

**OFFICE OF THE SUPERINTENDING ENGINEER,**

CIRCLE NO. III, R&B SECTOR, K.M.D.A.
UNNAYAN BHAVAN, BLOCK 'D', (3RD FLOOR)
BIDHAN NAGAR, KOLKATA - 700 091
e-Mail ID - sec3rbkmda@gmail.com , Pn. No. - 033- 23372565

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Memo No: 528/SE/C-III/R&B/KMDA/T-3

Date: 10/02/2026

NOTICE INVITING e-TENDER**e-NIT NO: - 51/SE/C-III/R&B/KMDA of 2025-26, Dt: -10/02/2026****Tender Ref. No. CIVIL/KMDA/51/SE/C-III/R&B/KMDA of 2025-2026**

Superintending Engineer, Circle-III, R&B Sector, KMDA, Unnayan Bhavan, 'D' Block, 3rd. floor Saltlake, Kolkata-700 091 invites online bids of the said NIT from bonafide, reliable, experienced & resourceful firms / individuals contractors, who have successfully completed works in Government / Govt. Undertaking / Autonomous Bodies / Semi-Govt. / Statutory Bodies/ Local Bodes having credentials of **1 (One) Similar Nature** Of Completed Work of the minimum value of **40%** of the estimated amount put to tender during last **5 (five) years** prior to the date of issue of the tender notice, **or** Intending tenderers should produce credentials of **2 (Two) Similar Nature** Of Completed Work, each of the minimum value of **30%** of the estimated amount put to tender during last 5(five) years prior to the date of issue of the tender notice, or Intending tenderers should produce credentials of **1 (One) Single Running Work** of similar nature which has been completed to the extent of **80%** or more.

SL. No.	Name of Work	Value of the work (Rs.)	Earnest Money (Rs.)	Time of Completion
1	2	3	4	5
1	ROAD REPAIRING WITH ROAD FURNITURE WORKS TO REDUCE THE ROAD ACCIDENTS WITHIN "DHULIYAN MUNICIPALITY" UNDER WEST BENGAL ROAD SAFETY SCHEME. Tender ID - 2025_KMDA_1003211_1	₹ 1,91,47,503.00	₹ 3,82,950.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.
2	ESTIMATE FOR ROAD REPAIRING WITH ROAD FURNITURE WORKS TO REDUCE THE ROAD ACCIDENTS WITHIN "COOPER'S CAMP MUNICIPALITY" UNDER WEST BENGAL ROAD SAFETY SCHEME. Tender ID - 2025_KMDA_1003211_2	₹ 1,89,36,756.00	₹ 3,78,735.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.
3	ESTIMATE FOR ROAD REPAIRING WITH ROAD FURNITURE WORKS TO REDUCE THE ROAD ACCIDENTS WITHIN "MAHESHTALA MUNICIPALITY" UNDER WEST BENGAL ROAD SAFETY SCHEME. Tender ID - 2025_KMDA_1003211_3	₹ 93,60,908.00	₹ 1,87,218.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.
4	ESTIMATE FOR ROAD REPAIRING WITH ROAD FURNITURE WORKS TO REDUCE THE ROAD ACCIDENTS WITHIN "PANSKURA MUNICIPALITY" UNDER WEST BENGAL ROAD SAFETY SCHEME. Tender ID - 2025_KMDA_1003211_4	₹ 1,64,07,748.00	₹ 3,28,155.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.
5	ESTIMATE FOR ROAD REPAIRING WITH ROAD FURNITURE WORKS TO REDUCE THE ROAD ACCIDENTS WITHIN "KHIRPAI MUNICIPALITY" UNDER WEST BENGAL ROAD SAFETY SCHEME. Tender ID - 2025_KMDA_1003211_5	₹ 48,67,566.00	₹ 97,351.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.

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6	ESTIMATE FOR ROAD REPAIRING WITH ROAD FURNITURE WORKS TO REDUCE THE ROAD ACCIDENTS WITHIN “HALISAHAR MUNICIPALITY” UNDER WEST BENGAL ROAD SAFETY SCHEME. Tender ID - 2025_KMDA_1003211_6	₹ 38,35,206.00	₹ 76,704.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.
7	ESTIMATE FOR ROAD REPAIRING WITH ROAD FURNITURE WORKS TO REDUCE THE ROAD ACCIDENTS WITHIN “ARAMBAGH MUNICIPALITY” UNDER WEST BENGAL ROAD SAFETY SCHEME. Tender ID - 2025_KMDA_1003211_7	₹ 99,37,913.00	₹ 1,98,758.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.
8	ESTIMATE FOR INSTALLATION OF CRASH BARRIER ALONG MUNDAPARA ROAD PARALLEL TO THE CANAL OPPOSITE THE BOUNDARY WALL OF URBANA HOUSING. Tender ID - 2025_KMDA_1003211_8	₹ 81,64,875.00	₹ 1,63,298.00 [Online through e-Procurement System of Govt. of W.B.]	60 (Sixty) days.

43.25

1. **Earnest Money deposit (EMD)** is to be remitted by the Tenderer in favour of **KMDA**. Payable at **KOLKATA**, as mentioned in the **column 4** above through Net- Banking/ RTGS/NEFT in respect of the Tender ID, as per requirement of e-Procurement System of Government of West Bengal (<https://wbtenders.gov.in/>).

In addition, instruction by the Finance Department **MEMORANDUM**, vide no. - **3975-F(Y)**; Dated, **28th July, 2016** to be followed for ready reference and guidance.

2. Intending bidder may download the tender documents from the website <https://wbtenders.gov.in> directly with the help of Digital Signature Certificate.
3. Bidders should quote the rate including all Gov. statutory Tax's and GST as applicable. The Tax invoice(s) need to be issued by the supplier for raising claim under the contract showing separately, the tax charged in accordance with the provisions of GST Act, 2017.
4. Submission of Tender: - a) Pre-qualification/Technical Bid and Financial Bid both will have to be submitted online concurrently duly digitally signed in the website <https://wbtenders.gov.in> as per time schedule stated herein under. Time will be reckoned as per Server Clock. b) The Financial Bid of the prospective tenderers will be opened only if the tenderer qualifies in the Technical Bid the decision of the Tender Inviting Authority will be final and binding to all concerned and no challenge against such decision will be entertained.
5. The intending Bidder, at his own responsibility and risk is encouraged to visit and examine the site of works and its surroundings and obtain all information's that may be necessary for preparing the Bid and entering into a contract for the services as mentioned in the Notice Inviting Tender, before submitting offer with full satisfaction, the cost of visiting the site shall be at his own expense.
6. The intending Bidders shall clearly understand that whatever may be the outcome of the present invitation of Bids, no cost of Bidding shall be reimbursable by the Department. The Tender accepting authority of **Roads & Bridge Sector, KMDA** reserves the right to accept or reject any offer without assigning any reason whatsoever and is not liable for any cost that might have been incurred by any Tenderer at the stage of Bidding.
7. Conditional / Incomplete Tender will not be accepted under any circumstances.



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8. During scrutiny, if it comes to the notice of the Tender inviting authority that the credential or any other paper found incorrect / manufactured / fabricated, that bidder would not be allowed to participate in the Tender and that application will be rejected without any prejudice.
9. **The Superintending Engineer (Circle-III), Roads & Bridge Sector, KMDA** reserves the right to cancel the NIT due to unavoidable circumstances and no claim in this respect will be entertained.
10. Successful bidder will have to install display board as instructed by Engineer-In-Charge and have to maintain that board at his own cost. No payment shall be made in this regard from KMDA
11. Before issuance of the WORK ORDER, the Tender inviting authority may verify the credential and other documents of the lowest Tenderer if found necessary. After verification if it is found that the documents submitted by the lowest Tenderer is either manufactured or false in that case work order will not be issued in favour of the said Tenderer under any circumstances.

12. Time Schedule for Downloading, Uploading and Opening of Tender Documents: -

12. Time Schedule for Downloading, Uploading and Opening of Tender Documents: -		
a)	Date of uploading of N.I.T. & other Documents (online) (Publishing Date)	Date: 10/02/2026, Time: 18.00 hrs
b)	Documents download start date (Online)	Date: 10/02/2026, Time: 18.00 hrs
c)	Documents download end date (Online)	Date: 07/03/2026, Time: 14.00 hrs
d)	Seek Clarification Start Date & Time	N.A.
e)	Seek Clarification End Date & Time	N.A.
f)	Pre-bid Meeting Date & Time	N.A.
g)	Issue of Response (As per written queries submitted by the bidders within scheduled period)	N.A.
h)	Online Bid Submission Start Date & Time	Date: 10/02/2026, Time: 18.00 hrs
i)	Online Bid Submission Last Date & Time	Date: 07/03/2026, Time: 14.00 hrs
j)	Time and Date of Opening of Technical Bid (Bid will be opened by the Authorized Officer)	Date: 09/03/2026, Time: 14.00 hrs
h)	Date for opening of Financial Proposal (Online)	To be notified later

Tenders will be opened by the Superintending Engineer, Circle-III, R&B SECTOR, KMDA or his authorized representative in presence of tenderer or their authorized representatives who may like to be present.

13. Eligibility criteria for the bidders: -

- a) Intending tenderers should produce credentials of **1 (one) Similar Nature of Completed Work** of the minimum value of **40%** of the estimated amount put to tender during last 5(five) years prior to the date of issue of the tender notice; or
- b) Intending tenderers should produce credentials of **2(Two) Similar Nature of completed work** each of the minimum value of **30%** of the estimated amount put to tender during last 5(five) years prior to the date of issue of the tender notice; or
- c) Intending tenderers should produce credentials of **1 (One) Single Running Work Of Similar**



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Nature which has been completed to the extent of **80%** or more and value of which is not less than the desired value at (a) above;

❖ **Other terms and condition of the credentials: -**

- i) Payment certificate will not be treated as credential.
- ii) Completion Certificate issued by the Executive Engineer or equivalent competent authority of a State/Central Govt., State/Central Govt. undertaking, Statutory/Autonomous bodies constituted under the Central/State Statute on the executed value of completed/running works will be considered as Credential.
- iii) No credential will be considered as valid unless it is supported by work order, price schedule or BOQ of work and completion certificate mentioning the date of completion issued by the competent authority not below the rank of Executive Engineer or equivalent or competent authority of a State / Central Government, State / Central Government undertakings, Statutory / Autonomous bodies constituted under the Central / State Statute. The completion certificate should indicate the value of the work (equal to booked expenditure).

N.B. Estimated amount, Date of completion of project & detail communicational address of Client must be indicated in the Credential Certificate.

- d) Scanned copy of **PAN card, P. Tax, Valid income tax (For Last 3 yrs), GST registration. Last 3 yrs audited balance sheet, Credentials, BOQ's of the respective credentials, Work Order, Payment certificate, Bank Solvency Certificate in Current Financial Year and other supporting documents, Registration Certificate and/or trade license** of the company must be submitted duly digitally signed at desired location in the website <https://wbtenders.gov.in>.
 - e) Scanned Copy of one original **affidavit before Notary will have to be submitted as per prescribed format, attached in the tender documents**, mentioning the correctness of the documents and a declaration of penalty debarment etc. faced by him under any Govt./Semi-Govt./Autonomous body/Institution through on line at desired location.
 - f) Agencies against which departmental proceedings or legal actions are pending or have been identified by KMDA as having violated the terms of existing contract(s) shall be debarred from participating in this bid.
 - g) **Earnest Money:** - The tenderer shall have to upload scanned copy of requisite documents in support of submission of EMD (as mentioned in the column-4 of the above table) through online, along with the tender document in prescribed manner failing which the tender shall be rejected. The balance earnest money if any to fulfill **2(two) percent** of the tender value is to be deposited at the time of execution of formal agreement.
- 14. Security Deposit: - Security Deposit (as per prevailed norms)** will be deducted from gross bill value(i.e. 8%) of each and every running bill and from final bill without any upper ceiling limit. Deposited EMD will be adjusted as part of Security Deposit. Refund of security Deposit will only be made after completion of works as well as Defect Liability Period without any kind of defect/damage of the property .
- 15. Security Deposit and Defect Liability Period of respective work in accordance to the notification of P.W.D, Govt. of W.B vide their no. - 5784-PW/L&A/2M-175/2017, dated 12.9.17: -**
- i) The Defect Liability Period for the work of **Repairing of Bituminous Road, 1 (one) year** from the actual date of completion of the work.



