INVITATION TO E-TENDER

WORKS DIRECTORATE, CENTRAL RESERVE POLICE FORCE

Level – 3, Block-7, Sec -1, East Block, R. K. Puram,
New Delhi–110066, Tel/Fax: 011-26108447

E-Mail id – digwks@crpf.gov.in **Tele / Fax No. :011-26108447**

No. B.V(GC NMH)AP/24-25-/MW/WksDte-C/Cell(NIT-52) Dated, January,2025

To,

…….
…….
…….
…….

Dear Sir,

On behalf of the President of India, I invite you to **online bid under two bid system** for the following work at **GC CRPF NEEMUCH (M.P.)**:-

Sl. No.	Details of proposal
1.	**REPAIR/MAINTENANCE OF FORT WALL AND RECARPETING OF PARADE GROUND AT CRPF RTC, NEEMUCH, M.P.**

02. Details **of works** are mentioned in **Schedule- "A"** and "**B.O.Q. of Tender**".

03. If you are in a position to quote for carrying out the proposed works in accordance with the requirements stated in the attached schedule to tender, all documents attached herewith should be properly filled in, signed and submitted through e-procurement site http://eprocure.gov.in/eprocure/app. You are further required to furnish along with the aforesaid tender all the information called for, attached list of questionnaire should also be answered and submitted along with documents through e-procurement site http://eprocure.gov.in/eprocure/cpp, failing which your tender will liable to be rejected and will not be considered.

04. This tender is not transferable.

05. **Since, work is being executed for a prestigious event of national level, there is a need by the firm to understand the importance of work to execute in given time failing which suitable punitive action shall be taken by CEA which may include penalty and/or blacklisting the firm for certain duration from bidding to CRPF projects.**

Thanking you.

Yours faithfully

DIG(Engr), Works Dte.
For and on behalf of the President of India

SCHEDULE TO TENDER (OPEN TENDER)

CENTRAL RESERVE POLICE FORCE

(Government of India, Ministry of Home Affairs)

Works Directorate, CRPF

No. B.V(GC NMH)AP/24-25-/MW/WksDte-C/Cell(NIT-52) Dated, January,2025

TENDER SET IS NOT TRANSFERABLE

Tender Enquiry No.	:	
Date of Publishing of Tender		**As per CPP Portal**
Time and date of submission/receipt of tender	:	
Time and date for opening of tender	:	

01. The intending tenderers must read the terms and condition carefully and submit their tender if they consider themselves eligible and are in possession of all the required documents, through online tender (e-procurement web site in CPP Portal) before due date & time. Tenderers are also advised to go through the Earnest Money, Payment terms and other clauses, terms and conditions of this Tender Enquiry carefully before filling the Tender Application.

Tender No	Name of work with its description and location	Category of service required / Quantity / Work Timing / Periodicity / Period	Estimated cost put to tender	Earnest Money Deposit @2 %	Procedure for deposit of Earnest Money Deposit (EMD)	Critical date
B.V(GC NMH)AP/24-25-/MW/WksDte-C/Cell(NIT-52)	**REPAIR/MAINTENANCE OF FORT WALL AND RECARPETING OF PARADE GROUND AT CRPF RTC, NEEMUCH, M.P.**	As "Schedule to tender"	**Rs. 1,05,45,593/-**	**Rs 2,10,912/-** [Note: - EMD Should be valid for 90 days from the bid submission end date of tender. If there after validity of the E.M.D require extension, the firm will be responsible to extend the same suitably till the validity of the bid]	**Rs 2,10,912/-** **Original Earnest Money Deposit (EMD) shall be deposited in office of the Works Dte, level-3, East Block-7, Sec -1, , RK Puram, New Delhi before the due date of submission of bid.**	As per CPP Portal

02. Tenders will be opened online on the given date & time at CRPF Works Dte, Level-3, East Block – 07, RK Puram, Sector- 1, New Delhi.

03. Tenderers are requested to submit their bid/tender documents online through e-procurement in CPP Portal. EMD, Tender Acceptance Letter (On firms letter head), Integrity Pact (On firms letter head) documents shall be submitted in original either by hand or by registered/speed post to CRPF Works Dte, Level-3, East Block – 07, RK Puram, Sector- 1, New Delhi.

04. All Tender documents attached with this invitation to tender including the specifications are sacrosanct for considering any offer as complete offer. It is therefore important that Tender Acceptance Letter which is a written undertaking that all the terms and conditions of the tender are understood and accepted should be signed and submitted along with all documents as required through e-Procurement site http://eprocure.gov.in/eprocure/app.

05. All bidders required to submit earnest money as mentioned above along with their offer. EMD should be paid by the bidder mandatorily. If the bidder fails to submit EMD then his tender will be rejected summarily.

06. All bidders are required to submit their offer in **two bid system**.

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

08. Details required to be furnished by all bidders in the bid (Composite i.e. Technical & Price or financial Bid together) are as under. The bid should contain the following: -

i) Documents to be submitted online in scanned copy on CPPP:-

1.	Tender acceptance letter (In firm's letter head)
2.	Earnest Money deposit (As per schedule to tender failing which offers will be summarily rejected).
3.	Copy of GST registration certificate & PAN Card.
4.	Copy of registration of the firm/contractor for Building Works with CPWD, MES, BRO, RAILWAY and MP PWD or All Documents required for Enlistment as specified in the latest CPWD Enlistment Rules.
5.	Copy of certificate of registration for EPFO and certificate of registration for ESIC (Declaration, if not applicable) failing which offers will be summarily rejected).
6.	Satisfactorily completed as a prime contractor at least one similar work of 80% value or two works of atleast 60% value or 3 works of atleast 40% value. (for non – enlisted contractors) Bidder has to submit on-line scanned copy of certificate of Work Order along with Work Completion certificate of similar nature work equal to required value during last five years issued by not below the rank of Executive Engineer.
7.	Partnership Agreement of the firm if the firm is a partnership firm. (If no papers submitted with the bid it will be assumed that the firm is a Single/Sole Proprietary and will be fully responsible if found false at later stage)
8.	Check list as per Appendix-'B' after compliance.
9.	Information regarding any litigation or arbitration resulting from contracts executed by the bidder in the last five years or currently under execution as provided. Bidder has to submit on-line scanned copy of an information regarding litigation, arbitration, black listing, debarring etc. This document must be up loaded on line duly signed by the bidder.
10.	Bidder has to submit on-line scanned copy of an affidavit duly signed stating that the near relations defined as first blood relations, and their spouses is/are not working in CRPF. If working, give details for the same. (a relation shall mean wife, husband, parents, grandparents, children, grandchildren, brothers, sisters, uncles, aunts, cousins and their corresponding in-laws)
11.	Bidder has to submit on-line scanned copy of an affidavit duly signed stating that no retired personnel in his employment is working who retired within last two years from CRPF. If employed, give details for the same.
12.	Non-enlisted bidders are required to submit (i) Either Banker's Certificate of **Rs. 41.6 Lakh (Proforma as Appendix-E)** **OR** Net worth Certificate of **Rs. 13 Lakh (proforma as Appendix-D)** **AND** (ii) Average Annual Turnover Certificate of **Rs. 41.6 Lakh (Proforma as Appendix-C)** on works during the last three financial years from a Chartered Accountant.

(ii)Documents to be submitted in original manually or by registered/speed post to CRPF Works Dte, Level-3, East Block – 07, RK Puram, Sector- 1, New Delhi.

1.	Tender acceptance letter (On firms letter head)
2.	Earnest Money deposit
3.	Integrity Pact (On firms letter head)

09. Following should be noted and kept in mind while submission of rate in price bid format of C.P.P Portal-

i) Price should only be quoted as per price bid format / B.O.Q along with tender documents at e-procurement site http://eprocure.gov.in/eprocure/app.

ii) The price bid in B.O.Q format / template should not be modified and replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for the tender. Bidders are allowed to enter the Bidder Name and Values only.

10. Bidder should deposit earnest money with required validity along with their Tender. Earnest Money should be in form of **Account payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque** from any of the commercial banks in an acceptable form in favour of **"THE DIGP GC, CRPF, NEEMUCH** [Payable At-**SBI**, **Kanawati Branch (Code-7293)**]"

11. The tender documents are consisting of specification, schedule of quantities of works to be provided and terms and conditions of this contract to be complied with other necessary documents.

SIGNATURE OF THE TENDERER

DIG (Engr), Works Dte
For and on behalf of the President of India

Appendix-'A'

TENDER ACCEPTANCE LETTER

(To be given on Firm's/Company's Letter Head)

Date:

To,

_____
_____

Subject:-**Acceptance of Terms & Conditions of Tender**.

Tender Reference No:- _____

Name of Tender / Work: - _____
_____
_____

Dear Sir,

1. I/We have downloaded/obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely..……. as per your advertisement, given in the above mentioned website(s).

2. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like annexure(s), schedule(s), etc.) which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.

3. The corrigendum(s) issued from time to time by your department/ organizations too have also been taken into consideration, while submitting this acceptance letter.

4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality/entirety.

5. In case any provisions of this tender are found violated , then your department/ organization shall without prejudice to any other right or remedy be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)
SIGNATURE OF TENDERER

Appendix-"B"

Check list for tenderer

(Tenderers should check following requirements for compliance before submission of the tender documents)

Sl. No.	Requirements to be checked by the tenderer before submission of the tender	Compliance (To be indicated With "YES" after Compliance of the requirements)
1.	Whether Tenderers has submitted required Earnest Money Deposit with their bid as specified? (As per schedule to tender failing which offers will be summarily rejected).	
2.	Whether rates have been quoted only as per price bid format / B.O.Q along with tender documents?	
3.	Whether rates have been quoted inclusive of all taxes including GST (ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. The EPF & ESIC contributions on the part of the employer paid by the contractor shall be reimbursed by the department to the contractor on actual basis with site of work at **GC CRPF NEEMUCH (M.P.).** only on producing original receipt of EPF & ESIC paid by the contractor to Govt. organization. (It may also be noted that the quoted rates are inclusive of all taxes.)	
4.	Whether copy of GST & PAN Card submitted?	
5.	Whether copy of registration of the firm/contractor with CPWD, MES, BRO, RAILWAY & MP PWD submitted?	
6.	Whether copy of registration of certificate registration for EPFO and certificate of registration for ESIC submitted? (Declaration, if not applicable) (Failing to submit the certificates offers will be summarily rejected).	
7.	Satisfactorily completed as a prime contractor at least one similar work of 80% value or two works of atleast 60% value or 3 works of atleast 40% value. (for non – enlisted contractors) Bidder has to submit on-line scanned copy of certificate of Work Order along with Work Completion certificate of similar nature work equal to required value during last five years issued by not below the rank of Executive Engineer.	
8.	Non-enlisted bidders are required to submit (iii) Either Banker's Certificate of **Rs. 41.6 Lakh (Proforma as Appendix-E)** **OR** Net worth Certificate of **Rs. 13 Lakh (proforma as Appendix-D)** **AND** (iv) Average Annual Turnover Certificate of **Rs. 41.6 Lakh (Proforma as Appendix-C)** on works during the last three financial years from a Chartered Accountant.	
9.	Tenderers should mention that Business dealing with their firms has not been banned by any Govt. / private agencies.	
10.	Tenderers should mention their address for communication with Telephone/Fax Number and e-mail address.	
11.	Whether all the Points under heading "Terms & Conditions", "Additional Conditions" and instructions are fully abided by the contractor or not?	
12.	Whether all the requisite documents as asked in tender Schedule of inviting tender notice have been submitted by the tenderer?	
13.	Whether the firm has enclosed valid documents if the firm is a partnership proprietary in nature? (If no papers submitted with the bid it will be assumed that the firm is Single/Sole Proprietary)	
14.	Whether any other relevant documents which the firms wish to submit as a part of offer?	
15.	Tender acceptance letter (In firm's letter head)	
16.	Integrity Pact (on firm's letter head)	

SIGNATURE OF THE TENDERER

Appendix-"C"

FORM OF CERTIFICATE OF ANNUAL TURNOVER ON WORKS FROM CHARTERED ACCOUNTANT

Certified that following is the annual turnover on works of the individual/firm/company as per returns filed with Income Tax Department for the past 3(three) financial years.

Name and registered address of individual / firm /company :……
.....

S. No.	Financial Year	Annual Turnover on Works in Rs. lakhs

Unique Document Identification Number (UDIN)……

(Signature of Chartered Accountant)

(Name of Chartered Accountant)

Membership No. of ICAI

Date and seal

Appendix-"D"

FORM OF CERTIFICATE OF NET WORTH FROM CHARTERED ACCOUNTANT

It is to certify that as per the audited balance sheet and profit & loss account during the financial year ……....., the networth of Shri/Smt/M/s….....….....(Name & Registered Address of individual/firm/company), is Rs…..... after considering all liabilities. It is further certified that the networth of the individual/firm/company has not eroded by more than 50% during the last three years ending on 31st March ……

Unique Document Identification Number (UDIN)……

(Signature of Chartered Accountant)

(Name of Chartered Accountant)

Membership No. of ICAI

Date and seal

Appendix-"E"

FORM OF BANKER'S CERTIFICATE FROM A COMMERCIAL BANK

This is to certify that to the best of our knowledge and information Shri/Smt/M/s…… having registered address, ... a customer of our bank, is/are respectable and can be treated as reliable for any engagement upto a limit of Rs…… (Rupees .....).

This certificate is issued without any guarantee or responsibility on the Bank or any of the officers. This certificate is issued on the request of Shri/Smt/M/S…… For obtaining Works tender in CRPF in…… (Name of Works).

(Signature)
For the Bank

Note:

1. **Banker's certificates should be on the letter head of the bank, addressed to enlisting authority.**
2. **In case of partnership firm, the certificate shall include names of all partners as recorded with the bank.**

NOTICE INVITING TENDER

The **DIG (Engr)**, Works Dte. invites online item rate bids for & on behalf of the President of India from approved and qualified firm/contractor with CPWD, MES, BRO, RAILWAY & MP PWD for **REPAIR/MAINTENANCE OF FORT WALL AND RECARPETING OF PARDE GROUND AT CRPF RTC, NEEMACH, M.P.**

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

1.1 The estimated cost put to the work is **Rs. 1,05,45,593/- (Rupees One Crore Five Lakh Forty Five Thousand Five Hundred Ninety Three) only** including all taxes.

2. Agreement shall be drawn with the successful bidders on prescribed form of CPWD (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 work has to be completed by within **40 days** from the date of placing of Work Order 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. Site of work is within the **RESTRICTED AREA.**

4. The site for the work is available.

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 CPP Portal (htpp://eprocure.gov.in/eprocure/app).

6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.

7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

8. Bidder should deposit earnest money with required validity along with their Tender. Earnest Money should be in form of **Account payee Demand Draft, Fixed Deposit Receipt. Banker's Cheque** from any of the commercial banks in an acceptable form in favour **of THE DIGP GC, CRPF, NEEMUCH** [Payable At-**SBI**, **Kanawati Branch (Code-7293)**]"

The Earnest Money shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The physical EMD of the scanned copy of EMD uploaded shall be deposited in original at **Works Dte, Sec - 1, East Block, Block – 7, RK Puram, New Delhi – 110066** failing which the tender shall be rejected.

Interested contractor who wish to participate in the bid has to make following payments in the form of Demand Draft / Pay order or Banker's Cheque of any Scheduled Bank to the e-Tendering website within the period of bid submission:

(i) Copy of Enlistment Order and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission. Original Demand Draft of Earnest Money Deposit (EMD) shall be deposited in the office of the **Works Dte, Sec -1, East Block, Block – 7, RK Puram, New Delhi – 110066** before the due date of submission receipt of tender bids

(ii) The bid/tender submitted shall be opened as per timing specified on CPP Portal.

9. The bid/tender submitted shall become invalid and cost of bid shall not be refunded if:-

I. The bidders are found ineligible.

II. The bidders does not upload all the documents (including Labour Licence, GST registration, EPFO & ESIC registration, PAN card and copy of registration/enlistment) as stipulated in the bid document including the undertaking about deposition of physical EMD of the scanned copy of EMD uploaded.

III. Any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically in the office of tender opening authority.

10. The contractor whose tender is accepted will be required to deposit **PERFORMANCE SECURITY** for an amount of **Five percent (5%) of the value of the contract within a period of 07 (SEVEN) days after the Tender is accepted by the Competent Engineering Authority**. **Performance Security may be furnished in the form of an Fixed Deposit Receipt from a commercial bank in an acceptable form.** Performance Security should remain **valid for a period of 180 days (six months)** beyond the date of completion of all contractual obligation of the supplier including warranty obligations if any. In case the contractor fails to deposit the performance security within the stipulated period including extended period, if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.
The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/registrations or Proof of applying for obtaining labour licenses and registration with EPFO & ESIC within the period specified in Schedule-"F". Failing to submit the above certificates / documents, offers will be summarily rejected.

11. The reimbursement of EPF & ESI contributions paid by the contractor on the part of employer is to be made on submission of documentary proof of payment provided the same is in order**.**

12. Intending Bidders may 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 and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidders implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The Competent Engineering Authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.

15. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.

16. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or before submission of the bid or engagement in the contractor's service.

17. The bid for the works shall remain open for acceptance for a period of Ninety (90)days from the end date of submission of bids, if any bidders withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 100% of the said earnest money as aforesaid. Further the bidders shall not be allowed to participate in the re-bidding process of the work.

18. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
    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 7/8 or other Standard C.P.W.D. Form as applicable.

19. The firm shall mention its authorized email address and mobile/land line number of authorized person to which any correspondence/virtual discussions can be made regarding the work. The firm shall ensure that contact details so provided are attended always & prompt action is taken on any message received.

DIG (Engr) , Works Dte
For and on behalf of the President of India

GOVERNMENT OF INDIA
CENTRAL RESERVE POLICE FORCE

STATE: MADHYA PRADESH **Work Site : GC CRPF NEEMUCH (M.P.)**

ITEM RATE TENDER & CONTRACT FOR WORKS

TENDER FOR THE WORK OF– REPAIR/MAINTENANCE OF FORT WALL AND RECARPETING OF PARDE GROUND AT CRPF RTC, NEEMACH, M.P.

(i) To be submitted online through website htpp://eprocure.gov.in/eprocure/app

(ii) To be opened in online **at Works Dte, Sec -1, East Block, Block – 7, RK Puram, New Delhi – 110066**

T E N D E R

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

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule-"F", viz. Schedule of Quantities and in accordance in all respects with the Specifications, Designs, Drawings 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 respects in accordance with, such conditions so far as applicable.

We agree to keep the tender open for Ninety (90) days from the date of opening of tender and not to make any modifications in its terms and conditions.

A sum of **Rs. 2,10,912/- (Rupees Two Lakh Ten Thousand Nine Hundred Twelve only)** is hereby forwarded in Bank Draft/ FDR of a Scheduled Bank/ Demand Draft of a scheduled bank as earnest money. If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/ We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money 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 CRPF 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 & integrity of the State.

Dated : **Signature of Contractor**
Witness: **Postal Address**
Address:
Occupation:

ACCEPTANCE

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

The letters referred to below shall form part of this contract agreement:-
(a)

(b)

(c)

Dated: - .....

DIG (Engr) , Works Dte.
For and on behalf of the President of India

SCHEDULES (A TO F)

SCHEDULE -"A"

Name of work :- **REPAIR/MAINTENANCE OF FORT WALL AND RECARPETING OF PARDE GROUND AT CRPF RTC, NEEMACH, M.P.**

Schedule of quantities:- As per BOQ :-

SCHEDULE - "B" :-

Schedule of materials to be issued to the contractor.

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

---------- NIL ----------

SCHEDULE - "C" :-

Tools and plants to be hired to the contractor

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

---------- NIL ----------

NOTE :-ALL THE TOOLS, PLANTS AND MACHINERY REQUIRED FOR CARRYING OUT THE SUBJECT WORK SHOULD BE OWNED/REGISTERED/LEASED EITHER IN THE NAME OF THE SOLE PROPRIETOR OF THE FIRM OR THE NAME OF FIRM AND THE CONTRACTOR SHALL ALSO MEET THE MINIMUM REQUIREMENT OF TOOLS, PLANTS AND MACHINERY SUCH AS VIBRATORY ROLLERS, PNEUMATIC WHEELED ROLLER, FULLY AUTOMATIC CONCRETE BATCHING PLANT, CONCRETE PAVER FINISHER ,CONTINUES TYPE HOT MIX PLANT, PAVER FINISHER (HYDRAULICALLY CONTROLLED SENSORS OPERATED ELECTRICALLY FOR THE PAVE FINISHER (HYDRAULICALLY CONTROLLED), BULL DOZERS, ROAD ROLLERS, DRILLING MACHINES, CONCRETE MOBILE WEIGH BATCHERS, TRANSIT MIXERS ONE BAG CAPACITY CONCRETE MIXER(DIESEL), VIBRATORS (NEEDLE AND PLATE TYPE), TRUCKS/ TIPPERS, TOTAL STATIONS, CONCRETE CUBE TESTING MACHINE(HYDRAULICALLY OPERATED), FULLY AUTOMATIC CONCRETE BATCHING PLANT AND ANY OTHER TOOLS, PLANTS AND MACHINERY REQUIRED FOR THE WORK AS PER GOOD ENGINEERING PRACTICE/RELEVANT IS-CODES WHICHEVER APPLICABLE.

