removal of concrete should begin at the interior of the repair areas and progress towards the boundaries. All edges and cavities shall be square shouldered.

6.0 CUTTING OF EXISTING REINFORCEMENT

- 6.1 The existing reinforcement bars to be cut shall be identified and approved for cutting by the Engineer-in-Charge.
- 6.2 The reinforcement shall be carefully cut with electrical cutter machine to minimize excessive vibrations or damaging the structure and the recovered reinforcement should be straightened, cleaned of concrete by wire brush

scrapped and stacked properly with in a lead of 50 meters as directed by the Engineer-in-Charge.

7.0 CLEANING OF EXISTING REINFORCEMENT

- 7.1 Before re-casting/ jacketing of members or repairs to members with polymer modified mortar, the reinforcement has to be cleaned properly, as specified.
- 7.2 At first rust shall be removed from the surface of the reinforcement manually using chisels, wire brush, emery paper etc. as directed by Engineer-in-Charge at no extra cost, till the steel surface is cleaned off loose rust.
- 7.3 Then sulphate and chloride free chemical rust remover, as approved by the Engineer-in-Charge shall be applied with paint brush over the reinforcement surface thoroughly along the full length of rusted reinforcement. After 24 hours of its application the surface shall be cleaned with wire brush to remove all loose particles.
- 7.4 Rates shall include cost of all materials, labour, T&P etc. involved in all the operations.

8.0 ADDITIONAL REINFORCEMENT BARS:-

For introducing additional reinforcement bars for new structural connections or supplementing additional steel area to the existing RCC member, the cross sectional area (diameter and no. of bars) and length required shall be approved by the Engineer-in-Charge. Also the depth of embedment of reinforcement bar shall be approved by the Engineer-in-Charge. The holes of specified diameter and depth have to be bored with diamond or hammer drill machine in RCC. Diameter of the hole shall be 4mm larger than dia of dowel bar. The bored hole in dry state, shall be cleaned with round brush and by blowing air through a tube inserted in the hole and connected to hand operated blower. Depth of holes shall be checked by the field staff by inserting rod marked with standard length.

Then, epoxy shall be injected from foil pack with help of epoxy dispenser and epoxy cartridge holder and disposable PVC mixing nozzle inserted inside the drilled hole to fill it from bottom/end of hole and slowly withdrawing the pipe while injecting epoxy till mouth of hole to ensure no air void is left inside the hole. Then dowel bar shall be inserted by pressing and turning till end of the hole is reached and shall be allowed to remain undisturbed for minimum 24 hours for epoxy to be air cured.

Rates shall include cost of all inputs of material, labour and T&P etc. involved in all the operational except the cost of reinforcement.

8.1 WELDING ADDITIONAL REINFORCEMENT:

In case cross sectional area of an individual bar of RCC slab has been reduced by 20% or more, then additional reinforcement shall be welded with existing bar to ensure continuity of the reinforcement of equal strength of original bar as illustrated in the sketch. If any existing reinforcement bar is found displaced/loosened, same shall be secured at its design location.

9.0 SHEAR KEYS :-

Shear keys shall also be provided in similar manner as illustrated in para 8.0 above. The shear key bars cut and bent to the required shape shall be embedded in parent concrete to a minimum depth of 50 mm or longer as specified in the item. Rates shall include cost of all materials, labour and T & P etc. involved in all the operations.

10.0 CLEANING OF EXPOSED RCC / CONCRETE SURFACE, INSERTING NIPPLES AND INJECTION GROUTING: -

- 10.1 The final chipped off concrete surface and exposed reinforcement, if any of the affected structural member should be cleaned off all loose and foreign materials by free air blast and then with water and allow it to dry.
- 10.2 For the honey combed portion of the concrete or cracked concrete, drill holes at least 18 mm in diameter and depth up to 60 mm or behalf the member thickness whichever is less, at the required spacing, as directed by the Engineer-in-Charge.
- 10.3 For cracked surface open up cracks by making V notch or groove of size 12 mm x 12 mm as directed by the Engineer-in-Charge.
- 10.4 Remove coarse debris and dust in opened up cracks and drilled holes by blowing air with hand operated blow out pump. Concrete surface required to be grouted shall be free from all loose and unsound material. The prepared surface should be clear of dust which could obstruct free flow of grout material and also impede its bonding with concrete surface. Saturate the concrete in vicinity of crack / honey combed concrete surface with water (but without excess water) only if the cementations / polymer admixed grout to be injected.
- 10.5 Insert 12 mm diameter specified injection nipples in holes drilled along cracked lines or in honey combed area of concrete and fix them by sealing on its sides with or polymer modified mortar, as directed by the Engineer-in-Charge.
- 10.6 Seal the crack or the honey combed surface between the nipples by means of epoxy mortar or polymer modified mortar, as approved by the Engineer-in-Charge. The polymer used shall be of approved grade and polymer modified mortar shall be applied as per specifications mentioned separately for polymer modified mortar. The polymer modified mortar shall be moist cured for 3 days and allowed to gain strength before actual grouting commences.