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- a) Full security deposit shall be refunded to the contractor on expiry of 1 **(one) year** from the actual date of completion of the work.
- ii) The Defect Liability Period for the work of **New Construction of Bituminous Road (Without Mastic)** is **3 (three) years** from the actual date of completion of the work.
- a) **30%** of the security deposit shall be refunded to the contractor on expiry of **2 (two) years** from the actual date of completion of the work.
- b) The balance **70%** of the security deposit shall be refunded to the contractor on expiry of **3 (three) years** from the actual date of completion of the work.
- iii) The Defect Liability Period for the work of **New Construction of Bituminous Road (Thorough Mastic), Concrete Road, Paver Block Road** is **5 (five) years** from the actual date of completion of the work.
- a) **No security deposit** shall be refunded to the contractor for first **3 (three) years** from the actual date of completion of the work
- b) **30%** of the security deposit shall be refunded to the contractor on expiry of **4 (four) years** from the actual date of completion of the work.
- c) The balance **70%** of the security deposit shall be refunded to the contractor on expiry of **5 (five) years** from the actual date of completion of the work.
- 16. Suspension and Debarment of Contractor:-** The detailed procedures for taking penal measures of suspension and debarment of suppliers, contractors and consultants delineated in memorandum No. 547-W©/1M-387/15 dated 16.11.2015 and its subsequent amendment notified vide memorandum no. 724-W©/1M-953/19 dated 19.12.2019, of works branch PWD, GOWB shall be followed for debarment and suspension of bidders & agencies selected for executing public works for their false declaration or forgery or falsification of records submitted for failure to execute committed contract or for their failure to perform contractual obligations and thereby resulting delay for execution of public works or execution of faulty works.
- 17. All test will be done as per specification of MORTH.**
- 18. List of common documents shall have to be uploaded by each tenderer at the time of submission of Tender through online: -**
- i) Income Tax Return (For last 3yrs).
 - ii) Audited Balance Sheet (For last 3yrs).
 - iii) Pan Card.
 - iv) Professional Tax clearance certificate.
 - v) GST registration.
 - vi) Trade License.
 - vii) Technical Credential.
 - viii) Work Order for the work in technical credential.
 - ix) Payment certificate of the said work.
 - x) Bank Solvency Certificate to be issued before six months from the dated of e-NIT @ 10 % (minimum) has been considered in Current Financial Year in conformity with the total project cost for this NIT.
 - xi) Engineer's qualification Certificate.



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- xii) B.O.Q of the similar nature of work.
- xiii) Registration certificates and relevant papers of Employees Provident Fund & ESI.
- xiv) **Average annual Turn Over of last 3 (three) years, of the intending bidder, should be more than 40% of tender value with the individual/ Cumulative Total Project Cost applied for this NIT. For multiple applications TIA will consider up to the exhaustion limit starting from the first response.**

19. **Mismatch in Name:** - All documents uploaded by the Bidder, in support of his eligibility/credential for Pre-qualification to participate in this Tender should be same and identical & with Digital signature certificate (DSC). Minor mismatch like “M/S”, “Kr/Kumar”, “Co-Op/Co-Operative” etc. has to be legalized /authenticated by the Bidder by uploading of proper Affidavit (duly Notarized) in this regard.
20. Neither prospective bidders nor any of constituent partner had been debarred to participate in tender by the **KMDA during the last 5 (five) years** prior to the date of this NIT. Such debar will be considered as disqualification towards eligibility. (A declaration in this respect has to be furnished by the prospective bidders as per prescribed format without which the Technical Bid shall be treated non-responsive).
21. For (a) Procurement of goods and services and (b) Works related contract involving supply of goods and services by contractor. Tax Invoice (S) needs to be issued by the supplier for raising claim under the contract showing separately the tax charged in accordance with the provision of **GST Act 2017**.
22. There shall be no provision of Arbitration.
23. No Adjustment of Price OR Price Escalation of any kind will be allowed.
24. No mobilization advance and secured advance will be allowed.
25. **Addenda/Corrigenda:** - During the tenure of the tender if any addenda/corrigenda take place that will be circulated only through the Government e-Procurement system. Contractors are to keep track of all the Addendum / Corrigendum issued with a particular tender and upload the same digitally signed along with the NIT. Tenders submitted without the Addendum / Corrigendum will be informal and liable to be rejected.
26. All possible precautions should be taken for the safety of the people and work force deployed at worksite as per safety rule in force Contractor will remain responsible for his labour in respect of his liabilities under the Workmen’s Compensation Act etc. He must deal with such cases as promptly as possible. Proper road signs as per P.W.D. practice will have to be made by the contractor at his own costs.
27. The work to be executed with necessary arrangements for safety, machineries, temporary Barricading, labour hutments, electricity and other misc. at contractors own cost. The contractor has to executed the work at site following all the guidelines of work for the ongoing Covid 19 pandemic situation viz. face mask for every labours, social distancing, application of sanitizer at regular interval etc.
28. **Bid Validity:** - Bids shall remain valid for a period of **120 days (One Hundred Twenty)** from the last date of submission of Financial Bid / Sealed Bid. If the bidder withdraws the bid during the period of bid validity the earnest money as deposited will be forfeited forthwith without assigning any reason thereof.
29. During scrutiny, if it is come to the notice to tender inviting authority that the credential or any other papers found incorrect/manufactured/fabricated, that tenderer will not be allowed to participate in the tender and that application will be out rightly rejected without any prejudice with forfeiture of earnest money forthwith.

List of “**Technically Qualified Bidders**” will be published in the web portal only. Financial Bid will be opened within a short period after such publication. Therefore, Bidders are requested to view the tender



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status on a regular basis. In case if there be any objection regarding Pre-qualification/ list of “**Technically Qualified Bidders**”, that objection should be lodged to the Chairman, Tender/Bid Evaluation Committee within **24 hours** from the date and time of publication of list of qualified Agencies and beyond that time schedule no objection will be entertained by the **Tender/Bid Evaluation Committee**.

30. Before issuance of the LOI, the tender inviting authority may verify the credential & other documents of the lowest tenderer if found necessary. After verification, if it is found that such documents submitted by the lowest tenderer is either manufacture or false in that case, LOI will not be issued in favour of the tenderer under any circumstances.
31. **Language of Tender:** - The tender shall be submitted in the prescribed form in English. All literatures and correspondence in connection with the tenders shall be in English.
32. **Others:** - The Tender Notice along with other documents like Tender **Form No. -1 KMDA, Technical Specification, Special Terms and Conditions, BOQ, Addendum and corrigendum etc.** whatever documents uploaded by the department concerned thereto shall be part and parcel of the Tender.
33. **Declaration:** - Tenderer must upload and submit duly digitally signed a declaration as per prescribed format for confirmation of his awareness of the contract.
34. **Additional Performance Security:** -
 - a) To ensure the quality and proper execution of the work in public interest, the **Additional Performance Security @10%** of the tender amount shall be obtained from the successful bidder if the **accepted bid value is 80% or less** of the Estimate put to tender.
 - b) The Additional Performance Security shall be submitted in the form of Bank Guarantee from any scheduled bank before issuance of work order. “**The issuing applicants must mention receiver's details as ICICI bank, IFSC:ICIC0006950, Branch Salt Lake, Sec-I, in BG Text at which SFMS IFIN 760 message to be sent by the issuing bank to establish the authenticity of the given BG**” If the bidder fails to submit the Additional Performance Security within seven working days from the date of issuance of LOI, his Earnest Money Deposit will be forfeited and other necessary action as per NIT like blacklisting of the contractor, etc. may be taken. The Bank Guarantee shall have to be valid up to end of the contract period and shall be renewed accordingly, if required.
35. The Bank Guarantee shall be returned immediately on successful completion of the contract. If the bidder fails to complete the work successfully, the Additional Performance Security shall be forfeited at any time during pendency of the contract period after serving proper notice to the contractor. Necessary provisions regarding deduction of security deposit from the progressive bills of the contractor as per relevant clauses of the contract shall in no way be altered / affected by provision of this Additional Performance Security.

The tender inviting authority reserves the right to accept or reject any or all the tenders without assigning any reason what so ever.

For detail information please visits <https://wbtenders.gov> in & www.kmda.wb.gov.in



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Date: 10/02/2026

Copy forwarded to the Deputy Secretary, P.R. Department, KMDA- enclosed please 2 (Two) Detailed Copies & 4 (Four) Abridge Copies of this NIT. He is requested to kindly circulate the NIT as per prevailing norms of KMDA.



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No: 528/1(10)/SE/C-III/R&B/KMDA/T-3

Date: 10/02/2026

Copy forwarded with the request to kindly display the NIT in the Notice Board for wide circulation to:

1. The Chief Engineer, R&B Sector, KMDA.
2. The Director of Finance, KMDA.
- 3-6. The Superintending Engineer Circle-I / II / V / Programme, R&B, KMDA
7. The Executive Engineer ,SCD-II, R&B Sector, KMDA
8. A.C.F.A., R&B Sector, KMDA.
9. The AE/JE, Circle-III / R&B Sector / KMDA
10. Notice Board, R&B Sector/ KMDA


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INSTRUCTION TO BIDDERS

Instruction / Guidelines for tenders for electronic submission of tenders online have been annexed for assisting the contractors to participate in e- tendering.

1. **Registration of Contractor:** - Any contractor willing to take part in the process of e – Tendering will have to be enrolled & registered with the Government e – Procurement system through logging on to <https://wbtenders.gov.in>. The contractor is to click on the link for e – Tendering site as given on the web portal.
2. **Digital Signature Certificate (DSC):-** Each contractor is required to obtain a class - II or class – III Digital Signature Certificate (DSC) for submission of tenders from the approved service provider of the national Information's Centre (NIC) on payment of requisite amount details are available at the Web Site stated in Clause -1 of Guideline to Bidder. DSC is given as a USB e – Token.
3. **Collection of Tender documents:** - The contractor can search & download NIT & Tender documents electronically from computer once he logs on to the website mentioned Clause 1 using the Digital Signature Certificate. This is the only mode of collection of Tender documents.
4. **Submission of Tenders: -**
 - a) **General process of submission:** - Tenders are to be submitted through online to the website stated in Cl.1 in two folders at a time for each work, one is Technical bid and other is Financial Bid before the prescribed date and time using the Digital Signature Certificates.
 - b) **Technical Bid:** - Technical Bid contain scanned copies of the followings further in two covers (folder).

A-1. Statutory Cover Containing.

- i) Demand Draft/Pay Order towards earnest money (EMD) as prescribed in the NIT.
- ii) NIT (download & upload the same digitally signed).
- iii) Declaration as per prescribed format.

N.B: Bidder must download KMDA Tender Form No-1, General Terms and Condition, Special Terms & Conditions, Technical Specifications, all other addendum, Corrigendum etc. whatever documents uploaded by the department in the web under the NIT and must go through carefully before quoting his rate. These documents are necessarily be uploaded by the bidder.

A-2. Non-Statutory/Technical documents Cover containing.

- i. Income Tax Return (For last 3yrs)
- ii. Audited Balance Sheet (For last 3yrs) average annual turnover for last three years should be in accordance to total project cost for this NIT.
- iii. Pan Card.
- iv. Professional Tax clearance certificate.
- v. Vat clearance certificate
- vi. GST registration.
- vii. Trade License.
- viii. Technical Credential.
- ix. Work Order for the work in technical credential.
- x. Payment certificate of the said work.
- xi. Bank Solvency Certificate in Current Financial Year in conformity with the total project cost for this NIT.
- xii. Engineer's qualification Certificate.
- xiii. B.O.Q of the similar nature of work.
- xiv. Registration certificates and relevant papers of Employees Provident Fund & ESI.

Note: Failure of submission of any of the above-mentioned documents (as stated in A-1 & A-2) will render the tender liable to summarily rejected for both statutory & non statutory cover.



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UNNAYAN BHAVAN, BLOCK 'D', (3RD FLOOR)
BIDHAN NAGAR, KOLKATA – 700 091
e-Mail ID – sec3rbkmda@gmail.com , Pn. No. – 033- 23372565

**Kolkata
Metropolitan
Development
Authority**

5. THE ABOVE STATED NON-STATUTORY / TECHNICAL DOCUMENTS SHOULD BE ARRANGED IN THE FOLLOWING MANNER.

Click the check boxes beside the necessary documents in the My Document list and then click the tab

Sl. No.	Category Name	Sub-Category Description	Details
A.	Certificates	Certificates	i) Pan Card. ii) Professional Tax clearance certificate. iii) Vat clearance certificate. Iv) Acknowledgement of IT return (For last 3 hrs.) v) GST registration.
B.	Company Details	Company Details-1	i) Trade License ii) Partnership Deed, iii) Society Registration, Power of Attorney, iv) MoA/MoU etc. as applicable.
C.	Financial Info	Financial Info-1	i) Audited Balance Sheet (For last 3 yrs.).
D.	Credential	Credential-1	i) Credential, Work Order, Payment certificate, Bank Solvency Certificate. Engineers Certificate Etc.

"Submit Non-Statutory Documents" to send the selected documents to non-Statutory folder. Next Click the tab "Click to Encrypt and upload" and then click the "Technical" Folder to upload the Technical Documents.

c) Financial Bid: -

I) The financial bid should contain the following documents in one cover (folder) i.e., Bill of Quantities (BOQ). The contractor is to quote the rate through on line in the space marked for quoting rate in the BOQ.

II) Only downloaded copies of the above documents are to be uploaded, virus scanned & digitally signed by the contractor.

6. Opening & Evaluation of Tender: -

a) Opening of Technical Bid:

i) Technical bid will be opened by the Superintending Engineer, Circle-III, R&B SECTOR, KMDA Intending tenderer may remain present if they so desire. Statutory Cover (folder) would be opened first & if found in order and correct Non-Statutory Cover (folder) will be opened. If there is any deficiency in the Statutory & Non statutory documents the tender will summarily be rejected.

ii) Decrypted (transformed in to readable formats) documents of the non-statutory cover will be downloaded & handed over to the evaluation committee.

iii) List of technically qualified tenderers would be uploaded.

NB: While evaluation, the committee may summon of the tenderers & seek clarification/ information or additional documents or original hard copy of any of the documents already submitted & if they are not produced within the stipulated time frame, their bid will liable for rejection.

b) Opening and evaluation of Financial Bid:

i) Financial bid of tenderers declared technically eligible by the Tender Evaluation Committee will be opened electronically from the web portal on the prescribed date and time.

7. Penalty for suppression / distortion of facts:

Submission of false document by tenderer is strictly prohibited.