SCHEDULE - "D" :-

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

SCHEDULE- "E" :-

Reference to General Conditions of Contract:-		General Conditions of Contract for CPWD Works 2023 with upto-date amendments.
1.1	Name of Work:	(1) **REPAIR/MAINTENANCE OF FORT WALL AND RECARPETING OF PARDE GROUND AT CRPF RTC, NEEMACH, M.P.**
1.2	Estimated Cost of work: -	**Rs. 1,05,45,593/-**
1.3	Earnest Money: -	**Rs. 2,10,912/-** (The EMD will be returned post receipt of Performance Guarantee)

1.4	Performance Guarantee	**5% of tendered value(It shall be valid up to the stipulated date of completion Plus 180 days beyond that)**
1.5	Security Deposit	**2.5 %**

SCHEDULE- "F" :-

General Rules & Directions:-

Officer Inviting Tender: - **DIG (Engr)**

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

Definitions :-

2(v)	Engineer-In-Charge	**AC Engr. or Designated by DC(Engr.)**
2(viii)	Accepting Authority	**DIG (Engr)**
2(x)	Percentage on cost of Materials and labour to Cover all overheads and Profits	15%
2(xi)	Standard Schedule of Rates	DSR
2(xii)	Department	CRPF
9(ii)	Standard CPWD contract Form CPWD form 8 & General Conditions of Contract for CPWD Works-2023 with upto-date correction slips.	

Clause-1 :-

(i)	Time allowed for submission of Performance guarantee **Programme Chart (Time & Progress) and** from the date of issue of letter of acceptance.	**07** days
(ii)	Maximum allowable extension Beyond the period as provided in (i) above	10 days by DC (Engineer) Dte.

Clause-1A :- Recovery of Security Deposit as per GCC :- Applicable

Clause-2 :- Authority for fixing compensation under clause 2. **DIG (Engr)**

Clause-2A:- Whether Clause 2A shall be applicable No

Clause- 3 :- Applicable

Clause 3A:- Applicable
Clause 4 :- Applicable

Clause-5:- Applicable

Time allowed for execution of work **40 days**

Authority to decide

i) Extension of time — **Since, it is an emergent work, time is of essence and work has to be completed within time for completion mentioned in tender/work order. No request for extension of time shall be entertained.**

ii)	Rescheduling of mile stones	**NA**
iii)	Shifting of date of start in case of delay in handing over of site	**DIG (Engr)**
Clause-6 :-	Computerized Measurement Book	**No**
Clause-7A :-	**Whether Clause 7A shall be applicable**	**Applicable**
Clause 8 :-	Completion Certificate and Completion Plans	**Applicable**
Clause-8A :-	Completion Plans to be Submitted by the Contractor	**Applicable.**
Clause-9 :-	Payment of Final Bill	**Applicable.**
Clause 9A :-	Payment of Contractor's Bills to Banks	**Applicable.**
Clause-10A:-	Materials to be provided by the Contractor	**Applicable**

Clause-10-B
(i) Secured Advance on Materials — **No**
(ii) Whether Mobilization advance will be paid — **No**

Clause-10C:-
Payment on Account of Increase in Prices/ Wages due to Statutory Order(s) — **Not applicable.**

Clause-10 CA:-
Payment due to variation in prices of materials after receipt of tender — **Not applicable.**

Clause-10-CC:-
Payment due to Increase / Decrease in Prices/ Wages (excluding materials covered under clause 10 CA) after Receipt of Tender for Works — **Not applicable**

Clause 10 D :-Dismantled Material Govt. Property
The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc. as Government's property and such materials shall be disposed off to the best advantage of Government according to the instructions in writing issued by the Engineer-in-Charge.

Clause-11:- Work to be Executed in Accordance with Specifications, Drawings, Orders etc.
The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department specified in Schedule 'F' or in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract. The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

Clause-12:-
Authority to decide deviation/extra items(As per CPWD norms) — **DIG (Engr)**

Clause -14: - Carrying out part work at risk & cost of contractor(Authority to decide) — **DIG (Engr)**

Clause-16:- Competent Authority for deciding reduced rates. — **DIG (Engr)**

Clause17: **<u>Contractor Liable for Damages, defects during defect liability period</u>**

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within twelve months (six months in the case of work costing Rs. Ten lacs and below except road work) after a certificate final or otherwise of its completion

shall have been given by the Engineer in- Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months after the issue of the certificate final or otherwise, of completion of work. Provided that in the case of road work, if in the opinion of the Engineer-in-Charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion.

In case of Maintenance and Operation works of E&M services, the security deposit deducted from contractors shall be refunded within Two months from the date of final payment or within Two months from the date of completion of the maintenance contract whichever is earlier.

Clause-18:- **Tools & Plants etc.**

The contractor shall provide at his own cost all materials machinery, tools & plants as specified in schedule F. In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

Clause-19 :-	Labour Laws to be complied by the contractor	Applicable.
Clause-19A :-	No labour below the age of Eighteen years shall be employed on the work.	Applicable.
Clause-19C :-		Applicable.
Clause -19D :-		Applicable.

Clause -19K :- Employment of skilled/semi skilled workers

The contractor shall, at all stages of work, deploy skilled/semi skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/Industrial Training Institute/ National Institute of construction Management and Research (NICMAR)/ National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/Central Government. The number of such qualified tradesmen. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer in charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer in- Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate specified in schedule 'F' per such tradesman per day. Decision of Engineer in Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding. Provided always, that the provisions of this clause, shall not be applicable for works with estimated cost put to tender being less than Rs. 5 crores. For work costing more than Rs. 10 Crores, and uptoRs. 50 Crores, the contractor shall arrange on site training as per National Skill Development Corporation (NSDC) norms for at least 20% of the unskilled workers engaged in the project in co-ordination with the CPWD Regional Training Institute& National Skill Development Corporation (NSDC) for certification at the level of skilled/semi skilled tradesmen. For works costing more than Rs. 50 Crores, the contractor shall arrange on site training as per National Skill Development Corporation (NSDC) norms for at least 30% of the unskilled worker engaged in the project in co-ordination with the CPWD Regional Training Institute & National Skill Development Corporation (NSDC) for certification at the level of skilled/semi skilled tradesmen. The cost of such training as stated above shall be born by the Government. The necessary space and workers shall be provided by the contractor and no claim what so ever shall be entertained.

Clause-19L :-	Contribution of EPF & ESI	Applicable.
Clause-20 :-	Minimum wages act to be complied with.	Applicable.

Clause 21 :- Work not to be sublet. Action in case of in solvency

The contract shall not be assigned or sublet without the written approval of the Engineer-in Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the President of India shall have power to adopt the course specified in Clause 3 hereof in the interest of Government and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

Clause 25 Settlement of Dispute by Conciliation and Arbitration

(i)	**Conciliator**	**--**	**IG (Works)**
(ii)	**Arbitrator Appointing Authority**	**--**	**IG (Works)**
(iii)	**Place of Arbitration**	**--**	**New Delhi**

Clause 28 Action where no Specifications are specified

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers' specifications, if not available then as per state/ District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

Clause 30 Water for Works

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

(i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.

(ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in- Charge, unsatisfactory.

(iii) WATER CHARGES:- The contractor has to make its own arrangement for water supply required for execution of the work, If water is used from CRPF campus then 1% amount of tendered cost shall be levied from contractor.

(iv) ELECTRICITY CHARGES:- The contractor has to make its own arrangement for power supply required for execution of the work, If electricity is provided by CPRF campus then charges shall be applied on contractor as decided by Engineer-in-charge.

Clause 31 Hire of Plant & Machinery

The contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter referred to as T&P) required for execution of the work.

Clause 32,33,34& 35 **Applicable**

Clause-32 Requirement of technical representative(s) and recovery rate

Sl. No.	Minimum qualification of technical representative	Minimum Experience	Designation of Technical Staff	Nos.	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of Clause 32	
					Figure	Words
1.	Graduate or Diploma Engineer	2 or 5 years (respectively) experience of similar nature of works	Project planning/Quality/Billing Engineer	1+1	**Rs. 25,000/- per month**	Rupees Twenty Five Thousand per month

Assistant Engineers retired from Govt. Services who are holding Diploma will be treated at par with Graduate Engineers.

Clause 37 :- No engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in an engineering department of the Government of India shall work as a contractor or employee of a contractor for a period of one year after his retirement from government service without the previous permission of Government of

India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Government of India as aforesaid, before submission of the tender or engagement in the contractor's service, as the case may be.

DIG (Engineer), Works Dte.
For and on behalf of the President of India

INTEGRITY PACT

To,

DIG (Engineer),
Works Branch, CRPF, Dte.
New Delhi.

Sub: Submission of Tender for the work of.....

Dear Sir, I/We acknowledge that CRPF is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by CRPF. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, CRPF shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid is accordance with terms and conditions of the tender/ bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

To be signed by the bidder and same signatory competent / authorized to sign the relevant contract on behalf of CRPF.

INTEGRITY AGREEMENT

This Integrity Agreement is made at..... on this .....day of ..... 20.....

BETWEEN

President of India represented through DIG GC CRPF NEEMUCH (M.P.).

.....
(Name of Zone)

CRPF, ..., (Hereinafter referred as the
(Address of Office)

'Principal/Owner', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND .....
(Name and Address of the Individual/firm/Company)

through ..... (Hereinafter referred to as the
(Details of duly authorized signatory)

"Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender (NIT No ....) (hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for

.....
(Name of work)

hereinafter referred to as the "Contract".

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as "Integrity Pact" or "Pact"), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....
(For and on behalf of Principal/Owner)

.....
(For and on behalf of Bidder/Contractor)

WITNESSES: 1 .....(signature, name and address)

2 ..... (signature, name and address)

Place:

Dated :

Instructions for online Bid submission

Instructions to the Bidders to submit the bids online through the Central Public Procurement Portal for e-Procurement at https://eprocure.gov.in/eprocure/app

1) Possession of valid Digital Signature Certificate (DSC) and enrolment/ registration of the contractors/bidders on the e-procurement /e-tender portal is a prerequisite for e-tendering.

2) Bidder should do the enrolment in the e-Procurement site using the "Click to Enrol" option available on the home page. Portal enrolment is generally free of charge. During enrolment/registration, the bidders should provide the correct/true information including valid eMail ID. All the correspondence shall be made directly with the contractors/bidders through eMail ID provided.

3) Bidder need to login to the site thro" their user ID / password chosen during enrolment / registration.

4) Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by SIFY/TCS/n-Code/ e-Mudra or any Certifying Authority recognized by CCA India on e-Token/Smart Card, should be registered.

5) The DSC that is registered only should be used by the bidder and should ensure safety of the same.

6) Contractor/Bidder may go through the tenders published on the site and download the required tender documents/ schedules for the tenders he/she is interested.

7) After downloading / getting the tender document/schedules, the Bidder should go through them carefully and then submit the documents as asked, otherwise bid will be rejected.

8) If there are any clarifications, this may be obtained online thro" the tender site, or thro" the contact details. Bidder should take into account the corrigendum published before submitting the bids online.

9) Bidder then logs in to the site through the secured log in by giving the user id/password chosen during enrolment/registration and then by giving the password of the e-Token/Smart Card to access DSC.

10) Bidder selects the tender which he/she is interested in by using the search option & then moves it to the „my tenders" folder.

11) From my tender folder, he selects the tender to view all the details indicated.

12) It is construed that the bidder has read all the terms and conditions before submitting their offer. Bidder should go through the tender schedules carefully and upload the documents as asked; otherwise, the bid will be rejected.

13) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/ schedule and generally, they can be in PDF/xls/rar/zip formats. If there is more than one document, they can be clubbed together and can be provided in the requested format. Each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same can be uploaded, if permitted. Bidders Bid documents may be scanned with 100 dpi with12 black and white option. However of the file size is less than 1 MB the transaction uploading time will be very fast.

14) If there are any clarifications, this may be obtained through the site, or during the pre-bid meeting if any. Bidder should take into account the corrigendum published from time to time before submitting the online bids.

15) The Bidders can update well in advance, the documents such as certificates, annual report details etc., under My Space option and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.

16) Bidder should submit the EMD as specified in the tender. The original should be Posted / couriered/given in person to the Tender Inviting Authority, within the bid submission due date & time for the tender. Scanned copy of the instrument should be uploaded as part of the offer.

17) While submitting the bids online, the bidder reads the terms & conditions and accepts the same to proceed further to submit the bid packets.

18) The bidder has to select the payment option as offline to pay the EMD as applicable and enter details of the instruments.

19) The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise submitted bid will not be acceptable.

20) The bidder has to digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.

21) The bidder has to upload the relevant files required as indicated in the cover content. In case of any irrelevant files, the bid will be rejected.

22) Tenderers should submit price bid in format available Annexure in **CPP Portal http://eprocure.gov.in/eprocure/app**and don't change the name of downloaded Annexure. Only fill the area which is available to fill and validate by the given button in Annexure, save the file and upload the file on portal.

23) The bidders are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.

24) After the bid submission (i.e after Clicking "Freeze Bid Submission" in the portal), the acknowledgement number, given by the system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and will also act as an entry pass to participate in the bid opening date.

25) The time settings fixed in the server side & displayed at the top of the tender site, will be valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system. The bidders should follow this time during bid submission.

26) All the data being entered by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered will not viewable by unauthorized persons during bid submission & not be viewable by any one until the time of bid opening.

27) Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers" public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

ADDITIONAL TERMS AND CONDITIONS

(i) PAYMENT:- (a) Works are required to be executed on credit basis only and payment will be released after submission of RA bill by the contractor and scrutiny by the department.

(b) Payment in advance or immediately cannot be made.

(c) The Payment action will be processed on production of the following documents:

(i) Bill in Triplicate.

(ii) A Copy of award of work.

(iii) A copy of Certificate issued by DIG GC CRPF NEEMUCH (M.P.) in consultation with Engineer-in-charge that contracted work for the period for which payment has been claimed, has carried out by the contractor satisfactory.

(d) GST/TDS/GST-TDS/ Labour Cess and other taxes will be deducted from the Bill of Contractor by RPAO as per norms. EPF & ESIC shall be reimbursed only on submission of proof of payment by contractor to concerned authorities.

(e) **Since work have to be completed in a very limited time, payment of bills will be done only in two tracnhes-1st RA bill at 50% completion of work and final bill on 100% completion of work.** RA bill should be checked by Insp/SI (Civil) & Engineer-in-charge and countersigned by Estate

Officer before release of payment. Security Deposit of 2.5% shall be retained from the Work Done in the RA Bill which will be paid after completion of Defect Liability Period.

(ii) MEASUREMENT: Entire work done at Site shall be recorded in measurement book duly signed by Contractor &Insp/SI (Civil) & AC(Engr). Measurements in measurement book shall be recorded jointly by contractor/authorized representative of contractor and Insp/SI Civil and 50% MB checked & signed by AC(Engr) before processing bill to Estate Officer for counter sign.

(iii) COMPLETION CERTIFICATE: Upon Completion of Work, Contractor shall intimate Estate Officer in writing of completion of work. If Estate Office is completely satisfied with the work, he shall issue Completion Certificate duly signed by Engineer-in-Charge (AC Engr) within 20 days of intimation of contractor. If Minor Defects Persists, Provisional Completion Certificate can be issued subject to rectification of defects brought out by Estate Officer. A suitable time frame for rectification of such defects shall also be intimated by Estate Officer in writing beyond which DIG Engineer Dte. Shall be empowered to rectify the defects through other agency at risk and cost of the contractor. This period shall not be less than 30 days and should not exceed 180 days in any case from the date of intimation of defects. Such defects list shall be made part of Provisional Completion certificate by Estate Officer.

(iv) DISPUTE IN CONTRACT:-In case of any ambiguity in the provisions of the Contract Agreement, Decision of Accepting Officer shall be Final & Binding on the Contractor. **GCC works-2023 (construction/maintenance) with upto date correction slips will prevail and applicable.**

(v) All materials required to be used on works shall be got approved from the Engineer-in-charge in advance. In case of doubt on any material, Engineer-in-charge has right to get the material tested from any Govt. approved labs/NABL and the charges for the same shall be borne by the contractor, upto the overall amount of Rs. 02 lakh in entire work. Beyond Rs. 02 lakh, the cost of such test shall be borne by the contractor if sample fails in the test & by CRPF if sample passes the test.

(vi) The quoted rate should be inclusive of all taxes, levies, works contract taxes, duties etc.

(vii)All items to be used in this work should be branded and ISI certified. In this case CPWD approved list of material for similar work may be followed. If any make is not specified, decision of Engineer-in-charge shall be final and binding.

(viii) Payment to contractor shall be released only after submission of purchase voucher of all new items.

(ix) TERMINATION OF CONTRACT :-
In case of violation/breach of any agreed terms and conditions of contract and persistently failure/negligence to observe and perform all or any of the acts, deeds, matters or things to be observed and performed by the Contractor. Tender Accepting Authority may cancel/Terminate this contract and the performance security deposit will be forfeited.

(x) CONFLICT OF INTEREST
The bids of any tenderer may be rejected if a conflict of interest between the bidder and CRPF is detected at any stage. Tender Accepting Authority reserves the right to accept or reject the tender without assigning any reason whatsoever.

(xi) Conditional tender is not acceptable and will be summarily rejected.

(xii) DEFECT LIABILITY PERIOD: - Defect liability period is 02 years, which will be reckoned from the date of final and complete handing/taking over of building/infrastructure. If any defects occurs/noticed during this period, then a notice in this regard will be issued to the contractor and it is the responsibility of contractor to rectify/repair the defects at his own cost. The work must be got started by the contractor within 15 days after receipt of the 1st notice. If the contractor is unable or unwilling to repair the defects, the competent authorities reserves full rights to forfeit the security deposit and may blacklisted/debarred the firm and rectify the defects at risk and cost of the contractor. Any amount on this account due to the department shall be recovered from the Contractor.

(xiii) Payment for execution of electrical works will be done only after inspection by the BOO/electrical engineer of State Electrical Department/any Govt. electrical engineer(serving) detailed by Estate Officer/Engineer-in-charge. A completion certificate is required to be submitted by the BOO/electrical engineer of State Electrical Department/any Govt. electrical engineer(serving). Any charges if occurs that will be borne by the contractor. No payment in this regard will be done by the CRPF.

(xvi) All credit obtained during dismantling shall be deposited with CRPF.

LIST OF MAKES

MATERIALS : Unless specific makes/manufacturers are specified in the tender documents all the materials to be procured by the contractor for incorporation in the work under this contract (with the exception of local materials like bricks, stone aggregate, stones, sand etc) shall be with ISI certifications mark.

SAMPLES OF MATERIALS: The contractor shall produce samples of all materials and shall obtain approval in writing from Engineer-in-charge before he places bulk order for the materials for incorporation in the work. The contractor shall not procure materials unless the samples are first got approved from the Engineer-in-charge .

TESTING : The contractor shall submit the manufacturer's test certificate in original along with the Test Sheet giving the result of each physical test as applicable and the chemical composition of the cement or authenticated copy thereof, duly signed by the manufacturer with each consignment clearly bringing out lot No. The Engineer-in-Charge shall record these details in the Cement Supply & Acceptance register

Following mandatory tests shall be carried out for cement procured by the Contractor:

(i) Initial and final setting time
(ii) Soundness test
(iii) Compressive strength test at 3, 7 & 28 days as specified in relevant IS code.

CONCRETE

MATERIALS FOR CONCRETE:-

I. **LIME:** Lime shall be eminently hydraulic lime (Class 'A') and shall conform to IS:712.

II. **CEMENT:** Cement shall be stored in dry a place covered all round and no stacks shall be more than 15 bags high.

III. **COARSE AGGREGATE:** Coarse aggregate shall be crushed stone aggregate and shall conform to standard specifications followed in the industry.