- 10.7 To inject grout in nipples, the cementious grout shall be prepared from cement (OPC-43 grade), sand (sharp, washed well graded generally conforming to zone IV of IS: 383) and water conforming of IS: 456 mixed in specified proportions as directed by the Engineer-in-Charge.
- 10.8 The emulsified acrylic polymer shall be as specified and shall conform to manufacturer's specification. The physical and mechanical properties of polymers shall conform to manufacturer's specification. One test shall be carried out mandatorily for every lot of acrylic polymer supplied at site, before use in the work.
- 10.9 The grouting equipment shall be capable of supplying mixing, stirring and pumping grout to the satisfaction of Engineer-in-Charge. It shall have capacity to inject grout at a pressure up to 7 kg / sq. cm measured at grout connections. It shall be capable cement ratio ranging from 0.5 to 1.0.
- 10.10 Wherever epoxy is to be used the surface of the concrete shall be dried with air blast, before grouting or applying epoxy.
- 10.11 The cementious grout in proportion as directed by the Engineer-in-Charge shall be prepared. It should be lump free of creamy consistency, thoroughly blended and shall be continuously stirred to keep the cement particles in suspension to retain uniform consistency in grout is injected.
- 10.12. In case of vertical cracks the injection shall be started at the lowest nipple and continued until the injected grout begins to flow out at the next higher nipple. The first nipple shall then be closed and injection continued from second until grout flows out at the third and so on. The process shall be repeated until the whole surface is treated. As soon as the system is cured, the nipples shall be suitably cut.
- 10.13 In case of honey combed concrete, each grout hole shall be grouted individually. The sequence of injection shall be as per the directions of the Engineer -in-Charge.
- 10.14 The measurement of grout material shall be on the basis of only the weight of cement consumed in kg.
- 10.15 Pre measurements of the quantities of such grouting materials brought at site and balance quantities remaining at the end of grouting application shall be recorded separately which will determine the quantity of grout material actually injected. Adequate care is to be taken by the contractor as not to waste the grout. The quantity which can be consumed immediately within the prescribed time only shall be prepared in batches.
- 10.16 The quantity of grout material wasted, discarded, hardened shall not qualify for payment and shall be recorded for deduction at the end of each operation.

11.0 BOND COAT

11.1 Bond coat is required to be applied for adhesion of applied repair concrete or mortar to the parent concrete. For this, the surface should be thoroughly cleaned by brushes and by blowing air from hand operated pump. The surface shall then be saturated with water minimum 1 hour before application of bond coat and allow surface to attain saturated surface dry condition (SSD).

11.2 PREPARATION OF BOND COAT:

The components of bond coat shall be weigh batched and mixed in specific proportions as indicated in the item. Area of chipped concrete surface shall be assessed roughly. Accordingly required quantity of acrylic polymer for bond coat shall be taken in a plastic bucket/mini drum then proportional quantity of OPC cement by weight (as per manufacturer's specifications) shall be blended slowly under continuous stirring with low speed (500 – 800 rpm) electric stirrer for minimum 2 minutes till a homogenous and lump free slurry is formed. In no case bond coat slurry shall be prepared without electric stirrer at site.

11.3 The specified bond coat shall be applied by stiff nylon bristle brush. The bond coat shall be worked well onto the concrete surface of the parent concrete including reinforcement surface ensuring that no pinholes are left. The polymer modified bonding cement slurry shall be applied to a thickness not more than 2mm. Bond coat shall be allowed to reach tacky condition before applying polymer modified mortar or pouring concrete jacket. (Area of exposed RCC unit shall be measured in sqm correct to two decimal places for the purpose of payment).

11.4 Prefabricated shuttering shall then be erected immediately. Fresh concrete / mortar shall be placed / applied while the bond coat is still tacky and well within pot-life / setting period. If adhesive cures to the extent of losing its tack or has set before concrete / mortar is placed / applied, the same shall be removed or slightly abraded and another coat of adhesive / bond coat shall have to be applied by the contractor at his own cost.