Superintending Engineer,
Circle-III, R&B Sector, KMDA

DECLARATION BY THE TENDERER

e-NIT NO: - 51/SE/C-III/R&B/KMDA of 2025-26, Dt: -10/02/2026

Tender Ref. No. CIVIL/KMDA/51/SE/C-III/R&B/KMDA of 2025-2026

I/We have carefully gone through the Notice Inviting Tenders and other tender documents mentioned therein. I/We have also carefully gone through the **Bill of Quantities (BOQ), General Terms and Conditions, Special Terms and Condition, Technical Specifications, KMDA Tender Form No-1 and all other documents, Corrigendum's uploaded** before the last date of submission which will be part & parcel of the **Contract Document**. I/We shall be bound to **sign all hard copies** of uploaded documents under the NIT, during execution of formal agreement. My/our tender is offered taking due consideration of all factors, and if the same be accepted I/We promise to abide by the stipulation of the, contracts Documents and carry out and complete the work up to the entire satisfaction of the Department.

Name of the Tenderer

Signature of the Tenderer

Postal Address :

BIDDER'S GENERAL INFORMATION

1. Bidder's Name: _____

2. Number of Years in Operation: _____

3. Registered Address:

4. Operation Address if different from above:

5. Telephone Number _____

(Country Code) (Area Code) (Telephone Number)

6. E-mail address & Web Site _____

7. Tele fax Number _____

(Country Code) (Area Code) (Telephone Number)

8. ISO Certification, if any {If yes, please furnish details}

9. GST No.: _____

10. Pan No.: _____

11. Bank A/C No with Bank IFSC code for electronic clearance of the payment:

(Seal & Signature of Bidder)

AFFIDAVIT
Declaration of the Tenderer

(Affidavit to be affirmed on a Non Judicial Stamp Paper of required value and Duly Notarized)

I,.....,son of.....
.....,aged about..... years by
occupation..... do hereby solemnly affirm and confirm as follow:

1. That, I am the Of have duly authorized by and competent to affirm this affidavit on behalf of the said Tender.
2. That, I have inspected the site of work covered under NIT (NIT No.....) circulated through Office memo bearing No -----dated ----- and has made myself fully acquainted with the site conditions existing level/proposed level and local conditions in and around the site of work. I have also carefully and meticulously gone through the Tender documents. Tender of the above named bidder is offered and submitted upon due consideration of all factors and if the same is accepted, I on and for behalf of the aforesaid Tenderer, being lawfully and duly authorized, promise to abide by all the covenants, conditions and stipulations of the Contractual documents and to carry out, complete the works to the satisfaction of the Tender accepting Authority of the Work and abide by all instructions as may give by the Engineer in Charge of the work time to time. I also hereby undertake to abide by the provisions of Law including the provisions of Contract Labour (Regulation & Abolition) Act, Apprentice Act 1961, West Bengal Sales Tax Act, GST Act, Income Tax Act as would be applicable to the Consultant upon entering into formal Contract / agreement with the Tender Inviting/Accepting authority.
3. That I declare that, no relevant information as required to be furnished by the Tenderer has been suppressed in the Tender documents.
4. That I declare that, no penalty or debarment etc. was ever made against the said firm in any way at any Govt. /Autonomous Body/Institutions.
5. That I, the undersigned, declare that all the statements made in the attached/uploaded documents in respect of mode of ownership of machineries are true and correct.
6. That I am a citizen of India.
7. That the statement above made by me is true to my knowledge.

Deponent

Solemnly affirmed by the said

.....

Before me.

.....

(1st class Judicial Magistrate / Notary Public)

FINANCIAL

1.1 GENERAL

All works are to be carried out in accordance with Special Terms and Special Specifications as mentioned herein after.

1.1.1 In addition to the above General specifications of the Schedule of Rates of P.W.D. (Roads) Govt. of West Bengal for the year 2018. (briefly referred to as the "Schedule") shall be applicable for works not covered by above. Any change on any subsequent dates will have no effect so far as this tender is concerned.

1.1.2 In addition to the above General specifications of the Schedule of Rates of Presidency Circle – I, P.W.D. Govt. of West Bengal (briefly referred to as the "P.C. Schedule" and as defined below) shall be applicable.

The "P.C. Schedule" referred to above shall comprise the following two schedules (Taken together) of Presidency Circle – I, P.W.D. Govt. of West Bengal for the year 2018 together with addenda and corrigenda thereto upto the date of issue of Tender Notice for the work concerned. Any change on any subsequent date will have no effect so far as this tender is concerned.

a) Schedule of Rates for Building Materials and Labour (briefly referred to as the Building Schedule), SOR ,latest I&W , S&D Schedule, KMDA – 2004, W&S Schedule, 2018

b) Schedule of Rates for Plumbing works, Sanitary and Drainage works etc. (briefly referred to as the Plumbing Schedule)

1.1.3 The specifications for works not covered by the specifications referred in clause – 1.1, 1.1.1 or 1.1.2 shall be governed by B.I.S code of practices, Most specification IRC codes of practice and as per base practice according to the direction of the Engineer-in-Charge.

1.2 The contract documents are to be taken as a whole. The several documents for king the contract are to be taken as mutually explanatory of one another. If, however, the stipulations of the different documents be at variance in any respect, one will over ride the others (only in so far as these are at variance) in order of precedence as given below:

1. Letter of Intent (L.O.I)
2. Notice Inviting Tenders
3. Special Terms & Conditions
4. Special Specifications
5. Specific Priced Schedule
6. The printed Tender Form (KMDA form No. I)
7. The schedule (as defined on clauses – 1.1.1 above)
8. P.C. schedule (as defined on clauses – 1.1.2 above)

2. ENHANCEMENT OF TENDER RATE

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In no circumstances, the tendered rate shall be enhanced after acceptance of the tender.

3.1 EXPLANATION OF TERMS

Heading and marginal notes are only for convenience of reference and have no contractual significance.

3.2 Words importing the singular also includes the plural and vice-versa where the context so requires.

3.3 The words "Approved" or "Direct" appearing any where in the tender documents shall indicate (unless specifically mentioned otherwise) the approval or direction of the Engineer-in-Charge.

3.4 The term "At the site of work" or "Near the site of work "Wherever it appears in the tender documents, shall mean any where within 150 (one hundred and fifty) meters from the actual site of work.

3.5 The word "Department" appearing anywhere in the tender documents, shall mean "Kolkata metropolitan Development Authority (KMDA in abbreviation)

3.6 The Engineer-in-Charge shall mean the Executive Engineer of the Division concerned as mentioned in clause 1 (b) of the tender notice.

3.7 The Sub-divisional officer shall mean the concerned Assistant-in-Charge of the work authorized to carry out on behalf of the engineer-in-charge, general supervision, issue of day to day instructions and to approve materials and workmanship.

3.8 The words "Deputy Director / Superintending Engineer" and "Director / Chief Engineer" appearing anywhere in the printed tender form shall mean the concerned Superintending Engineer and Chief Engineer of the sector concerned respectively.

4. CHARACTER OF SITE

Before submission of tenders, the intending tenderer shall inspect the site of work and get themselves thoroughly acquainted with the local conditions and difficulties under which the work will have to be carried out. They should consider, among others, the nature of soil, climate conditions of the locality, dearth of water in the area of work, condition of the existing roads, transport facilities, non existence of roads in many places etc. Extra cost involved due to above factors to be borne by the contractor and should, therefore, be include in the rates to be quoted by them.

5. INCIDENTAL FEES

All rates to be quoted by the contractors shall be inclusive of all incidental fees and charges, e.g. Royalties, Ferry charges, Octroi and Toll Tax of Materials,

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Electricity Water and other charges of Municipalities or Statutory Bodies, Sales Tax, Income Tax etc. Nothing extra will be paid such account.

6.1 STATUTORY OBLIGATIONS

The Contractor shall give all notices and pay all fees required to be given by any statute or any regulation or bye-law of any local or other statute authority which may be applicable to the works and shall keep KMDA indemnified against all penalties and liabilities of every kind for breach of such statute, regulation or bye-laws.

- 6.2 The Contractor shall indemnify the KMDA against any loss / harm and also against all claims, demands, suit and proceeding on account of infringement of any patent rights, design, trade mark or name of other protected rights in respect of any constructional plant, machine, work material thing process used for in connection with the work or temporary works.

7.1 SAFETY PRECAUTIONS

All necessary precautions are to be taken by the contractor for the safety of his workmen and of the general public. The work must be done in such a way as not to damage any property, existing structure or public utility services during work. Close co-operation must be ensured with other contractor or contractors working the area of work. All claims arising out of any damage to the existing structures, or properties due to works of the contractor shall be borne by the contractor.

- 7.2 The Contractor shall provide necessary fencing and lighting arrangements around the trench excavated by him and / or at the site of work for the safety of his workmen and of the general public. Such arrangement shall not be paid for separately and the cost thereof shall be included in the Contractor's rate for the work.

8. IDLE LABOUR

Whatever may be the reason no claim for idle labour, additional cost of establishment, hire and labour charges for Tools & Plants will be entertained.

9. TRANSPORT

The contractor shall arrange all transport including Railway Wagons required for carriage of all tools & plants, Implements and materials etc. at their own risk and cost.

10. PUMPING, DEWATERING ETC.

The contractor shall provide all pumping and other arrangements that may be necessary to remove from or keep out of foundations, trenches or any part of the structure under construction, water free (whether canal water, sub-soil water and water from any source, whatsoever). Such pumping or other necessary

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arrangements shall not be paid for separately and the cost thereof is to be including in the contractor's rate of relevant items of work.

11. WATER AND ELECTRICITY

The Contractor shall have to make his own arrangement for adequate supply of water and for electrical power that may be required for or in connection with execution of the work. All these will have to be done at Contractor's own cost and expense and no separate payment for any of these shall be made the cost thereof being deemed to be including in the rate for the work.

11.1 Arrangement for supply of piped water from existing service lines may not be possible. In that case the Contractor will have to make arrangements for supply of drinking water and all water required for execution of the work by sinking tube wells or other suitable alternatives that may be approved by the Engineer-in-Charge. Nothing extra will be paid for such account.

11.2 Electrical power from usual supply agencies may not be available. In that case the Contractor will have to make his own arrangement for electrical power through generator. Nothing extra will be paid for such account.

12.1 CLEARANCE OF SITE

Before starting any work, the work site where necessary, must be properly dressed after cutting, cleaning and clearing all varieties of jungles and shrubs including bamboo clusters or any undesirable vegetation, rubbish, sludge etc. from the site of works, for which nothing will be paid extra.

12.2 The site must be cleared by the Contractor from time to time in the course of execution of the work.

12.3 On completion of work, all temporary works shall be removed by the Contractor. All scars of construction shall be obliterated and the whole site left in a clean and workman like manner, to the entire satisfaction of the Engineer-in-Charge. No separate payment shall be made for these, the cost thereof being deemed to have been included in the Contractor's rate for the work.

13. SERVICEABLE MATERIALS

All serviceable materials obtained from excavations or from dismantling of existing structures shall remain the property of KMDA. The responsibility for stacking materials as are considered serviceable by the Engineer-in-Charge, and handling over the same to the Engineer-in-Charge shall lie fully with the Contractor and nothing will be paid on this account. In case of any loss or damage of serviceable materials prior to handling over the same as aforesaid full value thereof will be recovered from the Contractor's bill at rates as assessed by the Engineer-in-Charge.

14. UNSERVICEABLE MATERIALS

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The contractor shall remove all unserviceable materials to the place as directed. He should level and dress the work site on completion of the relevant portion of work as per direction of the Engineer-in-Charge of work. No extra payment will be made on this account.

15. QUALITY OF MATERIALS

All materials brought to the site must be to the approval of the Engineer-in-Charge. Rejected materials must be removed by the Contractor from the site within 24 hours of the issue of orders to that effect. In case of non-compliance with such orders, the Engineer-in-Charge shall have the authority to cause removal at the cost and expense of the Contractor and the Contractor shall not be entitled to claim any loss or damage on that account.

16. MATERIALS AND LABOUR

All materials and labour (skilled & unskilled including their water supply, sanitation. Procurement of food staff, medical aids etc. are to be arranged for the Contractor. Cost of transport of materials and labour and allied items aforesaid shall have to be borne by the Contractor and included in his rate for the work.

17. UNSKILLED LABOUR

For all items of work under contract unskilled labourers will have to be local labourer. Normally, without the consent of the Engineer-in-Charge, no unskilled labourer shall be imported from any district other than that where the work is to be executed imported labourers could be engaged with the permission of the Engineer-in-Charge, when the exigency or progress of works demands. Seventy percent of the unskilled labours shall never the less have to be recruited locally.

18.1 CONTRACTOR'S AGENT OR REPRESENTATIVE

The contractor shall not assign the agreement or sublet any portion of the work. The contractor shall appoint an authorized representative and requisite technical personnel (one Diploma and One Graduate Engineer) in respect of one or more of the following purpose only:

- a) General day to day management of the work.
- b) To requisition KMDA materials, to receive the same and sign Hand Receipt / materials issue notes therefore.
- c) To attend measurements when taken by KMDA officers and to sign the records of such measurements.
- d) The contractor will be penalized in the following manner for not recruiting at least One Graduate Engineer, One Diploma Engineer and a supervisor.