LIST OF APPROVED MANUFACTURERS AND MAKES

S/NO.	NAME OF PRODUCT	MAKES/BRANDS/MANUFACTURERS
1	ORDINARY PORTLAND CEMENT	J.K., ACC, AMBUJA, BIRLA
2	REINFORCEMENT BARS	TATA STEEL (TISCON), SAIL (EQR/ SEQR), RINL, JINDAL (JSW NEOSTEEL/PANTHER)
3	EXPANSION JOINTS	J.SONGS, METCO, SANFIELD (INDIA) P LTD. Z-TECH (INDIA) PVT. LTD.
4	ADMIXTURES FOR CONCRETE	FOSROC, SIKA, MBT, ASIAN LABORATORIES DURA BUILD CARE, BASF, FEVICOL, CICO TECHNOLOGIES LTD
5	STRUCTURAL STEEL	TATA, SAIL, RINL. ISCO, SRMB
6	WELDING ELECTRODES	ESAB, ADVANI-ORLIKON, WELD ALLOY
7	WATER PROOFING	SIKA, PIDILITE, ASIAN PAINTS, FOSROC
8	SYNTHETIC ENAMEL PAINT	|ICI (SUPER GLOCE), NEROLAC, BERGER (LUXOL), JENSONS AND NICHOLSON, ASIAN PAINTS (APCOLITE). CICO, MBT, FOSROC

9	ANTI CARBONATION PAINTS	CICO, MBT, FOSRO
10	THERMOPLASTIC PAINTS	CBM, CMS, RELIANCE THERMOPLAST
11	RMC	RMC, ACC, BIRLA, L&T AND OTHER REPUTED MANUFACTURE OF RMC SUBJECTED TO APPROVAL OF ENGINEER-IN-CHARGE
12	TMT FE 415/500	TISCON, ISCON, RINL, SAIL, JINDAL
13	WHITE CEMENT	BIRLA WHITE, J.K. WHITE
14	PUTTY	BIRLA, J.K. PUTTY OR EQUIVALENT.
15	WASH BASIN	PARRYWARE, CER, JAQUAR.
16	CLEAR GLASS	MODI GUARD, SAINT GOBAIN, AIS
17	G.I. PIPES	TATA STEEL TUBES, JINDAL, PRAKASH, SURYA
18	G.I. FITTINGS	UNIK, KS, AMCO, AVR, NVR, RR
19	HUBLESS CENTRIFUGALLY CAST IRON SPUN PIPES & FITTINGS IS:151205	NECO, HEPCO OR EQUIVALENT.
20	DI PIPES & FITTINGS	KESORAM, ELECTROSTEEL OR EQUIVALENT
21	CP BRASS FITTINGS	PARRYWARE, JAQUAR, CERA
22	BRASS STOP & BIB COCK	ZOLOTO, SANT, L&T, LEADER, CERA
23	ALUMINIUM SECTIONS (ANODISING BY APPROVED ANODIZING FIRM)	HINDALCO, JINDAL, INDIAN ALUMINIUM CO. OR AS APPROVED BY ENGINEER-IN-CHARGE
24	STAINLESS STEEL KITCHEN SINK	NIRALI, JAYNA, PRAYAG, JINDAL
25	PLASTIC W.C. SEAT COVER	PARRYWARE, HINDWARE, CERA
26	UPVC WINDOW	FENESTA, EWIN, REHAU
27	PVC TANKS	SINTEX, SUPREME, ASTREL-3 OR LAYERED MORE ISI MARKED
28	MIRROR GLASS	ATUL, SAINT GOBAIN, MODI GUARD, HNG, CERA
29	CP WASTE & FLUSH PIPES	AS APPROVED BY ENGINEER-IN-CHARGE.
30	PVC FLUSHING CISTERN.	PARRYWARE, HINDWARE, JOHNSON, CERA
31	TILE FIXER / ADHESIVE	AS APPROVED BY ENGINEER-IN-CHARGE.
32	VENEERED PARTICLE BOARD	NOVAPAN, KITPLY, ANCHOR, NATIONAL, ARCHIDPLY, CENTURY PLY
33	LAMINATED PARTICLE BOARD / LAMINTAES	NOVAPAN, KITPLY, NATIONAL, ARCHIDPLY, CENTURY PLY, ECOBOARD.
34	FLUSH DOOR SHUTTERS	DURO, ARCHIDPLY, KUTTY FLUSH DOOR, KITPLY INDUSTRIES (SWASTIK), CENTURY PLY.OR AS APPROVED BY ENGINEER-IN- CHARGE
35	FACTORY MADE PANELLED & WIRE GAUGE WOODEN DOOR/ WINDOW SHUTTERS	AS APPROVED BY ENGINEER-IN-CHARGE
36	STEEL WINDOWS / PRESSED STEEL FRAMES	AS APPROVED BY ENGINEER-IN-CHARGE.
37	M.S PIPE	TATA, JINDAL, BHUSHAN INDUSTRIES, PRAKASH STEEL TUBES, OR AS APPROVED BY ENGINEER-IN-CHARGE
38	PVC PIPE & FITTINGS	SUPREME, AKG, FINOLEX, PRINCE, SFMC
39	ACRYLIC DISTEMPER	NEROLAC, BERGER (BISION ACRYLIC) ASIAN PAINTS (TRACTOR ACRYLIC) IST QUALITY, DULUX WEATHER SHIELD, ICI
40	DRY DISTEMPER	BERGER (CASTLE), JENSON & NICHOLSEN (J&N)
41	STEEL PRIMER	ICI, NEROLAC, BERGER, ASIAN PAINTS. IST QUALITY
42	WOOD PRIMER	ICI, NEROLAC, BERGER, ASIAN PAINTS. IST QUALITY

43	MOSAIC TITLES / CHEQUERED TILES	HINDUSTAN, JONSON, NITCO, MODERN, NTC, A-1
44	CERAMIC WALL TILES	KAJARIA, SOMANY, JOHNSON, AGL, VERMORA
45	DASH / ANCHORING FASTENERS	HILTI / FISCHER OR EQUIVALENT
46	NUTS / BOLTS & SCREWS	GKW, ATUL OR EQUIVALENT
47	FLOAT VALVE	LEADER, PRAYAG, ZOLOTO, L&T
48	CP FITTINGS/MIXER PILLAR TAP WASHERS	JAQUAR, HINDWARE, PARRYWARE, CERA
49	CP ACCESSORIES	JAQUAR, HINDWARE, PARRYWARE, CERA
50	C.I SLUICE VALVES & REFLEX VALVES GUN METAL GATE VALVES, GLOBES	LEADER, ZOLOTO, SANT, KIRLOSKER, L&T
51	STONE WARE PIPES & GULLY TRAPES	PERFECT, HIND OR ISI MARKED S.W PIPES OR AS APPROVED BY ENGINEER-IN-CHARGE
52	GLAZED FIRE CLAY KITCHEN SINK	PAMINI, SANFIRE, RKCP OR AS APPROVED BY ENGINEER-IN- CHARGE
53	VITRIFIED TILES	JOHNSON, AGL, VARMORA, KAJARIA, SOMANY
54	WATER METER	PRIMA (ISI), KRANTI, DASHMESH OR BIS MARKED PRODUCT
55	GROUTING COMPOUND	ENDURA, PIDILITE OR AS APPROVED BY ENGINEER-IN-CHARGE
56	GLASS MOSAIC TILES	ITALIA, OPIO OR AS APPROVED BY ENGINEER-IN-CHARGE
57	PAVER BLOCKS & CURVE STONES	NITCO PREFEB, ULTRA KK, TERRAFIRMA, UNISTONE, UNITILE, NTC, ISI MARKED
58	GLASS MOSAIC TILES	ITALIA, OPIO OR AS APPROVED BY ENGINEER-IN-CHARGE
59	NON RETURN VALVE (CHECK VALVE)1/2" TO 1/4"	KALSI PUMP PVT. LTD, ZOLOTO, SAKARAL, UNIK OR BIS APPROVED PRODUCTS.
60	LINE FILTER VALVE 1/2" TO 2"	KALSI PUMP PVT. LTD OR BIS APPROVED PRODUCTS.
61	FERRULES 15 MM, 20MM & 25 MM	DHAWAN SANITARY UDYOG (PRIMA) OR BIS APPROVED PRODUCTS
62	STAINLESS STEEL STAIRCASE RAILING	JINDAL S S LTD, ICICH INDUS, ESSAL, DORMA OR AS APPROVED BY ENGINEER-IN-CHARGE
63	LOCKS/LATCH/FITTINGS	GODREJ, HARRISON, YALE, DORMA
64	HYDRAULIC DOOR CLOSER / FLOOR SPRING	HARDWYN, GODREJ, GRACE, EVEREST, DORMA
65	FIRE CHECK DOOR	NAVAIR, ROMAT, KUTTY DOOR
66	ANODISED ALUMINUM HARDWARE (HEAVY DUTY)	HARDIMA, EVERITE, SIGMA (ISI MARKED), DORMA
67	TEMPERED GLASS	MODI FLAT & SAINT GOBAIN, ASHAHI
68	POLYSTER POWDER COATING SHADES	NEROLAC, BERGER, J&N
69	FRICTION STAY HINGES	EARL-BIHARI OR AS APPROVED BY ENGINEER-IN-CHARGE
70	NUTS, BOLTS AND SCREWS, STEEL	KUNDAN PRIYA ATUL OR AS APPROVED BY ENGINEER-IN-CHARGE
71	EPDM GASKET	HANU / ANAND OR AS APPROVED BY ENGINEER-IN-CHARGE
72	STRUCTURAL SILICON	DOW CORNING / WACKER OR EQUIVALENT
73	WEATHER SILICON	DOW CORNING / WACKER OR EQUIVALENT
74	COPPER TUBES / PIPES	RAJCO, MAX FLOW ABC OR EQUIVALENT
75	COPPER FITTINGS	YORKSHINE, IBP, BCONEX
76	U-PVC PIPE	FLOW GUARD, FINOLEX, ASTRAL
77	C-PVC PIPE AND FITTINGS	ASTRAL, ASHIRVAD, PRINCE HEAVY DUTY, FINOLEX
78	CEMENT BASED PAINT	M/S SNOWCEM INDIA LTD, ASIAN, BURGER, DELUXE

79	ALUMINUM SLIDING DOOR BOLT, TOWER BOLT HANDLE.	PILOT AND AODI. OR AS APPROVED BY ENGINEER-IN-CHARGE
80	VITREOUS CHINA SANITARY WARE	PARRYWARE, NEYCER,CERA, HINDWARE
81	CENTRIFUGALLY SAND CAST (SPUN) IRON PIPES	NECO OR ANY OTHER AND FITTINGS B.I.S MARKED PRODUCT, BABULAL BAJAJ IRON FOUNDRY MATHURA (HIF) OR BIS APPROVED PRODUCTS
82	CENTRIFUGALLY CAST (SPUN) PIPE	ELECTRO STEEL, KESORAM (CLASS LA) OR EQUIVALENT
83	APP SHEET	SALIMAR, DR FIXIT, SIKKA OR AS APPROVED BY ENGINEER-IN- CHARGE
84	PVC DOOR SHUTTER & FRAME	SINTEX, RAJSHRI OR EQUIVALENT AS APPROVED BY ENGINEER-IN-CHARGE
85	PRE-COATED PROFILE SHEET	TATA, JSW OR EQUIVALENT
86	HDF LAMINATED BOARD	ACTION TESA, CENTURY OR AS APPROVED BY ENGINEER-IN- CHARGE
87	BITUMEN	HPL, COAL INDIA, IOCL OR AS APPROVED BY ENGINEER-IN-CHARGE
88	ACP SHEET	REYNOBOND, VIRGO ACP, ALEX PANELS, ALUDECOR OR AS APPROVED BY ENGINEER-IN-CHARGE
89	LED LIGHT FITTING & LUMINARIES FOR ROAD AND STREET LIGHTING (OUT DOOR)	WIPRO, C&S ELECTRIC, PHILIPS, CROMPTON, BAJAJ, OSRAM
90	LED LAMPS	WIPRO, PHILIPS, CROMPTON, BAJAJ, OSRAM
91	SMART STREET LIGHTS AND CONTROL SYSTEM	ORIENT ELECTRIC LTD, OPULUS
92	STREET LIGHT FITTING & ACCESSORIES -HPSC (70/ 150/ 250/ 400) HPMV (80/ 125/ 250/ 400)	POLYCAB, PHILIPS, C&S ELECTRIC, SURYA, WIPRO
93	SOLAR STREET LIGHT FITTINGS	JILCO, PHILLIPS, OSRAM
94	STREET LIGHT TIMERS	SINETRAC, INDO ASIAN, HAVELLS
95	CI PIPES & FITTINGS	JINDAL, TATA METALIKS, TATA KUBOTA
96	INTERLOCKING TILES/ PAVER BLOCKS	ISI MARKED GLOSSY FINISH
97	DECORATIVE PAINT (EXT & INT)	SNOWCEM, ASIAN, BERGER, DULUX
98	CHAIN LINK FENCING / BARBED WIRE / PUNCHED TAPE CONCERTINA COIL / RAZOR BLADE TAPE FENCING	A-1 FENCE, ARMOSTRONG WIRES, MAIMOM ROGER
99	GALVALUME SHEET	TATA BLUE SCOPE, JSW, BHUSHAN, VARDHMAN
100	CHROMIUM PLATED BATHROOM FITTINGS OF CP, CAST COPPER ALLOY FANCY TYPE BIB TAP, STOP VALVES AND PILLAR TAP, SANITARY FITTINGS, SHOWER PNAEL	JAQUAR /KOHLER/ROCA/GROHE
101	VITREOUS CHINA WC / WHB / URINAL / SOAP DISH / URINAL PARTITION WALL / LABORATORY SINK	PARRYWARE /CERA/ JAQUAR
102	NON ASBESTOSFIBRE CEMENT BOARDAS PER IS 14862	ARMSTRONG / SAINT GOBAIN (GYPROC) / EVEREST /INDIA GYPSUM/
103	ACRYLIC EMULSION / WEATHER PROOF PAINT	ASIAN PAINTS (ROYAL) / BERGER (LUXOL SILK SPLENDER)/ ICI (DULUX VELVET TOUCH)
104	PLASTIC EMULSION PAINT	ACROCEM / DUROCEM / SUPER SNOWCEM / BERGER / ASIAN PAINT

		(GUTUCAM)
105	HOUSE WIRING CABLE (1100 VOLTS)/CABLE FOR SERVICE CONNECTION/CABLE FOR PANEL BARD WIRING	POLYCAB, RR KABEL, FINOLEX, RPG
106	PIANO SWITCHES/SOCKETS ETC.	ISI MARKED PRODUCTS OF LEGRAND/ CRABTREE/ JAQUAR/SCHNEIDER/PHILLIPS (MODULAR TYPE)
107	PVC CASING CAPPING / CONDUIT	FINOLEX / MODI / PRESTO PLAST / PLAZA / KALINGA/ RICHA
108	WIRING ACCESSORIES AND FITTINGS	ANCHOR / LEGRAND/ KINJAL (ISI MARKED)/ RICHA
109	MCBS, DBS, ISOLATOR	LEGRAND /SIEMENS/ SCHNIEDER/ ABB.
110	MCCB	ABB/ LEGRAND/ SCHNEIDER/ SIEMENS
111	LT UG /SERVICE CABLE	POLYCAB/FINOLEX/KEC
112	EXHAUST FAN/CEILING FAN	CROMPTON GREAVES/KHAITAN/BAJAJ/HAVELLS/ORIENT
113	HEATER WATER STORAGE TYPE ELECTRIC GEYSER	CROMPTON GREAVES /BAJAJ/HAVELLS
114	FALSE CEILING	ARMSTRONG/ EVEREST/GYPROC
115	EPOXY PAINT	NEROLAC OR EQUIVALENT
116	CC KERB STONE	NITCO PREFAB, K.K. MANHOLE, TERRAFIRMA, UNISTONE.
117	MILD STEEL TUBES	TATA, SAIL, ISCO, SRMB
118	APP MEMBRANE	ASIAN PAINTS/FOSROC/SIKA/STP
119	GLOW STUD	TATA BP/3M India or Equivalent

- Raw material source to be approved by the Engineer-in-Charge.

Remarks:- Any change in the brands mentioned above and elsewhere shall be allowed only after approval of the Engineer-in-charge.

PARTICULAR SPECIFICATIONS

1 **ALL RUNWAY RELATED PRODUCTS**

(A) **POLYMER MODIFIED BITUMEN (PMB)**

SRL NO	PRODUCT DESCRIPTION	NAME OF FIRM
1	"OOMS POLYMER" BRAND 'POLYMER MODIFIED BITUMEN (ELASTOMERIC SBS MODIFIED) CONFIRMING TO IRC SP : 53/2002 AND IS- 15462:2004 SOURCE OF BASE MTRL: GOVT REFINERIES /GOVT APPROVED PSUs	M/S OOMS POLYMER MODIFIED BITUMEN PVT LTD.
2	"HINCOL" BRAND POLYMER MODIFIED BITUMEN (PMB) (ELASTOMERIC SBS MODIFIED CONFIRMING TO IRC SP: 53/2002 AND IS -1562:2004 AND PREAPRED WITH BASE BITUMEN SOURCED ONLY FROM ANY PSU OF INDIA : SOURCE OF BASE MTRL: GOVT REFINERIES /GOVT APPROVED PSUs	M/S HINDUSTAN COLAS LTD.
3	"STYRELF" BRAND 'POLYMER MODIFIED BITUMEN(PMB) CONFIRMING TO IRC SP 53/2010 AND IS-15462:2019, SOURCE OF BASE BITUMEN : GOVT REFINERIES/GOVT APPROVED PSUS	M/S INDIAN OIL TOTAL PVT LTD (ITPL)
4	"SHELL CARIPHALTE" BRAND 'POLYMER MODIFIED BITUMEN (PMB) CONFIRMING TO IRC SP 53/2010 AND IS-15462:2019, SOURCE OF BASE BITUMEN : GOVT REFINERIES/GOVT APPROVED PSUS	M/S TIKI TAR AND SHELL INDIA PVT LTD

(B) **POLYMERIC BITUMEN EMULSION (PME)**

SRL NO	PRODUCT DESCRIPTION	NAME OF FIRM
1	POLYMER MODIFIED EMULSION BRAND NAME : HINMAT PLUS	M/S HINDUSTAN COLAS PRIVATE
2	POLYMER MODIFIED EMULSIONS BRAND NAME : EMULCOTE	M/S LN PETRO CHEM. PRIVATE LIMITED
3	POLYMER MODIFIED EMULSIONS	M/S OOMS POLYMER MODIFIED BITUMEN PVT LTD.

(C) **BITUMEN EMULSION**

SRL NO	PRODUCT DESCRIPTION	NAME OF FIRM
1	HINCOL BITUMEN EMULSION CONFIRMING TO IS-8887:2004 AND ASTM D 2397	M/S HINDUSTAN COLAS LTD
2	EMULSIS BRAND BITUMEN EMULSION –CRS 1 AND CSS 1	M/s Indian oil total Pvt Ltd (TPL)
3	"SHELL SPRAMUL" BRAND BITUMEN EMULSION RS-1,SS-1 AND CSS-1	M/S TIKI TAR AND SHELL INDIA PVT LTD
4	CATONIC BITUMEN EMULSIONS RS1, RS2,MS,SS1 AND SS2	M/S OOMS POLYMER MODIFIED BITUMEN PVT LTD.
5	SHALI MULSION(C) CONFIRMING TO IS-8887 : 2004 AND ASTM D 2397	M/S STP LIMITED

(D) **GLASS GRID/FIBRE GLASS**

SRL NO	PRODUCT DESCRIPTION	NAME OF FIRM
1	GTF GLASS GEOGRID	M/S GIRIDHAR TECHFAB PVT LTD
2	SAINT GOBAIN BRAND GLASS GRID	M/S SAINT GOBIN ADFORS INDIA
3	MacGridar 10A.7	M/S MACCAFERRI ENVIRONMENTAL SOLUTION LTD

(E) OTHER RUNWAY RELATED PRODUCTS

SRL NO	PRODUCT DESCRIPTION	NAME OF FIRM
1	DURA BOARD HD 100 DURA ROD	M/S THE SUPREME INDUSTRIES LTD
2	(A) SHALIMARK (B) SEJ BOARD (C) SHALI MARKW	M/S STP LIMITED
3	'RECORN 3S' TRIANGULAR FIBRE (6 MM, 12MM & 18 MM)	M/S RELIANCE INDUSTRIES LIMITED NEW DELHI

4	MARUTI REFLO MARK (ROAD MARKING MATERIAL)	M/S MARUTI BITUMEN PVT LTD

2 CONSTRUCTION CHEMICALS, ADDITIVES (INCLUDING FIBRE) ANDWATERPROOFING

(A) M/S CHOKSEY CHEMICALS PVT LTD

ADMIXTURES (A) MASTERPLAST SPL-8 (B) MASTERPLAST SPL-10 **CURING COMPOUNDS** MASTERCURE RB 2M & WB **JOINT SEALANT** (A) TECHSEAL RDL 940/941 (B) TECHSEAL PU-2 POLYURETHANE SEALANT (C) TECHSEAL RDL-941 EH-POLYSULPHIDE SEALANT (D) TECHSEAL EH HPP-POLYSULPHIDE SEALANT (E) PRIMER RDL-942 PRIMER FOR POLYURETHANE & POLYSUPHIDE SEALANT **WATERPROOFING CHEMICALS/MATERIALS** (A) MASTERPROOF IWP-1&2 (B) MASTERCRETE M-81 (C) MASTERCRETE URP (D) TAR O THANE (E) TECHOXY (F) TECHCOAT (G) FUTURA 5 (H) MASTER LATEX (SBR) (J) COAL TAR EPOXY (K) TECHFORCE GREY (L) SUNSHELID-100 (M) TECHREPEL WB/SB	**CONCRETE SURFACE IMPROVEMENT** (A) MASTERGROUT EP-150 (B) MASTERBOND EP (C) MASTERROCK BASIC (D) MASTERGROUT CNS 50/100 **EPOXY/POLYURETHANE INDUSTRIAL FLOORING** (A) TECHFLOOR (FLOORING) (B) MASTERPRIME 52 (C) MASTERCOAT PU-150 **MEMBRANE & LIQUID MEMBRANE/COATINGS** TECHOTHANE-700 **POTHOLE REPAIR** FLEX O PATCH **OTHER CONSTRUCTION CHEMCIALS** (A) MASTEROL WD/MRA