11.5 Freshly placed concrete shall be thoroughly consolidated to ensure full bonding of the fresh concrete with the parent concrete. If there is a failure of bond of fresh concrete/ plaster with parent concrete surface and it sounds hollow on tapping, the repair work shall be dismantled and redone by the contractor at his own cost and to the entire satisfaction of the Engineer-in-Charge. CPWD specifications for manufacture and placing and curing of concrete shall, in general, be followed unless specified otherwise.

12.0 ADDITIONAL REINFORCEMENT FOR GUNITING / JACKETING WORK:

12.1 The existing reinforcement bars in the R.C.C. member to be guniting shall be cleaned properly to remove all scales and rust by wire brushing and by rubbing with sand paper, sandblasting wherever possible etc. complete as directed by the Engineer-in-Charge.

- 12.2 The additional reinforcement shall be provided to hold guniting material/concrete in position and shall be so fixed that it is creased in succeeding layer.
- 12.3 The additional reinforcement, if required, as per the directions of the Engineer-in-Charge, shall be placed in position including cutting, straightening, binding and fixing. in position by fixing into the existing concrete by fastening to shear keys and should be secured rigidly so that it does not belly out or get displaced during guniting jacketing work. The mesh reinforcement shall be fixed in a manner so that it is firmly held at least 12mm away from the parent concrete as well as final finished surface. Also clear spacing between the reinforcement bars shall not be less than 50mm.
- 12.4 Additional reinforcement if required shall be tied with required lap using G. I. binding wire or welded to the parent reinforcement and also to the shear keys is directed by the Engineer-in-Charge.
- 12.5 Additional vertical reinforcement shall be anchored to the base of the column by boring hole of diameter 4 mm larger than the dia of reinforcement bar for a depth of 12 times the dia of the bar and secured it in the hole with epoxy as per standard procedure described in para no – 8

13.0 ANTI CORROSIVE TREATMENT:

After cleaning off rust from reinforcement bar, coat of passivating slurry shall be applied on surface of reinforcement bar. Length of reinforcement bar to be treated with passivating coat shall be assessed roughly in advance. Accordingly required quantity of anticorrosive polymer shall be taken in a plastic bucket/mini drum and specified proportion of OPC cement by weight (as per manufacturer's specifications) shall be blended slowly under continuous stirring with electric stirrer for minimum 2 minutes till a homogenous and lump free slurry of creamy thick consistency is formed. One /Two coats of passivating slurry (as per manufacturer specifications) shall be applied on reinforcing bar by stiff nylon bristle brush ensuring no pinholes are left. In case application of two coats, the second coat shall be applied minimum six hours after application of 1st coat, the passivating coat shall be allowed to set for minimum 24 hours before operating next item. In no case passivating slurry shall be prepared without electric stirrer.

14.0 POLYMER MODIFIED MORTAR: -

- 14.1 Preparation of polymer modified mortar at site (PMM) :

Polymer modified mortar shall be prepared with OPC cement and graded quartz sand admix with acrylic polymer. The graded coarse sand shall be obtained from mixing of 3 different grade of quartz sand at site in following proportion by weight/volume.

Quartz sand of grade 8 x 16 (coarse) = Z1

Quartz sand of grade 16 x 30 (medium) = Z2

Quartz sand of grade 30 x 80 (fine) = Z3

Desired proportion of Z1 :Z2:Z3 = 8:3:4

Sufficient quantity of graded quartz sand shall be prepared before mixing of mortar. The same ratio shall be maintained throughout the execution of structural repair work. Area of chipped concrete surface shall be assessed roughly. Accordingly required quantity of acrylic polymer mortar shall be prepared for repair of RCC which can be applied within half an hour. Quantity of all components shall be found out as per theoretical consumption given in the item as per different manufacturers' specification. Calculated quantity of graded coarse sand and specified proportion of OPC cement shall be mixed in dry stage uniformly on GI mortar mixing tray. Quantity of polymer shall be taken in specified proportion of cement as per manufacturer's specifications in plastic bucket/mini drum. 85% of required quantity of water shall be taken in a bucket/mini drum (not more than 30% capacity of the bucket), then dry PMM shall be blended slowly under continuous stirring with low speed (500 – 800 rpm) electric stirrer for minimum 2 minutes and mortar shall be allowed to remain undisturbed for three minutes to dissolve polymer in the mortar. Balance quantity of water shall be added in the similar manner to form homogenous cohesive mortar of dough like consistency. Right consistency of mortar can be checked by making medium size ball of green mortar with hand. The ball should retain its shape when held on palm and at the same time it deforms easily without being cracked when it is pressed with palm.