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- 18.2 The selection of the authorized representative is subject to the prior approval of the Engineer-in-Charge and the contractor shall seek in writing such approval giving therein the name and address of the representative he wants to appoint and the specific purpose for which the representative will be authorized for. Even after first approval, the Engineer-in-Charge may issue at any subsequent date, revised directions about such authorized representative and the contractor shall be bound to abide by such directions. The Engineer-in-Charge shall not be bound to assign any reason for any of his directions with regard to the appointment of authorized representative.
- 18.3 The provisions of power of Attorney, if any, must be to the approval of KMDA. other wise KMDA shall not be bound to take consignee of such power of Attorney.

19. SITE OFFICE

The Contractor shall have an office adjacent to the work site as may be approved by the Engineer-in-Charge, where all directions and notice of any kind what so ever, be delivered from end of the Engineer-in-Charge or his representative or any higher officials in connection with the contract may be left and the same when left at or sent by post to such office or delivered to the Contractor's authorised agent or representative shall be deemed to be sufficiently served upon the Contractor. Contractor has to maintain separate site offices each for departmental staff/officers and his own staffs and engineers equipped with all necessary furniture's, electrical fittings, storage cabinets, computers, printers, scanners, walky-talkies etc.


20.1 GODOWN, LABOUR SHED ETC.

The Contractor shall make his own arrangements for storage space and godown for his tools and plants, materials and shall also erect at his own cost necessary sheds and godown of adequate capacity at the site of work or proper safety of KMDA materials such as cement, steel materials etc. that may be issued from time to time. All these shall have the approval of the Engineer-in-Charge. The sheds and godowns shall be readily accessible and be open to inspection to any officer of KMDA at any time during the pendency of the contract.

20.2 The Contractor shall arrange for temporary sheds latrines, water supply etc. for the accommodation of the use of his staff. These shall be properly maintained all through the period of construction in clean and hygiene condition to the satisfaction of the Engineer-in-Charge.

20.3 The locations of godown, stacking place other temporary structures must be to the prior approval of the Engineer-in-Charge. The land, if available within the site will be given free of rent. Any land outside the work site as may be required for the purpose will have to be arranged by the Contractor himself at his own cost.

20.4 On completion of the work all sheds, godown, vats, platform etc. erected by the Contractor for constructional purpose, shall have to be removed by him at his own



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cost and the ground restored to its original condition to the satisfaction of the Engineer-in-Charge.

21.1 SITE ORDER BOOK

The contractor shall within 7(seven) days of the receipt of the order to take up works, supply at his own cost SITE ORDER BOOK to Assistant Engineer concerned. The site order book shall be kept at the site of work under the custody of the Assistant Engineer or his authorised representative. The site order book shall have machine numbered pages in triplicate. Directions or instructions from KMDA officials issued to the contractor will be entered (in triplicate) in the site order book (except when such directions or instructions are given by separate letters). The contractor or his authorised representative shall regularly note the entries in the site order book and also record thereon the action taken or being taken by him complying with the said directions or instructions or any relevant point relating to the work, contractor or his authorized representative may take away the duplicate page of the work order book for his own record.


21.2 The first page of the work order book shall contain the following particulars :-

- a) Name of the work.
- b) Reference to contact no.
- c) Date of opening the site order book.
- d) Name and Address of the Contractor (with phone no. if any).
- e) Signature of the contractor.
- f) Name and Address of the authorized representative who is authorized to act on behalf of the Contractor.
- g) Specific purposes for which the contractor's representative is authorized to act on behalf of the contractor.
- h) Signature of the authorized representative duly attested by the contractor.
- i) Signature of the Assistant Engineer concerned.
- j) Date of written order to commence work.
- k) Time of completion of work with date.
- l) Extension of time granted, if any.
- m) Date of actual completion of works.
- n) Date of recording of final measurements.

Entries vide (m) & (n) above shall be filled in on completion of work and before the site order book is recorded in the office of the Assistant Engineer concerned.

22.1 ADDITIONAL ITEMS BEYOND THE SCOPE OF THE CONTRACT

During the process of execution of the job under the contract if any additional item of works quantities beyond the scope of the contract is required to be done as per the opinion of the Engineer-in-Charge, such additional items and quantities shall have to be executed by the Contractor as supplementary items when so directed by the Engineer-in-Charge.



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22.2 Notwithstanding what has been stated in clause 12 of the printed tender form, the rates of supplementary items of works will be determined according to sub-clauses in order of precedence as given below

22.2.1 The rates shall be analyzed to the maximum extent possible from the rates of allied items of work appearing in the specific priced schedule.

22.2.2 To complete the analysis, if necessary, the rates appearing in the "Schedule" (as defined under clause – 1.1.1. above) shall be applicable for the portion remaining after application of clause – 22.2.1.

22.2.3 To complete the analysis, if necessary, the rates appearing in the "P.C. Schedule" (as defined under clause – 1.1.2. above) shall be applicable for the portion remaining after application of clause – 22.2.1. and 22.2.2

22.2.4 If the analysis can not be completed even after application of clause – 22.2.1, 22.2.2 and 22.2.3 above, the balance shall be determined from the market rates of materials and labour.

22.2.5 The contractual percentage shall be applicable in regard to the portion of the analysis based on clauses 22.2.1, 22.2.2 and 22.2.3 above.

22.2.6 Profit inclusive of overhead charges shall be added at the rate of 10 (ten) percent in regard to the portion of the analysis based on clause – 22.2.4 above.

23.1 Contractor shall have to satisfy the Engineer – in – Charge regarding the quality of materials used for the purpose of construction, any dispute arising about the quality of the materials the decision of the Engineer – in – Charge will be final and bindings.


23.2.1 The Contractor shall keep in mind that KMDA may deploy / engage 3rd Party agency at site of work Viz. Jadavpur University; Bengal Engineering & Science University etc. for testing of materials and workmanship in addition to KMDA Quality Control. No extra payment to be made on this account, cost in this regard shall have to be borne by the contractor and included in his rate for the work.

23.2.2 The Contractor shall have to setup laboratory at site for testing of materials/ works from time to time in compliance with appropriate I.R.C. Code/ MORTH Specification at the cost of his own.

23.2.3. The contractor shall have to maintain motorable condition of existing road, by mending good damages time to time during the entire period of construction w.e.f. date of work order so as enable smooth movement of vehicle & pedestrian during construction.

No Departmental Materials shall be issued to the contractor to the extent of requirements as assessed and in small installments as decided by the Engineer-in-Charge.

The bidder must consider the costs of utility shifting while bidding. Any additional payment on this account shall not be made by KMDA. The tenderer shall have to make all liaisons with concerned department, however KMDA will provide administrative support in this regard if required.



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No extra payment made on this account, cost in this regard shall have to be borne by the contractor and included in his rate for the work.

The agency executing the work shall have to arrange supply of all required materials at their own cost from the enlisted suppliers of KMDA/ reputed manufacturers having BIS / ISO certification. The agency will have to furnish the required certificate regarding the quality of the materials. **No extra payment made on this account, cost in this regard shall have to be borne by the contractor and included in his rate for the work.**

The Executive Engineer may be asked for third party inspection regarding the quality of the materials from Jadavpur University/ BESU.

The decision of Executive engineer about the quality of the material supplied will be final and binding.

The rate quoted should be inclusive of the cost of carriage, loading, unloading, head load carriage stacking etc. of all construction materials to work site through any sort of carriage way.

24. WORK PROGRAMME


The Contractor, on receipt of the letter of acceptance of his tender, shall submit to the Engineer-in-Charge the work programme in the form of CPM Network chart and or in Bar Chart, each in triplicate for his approval.

24.1 The work must be taken up within 7(seven) days from the date of issue of work order and be complete in all respects within the specified time of completion as mentioned in Detailed Notice Inviting Tender.

24.2 The Contractor shall submit the work programmes clearly showing the materials, men and equipments and a time table divided into four equal periods of progress of the work, for the approval of the Engineer-in-Charge who will have authority to make additions, alteration and substitution to such programme in consultation with the Contractor, unless the same is subsequently found impracticable in some or all respect, in the opinion of the Engineer-in – Charge and is modified by him. The stipulations laid down in clause 2 of the condition of contract in the printed tender form regarding the division and progress as provided in the said clause, shall be deemed to have been sufficiently complied with if the actual progress of work does not fail short of the progress as laid down in the approved time table for one-fourth, half and three fourth of the time allowed for the work. The work programme shall be submitted in the form of CPM Network chart and or in Bar Chart each in triplicate.

25.1 SETTING OUT OF WORK

The contractor shall be responsible for the true and perfect setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the work. If at any time during the progress of the work any error shall appear or arise on the position, levels, dimensions or alignment of any parts of the works the contractor on being directed to do so by the Engineer-in-Charge shall at their own expenses rectify such error to the satisfaction of the Engineer-in-Charge.



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- 25.2 Any setting out that may be done or checked by the Engineer-in-Charge or his representative or any line or level that may have been given or checked by either of them shall not in any way relieve the contractor of his responsibility for the correctness thereof.
- 25.3 Before starting the work, the Contractor must at his own cost and expense, erect temporary pillars as may be required in suitable places as directed by the Engineer-in-Charge. These pillars from which the layout of all important levels and alignment will be fixed, must be at such locations and of such a nature as not to be disturbed in the process of construction. The Contractor shall provide all instruments, appliances and labour required for setting out of the works and for the use of and attendance upon the Engineer-in-Charge and / or his authorised representative whenever required for any purpose in connection with the works.

26.1 WORKING DRAWINGS

It is to be clearly understood that drawings forming a part of the tender documents, are only for the purpose of indicating the type and nature of work involved. These are subject to be subsequently modified and / or supplemented by other drawings, as required during actual execution of the work.

- 26.2 All works shall be carried out in conforming with drawings approved by KMDA. In token of such approval the drawings shall bear the signature of the Engineer-in-Charge before the same are issued for execution of the work in accordance there with. Such approval on drawings may be furnished on piecemeal as and when required during the progress of the work. The Contractor shall keep in touch with the Engineer-in-Charge about the drawings that may be under checking or in the process of approval and keep him informed well in advance of the particular drawing and drawings he would next require for the smooth progress of work.

27.1 WORKMANSHIP AND TESTING

All materials and workmanship shall be of the respective kinds described in the contract and shall be subject from time to time to such tests as the Engineer-in-Charge may direct at the place of manufacture of fabrication or on the site or at any such place. The Contractor shall provide such assistance, instruments, machines, labour and materials as the Engineer-in-Charge may require for examining, measuring and for testing the works and the quality, weight or quantity of the materials used and shall supply samples for testing as may be selected and required by the Engineer-in-Charge.

- 27.2 The Contractor shall keep in mind that officials of quality control unit of KMDA may be deputed at the site of works for testing of materials and workmanship. The Contractor shall extend necessary help in performing such tests.

28. CO-OPERATION AND CO-ORDINATION WITH OTHER CONTRACTORS

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During the pendency of this contract KMDA shall have the liberty to engage a number of contractors for ancillary works (not provided in this contract) on completion of any part of the job and the Contractor shall extend co-operation to other contractors.

29. COMPLETION DRAWINGS WITH PHOTOGRAPH

Contractor are required to furnish stage wise photograph for the work and Immediately on completion of the work the Contractor shall submit completion drawings in 6 (six) copies including original tracing along with C.D. in Auto Cad soft ware. Each for the work executed by him under the contract for approval of the Engineer-in-Charge. The Contractor's rate shall be inclusive of such costs.

30. REGISTRATION OF ESTABLISHMENT & COLLECTION OF CESS

As per Building and other construction workers (RECS) Act 1996 and Building and other construction workers Welfare Cess Act 1996 and rules framed there under, the contractor employing more than ten construction workers should obtain registration from the registering officer (Assistant Labour Commissioner at regional labour offices) and an amount @ 1% as Cess shall be deducted from the progressive bill for the work executed as per G.O.No. 853-F dated 01.02.2006 issued by Finance department, Govt. of W.B., Finance Deptt. Memo No. 6895 – F Dt. 11.09.2006 and memo no. 100 (7A) / LC dt. 30.08.2006 from the Labour Commissioner, W.B.

31. INCOME TAX

Income tax will be deducted from the Contractor's bill at the rate in accordance with the orders / circulars of the Govt. of India in force during the contractual period. The tenderer shall declare his permanent income tax account number issued by the income tax authority, in the tender.

32. GST


GST will be deducted from the contractor's bill at the rate in accordance with the orders / circulars of the Govt. of West Bengal in force during the contractual period. The tenderer shall declare his GST Registration Number in the tender.

33. ACCEPTANCE OF TENDER

The acceptance of tender will rest with the concerned Superintending Engineer, R&B Circle-III, R&B Sector, KMDA who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all the tenders received without assigning any reason thereof.

34. WITHDRAWAL OF TENDER

A tender once submitted shall not be withdrawn within a period of 180 (one hundred eighty) days from the last date of receipt of tenders. If a tenderer withdraws his tender within this period without giving any satisfactory explanation



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for such withdrawal, he shall be disqualified from submitting any tender for works under R&B Circle-III, KMDA for a minimum period of 1 (one) year.

35. COPIES OF AGREEMENT

The Contractor shall within 7 (seven) days from the date of receipt of the letter of acceptance of his tender, submit 5 (five) additional copies of the full set of the contract documents.

- 35.1 The documents required for the additional copies of the contract will have to be purchased by the Contractor from the office as instructed in LOI. All the copies must be duly completed as per the original and signed on every page by the Contractor before submission of the same to the concern Executive Engineer. Drawings and other documents attached to the tender shall also be attached to all the copies of the agreement.

37. GUARANTEE & MAINTENANCE

As per NIT and LOI.

38. EXECUTION AND PAYMENT OF CIVIL, ELECTRICAL / MECHANICAL WORKS.

The tender accepting authority will be the Superintending Engineer, Circle-III, R&B Sector, KMDA.