(B) M/S THERMAX LTD

ADMIXTURES (A) TECNOS 94 (B) TECNOS 95 (C) TECNOS RP (D) NEUTROL 100 (E) NEUTROL 200 (F) NEUTROL 500 (G) ACCELERATOR NT (H) WAREP 1000/L (J) WAREP 1000/P (K) MUCIS AD 28 TECNOS **JOINT SEALANT** (A) MAXFLEX PS (B) MAXFLEX PU1 (C) MAXFLEX PSPR (D) MAXFLEX PUPR (E) MAXFLEX ACS (F) MAXFLEX PS 500 **WATERPROOFING CHEMICALS/MATERIALS** (A) ELASTPLAST ROL 10 MUCIS	**CURING COMPOUND** (A) MAXCURE CC 75 (B) MAXCURE CC 80 (C) MAXCURE CC 90 (D) MAXCURE RR (E) MAXCURE MRA 102 **REINFORCEMENT /CONCRETE PROTECTIVE COATINGS/SYSTEMS** (A) T GUARD AC (B) T-GUARD WBP (C) T-GUARD EC 200 (D) T-GUARD ENC (E) T-GUARD CTE 45 (F) T-GUARD CTE 65 (G) T-GUARD BC (H) T-GUARD BCP **FLOOR HARDNER** (A) TECFLOOR HT (B)TECFLOOR HTS **EPOXY/POLYURETHANE INDUSTRIAL**

(B) ANTICORR 280 II MUCIS (C) TECNOSEAL V1 (D) MAXSHIELD PF 900 (E) CRYS TECO PWD (F) MAXSHIELD ROOFKOT (G) MAXSHIELD WALLKOT (H) MAXSHIELD T 15 (J) MAXSHIELD P 600 (K) MAXSHIELD PRIMER (L) MUCIS MIA 200 (M) MAXSHIELD PF 100 PW **REPAIR & REHABILITATION/BONDING AGENTS/GROUTS** (AA) BS 66 MUCIS (AB) BS 5F (AC) MAXTREAT PATCHUP (AD) MUCIS PROTEZIONE FERRO MONO (AE) MAXTREAT FIBRENET C (AF) MAXTREAT FIBRENET G (AG) MAXTREAT CARBON ROD (AH) MAXTREAT LAMINATE (AJ) MAXTREAT EHS (AK) SEISMOCRETE UHP (AL) RAPIDO FIX (AM) FLASH TIXO (AN) MAXTREAT EFC (AO) MAXTREAT EPG (AP) MAXTREAT PRIMER (AQ) MAXTREAT SATURANT (AR) MAXTREAT GLUE (AS) MAXTREAT LM (AT) TM-BOND AR (AU) TM-BOND EP (AV) TM-BOND SG (AW) TM-BOND SBR (AX) MAXTITE MP (AY) MAXTITE MG (AG) MAXTITE GROUT EP (AH) MAXTITE GROUT (AJ) MAXTITE BLOCK FIX (AK) MAXTITE LG (AL) MAXGROUT 100 (AM) MAXGROUT MMA (AN) MAXGROUT E 10 (AO) MAXGROUT PAF (AP) MAXGROUT 45 (AQ) MAXGROUT 60 (AR) MAXGROUT LE	**FLOORING** (A)TECFLOOR EC 500 (B)TECFLOOR ET 1000/2000/3000/4000 (C)TECFLOOR UL (D) TECFLOORPU CEM (E) TECFLOOR EC 100 (F)TECFLOOR PR (G)TECFLOOR ESD

(C) **M/S TRIMURTI (INDIA)**

RUSTONIL ® FZ-10 (WATER BASED RUST REMOVER CUM RUST CONVERTER AND RUST PROTECTOR SOLUTION

(D) M/S SIKA INDIA PVT LTD

JOINT SELANT (A) SIKASIL 728NS/SL (B) SIKA POLYSULPHINDE (C) SIKAFLEX CONSTRUCTION + (D) SIKAFLEX PRO-3 (E) SIKADUR COMBIFLEX SG (E) SIKAFLEX 11FC (G) SIKAFLEX PRO 3 SL (H) SIKAFLEX 402 AIRPORT (J) SIKA EMSEAL JOINT SYSTEMS (K) SIKA SEAL 106 CONSTRUCTION (L) SIKAFLEX 118 EXTREME GRAB (M) SIKAFLEX 406 KC (N) SIKAHYFLEX 160 CONSTRUCTION **REFURNISHMENT** (a) SIKAWRAP GLASS FIBRE. (b) SIKAWRAP CARBON FIBRE (c) SIKA ANCHOFIX 2/3+ (d) SIKADUR 31 (e) SIKADUR 32 (f) SIKADUR 32 LP (g) SIKADUR 41 (h) SIKADUR 43 (j) SIKA FERROGARD 903 (k) FRIAZINC R (I) SIKAGARD 550W ELASTIC (m) SIKA REP MICROCRETE 122 (n) SIKA REP MICROCRETE 3 UW (o) SIKA REP MICROCRETE 4 (P) SIKA CARBODUR (q) SIKADUR 12 PRONTO (r) SIKA TOP 77 (s) SIKA TOP 122. (t) SIKA TOP 122HS. (u) SIKA TOP ARMATEC 108 (v) SIKA TOP ARMATEC 110 EPO CE (w) SIKAGARD 551S ELASTIC PRIMER (x) SIKAGARD PU UR/SIKAGARD PU UR (W) (y) SIKA MONOTOP 122 F/ (z) SIKAGROUT PRECAST 40 (aa) INTEROL POXITAR (ab) SIKAGARD 552W AQUAPRIMER GROUT (ac) SIKAGARD 625 CLEARCOAT (ad) SIKA ANCHORFIX 3030 (ae) SIKAWRAP FX 50 (af) SIKA CARBODUR BC ROD (ag) SIKA CARBODUR NSM (ah) SIKA MONOTOP 412N (aj) SIKAGARD XT (ak) SIKA RUSTOFF 100 **ADMIXTURE** (A) SIKA AER (B) SIKA FERROGARD 901 (C) SIKA RAPID 1 (D) SIKA ANTIFREZE (E) SIKAMENT 2004NS (G) SIKAMENT 4003 NS (H) SIKAMENT 4211 PQ (J) SIKAMENT NN	**Water proofing** (A) SIKAPLAN WP 1120-15HL/20HL (B) SIKA450H/450I (C) SIKACEMFLEX (D) SIKA LATEX (E) SIKA 101H (F) SIKA TOPSEAL 107 (G) SIKATOPSESAL 109HI (H) SIKA 2. (J) SIKA 4A. (K) SIKA SWELL P PROFILE. (L) SIKA FUKO SWELL 1 (M) SIKA INJECTION 101 H (N) SIKA WATERBAR H. (O) SIKALASTIC 830 n (P) SIKALASTIC 842 bg (Q) SIKALASTIC 618 mtc. (R) SIKA WP SHIELD 103P/PM/104P/PM (S) SIKAPLAN 12G/15G (T) SIKA PROOF P 12/A12HC/T10 (U) SIKA SWELL A/S2 (V) SIKA WP SHIELD 103F/102F (W) SIKA FUKO VT1/VT2/ECO1 (X) SARNAFIL G 410L/G476/S327L (Y) SIKALASTIC 560/614 (Z) SIKABIT T 130PG/140PG/130MG/140MG (AA) SIKABIT T 130 SG/140SG (AB) SIKALASTIC 851/851R/901 (AC) SIKA INJECTION 202IN/201CE/306/307/310 (AD) SIKA MULTISEAL (AE)SIKACIM PINK (AF) SIKA RAINTITE I (AG) SIKA FLEXICOAT 1K (AH) SIKA COOLCOAT/SIKA COOLCOAT PRIMER (AJ) SIKA CEMCRETE (AK) SIKA CONTROL WT 200 P IN (AM) SIKASEAL TAPE S (AN) SIKABIT W 15 (AO) SIKALASTIC 853 RAP (AP) SIKA MONOTOP 160 MIGRATING (AQ) SIKA WP SHIELD 103 **GROUT** (A) SIKA GROUT 104 (B) SIKA GROUT 214 (C) INTRAPLAST EP (D) INTRAPLAST N 200. (E) INTRAPLAST NN (F) SIKADUR 42 (G) SIKADUR 42 HES (H) SIKADUR 52 (J) SIKADUR 53 OF (K) ROKKON 1 (L) ROKKON R (M) SIKADUR 42 MP(IN) (N) SIKADUR 52 LP(IN) (O) SIKAGROUT 60RR (P) SIKAGROUT 295 IN **FLOORING**

(K) SIKAMENT 1016 NS (L) SIKAMENT 2002 NS (M) SIKA VISCOCRETE 5101 NS (N) SIKAPLAST 5201NS (P) SIKAPLAST 4210 NS (Q) SIKAPLAST 3001NS (R) SIKA VISCORETE 20HE (S) SIKA VISCORETE2004NS (T)PLASTIMENT BV 40 (U) PLASTOCRETE PLUS (V) SINGUNIT L (W) SINGUNIT L54AF (X) SINGUNIT POWDER 1. (Y) ANTISOL A (Z) ANTISOL EWP (AA) SEPAROL (AB) SIKARAPID C100 (AC) SIKAMENT 3070NS/2009PQ (AD) SIKA VISCOCRETE 4107PQ (AE) SIKAPLAST 3144 PQ (AF) SIKA CONTROL WP-200P (IN)	(A) SIKA CHAPDUR. (B) SIKA CHAPDUR C. (C) SIKAFLOOR 20N PURCEM (D) SIKAFLOOR 21N PURCEM (E) SIKAFLOOR 29N PURCEM (F) SIKAFLOOR 31N PURCEM (G) SIKAFLOOR 81 EPOCEM (H) SIKAFLOOR 82 EPOCEM (J) SIKAFLOOR 105 (K)SIKAFLOOR 161 (L) SIKAFLOOR 220 W CONDUCTIVE (M) SIKAFLOOR 262 ASN (N) SIKAFLOOR 264 (O) SIKAFLOOR 381 (P) SIKAFLOOR 381ECF (Q) SIKAFLOOR 7530 (R)SIKAFLOOR CUREHARD 24 (S)SIKAFLOOR PROSEAL 22 (T) SIKAFLOOR 63 (U) SIKAGARD 63/1 (V) SIKAGARD 67 (W) SIKA CERAM (X) SIKA TILOFIX (Y) SIKA WALL DECOR (Z) SIKAFLOOR 235 ESD (AA) SIKAFLOOR 315 (AB) SIKAFLOOR 325 (AC) SIKAFLOOR 359 (AD) SIKAFLOOR 25 PURCEM (cn) (AE) SIKAFLOOOR 326 (AF) SIKA EXTENDER T (AG) SIKAFLOOR JOINT S/EX/XS/X (AH) SIKAFLOOR LEITSET (EARTHING KIT) (AJ) SIKAFLOOR 290 PRIMER (AK) SIKAFLOOR 291 (AL) SIKAGARD 720 EPOCEM (AM) SIKAFLOOR MULTIDUR SYSTEM (AN) SIKA DECO FLAKE (AO) SIKA BLOCK FLAKE (AP) SIKA TILOGROUT/EPOXY TILOGROUT (AQ) SIKA CERAM GREY/155/212/255(WHITE &GREY/288(WHITE & GREY)

(E) **M/S BOSTIK INDIA PVT LTD**

TILE ADHESIVE (A) FIX ALL (B) SUPER FIX ALL (C) TILE GROUT (D) EPOXY TILE GROUT **CURING COMPOUND** BOSTIK CCC **JOINTS SEALANT** BOSTIK SEAL N FLEX 1 BOSTIK SEAL N FLEX FC BOSTIK SEAL N FLEX 2K BOSTIK NO MORE NAILS **REINFORCEMENT/CONCRETE PROTECTIVE**	**REPAIR & REHABILITATION/BONDING AGENTS/GROUTS (CONT.)** (A) BOSTIK EP BOND (B) BOSCOCEM 475 (C) BOSTIK PLUG LEAK (D) BOSTIK PATCH FIX MC (E) BOSTIK PATCH FIX CONCRETE (F) BOSTIK LVEP (G) BOSTIK GROUT ADMIX (H) BOSTIK ERM (J) BOSTIK ANCHOR GROUT (K) BOSTIK EVO STIK FLASHBAND ORIGINAL (L) BOSTIK FLOW FILL GROUT GP **EPOXY/POLYURETHANE INDUSTRIAL FLOORING**

COATINGS/SYSTEMS (A) EPOXY COAT UW (B) RAINSHILED PU (C) PROCOAT PU (D) SCRATCH COAT (E) BOSTIK CTE (F) MAGIC REPELLENT SB (G) MAGIC REPLLLENT WB (H) EXTERIOR COAT **MEMBRANE & LIQUIDMEMBRANE/COATINGS** (A) AQUABLOCKER (B) BOSCOSEAL PU (C)ELASOCAOT **MISC CONSTRUCTION CHEMICALS** (A) BOSTIK IWP (B) BOSCOMATE PLASTER (C) BOSTIK LW (D) BOSTIK TWO IN ONE	(A) BOSTIK ULTRALEVEL ESL 1000 (B) BOSTIK ULTRALEVEL ESL 2000 (C) BOSTIK ULTRALEVEL EUL 1000 (D) BOSTIK ESM **FLOOR HARDNER** BOSTIK FLOOR HARDNER **WATERPROOFING CHEMICALS/MATERIALS** (A) BOSCOCEM SLURRY (B) BOSTIK K11 SLURRY (C) BOSCOCRETE (D) MOISTURE SEAL (E) BOSTIK CWP (F) HYDROMENT 476 (G) BOSCOLASTIC

(F) **M/S FOSROC CHEMICALS**

ADMIXTURE (A) AURAMIX 400 (B) AURAMIX 300 (C) CONPLAST SP430 **CURING COMPOUND** (A) CONCURE WB (B) CONCURE LP90 (C) CONCURE-1315 **JOINT SEALANT** (A) COLPOR 200 PF: COOL APPLIED , HIGH PERFORMENACE , PITCH FREE, POLYURETHANE PAVEMENT JOINT SEALANT (B) EXPOBAND ONE **REINFORCEMENT /CONCRETE PROTECTIVE COATINGS/SYSTEMS** (A) NITOZINC PRIMER (B) DEKGUARD S (C) NITCOTE EP 410 (D) NITCOTE EP405 (E) NITCOTE UR 512 (F)NITCOTE BCS300 G) NITOCOTE ET140 (H) NITOCOTE ET550 (H) NITOCOTE SN522 **MEMBRANE & LIQUID MEMBRANE/COATINGS** (A) PROOFEX ENGAGE (B) PROOFEX PGP I PROOFEX ORG (D) PROOFEX OGP (E) PROOFEX SELF ADHESIVE PR20	**REPAIR & REHABILITATION/BONDING AGENTS/GROUTS** (A) RENDEROC S2 (B) NITOMORTER S (C) RENDEROC RG (D) RENDEROC HS XTRA (E) NITOWRAP EP(CF) (F) NITOWRAP EP (GF) (G) NITOWRAP (CFP) (H) NITOBOND EP (I) NITOBOND AR (J) NITOBOND SBR (K) NITOFILL EPLV (L) CONBEXTRA EP10 (M) CONBEXTRA GP 2 (N) CONBEXTRA GP3 (O) LOKFX **EPOXY/POLYURETHANE INDUSTRIAL FLOORING** (A) NITOFLOR SL 2000 (B) NITOFLOR FC 150 (C) NITOFLOR TF 5000 (D) NITOFLOR EU5 (E) NITOFLOR SL CONDUCTIVE (F) NITOFLOR SL DISSIPATIVE (G) TRAFFICGUARD UR150 (H) NITOFLOR SL 3000UT **WATERPROOFING CHEMICALS/MATERIALS** (A) CONPLAST (B) SUPERCAST SW20 (C) SUPERCAST PVC **CONCRETE SURFACE IMPROVEMENT** REEBOL

(F) PROOFEX SELF ADHESIVE GEOTEXT (G) PROOFEX SELF ADHESIVE ANTIROOT (H) FOSROC POLYUREA WPE (J) BRUSHBOND (K) BRUSHBOND RFX (L) NITOCOTE CM210 (M) BRUSHBOND ROOF GUARD (N) BRUSHBOND TI FLEXICOAT (O) NITOPROOF 600 STD	**MISC CONSTRUCTION CHEMCIALS** (A) CEBEX (B) NITOFLOR HARDTOP **POTHOLE REPAIR** PATCHROC

(G) **M/S STP LIMITED**

ADMIXTURE (A) SHALIPLAST SP/ HP/ MCI/ PCE/ **REPAIR & REHABILITATION/BONDING AGENTS/GROUTS** (A) TARFELT APP (B) CPRX COMPOUND (C) SHALLICRETE (D) SHALICRYL 215 (E) SHALI TILE GLUE (F) SHALITILE GROUT (G) SHALIGROUT IP/73 (H) SHALIBOND CONCRETE (J) SHALISBR LATEX (K) SHALISLIP SB (L) SHALI SLIP SB (M) TARPLASTIC (N) PIPEWRAP CT/BT (O) SHALIPRIME PW CT (P) TANK MASTIC (Q) SHALIPRIME RC **WATERPROOFING CHEMICALS/MATERIALS** (A) STP NO 1 (B) SUPERTENE **APP MEMBRANE** (A) SUPER THERMOLAY APP PL/MT (B) SUPERIOR SHALIPLUS. (C) INDUSTRIAL BITUMEN. **MEMBRANE & LIQUID MEMBRANE/COATINGS** (A) SHALIURETHANE LM (B) SHALICRYL LM I SHALITEX PRIMER (D) TARFELT LM. (E) SHALICEM EWP. (F) SHALIURETHANE BTD. (G) SHALIURETHANE LHM. (H) SHALIDRAIN 08.	**CONCRETE SURFACE IMPROVEMENT** A) SHALIFIX EM **CURING COMPOUND** **(**A)SHALICURE PA/SS **JOINT SEALANT** (A) SHALISEAL PS PG /GG (B) SHALISEAL PU GG/PG 2K (D) SHALITEX/SHALIJET SEALING COMPOUND (E) SHALISEAL CSS A **REINFORCEMENT /CONCRETE PROTECTIVE COATINGS/SYSTEMS** (A)SHALISEAL RS TC (B) SHALI PLAST LW+ (C) SHALI PLAST LW++ (D) SHALI PROTEK PUR 40 (E) SHALI URETHANE PC (F) SHALIPOXY CTE 503 **EPOXY/POLYURETHANE INDUSTRIAL FLOORING** (A) SHALIFLOOR SL PU (B) SHALIFLOOR SL AS 3PU (C) SHALIFLOOR SL AS 3E (D) SHALIFLOOR NM (E) SHALIFLOOR 3ES (F) SHALIPOXY SL/FC (G) SHALISCREED SL UL 3ES (H) SHALIDECK SL **THERMAL INSULATION COATING** (A) SHALICRYL LM HI (B) SHALIXPS **POTHOLE REPAIR** (A) SHALIPATCH **MISC CONST CHEMICALS** (A) SHALI PATCH EC 20

(H) **M/S MARUTI BITUMEN PVT LTD**

ADMIXTURE (A) MARUTI PLAST SP 100/200/300 & 400 (B) MARUTI PLAST SR 100/200/300 & 400 (C) MARUTI PLAST PC (D) MARUTI PLAST XL (E) MARUTI PLAST FA **CURING COMPOUNDS** (A) MARUTI CURE WB (B) MARUTI CURE RB (C) MARUTI DEMOULD OB (OIL BASED) (D) MARUTI DEMOULD WB (WATER BASED) **REINFORCEMENT /CONCRETE PROTECTIVE COATINGS/SYSTEMS** (A) MARUTI GARD AC (B) MARUTI COAT ZR **FLOOR HARDENER** (A) MARUTI FLOOR MH (B) MARUTI FLOOR NMH **LIQUID MEMBRANE** MARUTI MEMBRANE	**GROUTS & ANCHORS** (A) MARUTI GROUT 50 (B) MARUTI GROUT 60 (C) MARUTI GROUT AG (D) MARUTI GROUT EG-65 (E) MARUTI FLOWADD 100 **JOINT SEALANT** (A) MARUTI SEAL AS (B) MARUTI SEAL PS PG (B) MARUTI SEAL PS GG (C) MARUTI SEAL EMS (D) MARUTI SEAL SS (E) MARUTI SEAL PU (F) MARUTI SEAL BS (G) MARUTI SEAL CTS **WATERPROOFING CHEMICALS/MATERIALS** (A)MARUTI VARSHA GARD 2K (B) MARUTI LATEX SBR (C) MARUTI CRETE E (D) MARUTI CRETE P (E) MARUTI PLAST LW+(LIQUID & POWDER)

(J) **M/S TORCHTAR MEMBRANES & BITUMEN PRODUCT PVT LTD**

APP MEMBRANE (A) TORCHTAR BRAND APP MEMBRANE, FLASHING TAPES AND WRAPPING COATS

(K) **M/S TIKI TAR DANSOSA (INDIA) PVT LTD**

APP MEMBRANE HYDROSTOP WATER PROOFING MEMBRANE, IN ALL ITS PERMUTATIONS AND COMBINATIONS, AS ALSO TIKI PRIMERS-WB & OB & TIKI FLASH (BITUMEN BASED ALUMINIUM PAINT)