14.2 Application of polymer modified repair mortar

The quantity of mortar shall be prepared at site it can be used up within 30 minutes after mixing dry mortar with water. Small balls of green mortar shall be pressed with palm applying small force against the concrete substrate primed with bond coat (wet on wet) for a thickness not more than 12mm. Next layer of mortar shall be applied over the first layer minimum after 6 hours to build up thicker section. The surface of repaired area shall be roughly finished with trowel upto the level of original RCC surface of the structural member. In no circumstances PMM shall be applied by trowel by increasing water in the mix.

14.3 Pre measurement of thickness shall be taken just after the surface preparation is completed. Area under repair shall be measured correct to a centimeter.

14.4 Curing: -

Curing shall be started after 24 hours of application of PMM. The repaired RCC member preferably wrapped with damp hessian cloth wherever feasible. Otherwise repaired member shall be kept damped by spraying water over it with spraying machine without causing any dripping to prevent leaching of polymer content from mortar. The repaired surface shall be moist cured for 3 days followed by air curing at ambient temperature; steam curing shall not be permitted.

- 14.5 Testing : One mandatory test of the polymer modified mortar for every 250 sqm of plaster or part there of shall be conducted. The test shall be conducted on cube of size 70 mm, made from cement and graded quartz sand in ratio 1:3 admixed with approved polymer in specified proportion as per manufacturer specification. The test result should conform to the following strength parameter.

- i) Minimum compressive strength after 28 days : 20 N/mm²
- ii) Minimum flexural strength after 28 days : 2 N/mm²

15.0 JACKETING BY CEMENT CONCRETE

- 15.1 All care for casting, curing etc. shall be taken as per CPWD specifications (Ingredients of concrete have to be tested before use. Requisite number of test specimens shall be casted and tested).

- 15.2 Concrete for jacketing shall be prepared strictly in drum mixture machine (electric /diesel operated) 80% of gauging water for particular batch shall be poured in the mixer drum. Measured quantity of super plasticizer shall be mixed with remaining 10% part of gauging water and then it shall be added to the pre-wetted concrete mixed. Then dry aggregate and cement in specified proportion in sequence shall be added in the mixer drum as per CPWD specifications. Balance water should be added in such a manner to produce homogenous high slum flowing yet very cohesive concrete without bleeding and segregation.

Before pouring concrete in the shuttering mould other repair items i.e. rust removal from reinforcement, anti corrosive treatment, providing additional reinforcement and shear key etc. shall be completed in advance. Only bond coat shall be applied five minutes before pouring concrete. Concrete shall be poured in the shuttering mould when bond coat reach tacky condition. There shall be no gap between shuttering and existing concrete surface. Thermocol sheet may be used to plug small irregular gaps.

- 15.3 While doing jacketing with cement concrete it should be ensured that dropping height of cement concrete should not be more than 60 cm.

- 15.4 Testing: One mandatory test for every 2.5 cum of concrete or part thereof shall be conducted. The test result should conform to the following strength parameter.

- i) Minimum compressive strength : 40 N/mm² in 28 days
- ii) Minimum flexural strength : 4.42 N/mm² in 28 days

16.0 Particular specifications for premixed single component polymer modified repair mortar: (PMRM)

Prior to applying premixed single component polymer modified repair mortar (PMRM) to RCC substrate, other repair items i.e. rust removal from reinforcement, anti corrosive treatment, providing additional reinforcement

shall be completed in advance. Only bond coat shall be applied five minutes before applying PMRM.

16.1 Preparation of polymer modified repair mortar

PMRM shall be prepared in a plastic bucket/mini drum. 85% of required quantity of water shall be taken in a bucket/mini drum (not more than 30% capacity of the bucket), then dry PMRM shall be blended slowly under continuous stirring with low speed (500 – 800 rpm) electric stirrer for minimum 2 minutes and mortar shall be allowed to remain undisturbed for three minutes to dissolve polymer in the mortar. Balance quantity of water shall be added in the similar manner to form homogenous cohesive mortar of dough like consistency. Right consistency of mortar can be checked by making medium size ball of green mortar with hand. The ball should retain its shape when held on palm and at the same time it deforms easily without being cracked when it is pressed with palm.

16.2 Application of polymer modified repair mortar

The quantity of mortar shall be prepared at site it can be used up within 30 minutes after mixing dry mortar with water. Small balls of green mortar shall be pressed with palm applying small force against the concrete substrate primed with bond coat (wet on wet) for a thickness not more than 12mm. Next layer of mortar shall be applied over the first layer minimum after 6 hours to build up thicker section. The surface of repaired area shall be roughly finished with trowel upto the level of original RCC surface of the structure member. In no circumstances PMRM shall be applied by trowel by increasing water in the mix.