All Civil works will be executed under the supervision of Executive Engineer, Special construction Division-II, R&B sector KMDA.

All Electrical / Mechanical works will be executed under supervision of concerned Executive Engineer, Electrical Division, E&M Sector KMDA. Which will be later inform to the successful bidder.

All design & drawings related to civil works will have to be got approved by the Superintending Engineer, Circle-III, R&B Sector, KMDA. The measurement of civil works will be recorded by concerned Division of R&B Sector.

All correspondence, approval of design & drawings related to Electro-Mechanical works including factory visit of Elevators , Escalators, Generator, pumps & motors will done by the, concern Superintending Engineer Executive Engineer, Electrical Division, E&M Sector KMDA. as deputed by the Chief Engineer, E-M Sector, KMDA.

- 39.1 There shall be no addition / deduction of any contract price on account of rise / fall in the cost of labour and / or materials or any other items, which may affect the cost of the execution of works. Only the effect due to change of tax structure by legislation will be applicable



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DECLARATION BY THE TENDERER

- I. I/We have inspected the site of works and have made me / us fully acquainted with local conditions on and around the site of works. I / We shall be bound by the conditions laid down in the Notice Inviting Tenders, Special Terms & Conditions, Special Specifications, General Specifications, Specific Priced Schedule and also printed Tender Form No. I (as amended). I / We have gone through the “P.W.D. (Roads) Schedule”, P.W.D (WB) Schedule of Rates”, B.I.S. codes of practices, relevant MOST specification and IRC codes of practices as mentioned in Clause above of the Special Terms & Conditions. My / Our tenders is offered taking due consideration of all the stipulations of contract documents. I / We shall also uniformly maintain such progress with the works as may be directed by the Engineer-in-Charge of the work to ensure completion of same within the target date.

- II. My / Our Permanent Income Tax Account No. is

- III. My / Our GST Registration No. is

- IV. a) I / We declare that I have no relative working under R&B Sector of KMDA

- b) I / We declare that the under noted personnel of R&B Sector, KMDA is related to me / us.

Name	Relationship	Designation with office Address
Sri.....

Postal address with Telephone No. & Mobile No., if any of the tenderer

(Dated & Signature of the Tenderer)



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Signature of the Tenderer

Signature of the Tender Accepting Authority



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Tenderer*

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TECHNICAL

1 ELIGIBILITY TO PURCHASE TENDER DOCUMENTS

- a) Intending tenderers will have to satisfy about their eligibility as stated in Detail N.I.T. and for this purpose they will have to submit along with Technical Bid (Part-I) the documentary evidence about the following.
- b) N.A.
- c) Clearance certificate of GST valid at least up to date of opening of tenders and valid GST Registration Certificate in Photo Copies. Original documents may be verified by the Tendering Authority at his discretion.
- d) Professional Tax Challan, GST Registration Certificate with current e-challan of GST in Photo copies. Original documents may be verified by the Tendering Authority at his discretion.
- e) Evidence with regard to engagement of technical personnel.
- f) Consortium / Joint Venture Firms will be allowed to participate as per following terms & conditions. IF allowed in the NIT.
- g) In case of purchase of tender paper more than one serial, separate application (in duplicate) along with cost of tender documents is to be submitted.
- h) In case of agency applying for more than one work, financial capability may be judged from the maximum annual turn-over of the agency during last five years



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- i) The Contractor shall have the following tools and plants as per **MOST /MORTH Specification** of their own and shall deploy such tools and plants at the site of work or near the site of work.
- j) PAN Card of the tenderer issued by the respective Department.
- k) Agencies to be submitted last 3 (three) years Audited Report.

Note: In order to establish the credentials, the tenderer must submit certified copies of his earlier works of similar nature and copies of receipts of payment by him. He should also give a written declaration in the form of an “**Affidavit**” before Notary so as to correctness of the copies of all the documents submitted and a declaration of penalty, debarment etc. faced by him under any Govt. / Semi Govt. / Autonomous Body / Institution etc. Clear provision should be made to the effect that the original documents may be verified by the Tendering Authority at his discretion.

.2.0 CONTRACT DOCUMENTS

- a) Tender is to be submitted in 2 (Two) Parts viz. Part-I and Part-II in two separate covers in a single outer sealed cover.
- b) Part-I should contain the General papers containing the papers relating to the eligibility, earnest money etc. including papers for financial-capability of the tenderer and the “Technical Bid”.
- c) Part – II should contain the financial bid and related matter, if any.
- d) Both Part-I and Part-II are to be properly sealed in separate covers with superscription of part no. and brief contents. Both these covers are to be sealed in another big cover and submitted as per prescribed procedure.

3.0 PREPARATION OF TENDER

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a) The tenderer shall quote his rate in figure as well as in words on the 2nd page of Printed Tender Form in the following form:

- i) “I / We agree to carry out the work mentioned in the memorandum at PAR with the rates shown in the specific priced schedule of probable items with approximate quantities”.
- ii) “I / We agree to carry out the work mentioned in the memorandum at% (..... percent) ABOVE / BELOW the rates shown in the specific price schedule of probable items with approximate quantities.

The said quotation, in the exact working of any one of the Forms (i) or (ii) above, must be written on page – 2 only of the printed tender form and nowhere else. For this purpose the various columns in the lower half of page – 2 of the printed tender forms should be ignored and across the full width of the page. The quotation shall be clearly and legibly written and the whole writing must be by the hand of the person signing the tender and with the same pen and ink. Failure to do so may invalidate the tender. This condition may be suitably relaxed in case of tenderer unable to write in English. Correction in the quotation should be avoided and if this becomes unavoidable, the entire rate (and not a portion only) shall be scored out and signed not simply initialed) by the tenderer in token of such cancellation. A fresh rate in one of the specified forms and in the specified manner shall then be correctly written.

- b) In the event of the tender being submitted by firm it must be signed by a member or members of the firm having legal authority to do so, and called for legal documents in support thereof must be produced for inspection and the same in the case of a firm carried out by one member of a joint family it must disclose that the firm is duly registered under the Indian Partnership Act. Any tender signed by a member not holding a power of attorney shall be treated informal.
- c) Before submission of the tender, the tenderer must see that the memorandum at page-2 of the printed tender form is properly filled in and all particulars given

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in the tender must sign in the space allotted in page –3 and 11 of the printed tender form and the declaration by the tenderer (at the end of the special terms and condition). The signature in page – 3 of the printed tender form must be properly witnessed in the space allotted for the purpose. The tenderer must also sign at the bottom of each page of the printed tender form and other tender documents. Overwriting shall not be allowed. All corrections, additions, alterations etc. must be duly signed.

- d) Before submission of tender the tenderer must see that whether the specific schedule of items of works with probable quantities attached with the tender documents contain priced items or unpriced items. In the event of unpriced items the tenderer shall first quote his rates for each items of works in the “Specific priced Schedule” under column “Rate” both in words and figures. The tenderer shall then quote their rate on 2nd page of the Printed Tender Form.


4. EARNEST MONEY

- a) **Earnest Money:-** The tenderer shall have to upload scanned copy of requisite earnest money along with the tender document in prescribed manner failing which the tender shall be rejected.
- B) The original document of EMD (Earnest Money Deposit) should be furnished before the Tender Inviting Authority, when asked to do so during evaluation of the Tenders and the H1 Bidder Shall submit the hard copy of original EMD and also have to furnish all the relevent documents in original to the Tender Inviting Authority before issuance the LOI.

5.0 SECURITY DEPOSIT

The earnest money (i.e. 2% of the amount put to tender) already deposited as per clause-5 above shall be converted into part of the **Security Deposit**.

6.0 CANVASSING



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Canvassing in connection with tender is strictly prohibited and the tender submitted by the contractors, who resort to canvassing, will be liable for rejection.

7.0 REJECTION OF TENDER

Tenders, which do not fulfill any of the above conditions or are incomplete in any respect, are liable for rejection.

8.0 OPENING OF TENDERS

Completed tender documents along with the earnest money, are to be placed in a sealed cover with the name of work, name and address of the tenderer super scribed on the cover. The sealed cover containing the tender is to be submitted within the specified date & time by inserting into the Tender Box kept in the room of the authority receiving the tenders. The tenders will be publicly opened by the authority receiving tenders or by his authorized representative on the date and time as mentioned in Detail NIT or as soon as possible thereafter in the presence of such tenderers or their authorized representative who may be present.

9.0 ACCEPTANCE OF TENDER

The acceptance of tender will rest with the concerned Superintending Engineer, R&B Circle – III, R&B Sector, KMDA who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all the tenders received without assigning any reason thereof.

10.0 WITHDRAWAL OF TENDER

A tender once submitted shall not be withdrawn within a period of 120 (one hundred twenty) days from the last date of receipt of tenders. If a tenderer withdraws his tender within this period without giving any satisfactory



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explanation for such withdrawal, he shall be disqualified from submitting any tender for works under R&B Circle – III, KMDA for a minimum period of 1 year.

11.0 COPIES OF AGREEMENT

The Contractor shall within 7 (seven) days from the date of receipt of the letter of acceptance of his tender, submit 5(Five) additional copies of the full set of the contract documents.

- 11.1 The documents required for the additional copies of the contract will have to be purchased by the Contractor from the office of the Executive Engineer, as mentioned in the NIT of R&B Sector; KMDA concerned on payment of Rs. 500/300 each copy AS MENTIONED IN THE LOI. All the copies must be duly completed as per the original and signed on every page by the Contractor before submission of the same to the Superintending Engineer, R&B Circle – III, R&B Sector, KMDA concerned within the specified date and time. Drawings and other documents attached to the tender shall also be attached to all the copies of the agreement.

12.0 WORK PROGRAMME


The Contractor, on receipt of the letter of acceptance of his tender, shall submit to the Engineer-in-Charge the work programme in the form of CPM work chart and / or in Bar chart in duplicate.

13.0 COMMENCE OF WORK

The Contractor shall have to start the work within 7 (seven) days from the date of issue of written order to commence work.

14.0 FORFEITURE INITIAL SECURITY

Failure on the part of the Contractor in depositing the additional amount of initial security where so required in terms of clause 5.2 above or in furnishing



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additional copies of the contract document in terms of clause 15 & 15.1 above or in timely commencement or work as required shall constitute a breach of the contractual obligations. This will render the contract liable to termination with forfeiture of the amount of initial security as per clause 5.1 and clause 5.2 that may be lying with KMDA at that time without any reference to the Contractor.

15.0 **RATE INCLUSIVE OF ALL CHARGES**

The rate quoted by the tenderer shall be inclusive of all charges e.g. Sales Tax, Income Tax, Octroi, Toll, Ferry Charges, Local Charges, Royalties, Turn Over Tax and all other charges as applicable.

16.0 **NIGHT WORK**

The Contractor must be prepared to continue work during night if so required by the nature of work involved speeding up the progress in order to keep up the time schedule. When the work at night is to be carried out, the contractor shall obtain prior permission from the Engineer-in-Charge for such night work and shall at his own cost and expense, make adequate arrangements for lighting and provide necessary facilities for such night work. No extra payment shall be made for the purpose.

17.0 **CONTRACT LABOUR**

The Contractor shall have to comply with the provisions of Contract Labour (Regulation and Abolition) Act, 1970 and rules made the under (W.B. Contract Labour Regulation and Abolition Rules, 1970) including amendments thereof and license so obtained from the competent authority will have to be produced to the Engineer-in-Charge, in absence of which the contractor will not be entitled to receive any payment for the works done by him under the contract.



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Special Attention
(opening and Verification of tender documents)

After verification of the eligibility, Technical Bid and Earnest Money etc. by the verification committee, a list of quailed tenderers will be prepared for Financial Bid and circulated through the Notice Board accordingly.

Superintending Engineer
Circle- III, R&B Sector, KMDA



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GENERAL SPECIFICATIONS

1.0 GENERAL

All works including materials to be used in works shall conform to Indian Standard Specification as published by Bureau of Indian Standard from time to time and as approved by the Engineer-in-Charge.

2.0 MATERIALS

Items of materials to be used in the work, not covered by the following specifications, shall conform to relevant B.I.S. Codes of practices and as per base practice as approved by the Engineer-in-Charge. The Contractor's rate for the job shall be inclusive of cost of all materials including taxes, handling, carriage, storage, guarding etc. all complete.

2.1 BRICKS

All Bricks shall be of approved quality of standard specifications, made of good brick earth, uniform deep red, cherry or copper colour, thoroughly burnt in klin (machined made) without being verified, regular in shape and of standard dimensions and shall be free from cracks, chips, flaws, stones or humps of any kind and shall not show appreciable sings of efflorescence either dry or subsequent to soaking in water. The size of bricks shall be 9¾ " x 4¾ " x 2¾ " (conventional), 190 x 90 x 90 mm (modular). The bricks shall emit a clear ringing sound on being struck and have a minimum crushing strength of 105 kg/sq.cm. All the bricks which absorb water more than 20% of their own dry weight after 24 hours immersion in cold water shall be rejected. Specification for Building Bricks shall conform to IS : 1077.

2.2.1 COARSE AGGREGATES FOR CEMENT CONCRETE WORKS

Stone chips or stone ballast for cement concrete (plain or reinforced) shall be hard, of uniform and fine texture, free from faults or planes of weakness and free from weathered faces. The ballast or chips must be free from loam, clay or any surface coating, free from organic matter or other impurities and screened, free of dust. Stone of black and hard variety as is generally available from quarries

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in pakur or chandil areas will be normally used. Stone aggregates from other sources may also be used provided the same is found suitable in the opinion of the Engineer-in-Charge. The opinion of Engineer-in-Charge must be recorded in writing. The ballast or chips shall be obtained by breaking from large blocks and must be more or less cubical in shape.