(L) **M/S SHIVAM TAR PRODCUTS**

APP MEMBRANE SHIVAM' BRAND SUPERIOR, MULTI POLYSTER FELT & MULTI POLYPLAS

(M) **M/S ASIAN PAINTS**

ADMIXTURES (A)SMARTCARE MAXIMOPLAST PX 100,PX200,PX300 (B)SMARTCARE MAXIMOPLAST PC 100,PC200,PC300 (C)SMARTCARE HYPERSHOT AF 100 (D)SMARTTECHNOPLAST S 300 (E)SMARTPLAST AEA	**EPOXY/POLYURETHANE INDUSTRIAL FLOORING** (A) SMARTCARE APCOFLOR HFP 120,130, MFP 140,FP 110 (B) SMARTCARE APCOFLOR SL 1 TC,SL 2,SL 1 AM,SL 1 TC BH, SL EPU , SL 1 TC F, SL 1 TC XL, SL 2 EPU

(F)SMARTCARE TECHNOSHRIN **BONDING AGENTS** (A) ASIAN PAINTS SMARTCARE EPOXY BONDING AGENT (B) SMARTCARE ACRYLIC BONDING AGENT **CURING COMPOUNDS** SMARTCARE CURING COMPOUND **JOINT SEALANT** (A) SMARTCARE HYBRID PU SEALANT (B) SMARTCARE POLYSULPHIDE SEALANT **WATERPROOFING CHEMICALS/MATERIALS** (A) GLASS FIBRE SHEET REINFORCED (2MM,3MM,4MM) (B) HYBRID SHEET REINFORCED (2MM,3MM,4MM (C) POLYESTER SHEET REINFORCED (2MM,3MM,4MM) (D) SMARTCARE DAMPPROOF (E) SAMRTCARE DAMP BLOCK 2K **FLOOR HARDENER** SMARTCARE APCOFLOR CEMENTITIOUS FLOOR HARDNER **GROUTS** SMART CARE GENERAL PURPOSE GROUT	(C) SMARTCARE APCOFLOR LSC 3, LSC 3 N LSC 3 NBH, LSC 2 NF, LSC3 XL, HSC 3 (D) SMARTCARE PU CRETE 4K,XL (E) SMARTCARE APCOFLOR PU SCREED, PU SCREED HD, SCREED SOL (F) SMARTCARE APCOFLOR ESD SL, ESD PRIMER (G) SMARTCARE APCOFLOR CAR DECKTC, BC (H) SMARTCARE APCOFLOR OIL SEALER (J) SMARTCARE TERRAFLOR GC,SC,BC **MEMBRANE & LIQUID MEMBRANE/COATINGS** (A) SMARTCARE PU AQUA (B) SBS MODIFEID POLYSTER SHEET REINFORCED SELF ADHESIVE BITUMENS MEMBRANE (2 MM ,3.5 MM) (C) SMARTCARE APP MODIFED BITUMENS MEMBRANE WITH MINERAL TOP (3MM, 4MM 5MM) APP 7 LAYER MEMBRANE (D) SMARTCARE SELF ADHESIVE SBS MEMBRANE WITH HDPE LINING (E) SMARTCARE PRE APPLY HDPE 40 ,DHPE 80,HDPE TAPE (F) SMARTCARE ULTORN HYBIRD ANTI ROUTE , POLYUREA (G) SMARTCARE PBC MEMBRANE B02 ,B01 (H) SMARTCARE PRFRESSIONAL DAMP BLOCK 2K , DAMP PRIMER ULTRA, SUPREMA BITUMEN PRIMER **OTHER CIVIL CONST PRODCUTS** MARVELLOPLAST , MARVELLOPLAST CLASSIC **REPAIR & REHABILITATION** (A) SMART CARE MICROCONCRETE , HS, REPAIR MORTAR (B) SMARTCARE APCOREP INJECT GROUT (C) SMARTCARE APCOREP EPOXY MORTAR , EPOXY SEAL (D) SMARTCARE ULTRA WRAP PRIMER (E) SMARTCARE APCOREP SACNODE **THERMAL INSULATION COATING** (A) SC PU INSULATOR (POLYOL+ISCYANATE **WATERPROOFING CHEMICAL** (A) SMARTCARE EDPM ADHESIVE (B) QUARTZ CRYSTALLINE COATING ADMIX (C) SMARTCARE APCOREP FOOD GRADE EPOXY 2K COAL TAR EPOXY .

(N) **M/S BENGAL BITUMEN**

APP MEMBRANE APP MODIFIED POLYMERIC MEMBRANES-BENGAL AQUAFLEX, BENGAL AQUAFLEX ALUMINIUM AND BENGAL SUPER MAT

PARTICULAR SPECIFICATIONS

GENERAL

Work under this contract shall be carried out in accordance with Specifications, drawings, General Specifications and other provisions contained in CPWD Manuals and SpecificationsGeneral Rules, specifications, special conditions and all preambles in the CPWD Schedule shall be deemed to be applicable to the work under this contract, unless specifically stated otherwise in these documents and in case of any conflicting provisions in CPWD schedule and in these tender documents, the provisions in these documents shall take precedence over the aforesaid provisions in the CPWD Schedule. The term "as specified" wherever appears in the tender documents and drawings, relates to relevant particular specifications and in its absence, general specifications.Where specifications for any item of work are not given in CPWD Schedule or in these particular specifications, specifications as given in relevant Indian Standard Code of Practice shall be followed.Unit rate quoted by the tenderer shall be deemed to include for any minor details/items of work and/or constructions which are obviously and fairly intended and which may not have been included in these documents but which are essential for the execution and entire completion of work. Decision of the Accepting Officer as to whether any minor detail of work and/or construction is obviously and fairly intended to be included in the contract or not, shall be final, conclusive and binding.

LOCAL MATERIALS:

Irrespective of actual distance involved, local materials such as stones, aggregates, sand, road metals etc shall conform to or superior to the specifications given here in after and to the samples kept in the office of Executing Officer. The tenderers are advised to inspect these samples. The tenderers shall be deemed to have inspected the samples and have full knowledge thereof whether they inspect them or not before quoting their tender.

SAMPLES OF MATERIALS: -

(a) Specific requirements regarding dimensions, strength, weight and finishes, as per IS, CPWD Specification and the particular specifications given hereinafter vis-à-vis actual properties check, tests carried out, reference to test certificates and markings, etc based on which samples of each materials are approved as Conforming to relevant specification shall be recorded in the sample approval register.

(b) The contractor shall produce samples of all materials and shall obtain approval in writing from Estate Officer before he places bulk order for the materials for incorporation in the work. The contractor shall not procure materials unless the samples are first got approved from the Estate Officer.

RECORD OF MATERIALS

(a) The quantity of all the proprietary materials (including the materials the quantity of which cannot be checked after incorporation in the works) shall be recorded in measurement books and signed by the Contractor, the Engineer-in-Charge and Insp/SI (Civil) as a check to ensure that the required quantity has been brought at site for incorporation in the work.

(b) Materials brought to site shall be stored as directed by the Engineer-in-Charge and shall be suitably marked for identification.

(c) The contractor shall procure all the materials (where specific makes/manufacturer's specified) directly from their manufacturers or from their authorised dealers only. The contractor shall ensure that the materials are brought to site in original sealed containers/packing bearing manufacturers marking except in the case of the requirement of material(s) being less than smallest packing.

(d) The contractor shall produce to Engr-in-charge original printed and machine numbered purchase vouchers/invoices including manufacturer's test certificate (where applicable) for all the materials mentioned. Copies of orders placed on the manufacturer/authorised dealers shall also be provided by the contractor to Engr-in-Charge along with above documents. Whenever procured and brought to site of work for incorporation in the work, a Xerox copy of such vouchers/invoices shall be stamped (office stamp) and defaced in ink by the Engineer-in-Charge &Insp/SI (Civil) stating verified for materials purchased and brought to the site of work for incorporation in the subject work and signed with date before allowing payment for these materials through RA Bills.

STANDARD OF WORKMANSHIP

To determine the acceptable standard of workmanship and of fittings, wiring etc, the Engr-in-charge shall order the contractor to execute certain typical portion of work (different trades) and services sufficiently in advance of other work. These shall be executed and completed under the close supervision of the Engineer-in-charge and Insp/SI(Civil) and shall be got approved from Estate Officer.

On approval by the Estate Officer of such items, these items shall signed and/or suitably identified by the Estate Officer and labeled as guiding samples. The record of such inspection and passing of each stage of these samples shall be recorded by Estate Officer under his dated signatures. Work on such sample shall be progressed well ahead (minimum two stages ahead). Approved finishes/workmanship shall be followed in the work as a whole.

TESTING OF CEMENT

The Engr-in-charge shall also organize independent testing of random samples of cement (both physical and chemical properties) drawn from various lots for each consignment to cement brought out by the contractor before incorporation in the work from the National Test House, SEMT, Regional Research Laboratories, Government approved laboratories, as per IS: 3535 (Method of sampling Hydraulic cement), IS: 4031 (Method of physical test for Hydraulic Cement) and IS: 4032 (Method of chemical analysis of Hydraulic cement.)The cement shall conform to chemical requirements and physical requirements as specified in respective IS. The tests carried out as per provisions of IS codes specified herein before shall be the criteria for acceptance of cement by Estate Officer on recommendation of Eng-in-Charge &Insp/SI(Civil). If samples from a lot/lots are not within the acceptance limits of Indian standard the lot/lots shall be rejected without any claims or compensation to the contractor for the lot/lots purchased. The contractor shall replace the lot/lots with the fresh one, which shall be tested again for acceptance. The cost of all tests carried out on cement before acceptance for incorporation in the work shall be borne by the contractor whether the results are acceptable or not.

STORAGE

Cement shall be stored over dry platform at least 20cm high in such a manner as to prevent deterioration due to moisture or intrusion of foreign matter. In case of store rooms, the stock should be at least 20cm above from floors and 60 cm away from walls in addition to precautions specified in Works Manuals. Inspections shall be carried out once a day by the Engineer-in-Charge&Insp/SI(Civil). It shall be ensured by the Engineer-in-Charge that tested and untested cement are segregated and stored separately with distinct identification. The cement godown shall be provided with two locks on each door. The key of one lock at each door shall remain with the Engineer-in-Charge or his representative and that of the other lock with the contractor's authorized representative at site of works so that cement is removed from the godown only according to daily requirement with the knowledge of both the parties.

DOCUMENTATION

The contractor shall submit original vouchers from the supplier for the total quantity of cement supplied under each consignment to be incorporated in the work. All consignments received at the work site shall be inspected by Engr-in-charge &Insp/SI(Civil)along with the relevant documents before acceptance. The original vouchers and the Test Certificates shall be defaced by the Engineer-in Charge &Insp/SI(Civil) and kept on record duly authenticated and with cross-reference to the control number in the cement Supply & Acceptance Register. The cement supply & Acceptance Register will be signed by Insp/SI(Civil), Engineer-in-Charge and the Contractor and cross-signed by Estate Officer. The Accepting Officer may order a Board of Officers for random check of cement and verification of connected documents. The entire quantity of all types cement shall also be suitably recorded in the Measurement Book for record purpose not to be abstracted before incorporation in the work and shall be signed by the Engineer-in-Charge, Insp/SI(Civil) and the contractor.

SCHEDULING OF SUPPLY

Schedule of procurement of cement shall be finalized by the contractor with Engr-in-charge and shall be incorporated in the CPM chart so that procurement is in accordance with the progress contemplated in the CPM prepared. The complete requirement of cement shall be worked out before making any RA Bill payment and procurement of cement by the contractor shall be completed sufficiently in advance of the execution of work.

FINE AGGREGATE (SAND)

Fine aggregate for all concrete work shall be M-sand and /or Badarpurriver sand (from near area or any other Sand) conforming to samples, complying with the requirement as specified in CPWD. Sand in the zone II grading may also be permitted provided mix design is done and the requisite strength of the concrete is achieved.

Note: Wherever M-sand has been specified in the tender documents, the Contractor shall be permitted to use Badarpur sand (from near area) at his own cost, if he so desire due to inadequate supply/non availability of M-Sand. No price adjustment shall be made on this account. Sample of sand shall however, be got approved from the Estate Officer on recommendation of Engr-in-charge &Insp/SI(Civil) before incorporation in the work. Other provisions in the respective clauses shall remain unchanged.

CONCRETE MIX

All mixes of concrete and mortar mentioned in this tender document shall be by volume except design mix concrete conforming to IS-456 for which all the ingredients are proportioned and mixed by weight.

WATER BOUND MACADAM (WBM)

WBM shall consist of consolidated thickness as per schedule of broken/crushed stone (granite, trap or basalt stone aggregate). Stone shall be hard and durable and shall be free from excess of flat and elongated, soft and disintegrated particles, dirt and other objectionable matter. Stone aggregate shall be grading 2 (63 to 45 mm size) as given under CPWD Specifications & Manuals. Screening shall be of red Bajri/Mooram. Unless otherwise specified, the laying, compacting and rolling etc shall be as specified in CPWD Works Manual & Specifications. Stone for WBM shall be laid out as specified in CPWD.

BITUMINOUS CONCRETE

MATERIALS

BINDER

Binder shall be paving bitumen VG-10 as per IS 73-1992 for priming/tack coat and VG-30 as per IS 73-2006/PMB-40 as per IS-15462 of 2004 for dense bituminous premix. The binder for mastic asphalt shall be industrial grade 85/25 bituminous as per IRC 107-2013. Bitumen shall be procured by contractor under his own arrangement and cost. The bitumen shall be procured in sealed containers directly from IOCL/BPCL/HPCL as approved by Estate Officer. PMB-40 as per IS-15462 of 2004 shall be procured directly from manufacturers as listed in Appendix D&E. Alternatively, hot mix plant owner can also procure the bitumen directly from IOCL/BPCL/HPCL and a certificate to the effect that hot mix supplied by plant has been prepared from bitumen of IOCL/BPCL/HPCL listed manufactures of grade VG-10/VG-30/PMB-40 shall be rendered for mix of each day to the department

Modified Bituminous:-Specification and requirements for modified bitumen shall be all as specified in CPWD. Where modified bitumen is placed a storage tank previously used for straight bitumen or a different grade of modified bitumen, the tank shall be emptied to minimum practicable level in order to minimize any dilution effect on the modifier content of the delivered modified bitumen.

Coarse Aggregate shall consist of crushed rock, crushed gravel or other hard materials. They shall be clean, hard and durable of cubical shape, free from dust and soft or friable matter, organic or other deleterious matter. The specification for binder and granular course shall be as per MORTH specifications, Fifth Revision (2013) or as per subsequent revisions from time to time.

Before sample of material for aggregates is approved, these shall be tested for stripping. Where aggregates have poor affinity for bitumen, these shall be treated with approved anti-stripping agents. Where crushed gravel is proposed for use as aggregate, not less than 90% by weight shall have at least two fractured faces. The aggregates shall satisfy the physical requirement & grading requirements as indicated hereinafter & shall be procured in bulk only after obtaining sample approval from the Estate Officer.

PHYSICAL REQUIREMENTS

The coarse aggregate shall satisfy the following physical requirements :-

Test	Percentage	IS Code
Flakiness and elongation index combined	35% maximum	2386 Part-I
Impact Value	24% maximum	2386 Part-IV
Los Angeles Abrasion Value	30% maximum	2386 Part-IV
Stripping Test	95% min retained coating	6241

Water Absorption Test	2% maximum	2386 Part-III
Sodium Sulphate	12%	2386 Part-V
Magnesium Sulphate	18%	2386 Part-V

Above report shall be rendered by Hot mix plant for every 50 cum mix.

FINE AGGREGATE

The fine aggregate shall consist of crushed or naturally occurring material and be fraction passing 236 mm sieve and retained on 75-micron sieve consisting of crushed screening, natural sand or mixture of both. It shall be clean, hard, durable uncoated and dry, free from injurious, soft or flaky pieces and organic or deleterious substance. The fine aggregate shall be Badarpursandconfirming to sample as approved by Estate Officer.

The combined grading of aggregate i.e coarse aggregate, fine aggregate & filler shall conform to the following table. The filler shall be an inert material whole of which passes 600 micron sieve, at least 90% passing 150 micron & not less than 70 % passing 75 Micron sieve. Unless otherwise indicated, filler shall be cement (OPC-43 Gde).

GRADATION OF AGGREGATES IN THE FINAL MIX

IS Sieve	**Percent passing by weight**
19mm	100
13.2 mm	90-100
9.5mm	70-88
4.75mm	53-71
2.36mm	42-58
1.18mm	34-48
600 Micron	26-38
300 Micron	18-28
150 Micron	12-20
75 micron	4-10

MIX DESIGN CRITERIA

The design requirements shall be as under:-

Properties	Viscosity Grade Paving Bitumen	Modified bitumen		Test Method
		Hot Climate	Cold Climate	
Compaction level	75 blows on each face of the specimen			
Minimum stability (kN at 600°C	9.0	12.0	10.0	AASHTO T245
Marshall flow (mm)	2 – 4	2.5 – 4	3.5 – 5	AASHTO T245
Marshall Quotient	2 – 5	2.5 – 5		MS-2 and

Stability / Flow			ASTM D2041
% air voids	3 – 5		
% Voids filled with Bitumen (VFB)	65-75		
Coating of aggregate particle	95% minimum		IS-6241
Tensile strength ratio	80% minimum		AASHTO T 283
% Voids in Mineral Aggregate (VMA)	Minimum percent voids in mineral aggregate (VMA) are set out in Table 500-13		

Note:-

(i) The quantity of binder contents has been indicated tentatively and shall be as per actual mix design.
(ii) Compression test to measure the loss of Marshall Stability due to effect of water on the mix shall be conducted. If the index retained stability is less than 75, the mix shall be rejected or the aggregate shall be processed by approved method to increase the index to minimum of 75. The immersion test shall be carried out on Marshall test specimens of design job mix after storing in 1% sodium chloride solution v/v distilled water for 24 hours at 60 degree C and then tested for Marshall Stability Values. The percentage loss or retention of stability values after immersion in water with reference to the values obtained before immersion is expressed in terms of percentage of the original values.

PREPARATION OF UNDER LYING COURSE

The underlying course shall be prepared, shaped and conditioned to a uniform grade and section as specified. Any depression or pot hole shall be properly made up and thoroughly compacted. The surface shall be scrapped clean and free from dust and foreign material before applying tack coat.

APPLICATION OF TACK COAT

The preparation and method of application shall be as per CPWD Specifications.

JOB MIX FORMULA

The exact binder content shall be worked out on the basis of designed job formula and indicated binder content. Job mix formula as per mix design criteria mentioned hereinbefore shall be submitted by considering aggregates from the approved hot mix plant from National Test House/Govt Engineering College/any other approved laboratory and cost for the same shall be deemed inclusive in the rates.

The contractor shall submit to the Engineer for approval at least 10 days before the start the work, the job mix formula proposed for use in the works, together with the following details:-

(i) Source and location of all materials
(ii) Proportions of all materials expressed as follows :-
(a) Binder type, and percentage by weight of total mix;
(b) Coarse aggregate/Fine aggregate/Mineral filler as percentage by weight of total aggregate including mineral filler;
(iii) A single definite percentage passing each sieve for the mixed aggregate;
(iv) The individual gradings of the individual aggregate fraction, and the proportion of each in the combined grading;
(v) The results of mix design such as maximum specified gravity of loose mix (Gmm), compacted specimen densities, Marshall stability, flow, air voids, VMA, VFB and related graphs and test results of AASHTO T 283 Moisture susceptibility test;
(vi) Where the mixer is a batch mixer, the individual weights of each type of aggregate, and binder per batch;
(vii) Test results of physical characteristics of aggregates to be used;
(viii) Mixing temperature and compacting temperature.

While establishing the job mix formula, the contractor shall ensure that it is based on a correct and truly representative sample of the materials that will actually be used in the work and that the mix and its different ingredients satisfy the physical and strength requirements of these specifications.

Approval of the job mix formula based on independent testing by the Engineer for which samples of all ingredients of the mix are furnished shall be done by Estate Officer on recommendation of Engr-in-Charge &Insp/SI(Civil).

The approved job mix formula shall remain effective unless and until a revised job mix formula is approved . Should a change in the source of materials be proposed, a new job mix formula shall be forwarded by the Contractor to the Estate Officer for approval before the placing of the materials.

PLANT TRIALS–PERMISSIBLE VARIATION IN JOB MIX FORMULA

Once the laboratory job mix formula is approved, the contractor shall carry out plant trials to establish that the plant can produce a uniform mix conforming to the approved job mix formula. The permissible variations of the individual percentages of the various ingredients in the actual mix from the job mix formula to be used shall be within the limits as specified in following table and shall remain within the gradation band. These variations are intended to apply to individual specimens taken for quality control tests in accordance with Section 900.