16.3 Curing

Curing shall be started after 24 hours of application of PMRM. The repaired RCC member preferably wrapped with damp hessian cloth wherever feasible. Otherwise repaired member shall be kept damped by spraying water over it with spraying machine without causing any dripping to prevent leaching of polymer content from mortar. The repaired surface shall be moist cured for 3 days followed by air curing at ambient temperature; steam curing shall not be permitted.

16.4 Testing

One mandatory test of the polymer modified mortar for every 250 sq. m of plaster of part thereof shall be conducted. The test shall be conducted on cube of size 70 mm, made from polymer modified repair mortar. The test result should conform to the following strength parameter.

- i) Minimum compressive strength after 28 days at w/p ratio 0.16: 40 N/mm²
- ii) Minimum flexural strength after 28 days at w/p ratio 0.16: 4 N/mm²

17.0 Particular Specification for Micro Concrete

17.1 Preparation of mix at site: 85% to 90% of required quantity of potable water shall be taken in a clean plastic bucket/ mini drum or in a Pan of a Pan mixer. Proportional quantity of micro concrete (as per manufacturer specification) in dry state shall be blended slowly under continuous stirring electric stirrer or in rotating pan of pan mixer for 2 minutes. Then balance quantity of water shall be added to the mix and shall be stirred for another 2-3 minutes to form a homogenous, free flowing lump free mix. 10 mm down coarse aggregate in the range of 25% - 40% by weight can be mixed where thickness of repair is more than 75 mm depending on site condition. Plastic bucket / Mini drum shall be used where volume of repair is less than 1 cum, otherwise pan mixer shall be used for preparation of micro concrete at site.

17.2 Application of Micro Concrete: Primary repair items i.e. chipping, rust removal for reinforcement and anticorrosive treatment to reinforcement shall be operated well before jacketing of RCC members. Only bond coat shall be applied five minutes before pouring concrete. Micro Concrete shall be poured in the shuttering mould when bond coat reach tacky condition. There shall be no gap between shuttering and existing concrete surface. Thermocol sheet may be used to plug small irregular gaps.

Gaps in the shuttering shall be effectively sealed with masking tape to prevent leakage of fluid concrete through joint of shuttering or gaps between shuttering of RCC members at contact point.

Repair surface shall be hacked immediately after removal of shuttering if it shall be finished with plaster later stage.

17.3 Curing:

Curing should be started after the shuttering. The repaired RCC member preferably wrapped with damp hessian cloth wherever feasible. Otherwise repaired member shall be kept damped by spraying water over it with spraying machine without causing any dripping prevent leaching of polymer content from mortar. The repaired surface shall be moist cured for 3 days followed by air curing at ambient temperature; steam curing shall not be permitted.

17.4 Testing

One mandatory test of Micro concrete for every 2.5 cum of concrete or part thereof shall be conducted. The test shall be conducted on cube of size 70 mm, made from micro concrete. The test result should conform to the following strength parameter.

- i) Minimum compressive strength (as per ASTM C109:99) = 55 N/mm² in 28 days
- ii) Minimum flexural strength (as per ASTM C580) = 6 N/mm² in 28 days

18.0 PARTICULAR SPECIFICATION FOR PREMIXED READYMADE CEMENT MORTAR

'READYPLAST' of Ultra tech or 'EASYPLAST' of Wall Plast Product Pvt. Ltd. Or any other brands as specified in the list of makes are used in place of traditional cement-sand mortar for plastering.

1) Surface Preparation

The surface needs to be cleaned and made free from grease, dust and loose particles to ensure proper binding. The surface needs to be pre-wetted with clean water before plastering.

2) Process of mixing

- i) Required quantity of dry mix shall be taken in a mortar mixing tray.
- ii) Measured quantity of potable water shall be added to dry mix as per manufacturer's specification. (6-7 litre of water is required per 40kg bag of 'Readiplast' and 7-8 litres of water is required per 40kg bag of 'Easyplast'). Correct ratio of water and dry mix is essential for better result.
- iii) The mortar shall be mixed well for 5 to 10 minutes to achieve homogenous and cohesive mix. (Use of mechanical mixer / electrical stirrer is recommended for better results.)
- iv) The prepared mix shall remain undisturbed for 5 minutes to dissolve polymer additive in mortar and shall be mixed once again without adding any water just before use.

3) Method of Application

- i) Pre wetting of surface is required before applying plaster.
- ii) The mixture should be applied within one hour of preparation of mix. This will ensure that the thin layer can be applied without cracking problems and proper cement hydration.
- iii) If the concrete surface is smooth and dense, it is recommended to apply a bond coat of acrylic polymer of any approved make.
- iv) Readymade mortar shall be applied manually using trowel and care should be taken that it does not expose to direct sunlight, wind and rain during its application.