2.2.2 The grading of coarse aggregates for cement concrete works shall be in conformity with the requirements laid down in IS : 383-1970 including amendments upto date. The Contractor shall arrange to supply single sized coarse aggregates. Such single sized coarse aggregates of different nominal sizes shall be mixed at site with other ingredients of concrete either directly in the mixture or on the platform in suitable proportions to get the desired overall grading of aggregates as per I.S. Specifications. Such proportions may be decided on making sieve analysis of the aggregates brought to the site, for obtaining better density and strength of concrete. The maximum size of aggregates shall not be more than 20 mm.


2.3 **JHAMA CHIPS FOR CEMENT CONCRETE WORKS**

Jhama chips for cement concrete work shall be obtained by breaking good quality Jhama bats, must not be spongy or with any coating of foreign materials and shall be homogeneous in texture. The chips shall be more or less cubical in shape. These shall be screened for removal of dust and if so necessary in the opinion of the Engineer-in-Charge, shall be washed at the cost and expense of the contractor.

2.4 **SAND**

All sand shall be clean sharp and free from clay, loam, organic or any other foreign matter, shall be obtained from approved source. The contractor shall get the sample of sand to be used in different kinds of work approved by the Engineer-in-Charge before using the same in work. Sand which in the opinion of the Engineer-in-Charge or his representative is dirty, must be washed to his satisfaction at the cost and expenses of the contractor.

2.4.1 Sand for all cement concrete work must be coarse. The sand shall pass through a mesh 4.75 mm. square measured in the clear. Sand shall not used for concrete works if contains more than 10% of fine grains passing through a 76



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mesh seive as used for cement test, nor should the fineness modulus be less than 2.00 unless specific permission is obtained from the Engineer-in-Charge.

2.4.2 Medium sand may be used for cement mortar for masonry, plaster etc., and also for bituminous works of road. Fineness modulus shall be between 2 to 1.8

2.4.3 Sand filling in plinth or foundation shall be done with fine sand or Silver Sand.

2.5.1 CEMENT

Ordinary Portland Cement shall conform to I.S. : 283-1967


2.5.2 Cement bags must be stored in a water-tight shed having wooden floor or platforms raised at least 50 mm from ground or as approved by the Engineer-in-Charge. Cement which is partly set or which is lumpy or caked is to be treated as damaged and shall be removed from the site immediately.

2.5.3. FLY ASH

Grade of Fly ash of concrete works conforming to I.S:3812(Part-II) **Construction** of road embankment with **fly ash** conforming to IRC: SP: 58

2.6 WATER

Water used for both mixing and curing shall be potable and free from injurious amounts of deleterious materials which are likely to affect the strength or durability of concrete, water containing any sugar, excess of acid, alkali or salt shall not be allowed for use. The PH value of water shall be between 6 to 8.



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2.7.1 STEEL

Where deformed high strength reinforcement bars are specified in the design of R.C.C. construction, the Contractor shall use Tor Steel conforming IS : 1786 – 1965 (With latest revision). All steel shall be clean and free from loose mill scales, dust, loose rust and coats of paints, oil or other coatings before its use in the work.

2.7.2 All other structural steel to be used in the work shall conform to IS : 226 (upto latest revisions)

2.8 Stainless Steel:

i) Supply of Stainless as per Specifications.[Martensitic Stainless Steel RDSO GRADE IRS 350 CR (Ref : RDSO Document No.BS-S-7.5.3.1-9, DT. 17/12/2020)].

A) Supplying of Structural Stainless steel --(As per attached specification of annexure I)

- (i) All Structural stainless Steel shall be procured as per specifications IRS 350CR. Independent tests shall be conducted, wherever required, to ensure that the materials procured conform to the specifications. The Stainless Steel shall be procured only from those firms, which are Established, Reliable, Indigenous and fully Integrated manufacturers/producers with Melting of Stainless Steel like SAIL/JINDAL."
- (ii) Some of the known major Integrated Steel Plants in both public and private sector is listed below (Stainless steel): 1. Jindal stainless Ltd. 2. Jindal stainless (Hisar) Ltd 3. SAIL, Salem.

B) Labour charge for fabrication & Erection of Stainless-steel work ---- (As per attached specification: Annexure-II (welding))

Labour charges for fabricating and erecting in position stainless steel in columns, roof girders, bracings, gussets, base plates holding down bolts, nosing angles, with necessary fixtures / lewis bolts etc. (conforming to relevant IS codes/ASTM code for structural steel/stainless steel including cutting, welding, bolting, rivetting with all lead, lift etc. i.e. all operations required to complete the work satisfactorily.

C)Painting as per relevant IS standards/RDSO specifications

D)Stainless steel Reinforcement bar of Grade G (410L)as per IS 16651 for all reinforced concrete structures.

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Bolt as per code ASTM A193 and grade GRBB class 2

Nut as per code ASTM A194 and grade GR8


Washer Type 303

3. STEEL

3 (a) Cast Steel

The use of cast steel shall be limited to bearings and other similar parts. Steel for castings shall conform to Grade 280-520 of IS: 1 030. In case where subsequent welding is unavoidable in the relevant cast steel components, the letter No at the end of the grade designation of the steel casting shall be replaced by the letter W.O.3 per cent to 0.5 per cent copper may be added to increase the corrosion resistance properties.

IS: 1148	Hot rolled rivet bars (upto 40mm dia) for structural purposes
IS :1149	High tensile rivet bars for structural purposes
IS: 1161	Steel tubes for structural purposes
IS: 1161	Hollow Steel sections for structural use
IS: 4923	Structural weather resistant steel
IS:11587	Specifications for Rolled Steel Beam, Channel and Angle Sections
IS: 808	Mild Steel Tubes
IS: 1239	Dimension for Steel Plate, sheet and strip for structural and general engineering purposes.
IS: 1730	Dimension 'for Steel flats for structural and general engineering purposes
IS:1731	Dimension for round and square steel bars for structural and general engineering purposes
IS: 1732	Rolling and cutting tolerances for hot rolled steel products
IS: 1852	The use of structural steel not covered by the above standards may be permitted with the specific approval of the authority. Refer to Section 1900 for further details.



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3. (b) Stainless Steel

Stainless steel shall be authentic chromium-nickel steel, possessing rust, acid and heat resistant properties conforming to IS :6603 and IS :6911. Mechanical properties/grade for such stainless steel shall be as specified by the accepting authority, but in no case be inferior to mild steel. Generally, stainless steel is available as per AISI grades. AISI 304 which is equivalent to 04 Cr18 Ni11 0 of IS :6911 satisfies the requirements of mechanical properties of structural steel. Other grades of stainless steel for specific purposes may be provided as per specific requirements. For application in adverse / corrosive environment, stainless steel shall conform to AISI 316L or 02G17 Ni M02 of IS :6911.


3. (c) Mild Steel

Reinforcement steel shall conform to cl.302.5 of IRC :21-1987 Pre stressing steel and untensioned steel in P.S.C. member should be in accordance with I. R. C. 18-1985. Reinforcements of Grade S240 and S415 conforming IS :432 (Part I) to M. S. and IS : 1786 to HYSD bars respectively are to be used.

Corrosions of reinforcement in concrete & it Remedial measures.

When corresive Salts, for example chlorides and sulphales increase beyond a critical limit and sufficient alkalinity is not obtained within the concrete to maintain steel in a passive condition corrosion in reinforcement takes place. Following points may particularly be noted in the context:

- (i) Quality of concrete: Quality concrete, dense concrete, rich in cement content generally resists corrosion of embedded steel.
- (ii) Cover thickness: The reinforcement is protected by the concrete cover over it. Evenness of specified cover over the reinforcement is also very important of corrosion protection.
- (iii) Condition of reinforcement: The surface condition of the steel reinforcement at the time of its placing concrete affects its corrosive rate. If the reinforcement is badly corroded or contaminated with salt corrosion action is aggravated and promoted rapidly



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after
placement in concrete.

**Placing of
concrete under
drilling fluid
or Water :-**

Concrete to be placed under water or drilling mud shall always be placed by termite except that when no drilling mud is used, concrete may with special permission be placed by means of specially designed under water placer, to permit deposition of concrete in successive layers without permitting the concrete within the placer to fall through free water.

3.0 EXECUTION

All works shall be carried out in proper workman like manner. Items of works not covered by the following, shall be carried out relevant B.I.S. codes of practice and as per base practices according to the direction of the Engineer-in-Charge and to his satisfaction. The cost of all stages of works shall be deemed to have been included in the rate to be quoted by the Contractor.

3.1 EXCAVATION OF FOUNDATION AND FILLING UP TRENCHES

Excavation for information shall be done as per drawing and direction of the Engineer-in-Charge. The excavated areas around the foundation structures are to filled up properly to the required levels with earth obtained from excavation of foundation and also with carried earth if necessary in layers not exceeding 150 mm at a time.

3.3.1 CEMENT CONCRETE WORKS (PLAIN OR REINFORCED) SHUTTERING AND STAGING

Wherever necessary, shuttering and staging must be provided and the cost thereof will be deemed to have been covered by the rate quoted by the Contractor.

Shuttering may be of approved dressed timber true to line, not less than 25 mm thick, Surface to be in contact with concrete are to be planed smooth except where otherwise stated. As an alternative, sufficiently rigid steel shuttering may be used. In every case, joints of the shuttering are to be such as to prevent the loss of liquid from concrete. In timber shuttering the joints must be perfectly closed and the entire shuttering surface shall be covered with polythene sheets of approved quality. In case of steel shuttering also the joints are to be similarly lined.



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All shuttering and framing must adequately be stayed and braced to the satisfaction of the Engineer-in-Charge for properly supporting the concrete during the period of hardening. It shall be so constructed that it may be removed without shock or vibration to the concrete.

Before the concrete is placed, the shuttering shall, if considered necessary, be coated with an approved preparation for preventing the adhesion of the concrete to the moulds, and it is to be of such a nature and so applied that the surface of the finished concrete is not stained. Care shall also be taken that such approved preparation shall be kept out of contact with the reinforcement.

In no circumstances shall forms be struck until the concrete reaches a strength of at least twice the stress of which the concrete may be subjected at the time of striking.

Interior of all moulds and boxes must be thoroughly washed out with a hosepipe or otherwise so as to be perfectly clean and free from all extraneous matter prior to the deposition of concrete.

All form works shall be removed without shock or vibration. Before the form work is stripped, the concrete surfaces shall be exposed where necessary in order to ascertain that the concrete has hardened sufficiently. In normal weather and with ordinary cement, vertical or side shuttering may be removed after three days and the bottom shuttering of horizontal members after fourteen days in case of slabs and twenty one days in case of beams and cantilevers etc. from the date of placing the last portion of the concrete in the structure. The above are the minimum and may be extended if found necessary. Before stripping the shuttering of structural members the Contractor shall take previous permission of the Engineer-in-Charge or his representative.

No plugs, bolts, ties, hold fasts or any other appliances whatsoever for the purpose of supporting the shuttering are to be fixed in the structure or placed in such a way that damage might result to the work in removing the same when the shuttering is struck.



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3.3.2 SCAFFOLDING

The scaffolding with steel pipe must be strong and rigid stiffened with necessary cross bracers and always decked and boarded on the stills with close boarded ceiling and swings to prevent any injury to persons or materials. The Contractor shall have to allow other traders to make reasonable use of his scaffolding as and when directed by the Engineer-in-Charge.

If for the interest of the work contractors have to erect scaffolding in other's properties including local bodies or corporation, the arrangement for the same including the cost of licensing fees etc. shall have to be borne by the Contractor and the department should be kept free from any liability on this account.

3.3.3 MIXING OF CONCRETE

(The Structural concrete & ready mix concrete)

Boxes of suitable size shall be used for measuring sand and aggregate in specified proportion. The unit of measurement for cement shall be bag of cement weighing 50 kg and this shall be taken as 0.035 cubic metre. While measuring the aggregate, shaking, ramming or hammering shall not be done, the proportioning of sand shall be on the basis of its dry volume and in case of damp sand, allowance for bulking be made. The aggregate in each batch of concrete are to be so proportioned as to contain full bags of cement.

Normally all structural concrete shall be mixed in mixture machine of appropriate proportion, shall have to be vibrated with suitable vibrator. Mixing shall be

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continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency, but in no case shall the mixing be done for less than two minutes. For particular job the Engineer-in-Charge may allow hand mixing and or hand tapping of concrete. In case of hand mixing concrete, extra cement up to 10% over the standard requirement of cement for machine mix of particular mix shall have to be provided by the Contractor at his own cost.

As the bulking of sand may vary from day to day and at different parts of the day on account of varying moisture content, frequent tests for bulking shall be carried out with the sand to be used and the amount of bulking allowed for in the field mix so as to keep the actual proportion constant throughout.

Only such quantities of concrete as are required for immediate use are to be mixed at any one time. Sufficient water is to be added to obtain proper workability so that the mixture may flow readily round the reinforcements and into every part of the moulds. The workability shall be measured by the amount of slump.

The quantity of water to be used for each mix of 50 kg cement to give the required consistency shall not be more than 34 litres for 1:3:6 mix, 3:6 mix, 32 litres for 1:2:4 mix, 30 litres for 1:1½ :3 mix and 27 litres for 1:1:2 mix. In the case of vibrated concrete, the limit specified may be used suitably reduced to avoid segregation.