Permissible variations in the Actual Mix from the Job Mix Formuala

Description	**Base/Binder Course**
Aggregate passing 19mm sieve or larger	±8%
Aggregate passing 13.2mm, 9.5mm	±7%
Aggregate passing 4.75mm	±6%
Aggregate passing 2.36mm, 1.18mm, 0.6mm	±5%
Aggregate passing 0.3mm, 0.15mm	±4%
Aggregate passing 0.075mm	±2%
Binder content	±0.3%
Mixing temperature	±10ºC

PREPARATION OF MIX

Hot mix plant of not less than 100 ton/hour output and capable of producing a proper and uniform quality mix shall be used for preparation of the mix. The plant will have separate load cells to accurately weigh and feed different type of aggregates and a separate load cell for bitumen. The plant will be of batch type. The plant shall have coordinated set of essential units such as a dryer for heating the aggregates, device for batching, feeding by weight the required control unit for ensuring that the correct quantity of heated binder is

fed into the mechanical mixer for thorough mixing of the binder and aggregates. The plant shall have coordinated set of essential units capable of producing uniform mix as per the job Mix formula such as :-

(a) Cold aggregate feed system for providing blended aggregates in correct proportions. At least 4 bin system shall be deployed.
(b) The rotating drum shall be fitted with suitable burners capable of heating the aggregates to the required temperature without any visible un burnt fuel or carbon residue on the aggregate.
(c) The dryer part shall be fitted with thermometric instruments so as to indicate/automatically record the temperature of heated aggregates before mixing with the binder.
(d) The three bin aggregates feed system shall have variable speed belt conveyors. (load cells or other suitable devices) for regulating the accurate proportioning of aggregates into an even flow automatically from a central control cabin.
(e) Bitumen control unit of the system shall be capable of measuring/metering and spraying required quantity of bitumen a specified temperature with synchronization of bitumen and aggregate feed.
(f) Filler system suitable receive bagged or bulky supply of filler material and its incorporation in the mix in correct quantity which could be controlled from central unit.
(g) Dust control units shall be part of the plant.
(h) Suitable auxillary bitumen boiler of adequate capacity with self-heating arrangement and temperature control device.

The temperature of binder at the time of mixing shall be in the range of 150 degree -177 degree C and of aggregates in the range of 155 degree -163 ◌̊ C. Provided also that at no time, the difference in temperature between the aggregates & the binder shall exceed 14 ◌̊ C. The temperature of mix shall not exceed 160 ◌̊C.

TRANSPORTATION OF MIX

The mix shall be transported from the mix plant to the point of use in suitable tipper vehicles. The vehicles employed for transport shall be clean and be covered using suitable covers in transit to ensure that temperature of mix does not fall below 140 degree celsius at the time of laying. An asphalt release agent, such as soap or lime water, may be applied to the interior of the vehicle to prevent sticking and to facilitate discharge of the material. The temperature of the mix in every transporting vehicle shall be checked immediately prior to discharge into the spreader. If the temperature of any batch is below the laying temperature the mix shall be rejected and shall be removed from the site immediately.

SPREADING OF MIX

(a) Laying shall be suspended:

(i) In presence of standing water on the surface;
(ii) Where rain is imminent, and during rains, fog or dust storm;
(iii) When the base/binder course is damp;
(iv) When the air temperature on the surface on which it is to be laid is less than 10ºC for mixes with conventional bitumen and is less than 15ºC for mixes with modified bitumen;
(v) When the wind speed at any temperature exceeds the 40 Km per hour at 2m height.

(b) The mix shall be transported from the hot mix plant by tipper trucks to the site and spreading, shall be done by means of an approved self propelled mechanical paver leveling and temping. The paver shall also have electronic sensing device for automatic leveling and profile control within the specified tolerance and internal heating arrangement for the screed. The longitudinal joints and edges shall be constructed true to line making parallel to the centre line.

(c) As soon as possible after arrival at site, the materials shall be supplied continuously to the paver and laid without delay. The rate of delivery of material to the paver shall be regulated to enable the paver to operate continuously. The travel rate of the paver, and its method of operations, shall be adjusted to ensure an even and uniform flow of bituminous material across the screed, free from dragging, tearing and segregation of the material. In areas with restricted space (such as confined space, foot ways, of irregular shape and varying thickness, approaches to expansion joints, etc) where paver cannot be used, the material shall be spread, raked and leveled with suitable hand tools by trained staff.

(d) When laying binder course or wearing course approaching an expansion joint of a structure, machine laying shall stop 300mm short of the joint. The remainder of the pavement up to the joint, and the corresponding area beyond it, shall be laid by hand, and the joint or joint cavity shall be kept clear of surfacing material.

(e) Bituminous material, with a temperature greater than 145ºC, shall not be laid or deposited on bridge deck water-proofing systems, unless precautions against heat damage have been approved by the Engr-in-Charge &Insp/SI(Civil).

CLEANLINESS AND OVERLAYING

Bituminous material shall be kept clean and uncontaminated. The only traffic permitted to run on bituminous material to be overlaid shall be that engaged in laying and compacting the next course or, where a binder course is to be sealed or surface dressed, that engaged on such surface treatment. Should any bituminous material become contaminated, the Contractor shall make it good to the satisfaction of the Engineer.

COMPACTION

Bituminous materials shall be laid and compacted in layers, which enable the specified thickness, surface level, regularity requirements and compaction to be achieved. Compaction of bituminous materials shall commence as soon as possible after laying. Compaction shall be substantially completed before the temperature falls below the minimum rolling temperatures stated below:-

Bitumen Viscosity Grade	Bitumen Temperature	Aggregate Temperature	Mixed Material Temperature	Laying Temperature	*Rolling Temperature
VG-40	160-170	160-175	160-170	150 Min	100 Min
VG-30	150-165	150-170	150-165	140 Min	90 Min
VG-20	145-165	145-170	145-165	135 Min	85 Min
VG-10	140-160	140-165	140-160	130 Min	80 Min
PMB-40	165-185	165-185	150-170	130 Min	115 Min

The other control during mixing, laying shall be same as specified in IRC: 111 for dense asphalt concrete or as indicated in technical literature of product.

Rolling of the longitudinal joints shall be done immediately behind the paving operation. After this, rolling shall commence at the edges and progress towards the centre longitudinally except that on super-elevated and unidirectional by cambered portions, it shall progress from the lower to the upper edge parallel to the centre line of the pavement. Rolling shall continue until all roller marks have been removed from the surface. All deficiencies in the surface after laying shall be made good by the attendants behind the paver, before initial rolling is commenced. The initial or breakdown rolling shall be done with 8-10 tonne static weight smooth-wheel rollers with minimum 02 passes. The intermediate rolling shall be done with 8-10 tonne

tandem vibratory roller with minimum 02 passes and with a pneumatic tyre roller of 12 to 15 tonne weight, with a tyre pressure of at least 0.56 MPa with minimum 04 passes. The Contractor shall demonstrate the efficiency of the equipment proposed to be used by carrying compaction trials. The procedure for site trials shall be submitted to the Engr-in-Charge for approval. The finish rolling shall be done with 6 to 8 tonne smooth wheel tandem rollers. Rolling shall continue until the specified compaction is achieved.

Bituminous materials shall be rolled in a longitudinal direction, with the driven rolls nearest the paver. The roller shall first compact material adjacent to joints and then work from the lower to the upper side of the layer, overlapping on successive passes by at least one-third of the width of the rear roll or, in the case of a pneumatic-tyred roller, at least the nominal width of 300mm.

In portions with super-elevated and unidirectional camber, after the edge has been rolled, the roller shall progress from the flower to the upper edge.

Rollers should move at a speed of not more than 5 km per hour. The roller shall not be permitted to stand on pavement which has not been fully compacted, and necessary precautions shall be taken to prevent dropping of oil, grease, petrol/diesel or other foreign matter on the pavement either when the rollers are operating or standing. The wheels of roller machine shall be in good working order, to prevent the mix from adhering to the wheels. Only sufficient moisture to prevent adhesion between the wheels of rollers and the mix should be used. Surplus water shall not be allowed to stand on the partially compacted pavement.

HOT MIX PLANT

Hot mix plant of not less than 100 tonnes/hour output and capable of producing a proper and uniform quality mix shall be used for preparation of the mix. The plant will have separate load cells to accurately weigh and feed different type of aggregates and a separate load cell for bitumen. The plant will be of batch type. The plant shall have coordinated set of essential units as a dryer for heating the aggregates, device for batching, feeding by weight the required control unit for ensuring that the correct quantity of heated binder is fed into the mechanical mixer for through mixing of the binder and aggregates. Have coordinated set of essential units capable of producing uniform mix as per the Job Mix formula such as:

(a) Cold aggregate feed system for providing blended aggregates in correct proportions. At least 4 bin system shall be deployed.
(b) The rotating drum shall be fitted with suitable burners capable of heating the aggregates to the required temperature without any visible un burnt fuel or carbon residue on the aggregate.
(c) The dryer part shall be fitted with thermometric instruments so as to indicate/automatically record the temperature of heated aggregates before mixing the binder.
(d) The three bin aggregates feed system shall have variable speed belt conveyors, (Load cells or other suitable devices) for regulating the accurate proportioning of aggregates into an even flow automatically from a central control cabin.
(e) Bitumen control unit of the system shall be capable of measuring/metering and spraying required quantity of bitumen at specified temperature with synchronization of bitumen and aggregates feed.
(f) Filler system suitable to receive bagged or bulk supply of filler material and its incorporation in the mix in correct quantity which could be controlled from central control unit.
(g) Dust control unit shall be part of the plant.
(h) Suitable auxillary bitumen boiler of adequate capacity with self-heating arrangement and temperature control device.
Contractor shall facilitate visit to hot mix plant by Engr-in-Charge &Insp/SI(Civil) during preparation of mix while execution of work and contractor shall submit the details of hot mix plant conforming to above requirements along with sample of materials for approval prior to getting for job mix'

PAVER FINISHER

Paver finisher shall have the following essential features:-

(a) Loading hoppers and suitable distributing mechanism.
(b) Hydrostatic drive/control for all devices.
(c) Hydraulically extendible screed for appropriate width requirement. The screed shall have tamping and vibrating arrangements for initial compaction to the layer as it is spread without rutting or spoiling the surface. It shall have adjustable amplitude and infinitely variable frequency. The screed plate should have preheating arrangements.
(d) Necessary control mechanism so as to ensure that the finished surface is free from surface blemishes
(e) Electronic sensing device for automatic leveling and profile control.
(f) Internal heating arrangement for screed.

SPRAYER FOR PRIME AND TACK COAT

A tipper mounted with storage browser for bitumen with heating arrangement and having nozzles fixed at the end with suitable pumping arrangement to spray the heated bitumen shall be used for the purpose. The system should have a built in arrangement to control the speed of the vehicle to give exact/desired quantity of bitumen be sprayed.

TIPPERS

Tippers deployed for transportation of bituminous concrete should be minimum six cum capacity and be directly able to discharge into the paver hopper and shall have suitable hydraulic control for operating the system.

ROLLING OR COMPACTION EQUIPMENT

TANDEM VIBRATORY ROLLER

Tandem vibratory roller shall have both modes of compaction i.e static mode as well as vibratory mode. It is desirable to use the static mode for the initial rolling and then resort to vibratory rolling and final finishing to be done by static rolling. The machine shall have auto water spraying system.

PNEUMATIC TYRES ROLLERS Pneumatic tyres rollers of 12 to 15 tonne capacity shall have auto water sprays of system.

REPAIR TO POT HOLES: The pot holes shall be drained off water and cut to arectangular form with vertical sides. All loose and disintegrated materials shall be **r**emoved. The pot holes shall then be filled with premix bituminous macadam after application of tack coat as given in Schedule & Specifications of CPWD

Solar Road Stud : Solar Road Stud shall be of description as specified in BOQ. These shallbe fixed all as per manufacturer's instructions and as directed by Engr-in-Charge. These shall be of Make : Tata BP (Sparkle) / 3 M India or Equivalent

CAT EYES : Cat Eyes shall be of description as specified in BOQ. These shallbe fixed all as per manufacturer's instructions and as directed by Engr-in-Charge. These shall be of Make : - TATA BP/3M India or Equivalent

Reflective Convex Mirror : Reflective Convex Mirror shall be of description as specified in BOQ. These shallbe fixed all as per manufacturer's instructions and as directed by Engr-in-Charge. These shall be of Make : - Greenlite/TATA or equivalent

Speed Breaker/ Bumps :- Speed Breaker/Bumps shall be of description as specified in BOQ. These shallbe fixed all as per manufacturer's instructions and as directed by Engr-in-Charge. These shall be of Make : Cat part No DA 1005 of Dark Eye or GP 1005 of Gogia plastics or equivalent.

Delineator : Delineator shall be of description as specified in BOQ. These shallbe fixed all as per manufacturer's instructions and as directed by Engr-in-Charge. These shall be of Make : - TATA BP/3M Indi or equivalent

THERMOPLASTIC PAINT FOR ROAD MARKING

GENERAL :

(i) The work shall consist of marking traffic stripes using a thermoplastic compound meeting the requirement specified herein after.

(ii) The thermoplastic compound shall be screeded /extruded on to the pavement surface in a molten state by suitable machine capable of controlled preparation and laying with surface application of glass beads at a specific rate. Upon cooling to ambient pavement temperature it shall produce an adherent pavement marking of specified thickness and width and capable of resisting deformation by traffic.

(iii) The colour of the compound shall be white or yellow (IS colour No. 356) as directed by the Engineer in Charge.

Where the compound is to be applied to cement concrete pavement, a sealing primer as recommended by the manufacture, shall be applied to the pavement in advance of placing of the stripes to ensure proper bonding of the compound. On new concrete surface any laitance and/or curing compound shall be removed before the markings are applied.

Make : Berger, Asian Paint, Nerolac

THERMOPLASTIC MATERIAL

GENERAL : The thermoplastic material shall be homogeneously composed of aggregate, pigment, resins and glass reflectorizing beads.

REQUIREMENTS:

(a) **COMPOSITION**: The pigment, beads, and aggregate shall be uniformlydispersed in the resin. The material shall be free from all skins, dirt and foreign objects and shall comply with requirements indicated in Table below:

PROPORTIONS OF CONSTITUENTS OF MARKING MATERIAL

(Percentage by weight)

	Component	**White**	**Yellow**	
	Binder	18.0 min	18.0 min	
	Glass Beads	30-40	30-40	
Titanium Dioxide		10.0 min	-	
CalciumCarbonate and inert Fillers		42.0max	See not below	
Yellow Pigments			See not below	

Note : Amount of yellow pigment, calcium carbonate and inert fillers shall be at the optionof the manufacture provided all other requirements of these specifications are met.

PROPERTIES: The properties of thermoplastic material, when tested in accordancewith ASTM D36/BS-3262-(PartI) shall be as below:

(a) **LUMINANCE** :
WHITE: Daylight luminance at 45 degrees-65 per cent min. as per AASHTO M 249.

YELLOW: Daylight luminance at 45 degrees-45 per cent min. as per AASHTO M249

DRYING TIME : When applied at a temperature specified by the manufacture and to the required thickness, the material shall set to bear traffic in not more than 15 minutes.

(c) **SKID RESISTANCE**: not less than 45 as per BS 6044.
(d) **CRACKING RESISTANCE AT LOW TEMPERATURE**: The material shallshow no cracks on application to concrete blocks.
(e) **SOFTENING POINT**: 102.5$\pm$9.5^{O}C as per ASTM D 36.
(f) **FLOW RESISTANCE**: Not more than 25 per cent as per AASHTO M 249.
(g) **YELLOWNESS INDEX (FOR WHITE THERMOPLASTIC PAINT) :**notmore than 0.12 as per AASHTO M 249.

STORAGE LIFE: The material shall meet the requirements of these Specificationsfor a period of one year. The thermoplastic material must also melt uniformly with no evidence of skins or unmelted particles for one year storage period. Any material not meeting the above requirements shall be replaced by the manufacturer/supplier/contractor.

REFLECTORISATION: This shall be achieved by incorporation of beads, thegrading and other properties of the beads shall be as specified in here in after.

MARKING: Each container of the thermoplastic material shall be clearly andindelibly marked with the following information :
a) The name, trade mark or other means of identification of manufacturer
b) Batch number
c) Date of manufacture
d) Colour (white or yellow)
e) Maximum application temperature and maximum safe heating temperature.

SAMPLING AND TESTING:The thermoplastic material shall be sampled andtested in accordance with the appropriate ASTM/BS method. The Contractor shall furnish to the deptt a copy of certified test reports from the manufacturer of the thermoplastic material showing results of all tests specified and shall certify that the material meets all requirements.

REFLECTORISING GLASS BEADS

GENERAL: This Specification covers two types of glass beads to be used for the production of reflectorised pavement markings. Type 1 beads are those which are a constituent of the basic thermoplastic compound and Type 2 beads are those which are to be sprayed on the surface.

The glass beads shall be transparent, colourless and free from milkyness, dark particles and excessive air inclusions.

SPECIFIC REQUIREMENTS

A. GRADATION: The glass beads shall meet the gradation requirements for the twotypes as given in Table as below.

Sieve size	Per cent retained	
	Type 1	Type2
1.18 mm	0 to 3	-
850 micron	5 to 20	0 to 5
600 –do-	-	5 to 20
425 –do-	65 to 95	-
300 –do-	-	30 to 75
180 –do-	0 to 10	10 to 30
below 180 micron	-	0 to 15

B. ROUNDNESS: The glass beads shall have a minimum of 70 per cent true spheres.

C. REFRACTIVE INDEX: The glass beads shall have a minimum re-fractive index of 1.50.

D. FREE FLOWING PROPERTIES: The glass beads shall be free of hard lumps and clusters and shall dispense readily under any conditions suitable for paint striping. They shall pass the free flow test.

TEST METHODS: The specific requirements shall be tested with the following methods:

FREE-FLOW TEST:

i) Spread 100 grams of beads evenly in a 100 mmdiameter glass dish. Place the dish in a 250 mm inside diameter desiccator which is filled within 25 mm of the top of a desiccator plate with sulphuric acid water solution (specific gravity 1.10). Cover the desiccator and let it stand for 4 hours at 20 to 29 degree C. Remove sample from desiccator, transfer beads to a pan and inspect for lumps or clusters. Then pour beads into aclean, dry glass funnel having a 100 mm stem and 6 mm orifice. If necessary, initiate flow by lightly tapping the funnel. The glass spheres shall be essentially free of lumps and clusters and shall flow freely through the funnel.

(ii) The requirements of gradation, roundness and refractive index of glass beads and the amount of glass beads in the compound shall be tested as per BS 6088 and BS 3262 (Part-I).

(iii) The contractor shall furnish to the deptt a copy of certified test reports from the manufacturer of glass beads obtained from a reputed laboratory showing results of all tests specified herein and shall certify that the material meets all requirements of this Specification. However, if so require, these tests may be carried out as directed by the Engineer-in-Charge.

APPLICATION PROPERTIES OF THERMOPLASTIC MATERIAL

The thermoplastic material shall readily get screeded/extruded at temperatures specified by the manufactures for respective method of application to produce a line of specified thickness which shall be continuous and uniform in shape having clear and sharp edges.

The material upon heating to application temperatures , shall not exude fumes, which are toxic, obnoxious or injurious to persons or property.

PREPARATION :

(i) The material shall be melted in accordance with the manufacturer's instructions in a heater fitted with a mechanical stirrer to give a smooth consistency to the thermoplastic material to avoid local overheating. The temperature of the mass shall be within the range specified by the manufacture, and shall on account be allowed to exceed the maximum temperature stated by the manufacturer. The molten material should be used as expeditiously as possible and for thermoplastic material which has natural binders or is otherwise sensitive to prolonged heating, the material shall not be left in a molten condition for more than 4 hours.

(ii) After transfer to the laying equipment, the material shall be maintained within the temperature range specified by the manufacturer for achieving the desired consistency for laying.

PROPERTIES OF FINISHED ROAD MARKING :

(a) The strip shall not be slippery when wet.
(b) The marking shall not lift from the pavement in freezing weather.
(c) After application and proper drying, the stripe shall show no appreciable deformation or discoloration under traffic and under road temperatures upto 60^{o} C.
(d) The marking shall not deteriorate by contact with sodium chloride, calcium chloride or oil drippings from traffic.

The strip or marking shall maintain its original dimensions and position. Cold ductility of the material shall be such as to permit normal movement with the road surface without chopping or cracking.

(e) The colour of yellow marking shall conform to IS Colour No 356 as given in IS:164.

BITUMEN MASTIC WEARING COURSE

Bitumen Mastic Wearing course shall be all as specified for road work.

PRECAST INTERLOCKING PAVER BLOCKS: Precast inter locking paver blocks shall be of description as specified in BOQ. These shallbe fixed all as specified in clauses of CPWD.

GENERAL

Work under this contract shall be carried out in accordance with Specifications, drawings, General Specifications and other provisions contained in CPWD Manuals and Specifications General Rules, specifications, special conditions and all preambles in the CPWD Schedule shall be deemed to be applicable to the work under this contract, unless specifically stated otherwise in these documents and in case of any conflicting provisions in CPWD schedule and in these tender documents, the provisions in these documents shall take precedence over the aforesaid provisions in the CPWD Schedule. The term "as specified" wherever appears in the tender documents and drawings, relates to relevant particular specifications and in its absence, general specifications. Where specifications for any item of work are not given in CPWD Schedule or in these particular specifications, specifications as given in relevant Indian Standard Code of Practice shall be followed. Unit rate quoted by the tenderer shall be deemed to include for any minor details/items of work and/or constructions which are obviously and fairly intended and which may not have been included in these documents but which are essential for the execution and entire completion of work. Decision of the Accepting Officer

as to whether any minor detail of work and/or construction is obviously and fairly intended to be included in the contract or not, shall be final, conclusive and binding.