4) Curing

Curing shall be started after 24 hours of plastering in normal weather condition. After the plaster is completely dried, curing shall be done 2 to 3 times for 2 to 3 days. In abnormally dry weather conditions, curing for 5-7 days is required.

LIST OF PREFERRED MAKES**Note :**

1. The contractor shall obtain prior approval from the Engineer-in-Charge before placing order for any specific material or engaging any of the specialized agencies. The contractor shall make a detailed submittal with catalogues and highlighted proposed specification as well as full details of the works executed by the specialized agencies, as specified.
2. Wherever applicable, the Engineer-in-Charge may obtain prior approval from T.S authority for any material equivalent to that specified in the tender subject to proof being offered by the contractor for equivalence to his satisfaction.
3. Unless otherwise specified, the brand / make of the material as specified in the item nomenclature, in the particular specification and in the list of approved materials attached in the tender, shall be used in the work.
4. In case of non availability of the brand specified in the contract the contractor shall be allowed to use alternate equivalent brand of the material subject to submission of documentary evidence of non availability of the specified brand and prior approval of Engineer-in-charge. The necessary cost adjustments on account of above change shall be made for the material.
5. The Engineer-In-Charge shall verify that manufacturers must have valid IS Certification as on date for materials wherever applicable.
6. In case brand/make for any material to be used in work is not specified in this list the Engineer-in-charge may approve the brand.

The following brands shall be used if not otherwise mentioned in the items.

LIST OF PREFERRED MAKES

MATERIALS	APPROVED BRANDS
Ordinary Portland Cement / Portland Pozzolana Cement	Ultra Tech, A.C.C., Gujarat Ambuja, Birla, Jaypee Cement, J.K. Cement
White Cement	J.K., Birla,
Reinforcement Steel	Tiscon, Sail, RINL, Jindal Steel & Power Ltd., JSW Steel Ltd.
Parallel Threaded Couplers	DEXTRA, G-TECH, Spplcetek, ISHITA
Re-barring Chemical	HILTI, 3M INDIA, Fischer
Structural Steel/Tubes	Tata Steel, SAIL, RINL, Jindal, APL Apollo
Plasticizer, Super Plasticizer, Admixtures, Other construction chemicals	MC Bauchemie, Sika, Fosroc, BASF, Dr. Fixit, CICO, Asian
AAC Block	ULTRATECH, BILTech, SIPOREX, Ecolite, Aerocon, ACC
ACC Block Adhesive	ACC, ULTRA TECH, J.K., FERROUS CRETEM, BAL ENDURA, AEROCON, ARDEX ENDURA
Polymer modified cementitious grout / Tile Adhesive	ARDEX ENDURA, LATECRETE, FOSROC, BASF, ACC.
List of RMC producers	A.C.C., ULTRA TECH, READY MIX INDIA (PVT.)LTD, Godrej & Boyce Ltd., Skyway , NUVOCO (Lafarge)
Waterproofing Compound	KRISHNA CHEM, DOCTOR FIXIT (Pidilite), BASF, CICO, SIKA , Fosroc, STRUCO, STP Ltd.
Silicon based water repellent/ Weather Sealant	GE Plastics, Dow Comings, Wacker, BASF, Pidilite
Poly-Sulphide Sealant	Fosroc, Pidilite, Sika, BASF
Plywood	ARCHID PLY, KITPLY, GREEN PLY, CENTURY, Anchor
Flush door shutters	ARCHID PLY, KUTTY FLUSH DOORS, Greenply, A-1 Teak, Century Ply, Duro, Anchor, Regency wood panel pvt Ltd.
High-pressure laminate	Formica, Merino, Greenlam, Century, Decolam, Kitply, Action TESA, Sunmica
Metal-Fire rated Door Shutters	Signum, Adhunik Technology, Navair, Godrei, Basic Arch, Sukri, Bhawani Fire protection, Shakti Met Ozone, Alada
SS Railing	KICH, Godrej, Archware
SS Hardware and accessories for Doors and fire doors	KICH, Archware, Ozone
Stainless Steel	Salem Steel, Jindal or equivalent