The total water content in each batch of concrete shall always be kept constant as the amount previously determined by experiments. The quantity of water to be actually added may, therefore, vary depending on the moisture content in the aggregates. In actual job, if the quantity of the ingredients remain constant the amount of slump may be taken as good guide indicating the total water content in the mixture. The consistency and consequently the water content of the concrete shall, therefore, be kept constant and checked from time to time as work proceeds by means of standard slump tests. The slump test shall be carried out with concrete immediately after it has been mixed and before any initial set has commenced, the sample being taken preferably at the point where the concrete is being delivered for placing in the moulds.



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The mould shall be filled about one-fourth of its height with concrete which shall then be tamped, using 25 strokes of a 18 mm. diameter steel rod, 80 cm long and bullet-pointed at the lower end. The filling shall be compacted in successive layers similar to the first and the top struck off so that the mould is exactly filled.

The mould shall then be removed by raising vertically immediately after filling. The moulded concrete shall then be allowed to subside and the height of the specimen measured after coming to rest.

The consistency shall be recorded in terms of millimeters of the subsidence of the specimen during the test, which is known as slump.

The following slumps shall be adopted for different works.

Sl. No.	Type of Work	Slumps	
		When vibrators are used	When vibrators are not used
1.	concrete in foundation footings, retaining walls and pavements.	10 to 25 mm	50 to 75 mm
2.	concrete in R.C.C. foundation footings and retaining walls.	10 to 25 mm	80 mm
3.	beams, slabs and columns simply reinforced.	25 to 40 mm	100 to 125 mm
4.	R.C.C. section or section with congested steel.	40 to 50 mm	125 to 150 mm

I.S.: 456-2000 allows use of nominal mix of concrete upto grade M20 and may be allowed in works at the discretion of Engineer-in-Charge and will be guided by

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the provision of IS : 456-2000. For graded of concrete above M20, design mix has to be adopted. For determination of mix proportion for design mix concrete, the target strength should be higher than the specified characteristic strength to ensure that characteristic strength is attained at 28 days.

Target strength = Characteristic strength + 1.65 x standard deviation. Standard deviation for different grades of concrete in absence of any test may be taken as per IS: 456-2000 as follows:-

Grade of concrete	Assumed standard deviation N / MM ²
M 10	3.5
M 15	3.5
M 20	4.0
M 25	4.0
M 30	5.0

Once the target strength of cube moulds with specific mix design is obtained in the laboratory, it may be inferred that the corresponding characteristic strength of concrete, prepared with the materials used in the test mould (s) cured under identical condition as that of the test specimen, shall be obtained at site at 28 days.

An approximate formula for expressing the strength of concrete at age 't' (in days) is given below :-


$$f_t = \frac{t}{a + bt} \times f_{28} \text{ where } f_{28} \text{ is the strength at 28 days,}$$

$$f_t = \text{strength of concrete at any age 't' (in days), } a = 4.7 \text{ and } b = 0.833$$

3.3.3.1 ACCEPTANCE CRITERIA

The concrete shall be deemed to comply with the strength requirements if:

- a) Every sample has a test strength not less than the characteristic value; or



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b) The strength of one or more samples though less than the characteristic value, is in each case not less than the greater of :

- 1) The characteristic strength minus 1.35 times the standard deviation; and
- 2) 0.80 times the characteristic strength, and average strength of all the samples is not less than the characteristic strength plus

$$1.65 - \sqrt{\left[\frac{1.65}{\text{number of samples}} \times \text{Times the standard deviation} \right]}$$

The concrete shall be deemed not to comply with the strength requirements if :

c) The strength of any sample is less than the greater of :


- 1) The characteristic strength minus 1.35 times the standard deviation; and
- 2) 0.80 times the characteristic strength; or

d) The average strength of all the samples is not less than the characteristic strength plus

$$1.65 - \sqrt{\left[\frac{3}{\text{number of samples}} \times \text{Times the standard deviation} \right]}$$

Concrete which does not meet the strength requirements as specified in (a) and (b) above but has a strength greater than that required by (c) and (d) may, at the discretion of the designer, be accepted as being structurally adequate without further testing.

If the concrete is deemed not to comply pursuant to (c) or (d) above the structural adequacy of the parts affected shall be investigated and any consequential action as needed shall be taken.



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Concrete of each grade shall be assessed separately.

Concrete shall be assessed daily for compliance.

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

3.3.3.2 FREQUENCY OF SAMPLING

Sampling procedure – A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested, that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

Frequency: - The minimum frequency of sampling of concrete of each grade shall be in accordance with the following;

Quantity of concrete in the work, M ³	Number of samples	
5	1	
15	2	
30	3	
50	4	
and above	4	one additional sample for each additional 50 m ³ or part thereof.

3.3.3.3 TEST SPECIMEN

Three test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the strength of concrete at 7 days or at the time of striking the form work, or to determine the duration of curing, or to check the testing error. Additional cubes may also be required for testing cubes cured by accelerated methods as described in IS : 9013. The specimen shall be tested as described in IS : 516.

3.3.3.4 TEST RESULTS OF SAMPLE

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The test results of the samples shall be the average of the strength of three specimens. The individual variation should not be more than @ 15 percent of the average if more, the test results of the sample are invalid.

3.3.4 PLACING OF CONCRETE


Concrete shall be handled from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent the segregation or loss of the ingredients. It shall be deposited as nearly as practicable in the final position to avoid re-handling or flowing. Unless specially permitted by the Engineer-in-Charge, concrete shall not be dropped freely from a height of more than 2 metres.

Before placing the concrete, the moulds shall be cleaned for shavings, pieces of wood or other rubbish. When placing the concrete, the fine materials must be carefully worked against the moulds so that the faces of the concrete shall left perfectly smooth and free from honey-combing upto withdrawal of the moulds. Any defect in this respect must be dealt with by the Contractor as directed by the Engineer-in-Charge without any extra charges therefor.

Depositing concrete under water shall not be allowed without specific permission from Engineer-in-Charge. The method of concreting to be adopted in such cases shall have to be previously approved by him.

3.3.5 COMPACTION OF CONCRETING

During placing and also immediately after deposition, the concrete shall be throughly compacted by ramming spreading etc. until it has been made to penetrate and fill all the spaces between and around the steel rods, around embedded fixtures, and into the corners for formwork in such a manner as to ensure a solid mass entirely free from voids. If so directed by the Engineer-in-Charge, in addition to usual ramming, spreading etc. sufficient number and suitable type of vibrators may have to be used on important jobs to enable working with homogeneity. It is imperative that the work should be done quickly as well as efficiently and adequate number of hands must therefore be employed to ensure this. Mechanical vibrators used shall comply with IS : 2505, IS : 2506, IS : 2514 and IS :4656.



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Concrete shall be placed and compacted in its final position before setting has commenced and shall not subsequently be disturbed.

3.3.6 CONTINUOUS CONCRETING

Concreting shall be carried out continuously upto construction joints, the position and arrangement of which shall be predetermined by the Engineer-in-Charge or his representative. Any rest, pauses, such as for meal, shall also be subject to his approval. All concreting work should be so programmed as not to necessitate work at night. If for any reason this becomes imperative, the Contractor shall obtain previous permission of the Engineer-in-Charge or his representative and make proper lighting arrangement to his satisfaction.


3.3.7 PROTECTION AND CURING

The Contractor shall adequately protect freshly laid concrete, about 1 to 2 hours after its laying from too rapid drying due to sunshine, drying winds etc. and also from rains or surface water and shocks. About 24 hours after laying of concrete, the surface shall be cured by flooding with water of minimum 25 mm depth or by covering with wet absorbent materials. The curing shall be done for a minimum period of 10 days. Over the foundation concrete the masonry work may be started after 48 hours of its laying, but the curing of cement concrete shall be continued along with masonry work for a minimum period of 10 days.

In case of cement concrete used as sub-grade for flooring, the flooring may be commenced with 48 hours of the laying of sub-grade. In case it is not possible to do so due to exigencies of work, the sub-grade shall be roughened with steel wire brush without disturbing the concrete, wetted and neat cement slurry at the rate of 1.75 kg. of cement per square metre applied to the base before laying floor. The curing to be continued along with top layer of flooring for a minimum period of 10 days.

3.3.8 CONSTRUCTION JOINTS

All construction joints in slabs and other horizontal members are to be formed by inserting vertical boards against which the concrete deposited can be properly rammed. The positions where such construction joints may be made will be indicated by the Engineer-in-Charge or his representative.



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In the case of horizontal joint any excess mortar or laitance shall be moved from the surface after the concrete is deposited and before it has set.

When the work has to be commenced on a surface which has hardened, such surface shall be well roughened and all laitance removed, the surface shall then be swept clean, thoroughly wetted and covered with a thin layer of mortar composed of equal volumes of cement and sand.

3.3.9 TEST FOR CONCRETE

For R.C.C. work, (where concrete is specified by strength) the mix should not be leaner than 1 : 1½ : 3 so as to give ultimate crushing strength not less than 20 N / MN² at 28 days cured under field condition. The mix for the concrete is to be so

adopted and the slumps is to so allowed as to give specified strength and proper workability at the existing site conditions. Contractor shall remain fully responsible for producing concrete of specified strength in the actual job and therefore cast at his own cost test specimens of 15 cm. cube as already specified during work and cure the same in similar way as for laid concrete for being tested for strength. Each set of test specimen shall be taken to cover the quantity of concrete laid on the job during the period from the time of taking the previous set of specimens and the quantity will be estimated by the Engineer-in-Charge from records maintained by him.

The interior surface of the mould and base plate shall be lightly oiled before the concrete is placed in the mould.

- a) When the job concrete is compacted by ordinary methods, the test specimen shall be molded by placing the fresh concrete in the mould in three layers, each approximately one-third of the volume of the mould. In placing each scoopful of concrete, the scoop shall be moved around the top edge of the mould as the concrete there slides from it in order to ensure a uniform distribution of concrete within the mould. Each layer shall be rodded, 25 times with a 16 mm rod, 60cm in length, bullet pointed at the lower end and the strokes shall be distributed in a uniform manner over the cross-section of the mould and shall penetrate into the underlying layer. The bottom layer shall be rodded, throughout its

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depth. After the top layer has been rodded, the surface of the concrete shall be struck off a trowel and covered with a glass plate at least 6.5 mm thick or a machined metal plate. The whole process of moulding shall be carried out in such a manner as to preclude the alteration of the water-cement ratio of the concrete, by loss of water either by leakage from the bottom or overflow from the top of the mould.

- b) When the job concrete is placed by vibration and consistency of the concrete is such that the test specimens cannot be properly moulded by hand rodding as described under (a) above, the specimens shall be vibrated to give a compaction corresponding to that of the job concrete. The fresh concrete shall be placed in the mould in two layers, each approximately half the volume of the mould. In placing each scoopful of

concrete, the scoop shall be moved around the top edge of the mould as the concrete there slides from it, in order to ensure a symmetrical distribution of concrete within the mould. Either internal or external vibrator may be used. The vibration of each layer shall not be continued longer than is necessary to secure the required density. Internal vibrators shall be of appropriate size and shall penetrate only the layer to be compacted. In compacting the first layer, the vibrators shall not be allowed to rest on the bottom of the mould. In placing the concrete for the top layer, the mould shall be filled to the extent that there will be no mortar loss during vibration. After vibrating the second layer, enough concrete shall be added to bring the level above the top of the mould. The surface of the concrete shall then be struck off with a trowel and covered with a glass or steel plate as specified under (a) above. The whole process of moulding shall be carried out in such a manner as to preclude the alteration of water-cement ratio of the concrete by loss of water either by leakage from the bottom or overflow from the top of the mould.

After curing, the specimen properly wrapped shall be made over to the Engineer-in-Charge or his representative who will arrange to have them tested at 28 days from the date of casting. If there by any delay for any reason whatsoever the result of the test shall nevertheless be valid and will be applicable as per rules in each case for all test specimen whatsoever.

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The Contractor shall be responsible for proper packing of the specimens at his own cost, for safe and convenient transport of the same from the site to the testing laboratory. The cost of testing the test moulds and other charges including cost of carriage of the test moulds from the work site to the particular laboratory (both ways) and other incidental charges in this connection will have to be borne by the Contractor.

In case of concrete showing, on the result of the cube tests, strength less than that specified in (a) and (b) of the Acceptance Criteria but has a strength greater than (c) & (d) of the said Acceptance Criteria concrete may, at the discretion of the Engineer-in-Charge, be accepted as being structurally adequate without further testing.


If the concrete is deemed not to comply pursuant to (c) & (d) of the Acceptance Criteria, the Structural adequacy of the parts affected may be investigated as per provision of Clause 16.3 and / or clause 16.5 of I.S. 456-1978 i.e. core test and / or load test, as the case may be before rejection on the application of the Contractor with the undertaking to bear the cost of such tests.

If the strength of the concrete is such that it satisfies provisions made in sub clause 16.3.3 and / or sub-clause 16.5.3 of I.S. 456-2000 concrete in the member represented by such tests shall be considered acceptable but the Engineer-in-Charge shall have the full power to fix the rate of deduction @ Rs. 200/- per cubic metre.

In case the test results do not satisfy the relevant requirement of the proceeding paragraph, the volume of concrete so deficient shall be deemed to be unacceptable and shall be removed from the structure and replace by fresh concrete of specified strength and the Contractor shall, in the case, have to carry out the instruction of the Engineer-in-Charge irrespective of the amount of loss, inconvenience and difficulties involved.