LOCAL MATERIALS:

Irrespective of actual distance involved, local materials such as stones, aggregates, sand, road metals etc shall conform to or superior to the specifications given here in after and to the samples kept in the office of Executing Officer. The tenderers are advised to inspect these samples. The tenderers shall be deemed to have inspected the samples and have full knowledge thereof whether they inspect them or not before quoting their tender.

SAMPLES OF MATERIALS: -

(c) Specific requirements regarding dimensions, strength, weight and finishes, as per IS, CPWD Specification and the particular specifications given hereinafter vis-à-vis actual properties check, tests carried out, reference to test certificates and markings, etc based on which samples of each materials are approved as Conforming to relevant specification shall be recorded in the sample approval register.

(d) The contractor shall produce samples of all materials and shall obtain approval in writing from Engineer-in-charge before he places bulk order for the materials for incorporation in the work. The contractor shall not procure materials unless the samples are first got approved from the Engineer-in-charge.

(e) Samples of approved materials shall be kept in custody of Engineer-in-Charge till completion of work.

RECORD OF MATERIALS

(e) The quantity of all the proprietary materials (including materials and quantity of which cannot be checked after incorporation in the works) shall be recorded in measurement books and signed by the Contractor, the Engineer-in-Charge and Insp/SI (Civil) as a check to ensure that the required quantity has been brought at site for incorporation in the work.

(f) Materials brought to site shall be stored as directed by the Engineer-in-Charge and shall be suitably marked for identification.

(g) The contractor shall procure all the materials (where specific makes/manufacturer's specified) directly from their manufacturers or from their authorised dealers only. The contractor shall ensure that the materials are brought to site in original sealed containers/packing bearing manufacturers marking except in the case of the requirement of material(s) being less than smallest packing.

(h) The contractor shall produce to Engr-in-charge original printed and machine numbered purchase vouchers/invoices including manufacturer's test certificate (where applicable) for all the materials mentioned. Copies of orders placed on the manufacturer/authorised dealers shall also be provided by the contractor to Engr-in-Charge along with above documents. Whenever procured and brought to site of work for incorporation in the work, a Xerox copy of such vouchers/invoices shall be stamped (office stamp) and defaced in ink by the Engineer-in-Charge &Insp/SI (Civil) stating verified for materials purchased and brought to the site of work for incorporation in the subject work and signed with date before allowing payment for these materials through RA Bills.

STANDARD OF WORKMANSHIP

To determine the acceptable standard of workmanship and fittings, wiring etc, the Engr-in-charge shall order the contractor to execute certain typical portion of work (different trades) and services sufficiently in advance of other work. These shall be executed and completed under the close supervision of the Engineer-in-charge and Insp/SI(Civil).

On approval by the Engineer-in-charge of such items, these items shall signed and/or suitably identified by the Engineer-in-charge and labeled as guiding samples. The record of such inspection and passing of each stage of these samples shall be recorded by Engineer-in-charge under his dated signatures. Work on such sample shall be progressed well ahead (minimum two stages ahead). Approved finishes/workmanship shall be followed in the work as a whole.

TESTING OF CEMENT

The Engr-in-charge shall also organize independent testing of random samples of cement (both physical and chemical properties) drawn from various lots for each consignment to cement brought out by the contractor before incorporation in the work from the National Test House, SEMT, Regional Research Laboratories, Government approved laboratories, as per IS: 3535 (Method of sampling Hydraulic cement), IS: 4031 (Method of physical test for Hydraulic Cement) and IS: 4032 (Method of chemical analysis of Hydraulic cement.)The cement shall conform to chemical requirements and physical requirements as specified in respective IS. The tests carried out as per provisions of IS codes specified herein

before shall be the criteria for acceptance of cement by Engr-in-Charge &Insp/SI(Civil). If samples from a lot/lots are not within the acceptance limits of Indian standard the lot/lots shall be rejected without any claims or compensation to the contractor for the lot/lots purchased. The contractor shall replace the lot/lots with the fresh one, which shall be tested again for acceptance. The cost of all tests carried out on cement before acceptance for incorporation in the work shall be borne by the contractor whether the results are acceptable or not.

STORAGE

Cement shall be stored over dry platform at least 20cm high in such a manner as to prevent deterioration due to moisture or intrusion of foreign matter. In case of store rooms, the stock should be at least 20cm above from floors and 60 cm away from walls in addition to precautions specified in Works Manuals. Inspections shall be carried out once a day by the Engineer-in-Charge & Insp/SI(Civil). It shall be ensured by the Engineer-in-Charge that tested and untested cement are segregated and stored separately with distinct identification. The cement godown shall be provided with two locks on each door. The key of one lock at each door shall remain with the Engineer-in-Charge or his representative and that of the other lock with the contractor's authorized representative at site of works so that cement is removed from the godown only according to daily requirement with the knowledge of both the parties.

DOCUMENTATION

The contractor shall submit original vouchers from the supplier for the total quantity of cement supplied under each consignment to be incorporated in the work. All consignments received at the work site shall be inspected by Engr-in-charge &Insp/SI(Civil)along with the relevant documents before acceptance. The original vouchers and the Test Certificates shall be defaced by the Engineer-in Charge &Insp/SI(Civil) and kept on record duly authenticated and with cross-reference to the control number in the cement Supply & Acceptance Register. The cement supply & Acceptance Register will be signed by Insp/SI(Civil), Engineer-in-Charge and the Contractor. The Accepting Officer may order a Board of Officers for random check of cement and verification of connected documents. The entire quantity of all types cement shall also be suitably recorded in the Measurement Book for record purpose not to be abstracted before incorporation in the work and shall be signed by the Engineer-in-Charge, Insp/SI(Civil) and the contractor.

SCHEDULING OF SUPPLY

Schedule of procurement of cement shall be finalized by the contractor with Engr-in-charge and shall be incorporated in the CPM chart so that procurement is in accordance with the progress contemplated in the CPM prepared. The complete requirement of cement shall be worked out before making any RA Bill payment and procurement of cement by the contractor shall be completed sufficiently in advance of the execution of work.

SAND(Coarse & Fine)

Sand for all concrete work shall be M-sand and /or Badarpur river sand (from near area or any other Sand) conforming to samples, complying with the requirement as specified in CPWD. Sand in the zone II grading may also be permitted provided mix design is done and the requisite strength of the concrete is achieved.

Note: Wherever M-sand has been specified in the tender documents, the Contractor shall be permitted to use Badarpur sand (from near area) at his own cost, if he so desire due to inadequate supply/non availability of M-Sand. No price adjustment shall be made on this account. Sample of sand shall however, be got approved from the Engr-in-charge &Insp/SI(Civil) before incorporation in the work. Other provisions in the respective clauses shall remain unchanged.

CONCRETE MIX

All mixes of concrete and mortar mentioned in this tender document shall be by volume except design mix concrete conforming to IS-456 for which all the ingredients are proportioned and mixed by weight.

WATER BOUND MACADAM (WBM)

WBM shall consist of consolidated thickness as per schedule of broken/crushed stone (granite, trap or basalt stone aggregate). Stone shall be hard and durable and shall be free from excess of flat and elongated, soft and disintegrated particles, dirt and other objectionable matter. Stone aggregate shall be grading 2 (63 to 45 mm size) as given under CPWD Specifications & Manuals. Screening shall be of red Bajri/Mooram. Unless otherwise specified, the laying, compacting and rolling etc shall be as specified in CPWD Works Manual & Specifications. Stone for WBM shall be laid out as specified in CPWD.

STEEL AND IRON WORK

General:- All items of steel which are required for the work under this contract shall be procured supplied and incorporated in the work by the contractor under his own arrangement.

Grades and Quality
Steel supplied by the contractor shall conform to the following grades and quality.
Structural steel

(i) Structural steel wherever mentioned shall be conforming to Fe 550 Gde conforming to IS-2062.
(ii) General purpose steel wherever mentioned shall be conforming E-165(Fe-290) conforming toIS-2062.

Source of Procurement
(a) Structural Steel : The Contractor shall procure all the structural steel from the main manufacturers.
(b) The contractor shall within 15 days of placing of work order indicate the source for procurement of steel to Engineer-in-charge in writing.
(c) However, steel sections for railing, gates, fencing, guard bars, grills steel chowkats, hold fast etc,which do not constitute structural members, can be procured from main producers/secondary producer/BIS marked manufacturers or their authorized dealers at the option of contractor
(d) The contractor shall produce original vouchers from suppliers for the total quantity of steel purchased, under each consignment and be kept on record by Engineer-in-Charge and authenticated.
Testing and Test Certificate
(a) The contractor shall produce manufacturers test certificate in original along with the test sheet giving the result of each mechanical test as applicable and the chemical composition of the steel supplied as specified in relevant IS Codes, duly signed by the manufacturer of their authorized dealers with each consignment.

(b) The original test certificate shall be kept on record in the office of Engineer-in-Charge(AC Engr).

(c) Independent testing of structural steel by the Engineer-in-Charge shall be mandatory in case of procurement from secondary producers and testing charges shall be borne by the Contractor irrespective of the outcome of test results.

(d) In both the cases at sub para (c) and (d) above, the contractor at his cost shall provide all facilities required for the testing and cost consumed in tests shall be borne bythe contractor.

Minimum frequency of testing for each source and each consignment
(a) Structural Steel: -

(i) Tensile test : One sample(3 specimen) for each test for every 25 tonnes or part thereof.

(ii) Bend test : One sample(3 specimen) for each test for every 10 tonnes or part thereof.

(b) Steel for concrete reinforcement: -

(i)Bar size less than 10mm : One sample(3 specimen) for each test for every 25 tonnes or part thereof.

(ii)Bar size 10mm to 16mm (inclusive): One sample(3 specimen) for each test for every 35 tonnes or part thereof

(iii) Bar size over 16mm: One sample(3 specimen) for each test for every 45 tonnes or part thereof.

(c) Bend test and tensile test for structural steel shall be carried as per IS-226 of 1975. For high strength deformed bar tensile, bend test and rebend test shall be done as per IS-1786 of1985. For MS bars tensile and bend test shall be carried out as per IS 432 of 1982.

(d) Engineer-in-Charge has the right to get one more sample (3 specimen) tested if he is not satisfied with test result of the consignment.

(e) If the test results as per manufacturer's test certificate or of independent testing of random samples are not as per criteria laid down in the relevant BIS provisions, the entire consignment which is represented by the samples shall be rejected. Such rejected materials shall be removed and replaced by the contractor at his own cost forthwith.

(f) Cost of transportation of samples to the approved laboratory/test house and all testing charges shall be borne by the contractor.

Storage: - Steel supplied by the contractor shall be stored in accordance with the requirement of IS. Each grade and quality of steel shall be stored separately and have identification tags indicating the source, quality and grade.

Preservation and maintenance of steel :- The steel brought by the contractor shall be preserve do ensure that no rusting takes place till it is incorporated in the works.

Schedule of Supply :- The contractor shall procure the steel sections, timely as required in accordance with CPM Chart, agreed between Engr-in-charge and contractor. The contractor will forego his right to demand extension of time if the supply of steel got delayed due to his failure in placing order in time to the manufacturer/supplier.

Payment :-. Payment shall allowed after production of test certificate and original paid/purchase vouchers by the contractor.

Measurement
(a) The entire quantity of steel brought to site shall be recorded in measurement book as "NOT TO BE ABSTRACTED" indicating the reference to manufacturers, source of supply voucher number and test certificate before incorporation in the work and shall be signed both by the Engineer-in-Charge and the contractor. Proper documentation/record shall be maintained as per the instructions on the subject.

Normal waste and off cuts shall be stacked neatly which shall be the property of the Contractor. Contractor shall be allowed to remove such cut pieces after inspection and certifications by the Engineer-in-Charge.

Advance on account of payment made towards these cut pieces shall be recovered from advance on account of payment immediately falling due and before removal of such cut pieces from site.

Bending and fixing of bars for concrete reinforcement including mild steel wire for binding shall be carried out all as specified in CPWD. Binding wire for reinforcement shall be mild steel wire(annealed) of size not less than 0.9mm.

Steel supply/Acceptance form :- For each consignment of steel supply/acceptance form will be filled in and jointly signed by the department Rep.(Engineer-in-Charge/SI civil/Insp Civil) and contractor and accepted/rejected by Engineer-in-Charge before incorporation in the works.

Steel Reinforcement :- Reinforcement shall be fabricated, placed in position all as specified in CPWD specifications.

Guard Bars/Grills:
MS Guard bars/grills wherever applicable and as indicated shall be provided to wooden/steel windows/ventilators as per details shown on drawings/schedule. Steel Guard bars/ steel grills shall be painted with 2 coats of synthetic enamel paint over a coat of primer as specified here-in-after.

Hold Fasts/Lugs: Flat iron hold fast/lugs shall be provided by welding as and where shown on drawings except those, to be provided to wooden chowkats, which shall be fixed with screws as per details shown on

drawings. Hold fasts/lugs shall be embedded in PCC(1:3:6) bed blocks of size 220mmx220mmx75mm in one brick thick walls and 100mmx220mmx75mm in half brick thick walls..

FLOORING

General adopted for laying floors and pavements.

Floors shall be laid to levels and as directed by the Engineer-in-Charge.

Floor topping of cast-in-situ cement concrete shall be finished even and smooth using extra cement as specified in CPWD specifications.

Pozzzolana or pozzolana slag cement shall not be used for floor topping.

Floor finish over RCC slabs shall be laid all as specified.

Sub floor may not be laid in panels. The thickness of sub base concrete shall be as indicated in schedule.

CEMENT CONCRETE FLOORS :- PCC floors shall be provided as indicated in Schedule.

All tiling works in floors, proper slope shall be ensured to avoid accumulation of water/liquids or formation of puddle. Slope shall be checked by spirit level/pouring water on the floor & then only the work shall be passed. In case work fails in the slope test, firm shall re-do the tiling work at that particulars location as its own cost.

VITRIFIED TILES FLOORING

Where vitrified tiles specified on Schedules provide coloured vitrified tiles of size as specified in the schedule and shall be laid and jointed pointed with white cement paste & pigment. Tiles shall confirm to IS – 15622-2006.

The tiles shall be first quality product procured from any of the manufacturers as listed in list of manufacturers
Laying jointing and finishing shall be all as per manufactures guidance/ instructions.
The colour of tiles shall be as decided by Estate Officer and Engineer-in-Charge.

KOTA STONE SLAB FLOORING

Kota stone shall be hard, durable, regular in shape, of uniform colour and free from cracks, decay and weathering. It shall be set, jointed and pointed in neat cement slurry mixed with pigment to match with the colour of stone. The slabs used in one location shall be of uniform size and shall be laid over cement screed as indicated. Kota stone slabs shall be machine cut and true fine cut dressing on all sides up to full depth . All angles and edges shall be true, square, free from chipping and surface shall be true and plain. The joints of the tiles shall not be more than 1mm.Laying, polishing and finishing of kota stone shall be all as specified.

GLAZED CERAMIC TILE DADO

The ceramic dado shall be provided with ceramic tiles of size as specified in BOQ and shall be glazed quality colour and/or white as indicated in BOQ and conforming to relevant IS specifications.

The tiles shall be jointed and pointed with white or coloured cement to match with the colour of tiles. Thetiles shall be laid over cement mortar screed as specified in BOQ.

GRANITE FLOORING /CILL

It shall be all as described on Schedule. Granite slab shall be machine cut, pre-polished, over cement screed 15mm thick in CM 1:6 over 25mm thick PCC 1:2:4 using 12.5mm aggregate over RCC slab or as per BOQ.

WHITE MARBLE TILE: 20mm thick makrana white marble tile shall be laid over cement screed CM 1:4,15mm thick jointed with grey cement slurry mixed with pigment to match the shades of slab used as the boarder to kota slab flooring.

CERAMIC FLOOR/WALL TILES

Where Non-skid ceramic tiles specified on Schedules provide coloured non-skid ceramic tiles of size as specified in the schedule, as per Gde B II (a) shall be laid and jointed pointed with white cement paste& pigment. Tiles shall confirm to IS – 15622-2006.

The tiles shall be first quality product procured from any of the manufacturers as listed in list of manufacturers here-in-below.
Laying jointing and finishing shall be all as per manufactures guidance/ instructions.
The colour of ceramic tiles shall be as decided by Estate Officer and Engineer-in-Charge.

PLASTERING AND POINTING
GENERAL

Cement: Refer to specifications and list as mentioned above.

Fine aggregate for plastering and pointing work shall be river sand conform to IS 1542-1992and as specified in Clause 14.5 to 14.5.2 of SSR Part I. Sand shall be obtained from sources as approved by Engineer-in-Charge.

Particular attention of the contractor is invited to take note of local practices and the local availability of materials like bricks form work etc and cater for any extra quantities of mortar required for rendering smooth for extra dubbing required for touching up properly and for smooth and even surfaces.

This shall be deemed to have been included in the lump sum.

Plaster and skirting/dado shall be returned in jambs, soffits of lintels and windows sills etc.

All plastered surface shall be trowel led to a smooth and even surfaces, without using extra cement.

Thickness of cement plaster mentioned hereinafter shall be finished thickness exclusive of dubbing. Dubbing may however be done in one operation with plaster.

Plaster on external surface shall be carried out upto 15cm below ground level or as per BOQ except where plinth protection/ramp etc are provided.

All corners, angles, junctions and riser shall be truly vertical or horizontal as the case may be and shall be carefully finished. Corners around jabs of openings and junction of walls shall be finished straight and square. 12mmwide groove at the junction of wall and RCC slabs to the entire thickness of wall plaster shall be provided. Also trowel groove shall be provided at junction of walls and RCC columns or any other dissimilar material e.g. wooden chowkhats etc.

Any spalling of concrete/plaster on the surface to be painted/distempered shall be repaired first as per instructions of Engineer-in-Charge followed by premier cost of patch work and then only paint/distemper shall be applied.

Plastering shall be carried out all as specified in Schedule ‘A’ .

OIL EMULSION DISTEMPER

Distemper shall be applied as specified in BoQ. Preparation of surfaces and applications of distempering shall be all as per BOQ/CPWD specifications.

Preparation of surfaces and application of interior emulsion shall be done all as per manufacturer's instructions/ as specified in BOQ. The contractor shall give 05 years Guarantee for interior emulsion on stamp paper of value for Rs.100/-

CEMENT BASED PAINT

Cement based paint shall comply with IS 5410-1992, specification for cement paint colour as required. The material shall be in powder form, free from lumps that are not friable and when mixed with required volume of water shall be suitable for use on porous surfaces of masonry, concrete, bricks and rough plaster work. Cement base painting shall be provided where indicated in BOQ and all as specified.

WHITE/COLOUR WASHING

Lime shall be fresh burnt lime (Class 'C'), white in colour conforming to IS-712, 1984. The samples of lime, blue, sodium chloride and gum shall be approved the Engineer-in-Charge before incorporation in work.

Workmanship shall be generally conforming to specification as described in Schedule.

SYNTHETIC ENAMEL PAINTING

The synthetic enamel paint shall be from any of the make/ brand listed in list of manufacturers.

Preparation of surfaces and application of synthetic enamel paint shall be done through the authorized applicator of approved manufacturer all as per manufacturer's instructions/ as specified in BOQ.

The colour scheme for building shall be got approved from Estate officer in consultation of Engineer-in Charge and the contractor shall progress the application of paint only on receipt of approval from Engineer-in-Charge.

GENERAL NOTES FOR APPLYING PUTTY, DISTEMPER, ANTIFUNGAL AND ENAMEL PAINTING

These works shall be executed using modern technics and tools to maintain the required quality work. Following smart painting tools shall be used in site.
(a) Hand held sander / long handle sander shall be used for plaster / putty work.
(b) Multipurpose mixer shall be used for mixing putty to get a uniform mix.
(c) Auto roller and Airless spray shall be used for painting.
(d) Jet washer to be used for cleaning dirt and fungus etc from external walls.

WORKMANSHIP

All wood work required to be painted shall be smoothened sized and knotted and then applied with priming coat. Stopping and filling (filler coat) shall be done after priming coat and surface rubbed down to a level and smooth surface and thereafter under coat and finishing coat applied. Where painting to wood work is specified prepare surface and apply one priming coat of pink primer, one under coat and one finishing coat of synthetic enamel paint all as specified in Schedule/BOQ.

GALVANIZED SHEET

Galvanized steel sheet, plain or corrugated shall comply with the requirement of IS 277- 2003,Specification for galvanized steel sheets, plain or corrugated. The thickness sheet shall be 0.63mm and Grade of coating shall be 275 or as per BOQ

Plain sheets shall be reasonably flat and free from twist. Corrugated sheet shall be free from twist or buckle and shall have uniform corrugation, true in depth and pitch, and parallel to the sides of the sheets. The tolerance on weight of an individual sheet shall be ±10% and tolerance on bundle of sheets hall be ± 5%.