Hardware for Kitchen cabinet, ward robe and shelves	Godrej, EBCO, KAFF, SLEEK,
Particle board	Action TESA, Greenlam, Merino, Kitply
Melamine Polish	ASIAN PAINTS (MELAMYNE GOLD), PIDILITE INDUSTRIES (WUDFIN), ICI DULUX (TIMBERTONE)
Cement Based Wall putty	Birla wall care, JK White , Berger, Asian Paints
Oil Bound Washable Distemper/ Dry Distemper	Asian paint :(Professional Acrylic Distemper), NEROLAC : Beauty Acrylic Distemper Berger: Bison Acrylic Distemper Dulux ICI : Maxilite
1st Quality Acrylic Distemper/ Dry Distemper	Asian Paints :(Tractor Aqua Lock Paint), Berger : Commando Or equivalent paints of Nerolac or ICI-Dulux
Acrylic Emulsion Paints	Asian Paints :(Professional Premium Interior Emulsion Paints), Nerolac :Beauty Gold Berger : Rangoli total care ICI-Dulux : Super Cover
Plastic Emulsion Paint	Asian Paints :(Apolite Heavy Duty Premium Emulsion Paint), Nerolac : Impression Berger : Easy Clean ICI-Dulux : 3 in 1
Premium Acrylic Emulsion Paints (Interior)	Asian Paints :(Royal Luxury Emulsion), Nerolac : Impression Berger : Silk ICI-Dulux : Velvet touch
Textured Exterior Paint	Asian paints, Nerolac, Berger Paints, Ultratech Paints, Luxture
Acrylic Smooth Exterior Paint	Asian Paints :(Apex/Professional Premium Exterior Emulsion), Nerolac : XL Berger : weather Coat ICI-Dulux : Weather Shield
Premium Acrylic Smooth Exterior Paint with Silicon additive	Asian Paints :Apex Ultima Nerolac : XL Total Berger : weather Coat all guard , ICI-Dulux : Weather Shield max
Synthetic Enamel Paint	Asian Paints : ApolitePremium Gloss Enamel, Nerolac : Synthetic Hi Gloss Berger : Luxol Hi Gloss ICI-Dulux : Gloss Synthetic Enamel

Cement Primer	NEROLAC, Berger, BP White (Berger), Decoprime WT (Asian), White primer (ICI).
Steel Primer (Red Oxide Zinc Chromate Primer)	Asian paints, Berger, ICI , NEROLAC
Wood Primer	Asian paint (Wood Primer- White/Pink), Berger ICI , NEROLAC
Epoxy Paint	ICI, NEROLAC, ASIAN, BERGER, Kansai Akzo Nobel.
Fire Paint	ASIAN PAINTS, Akzonobel Coatings India Ltd, PROMAT, Jotun
Gypsum Plaster	Gyproc, Asian Paints, Birla ,Ferrous Crete, Ultra Tech.
Cement based Ready Mix Plaster	Ultratech, Wallplast, Buildwell, ACC.
EPDM Gasket	Ame Rubber Industries Pvt. Ltd., Bohra Rubber, Osaka
Dash / Anchoring Fasteners	Hilti, Fischer, Arrow, Kundan, Trixel, Wurth
Aluminium Structural Members - Windows, Glazing and Partitions	Hindalco, Indalco, Jindal Aluminium Ltd.
Metallic False Ceiling	Armstrong, Hunter Douglas, Interach,
Floor & Wall Tiles : Ceramic / Vetrified tiles / Antiskid / Matt / Glazed	KAJARIA, JOHNSON, NITCO, SOMANY, RAK, Marbitto, Ambani Tiles
Chequered Tiles, Paver Block &Kerb Stone	Super Tiles, Hind Mosaic, Vyaara, Kajaria, Ultra Designer Tile, Nitco, Vitco.
Vitrified paver tiles	Kajaria, Pavit, Johnson, Nitco
Clear/Float/Frosted Glass / Mirror	ST. GOBAIN, MODIGUARD, ASAHI
Viterous Chinaware sanitary work	Parryware, Hindware, Dovel, Jaquar
Bathroom accessories (Towel ring, Towel rack, Soap Dish Holder, etc)	Jaguar, Kich, Archware
Water supply CP Fittings & Accessories	Jaquar, Kohler, Roca
PVC water tank	Sintex, National Plastic, Kaveri
Stainless Steel Sink	Nirali, Cera, Jaquar, Neelkantha
GI Pipes	Zenith / Tata / Jindal
GI Fittings	Unik, Zoloto, AVR
Valves	Zoloto, Sant, KIRLOSKAR, LEADER
HDPE Pipe	Reliance, Jain Pipes, ORIPLAST, Supreme
DI Pipes AND Fittings	ELECTROSTEEL, Kesoram, JINDAL, TATA DUCTURA, Neco, Kapilansh
Centrifugally Cast (Spun) Iron Pipes & Fittings	Neco, Kapilansh, SKF
Hubless CI Pipes & Fittings	Neco, Kapilansh, SKF
CI Manhole covers, Frames & GI Gratings	Neco, Kapilansh, SKF

SFRC Covers	KK spun pipes, Jain spun pipes, SS industries
RCC Pipes	Jain Spun Pipes, K.K.Spun Pipe, The Indian Hume Pipe Co.Ltd., Patel Hume Pipes.
UPVC / CPVC Pipe & Fittings	Finolex Supreme, Prince, Astral, Ashirwad, Raksha.
UPVC DOORS & windows (Profile makers & their authorized Fabricators only)	Fenesta, Kommerling, Aluplast
UPVC DOORS & windows Hardware	Rotto, Dorset, Kinlong
FRP chajja, FRP Shutters & Frame	Fibreways ,Bhutt FRP
AnodisedAluminium Doors Fittings (ISI Marked only)	Classic , Shalimar , Prestige
PVC Shutters & Frame	Rajashree, Plastiwood, Accucel, Vijay Doors.
Steel Door / Window Frames	AGEW, SenHarvik , Shiv Mular, Steel Plast
SBR COMPOUND (For REPAIR MORTAR & WATER PROOFING SLURRY)	MASTER EMACO SBR2 OF BASF, SIKA LATEX POWER, CICO LATEX sbr
Acrylic Polymer FOR BOND COAT AND POLYMER MODIFIED MORTAR	Anuvi Chemical, Sunanda Specialty Coating Pvt. Ltd,
Rust remover	Anuvi Chemical, Sunanda Specialty Coating Pvt. Ltd,
Rust Passivator	Anuvi Chemical, Sunanda Specialty Coating Pvt. Ltd,
READYMADE SINGLE COMPONENT POLYMER MODIFIED REPAIR MORTAR	MASTER EMACO S 348 OF BASF, ANUVI CHEMICAL, SUNANDA SPECIALITY COTING PVT.LTD, SKG CONSTN.
MICRO CONCRETE	DR. FIXIT , BASF , FOSROC
Stone Ware Pipes Grade-A (ISI Marked only)	Sonya, Supertech, Cherry
PTMT (ISI Marked only)	Prayag , Polytuf
Readymade plaster	Precise Conchem Pvt. Ltd., Ultratech, Wall plast

Schedule of Quantity					
Name of Work: Repair and refixing of damaged paver block in sector I to IV, Antop Hill, Mumbai-37.					
SLNo	Description	Qty	Unit	Rate	Amount
1	EARTH WORK				
1.1	Surface dressing of the ground including removing vegetation and in- equalities not exceeding 15 cm deep and disposal of rubbish, lead up to 50 m and lift up to 1.5 m.				
1.1.1	All kinds of soil	205	sqm	34.15	7001.00
	Sub-Total				7001.00
2	ROAD WORK				
2.1	Taking out existing CC interlocking paver blocks from footpath/ central verge, including removal of rubbish etc., disposal of unserviceable material to the dumping ground, for which payment shall be made separately and stacking of serviceable material within 50 metre lead as per direction of Engineer-in-Charge.	185	sqm	131.75	24374.00
2.2	Laying old cement concrete interlocking paver blocks of any design/ shape laid in required line, level, curvature, colour and pattern over and including 50 mm thick compacted bed of coarse sand, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge. (Old CC paver blocks shall be supplied by the department free of cost).	185	sqm	402.95	74546.00
2.3	Providing and laying factory made chamfered edge Cement Concrete paver blocks in footpath, parks, lawns, drive ways or light traffic parking etc, of required strength, thickness & size/ shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50 mm thick compacted bed of sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand. complete all as per direction of Engineer-in-Charge.				
2.3.1	60 mm thick cement concrete paver block of M-35 grade with approved colour, design & pattern.	230	sqm	1045.65	240500.00
	Sub-Total				339420.00
	Total				346421.00
	Modified Estimated Cost after using correction factor on DSR 2023 on account of GST @ 0.973 * 346421 = 337068				337068.00
	Add Cost Index @17% on SR&DR Total 3,37,068.00				57301.56
	Total (A) =				394369.56

3	New Non Schedule				
3.1	Supplying and fixing of precast SFRC manhole / stormwater grating covers without frames at site including the cost of transportation, loading, unloading & stacking as per the direction of Engineer-in-Charge.				
3.1.1	MD Rectangular cover without frame (size of cover 900 x 450 X 50 mm).	75	Each	2024.30	151823.00
	Sub-Total				151823.00
	Total (B) =				151823.00
	Total (A + B) =				546192.56
	Say =				5,46,193.00

**Assistant Engineer-IV,
Mumbai-IV, CPWD, Mumbai-37**