GALVALUME SHEETING:-

Galvalume sheet shall be colour coated corrugated / plain sheeting as per requirement and as directed. The feed material is manufactured out of steel with minimum 550 MPa yield strength coated with hot-dip metallic zinc aluminum alloy coating zinc alume AZ-150 or equivalent (as per AS 1397). AS150 Gms/sqm total on both sides of Zn (43.5%), Al (55%) & Si (1.5%) with Regular silicon modified(SMP) polyester paint or equivalent as per AS/NZS-2728-(category 3-4) of approved colour. The colour shall have a total coating thickness of 35 microns of approved paint system or equivalent comprising of20 microns (nom) exterior coat on top surface and 5 microns(nom) reverse coat of back surface over 5micron (nom) primer coat on both surfaces of approved colour shade.

The sheet shall have brand marking of the manufacturer on the back of the sheet at spacingnotexc 1.5 m c/c confirming to genuinity of the material. The sheet shall be fastened with good quality fastener of suitable size as directed by Engineer –in-Charge/SI/Insp/Civil, galvanized water head, self-drilling, tapping screw as per AS 3566 class 4 (min) of approved make (Buildex, Corroshield or equivalent) and quality including EPDM/neoprene washer on each crest of sheets for connecting with purloins or as per design. All accessories shall be made from the same material which is used for main roofing/ wall cladding application .

INTERLOCKING PAVER BLOCK

Precast interlocking paver blocks shall be M 40/M-35 grade for 60/80mm thick and shall be laid over 30mm thick cushioning using 6mm and below aggregate or as per BOQ. The paver blocks shall be ISI marked having Glossy Finish. Paver blocks shall be sound and free from cracks or other defects. The tolerance in thickness shall be +3mm. Water absorption shall not be more than 6% by mass. Size, shape, pattern and colour shall be as approved Estate Officer in consultation with Engineer-in-Charge.

PRECAST PCC SOLID BLOCKS FOR MASONRY

SOLID PCC BLOCKS : PCC solid block masonry shall conform to the specifications as per IS2185 -2005.

The blocks shall have a minimum average Compressive strength of 5 N/ Sq mm (Minimum strength of individual unit 4 N/ Sq mm) conforming to C-5 grade IS 2185 -2005 when tested for 28 days cube test. The manufacture of Block, surface texture and finish, physical requirements of blocks, testing of PCC blocks, sampling etc shall be all as per IS 2185-2005 and proper record shall be maintained. The cost of blocks including transportation of block from work site to an approved laboratory for testing and cost of testing shall be borne by the contractor.

Notes:-

(i) Trial mix shall be carried out before casting the blocks to ensure that the required strength and block density is obtained as per IS.

(ii) Proper care shall be taken to protect the corners of PCC blocks. To achieve better consistency, contractor may use suitable plasticizers as approved by the Engineer-in-Charge without any price adjustment.

Masonry work shall be kept constantly moist for a minimum of 7 days. All concrete shall be mixed in mechanical mixer. The blocks shall be manufactured with vibratory moulding machines.. However, contractor may use machine moulds of other standard manufacturers if approved by Engineer-in-Charge. Appropriate consistency of concrete shall be used to enable de-moulding of the blocks immediately after casting. The blocks shall have sufficiently rough surface to afford a good key to the plaster and joints. The hardened blocks shall be cured in a water tank in curing yard and shall be kept continuously moist for 14 days. The curing water tank/yard must therefore be of adequate capacity/size. Curing shall be done as per IS –2185.

After curing, the blocks shall be dried for a period of 4 weeks before being used in the work. The blocks shall be allowed to complete their initial shrinkage before they are laid in wall.

Chain Link Fencing:-Mild steel galvanized chain link fencing with mesh of size 50mm x50mm nominal dia of wire 3.10mm fixed to fencing posts sing suitable bolts and nuts.

HARD CORE

The materials for hard core shall be of broken granite stone to a gauge not exceeding 63mm and shall be free from dust and impurities.

Hard core shall be of stones/ boulders (Broken to gauge) not exceeding 63mm. Hard core shall be deposited spread and leveled in layers not exceeding 15cm thick and well watered, rammed to a true surface and compacted. The thickness of the hard core specified or as indicated in the drawings is the thickness after consolidation, where thickness had not indicated, it shall be 100 mm (consolidated thickness).

FORM WORK- As per CPWD Specifications.

GENERAL

(a) The work under these specifications consists of furnishing all labour , equipments and materials required for form work including all supporting structure for all works of cast in situ concrete as required by drawing and specification of contract.

(b) The contractor shall submit Form and Centering layout to SI/Insp Civil for checking and final approval by Engineer-in-charge and Estate officer. The complete final approval of the plan will be obtained by the contractor before such work is started on ground. The procedure of erection and removal of forms will be decided at this stage itself. These approvals shall not relive the contractor of any responsibility for correct and complete performance of all works included in the contract. The design and engineering of the formwork as well as its construction shall be the responsibility of the contractor.

ELECTRIFICATION

General-The scope of work consists of providing internal electric wiring to the buildings and connected other works as described in BOQ and as specified/Shown on drawings.

The general layout of wiring points and fittings are as directed by the Engineer in charge.

All electrical fittings and wiring must run clear of door, windows and openings No diagonal run shall be allowed. These must always be parallel or perpendicular to the ground.

The specification and general rules/conditions laid down in the CPWD Schedule(E&M) and CPWD Specifications will be generally applicable to the whole work unless otherwise specified hereinafter.

The work shall be carried out in strict compliance with the latest edition of Indian Electricity Act the Indian Electricity Rules and IEE Regulations and the latest edition of IS732. It shall be of high standard and approved construction used in a modern electrical work both as regards design and workmanship. Complete work shall be suitable in every respect of type of voltage specified and shall be to the satisfaction of Engineer-in-Charge.

WORKMANSHIP

The execution of electrical & mechanical works shall be mandatorily carried out only by licensed person under the supervision of contractor or representative of contractor. License of concerned person shall be produced for inspection, if asked by the Engineer-in-Charge.

Passing of cables through walls floors etc shall be protected.

SAMPLES

Before starting the work, the contractor shall produce samples of all materials including accessories and got approved by the Engineer-in-Charge. Samples that are approved will be retained by Engineer-in-Charge until the work is completed and accepted. The contractor will not be allowed to commence the work before the samples are produced and approved. The contractor shall ensure that the materials used in the work are identical with approved samples and are uniform through out. All materials shall be accordance with latest edition of the IS/BS specification and shall be of the best indigenous make approved by the Engineer-in-charge.

MATERIALS : All materials shall be accordance with latest edition of the relevant IS/BS specification and shall be of indigenous make approved by Engineer-in-Charge.

CABLES: Cables shall be single core PVC insulated and PVC sheathed/unsheathed (all as described in BOQ). All cables shall be 1100 volts grade for point wiring and shall be of such size as to be capable to carrying the maximum current which will normally flow through them without the respective rating being exceeded as laid down in IEE Regulations.

Cables shall be delivered a site in makers wrappers etc, with the seal intact and shall not be installed unless approved by Engineer-in-charge. If cables of size as specified in BOQ as per relevant IS are not available, cables of equivalent size with identical current carrying capacity and with multi-stands shall be got approved from accepting office before incorporation works without extra cost to Govt.

MS PRESSED STEEL TERMINAL BOXES

Mild steel pressed terminal boxes shall be made out of 2 thick MS sheet of suitable size. The boxes shall be embedded in the walls with cement mortar (1:2) clear depth of the box shall be not less than 60mm and this shall be increased suitability to accommodate mounting of fan regulators. The box shall be painted with one coat of red oxide primer.

LAMINATED SHEET

Laminated sheet shall be 3mm thick fixed in MS pressed steel terminal boxes by cadmium plated iron screws

CIRCUITS

Separate circuits shall be provided for lighting and power wiring.
Lighting sub circuits shall not be loaded with more than 8 light points.

CONDUIT AND CONDUIT ACCESSORIES: All conduits, conduit fittings and accessories shall be rigid PVC conduit and fittings conforming to IS-9537 Part III of 1983 of (Medium grade).

CEILING ROSES: Ceiling roses shall be ISI marked.

SOCKET OUTLETS: These shall be ISI marked.

MINIATURE CIRCUIT BREAKERS AND DISTRIBUTION BOARDS

MCB shall be of approved make and shall be obtained form any one of the manufacturers listed above.

The unused portion of DBs are to be blocked by the blank piece.

FAN REGULATOR: Fixing of fan regulator and hanging ceiling. All ceiling fans and regulators shall be earthed effectively by means of 2mm bare GI iron conductors. Cost of this earthing to fans and regulators shall be deemed to be included in the rate for point wiring for fans.

EARTHING : Earthing shall be carried out as specified in BOQ. Earthing shall be with earth plate electrode as mentioned in BOQ buried directly in ground (earth pit) not less than 2.25m deep below ground level connected to galvanized earth top edge of the plate not less than 1.5m below ground level connected to earth strip as mentioned in BOQ by means of bolt nut and washers of galvanized iron or steel, and protected by GI pipe light grade of suitable size. Excavation and earth work shall be in soft/loose soil. All surplus soil to be removed to a distance not exceeding 50m. Cement concrete for PCC chamber , cover slab, reinforcement etc shall be as per BOQ. The unit rate of relevant item of BOQ including the cost of earth work, PCC Chamber, RCC cover, testing etc complete.

LED LIGHT FITTING: These shall be all as specified in BOQ and shall be obtained from any of the manufacturer listed here in after and shall be fixed to walls/roofs etc with proper size of

clamps/screws and connecting cables etc complete.

PAINTING: Unless otherwise specified all exposed surface of steel works like terminal boxes LT panel board MS clamps etc shall be painted with 2 coats of synthetic enamel paint over a coat of red-oxide primer. Metallic suspenders of tube light fittings shall be black painted.

SYSTEM OF WIRING: Wiring shall be carried out with PVC insulated cable and shall run as far as possible on walls, ceilings so as to be easily accessible and capable of being inspected. Power wiring shall be kept apart at minimum distance of 2 run unless they are enclosed in earthed metal conduit suitably marked to indicate the risk of dangerous shock due to voltage in the conductor.

CONCEALED WIRING: Provide concealed wiring all as described in BOQ. PVC conduit shall be rigid PVC conforming to relevant IS. The make of PVC conduit as mentioned above. PVC conduit shall be adequate size to draw required for cables.

TESTING

On completion of the work, the entire electrical installation including energy meter shall be tested by the contractor for the necessary following tests in the presence of and to the satisfaction of Engineer-in-Charge :-
(a) Continuity
(b) Insulation resistance
(c) Any other test prescribed by the Engineer-in-Charge
.
All testing equipment/apparatus, material, labour etc required for above tests shall be provided by the contractor at his own expenses through his sources, works for which test results do not conform to standard will be redone by the contractor at his own expenses.

RECORD DRAWINGS: On completion of work, wiring diagram showing the internal electrification (including high frequency supply) and layout of the buildings shall be prepared by the contractor at his own expenses through his sources and submitted to Engineer-in-Charge in triplicate.

SUB MAIN WIRING

CABLES:- Cables shall be single core PVC insulated and PVC sheathed/unsheathed(all as described in BOQ' with multistranded copper conductor conforming to specifications. All cables shall be 1100 volts grade for point wiring and shall be of such size as to be capable to carrying the maximum current which will normally flow through them without the respective rating being exceeded as laid down in IEE Regulations. Cables shall be delivered at site in makers wrappers etc, with the seal intact and shall not be installed unless approved by the Engineer-in-charge.

CONDUIT WIRING: Provide PVC conduit wiring all as described in BOQ. PVC conduit shall be rigid medium grade PVC conforming to relevant IS. The make of PVC conduit shall be as specified inhere-in-after . PVC conduit shall be of adequate size to draw required No of cables.

System of wiring: Wiring shall be carried out with PVC insulated cable and shall run as far as possible on walls, ceiling so as to be easily accessible and capable of being inspected. Power wiring shall be kept apart at minimum distance of 2mm unless they are enclosed in earthed metal conduit suitably marked to indicate the risk of dangerous shock due to voltage in conductor.

DISMANTLING/ DEMOLITION/ TAKING DOWN: The work of dismantling/ demolition/ taking down shall be done carefully and in a workman like manner. Any damage done by contractor or his workmen to existing sanitary fittings/ water supply fittings/ electrical fittings etc in the building while working shall be made good by him at his own expense. All the materials retrieved from demolition/ dismantling/ taking down shall become the Government property except those listed in Credit Schedule. The rates inserted by the CPWD or quoted by the contractor (whichever is more) shall be deemed to include removal or disposal of

all waste materials from site of work and site shall be left clean and tidy to the entire satisfaction of Engineer-in-Charge.

SITE CLEARANCE

The contractor shall from time to time, clear away all debris and excess materials accumulated at the site. After the fixtures, etc have been fixed, contractor shall clean-up the same and remove all paints, strains and other foreign matter or discoloration leaving the same in a ready to use condition. On completion of all works, contractor shall demolish all stores, remove all surplus materials and leave the site in a broom clean condition.

SETUP OF FIELD SAMPLE TEST LABORATORY:- Contractor will setup a laboratory at site for testing of sample i.e. cube testing, Sand test, gravel testing, cement testing, sieve analysis, CBR test, Compressive strength machine, Los angles abrasion, Slump test, Silt test of sand etc.

ACCEPTABLE MAKES OF VARIOUS EQUIPMENTS/MATERIALS:-

The acceptable makes of various equipment/components/accessories/materials have been indicated in "Acceptable Makes" appended with the tender documents. The tenderer shall work out the cost of the offer on this basis. Alternate makes are not acceptable.

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APPENDIX-A

SL.No.	Description	Qty	Unit
1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and for all lift, as directed by Engineer-in-charge.		
	Total	20.56	cum
2	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor etc., up to floor five level, excluding the cost of centering, shuttering and finishing :		
	1:2:4 (1 Cement : 2 coarse sand (zone-Ill) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources)		
	Total	0.90	cum
3	Providing supplying and installing of M35 Precast compound wall of 100mm thickness panels with columns of 02 grooves complete all works as per direction of Engineer-in-charge.	594	Sqm
4	Providing supplying and installing of M35 Precast compound fort type congura of size 600mm height and 100 mm thickess with archs as designed approved by Er.-In-Charge complete all works as per direction of Engineer-in-charge.	140	Nos
5	Providing supplying and installing of M35 Precast compound wall of 100mm thickness panels with columns of 02 grooves complete all works		
	Total	100.04	Sqm

6	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in:						
	Cement mortar 1:6 (1 cement : 6 coarse sand)						
					Total	29.04	cum
7	Brick work with common burnt clay machine moulded perforated bricks of class designation 12.5 conforming to 1S: 2222 in superstructure above plinth level up to floor five level in cement mortar 1:6 (1 cement : 6 coarse sand) :						
	With F.P.S.(non modular) bricks					67.31	cum
8	12 mm cement plaster of mix :						
	1:6 (1 cement: 6 fine sand)					585.30	Sqm
9	Providing and laying gang saw cut 18 mm thick, mirror polished pre moulded and pre polished machine cut granite stone of required size and shape of approved shade, colour and texture in footpath, flooring cut granite stone of required size and shape of approved shade, colour and texture in footpath, flooring in road side plazas and similar locations, laid over 20 mm thick base of cement mortar 1:4 (1cement : 4 coarse sand) including grouting the joints with white cement mixed with matching pigment, epoxy touch ups etc. complete as per direction of Engineer-in-Charge :With granite stone of area less than 0.50 sqm. sqm 4746.20						
					Total	18.00	sqm
10	Finishing walls with Acrylic Smooth exterior paint of required shade :						
	Old work (Two or more coat applied @ 1.67 ltr/ 10 sqm) on existing cement paint surface sqm 120.75						
					Total	1896.00	sqm
11	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade:						
	New work (Two or more coats applied @ 1.43 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)						
					Total	1584.00	sqm
12	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.						
						20.00	sqm
13	Removing dry or oil bound distemper, water proofing cement paint and the like by scrapping, sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete.					20.00	sqm
14	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :						
	One or more coats on old work				Total	2314.36	sqm
15	Repairs to plaster of thickness 12 mm to 20 mm in patches of area 2.5 sq.meters and under, including cutting the patch in proper shape, raking out joints and preparing and plastering the surface of the walls complete, including disposal of rubbish to the dumping ground, all complete as per direction of Engineer-in-Charge.						
	With cement mortar 1:4 (1 cement : 4 fine sand)				Total	21.33	sqm
16	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge. In cement mortar cum 2060.20						
						112.13	Cum

17	Dismantling dressed stone work ashlar face stone work, marble work or precast concrete work manually/ by mechanical means including stacking of serviceable and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge : In cement mortar	Total	1.08	cum
18	Dismantling tile work in floors and roofs laid in cement mortar including stacking material within 50 metres lead.	Total	3	sqm
19	Cleaning and desilting of gully trap chamber, including removal of rubbish mixed with earth etc. and disposal of same, all as per the direction of Engineer-in-charge.		40.00	each
20	Cleaning of chocked sewer line by diesel running vehicle mounting hydraulic operated high pressure suction cum jetting sewer cleaning machine fitted with pump having 4000 litres suction capacity and 6000 litres water jetting tank capacity including skilled operator, supervising engineer etc. for cleaning and partial desilting of manholes and dechocking of sewer lines. Dechocking and flushing of sewer line from one manhole to another by high pressure jetting system of 2200 PSI for sewer line from 150 mm dia upto 300 mm		715.00	Metre
21	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. Fixed to steel		48.00	Kg
22	Supplying and fixing C.I. cover 300x300 mm without frame for gully trap (standard pattern) the weight of cover to be not less than 4.5 kg		44.00	each
23	Construction RCC Precast Slab Pedestral size 4 Nos 0.60 X 1.20 X 0.10 Meter and 04 Nos brick stair size 0.90 X Tread 300mm rise 180mm of gate roof with RCC on the fort Gate		1.00	Nos
21	Providing and applying tack coat using hot straight run bitumen of grade VG - 10, including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per specifications :			
	On bituminous surface @ 0.50 Kg / sqm	Total	19484.00	sqm
22	Providing and laying semi- dense Bituminous concrete using crushed stone aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site by tippers, laying with paver finisher equiped with electronic sensor to the required grade, level and alignment and rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction and density as per specification, complete and as per directions of Engineer-in-Charge.			
	25 mm compacted thickness with bitumen of grade VG-30 @ 5% (percentage by weight of total mix) and lime filler @ 2% (percentage by weight of Aggregate) prepared in Batch Type Hot Mix Plant of 100-120 TPH capacity.		19484.00	sqm

23	Providing and applying 2.5 mm thick road marking strips (retro- reflective) of specified shade/ colour using hot thermoplastic material by fully/ semi automatic thermoplastic paint applicator machine fitted with profile shoe, glass beads dispenser, propane tank heater and profile shoe heater, driven by experienced operator on road surface including cost of material, labour, T&P, cleaning the road surface of all dirt, seals, oil, grease and foreign material etc. complete as per direction of Engineer-in-charge and accordance with applicable specifications.	129.80	sqm
24	supplying, assembling, laying and fixing in position unplasticized PVC medium pipe(ISI marked) of required dia, including required hire and labour charges, excavation upto 0.6 metre, fittings & accessories etc. all complete including cutting and making good the surface/floors wherever required, for all depths, as per direction of Engineer -in-charge.		
	150 mm nominal size dia	300.00	METRE
25	Providing and laying Dense Graded Bituminous Macadam using crushed stone aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site by tippers, laying with paver finisher equiped with electronic sensor to the required grade, level and alignment and rolling with smooth wheeled, vibratory and tandem rollers as per specifications to achieve the desired compaction and density, complete as per specificatons and directions of Engineer-in-Charge.		
	50 to 100 mm average compacted thickness with bitumen of grade VG-30 @ 5% (percentage by weight of total mix) and lime filler @ 2% (percentage by weight of Aggregate) prepared in Drum Type Hot Mix Plant of 60-90 TPH capacity		
	Total	15.00	CUM
26	Providing and fixing Glow studs of size 100x20 mm made of heavy duty body shall be moulded ASA (Acrylic styrene Acryloretrite) or HIP (High impact polystyrene) or ABS having electronically welded micro- prismatic lens with abrasion resistant coating as approved by Engineer in charge. The glow stud shall support a load of 13635 kg tested in accordance with ASTM D4280. The slope of retro- reflective surface shall be 35 (+/-5) degress to base .The reflective panels on both sides with at least 12 cm of reflective area up each side. The luminance intensity should be as per the specification and shall be tested as described in ASTM I: 809 as recommended in BS: 873 part 4 : 1973. The studs shall be fixed to the Road surface using the adhesive conforming to IS, as per procedure recommended by the manufacturer complete and as per direction of Engineer-in-charge.	300.00	EACH
27	Providing and laying 60mm thick factory made cement concrete interlocking M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.	527.80	SQM
28	Providing and applying red oxide paint including cleaning etc. all complete as per the direction of Engineer-in-charge.	200.00	sqm

Note: - Lowest Contractor (L-1) will be decided on overall lowest rates basis. (All items to be used in this work should be branded and ISI certified or as per approved list of material may be followed. If any make is not specified, decision of Engineer-in-charge shall be final.)

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