The Contractor shall remain liable to act / to carry out instructions under the provision of this clause, not with standing issuing by the Engineer-in-Charge of any certificate or the passing of any bills or accounts.

3.4 1ST CLASS BRICK WORK



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Cement mortar shall be prepared by mixing sand and cement in specified proportion. Sand shall be measured on the basis of its dry volume. In case of damp sand, its quantity shall be increased suitably to allow for bulkage.

Brickwork shall be laid in English bond. The brick shall be laid by larrying method, a layer of mortar shall be spread on full width for suitable length of the lower courses. Each brick shall first be laid so as to project over the one below, both at the end and at the side, then pressed into the mortar and shoved into final position so as to embed the brick and to fill its inside face fully with mortar. Cut bricks shall not be used except where necessary.

The walls shall be taken up truly plumb with plumb bob. The thickness of brick courses shall be kept uniform and for this purpose, wooden straight edge with graduations giving thickness of each brick course including joint shall be used. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical.

Vertical joints in alternate course shall come directly one over the other. A set of tools comprising wooden straight edge, masons spirit level, square, half metre rule, line and pins, string and plumb shall be kept for every 3 masons for frequent checking during progress of work. Faces of walls found not in plumb shall be dismantled.

Both the faces of walls of thickness greater than 25cm (10") shall be kept in proper plane. All the connected brickwork shall be carried up nearly at one level and no portion of the work shall be left than 1m below the rest of the work. Where this is not possible, the work shall be racked according to bond (and not left toothed) at an angle not steeper than 45° . Bricks shall be so laid that all joints are quite full of mortar. The thickness of joints shall not exceed 10 mm. (2/5)". Bricks shall be laid with frogs upward except in the top course where they shall be placed downward. The face joints shall be racked to a minimum depth of 15 mm (3/5") by racking tools daily during the progress of work when the mortar is still green, so as to provide proper key for plaster or pointing to be done. Where plastering or pointing is not required to be done, the joints shall be struck flush and finished at the time of laying.

The face of brickwork shall be cleaned the very day that brick work is laid daily and all mortar dropping removed.



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Green work shall be protected from rain suitable covering. The brick work shall be kept wet for a period at least 7 days. The top of masonry work shall be left flooded at the close of the day.

Scaffolding shall be sound and strong and holes left in masonry work for supporting the scaffolding shall be filled and made good, before plastering.

3.5 DAMP PROOF COURSE

This shall be laid to specified thickness over walls for the full thickness of the super structure walls. The surface shall be levelled and prepared before laying the cement concrete. Edges of damp proof course shall be straight, and even vertical. Side shuttering shall consist of wooden form and shall be strong and properly fixed so that it does not get disturbed during compaction and the mortar

does not leak through. The concrete mix shall be of workable consistency and shall be tamped thoroughly to make a dense mass. When the sides are removed the surface should come out smooth without any honey-combing. The damp proof course shall be laid continuous and the surface shall be double chequered. Damp proof course shall be cured for at least seven days, after which it shall be allowed to dry. Water proofing materials of approved quality shall be added to the concrete mixture in accordance with the manufacturer's specifications stating the quantity of water proofing material in litres or kg. per 50 kg of cement and will be paid for separately. Similarly, polymer based paid used under damp proof course as per manufacturer's specification shall also be paid separately.

3.6 CEMENT PLASTER

The proportion of mortar for exterior or interior plaster shall be as specified in the items of work.



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The plaster shall be of thickness as specified and the surface shall be similarly cured as for cement concrete. The moulding shall be carried out as shown in the drawing and shall be separately measured in overall length unless otherwise specified in the items. Interior corners and edges of openings if so directed by the Engineer-in-Charge shall be rounded off or chamfered with the same mortar for which no extra payment will be allowed. All cement concrete surface should be chipped off properly before taking up to the plastering work.

3.7 ARTIFICIAL STONE FLOORING

The Artificial stone flooring shall be laid in panels of shape and size as directed. The casting of the panels will be so programmed as to prevent bonding on the freshly laid panel with advancement panels.

Unless otherwise specified, the underlay shall be with graded stone chips 12mm. down, the thickness of topping shall be of 10mm thick and colouring pigment as may be required shall only be added with the topping. The topping and the underlay shall not be laid in one operation. After laying the 'Underlay' the surface shall be left out to dry. The topping shall be laid only after the underlay as sufficiently dried and initially set and after thoroughly brushing with hand wire brush and sweeping clean and after application of slurry. The topping shall be finished with an English towel and a piece of clean dry linen. During all the stages the required level shall be carefully observed and maintained. Suitable grading, where required shall be provided in the flooring for water drainage as directed by the Engineer-in-Charge.

The corner between floor and wall shall be round off as directed by the Engineer-in-Charge for which no separate payment shall be made. All cement concrete surfaces should be chipped off properly before taking up the flooring work.



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TECHNICAL SPECIFICATION

GENERAL

1.1 Materials

All materials used in the construction of permanent work shall be of the best quality of the kind and to the approval of the Engineer-in-Charge. Any materials not covered by these specifications, shall comply with the relevant Indian Road Congress standard specifications and code of practice and Indian Standard Specifications (referred to hereinafter as I.R.C. and I.S. respectively), as revised or modified upto the date one month prior to the Tender Notice.

Samples of materials to be supplied and used by the contractor in the works shall be to the prior approval of the Engineer-in-Charge for this purpose the contractor shall furnish in advance representative samples in sufficient quantities and in the manner as directed by the Engineer-in-Charge for this approval materials brought to the site which, in his opinion do not conform to the approved sample, shall not so directed by him, be removed by the contractor from the site and replaced by materials of approved quality.

In spite of the approval of the Engineer-in-Charge of any materials brought to the site, he may subsequently reject the same if in his opinion the materials has since detracted due to long and defective storage or for ant reason whatsoever and is thereby considered unfit for use in the permanent works .any materials thus rejected shall be immediately removed from the site at contractor's cost and expense.

All materials brought to site shall be properly stored and guarded in the manner as directed by the Engineer-in-Charge or his authorised representatives and to his satisfaction.

The Engineer-in-Charge may carry out test of materials as he may decided. The contractor shall, at his cost and expense, for this purpose supply requisite materials and render such assistance to the Engineer as he may decide. The cost and expense of such tests are to be borne by the contractor.

2. **Workmanship**

All works are to be carried out in proper workman like manner, items or works



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not covered by those specifications or by the Tender Documents shall be carried out as per the best practice according to the direction of the Engineer-in-Charge and to his satisfaction. The relevant I.R.C. specifications or code of practice shall be taken as guide for this purpose. publication - "Handbook of Quality. Control for the construction of roads and Runway" (1977). In case relevant particulars are not available in the said publication, reference shall be made to the "Specification for Road and Bridge Works" of the published by I.R.C. (1978).


3. **Basic Materials**

3.1 **Cement**

All cement to be used in the works shall be ordinary Portland cement of Indian manufacture or Foreign manufacture complying with I.S. 269 of Blast Furnace slag cement complying with I.S. 445. The quantity of cement required for the work will be procured by the department and issued to the contractor at the rate specified in Annexure of the Special Terms and Condition. The cost, of the cement consumed in works will be recovered at the issue rate from contractor's bill.

3.1.1 With regard to the quality of cement to be used in concrete of specified strength, the responsibility of the Department shall cease on making over to the contractor such consignment or consignments of cement if the contractor is apprehensive about the quality of cement in any consignment, the contractor will have to write immediately to the Engineer-in-Charge about such consignment on receipt of such written intimation will arrange to collect sample of cement in presence of the contractor and got sample so collected tested for complete test both physical and chemical at the Central Laboratory, KMDA, Unnayan Bhavan, Salt Lake City. The result of the Central Laboratory, KMDA will be binding on both the parties. If the results of such test be satisfactory i.e. complying with relevant IS specifications, the cost of the test including all incidental charges as determined by the Engineer-in-Charge shall have to be paid by the contractor and will be recovered from the bills of the contractor. If best results fail to comply with IS specification then the cost of the test shall be borne by the department and the Engineer-in-Charge shall arrange the concerned consignment to be replaced by cement of requisite quality. Inspire of unsatisfactory test result the Engineer-in-Charge at his discretion may direct to consume the cement in unimportant nature of works and in that case the contractor shall comply with the direction of the Engineer-in-Charge.

3.1.2 The responsibility for asking for a satisfactory test results in respect of any consignment shall rest with the contractor any failure on their parts in this



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respect shall not relieve the of the liability to produce concrete of specified strength. No subsequent plea that the under strength which the resultant concrete might indicate, as *per* tests specified hereinafter, was due to the quality of cement below specification shall be entertained.

PUMPNG AND DEWATERING Etc.

The contractor shall provide all pumping and other arrangements necessary to remove from or to keep outer foundation or any part of the structures under construction free from water, whether canal water or at his own cost and expense.

5. **Earth work**

5.1 **Earth work in excavation of foundation shall include**

- a) Before taking up construction of work, the contractor may have to construct two earthen bundhs or may have to strengthen the earthen bundhs to protect the worksite free from see-page of canal or other stagnant water. All adequate protection for constructing such bundhs as per drawing and approval of the Engineer-in-Charge will have to be made by the contractor.
- b) Removing the spoils within a lead of 150 metre and including lift & stacking or spreading the spoils as per direction of the Engineer-in-Charge.
- c) Trimming the sides of the trenches, levelling dressing & ramming the bottom.

5.1.1 Adequate shoring as per approval of the Engineer-in-Charge during excavation of earth shall have to be made by the contractor at his own cost and expense.

5.2 **Mode of payment**

Irrespective of the area of excavation actually done by the contractor measurement for the purpose of payment for excavation of foundation and related items or works, such as trench filling, shall be on the following basis.

For excavation actually done by the contractor measurements shall be on the basis of vertical shaft excavation as per the drawing plus 31 (thirty one) cm. or 300 mm. (three hundred millimetre) on all sites of theoretical outlines of foundation or as actually executed whichever is less.

6. **Clearing and Grubbing**

Prior to commencement of earthwork the site, as will b^ shown by the Engineer-in-Charge/or his representative should be clearer of obstruction including buildings, fences, utility lines, abandoned drainage structures and



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vegetation such as tree "(upto 3' -0" girth) roots, undergrowth grass, rubbish etc. except

where it maybe desirable be retain the vegetation for appearance shade or other reasons as will be decided by the Engineer-in-Charge, whose decision in will be final and binding and complete clearance shall have to be as will be directed by the Engineer-in-Charge or his representative, so provide adequate sight distance for safe trader, to improve the obstruction to drainage or decayed or dead trees which might otherwise fall on the highway or to permit access to use of borrow pits and other sources of materials. The materials thus removed should be stacked in neat stacks in specially selected sites as will be directed by the Engineer-in-Charge or his representative. The cost of these works should be included in the earthwork rate of the contractors and they will have not claims over the recovered materials and tree etc.

6.1 The contractors at their own cost will then have to mark out the centre line of the


alignment by stronger wooden pegs and other edges of slopes and scarify the space between the two lines (outer edges of the slopes). The contractor will at their own cost have to construct and maintain brick pillars at safe distance on both sides of the embankment for taking pre-work and post work levels. These level brick pillars (15" x 15") should connected with pucca bench mark (S.M.) pilfer one for mile, i.e. two in a mile. R.L. should be kept inscribed on the plastered surface (with neat cement finish) in B.M. pillar which will have to enter in the level book & will have to enter in the level book & will to have to be signed

jointly by the contractor and the representative of Engineer-in-Charge. Brick pillars are to be numbered serially and their reference may be noted in the level books The contractor will remain solely responsible for same guarding the pucca B.M. pillars.

6.2 The contractor will have to arrange their own land for excavation or earth for the construction of embankment. Before earth is excavated from the land the site and quality of the earth available are to be shown tested and approved by the Engineer-in-Charge. In no case the contractor will be allowed to bring earth from

other places than the approved one. No extra claim for selection of site testing of

earth and etc. will be entertained. The contractor will have to arrange their transport (i.e. Lorries, Trailers and other suitable machineries) for carrying earth from the places of excavation to the work site. They will also have to arrange



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provide rules lubricants etc. for their transport. The department in to case will be

held reasonable for delay in carrying and completion of work due. non-availability

of fuel and lubricants etc.

7 Compacting .original ground

- 7.1 In all cases, the original scarified ground should be consolidated as must as possible by rolling or other means. Any empty pockets or depression left in the soil as result of cleaning and grubbing operation should be filled up an compacted upto the satisfaction of the Engineer-in-Charge for which no extra payment will be made.

where embankment is to be placed on step sloping ground the surface shall be l. benched in steps or trenched or broken up in such way as directed by the Engineer-in-Charge at no extra cost.

Where the embankment is to be placed over an existing road surface that should be scarified to a minimum depth of 6" so as to provide to bend between the old and new materials. The embankment is to be broken up in pieces not be exceed on sq. ft. and may be left under the new embankment for which no extra payment will be made when the embankment is to be placed over any old black top concrete payment

- 7.3 The embankment work must not proceed until the foundation have been inspected by the Engineer-in-Charge or his representative for ensuring satisfactory condition and approved. The cost of the above items of work should be included in the earthwork rate of concrete.


Embankment slope : As will be decided by the Engineer-in-Charge.

7.4 **Placing of soil in layers and drainage**

The contractor will make the road profile with the help of bamboo posts and ropes as per plan and section and / or as directed by the Engineer-in-Charge. All pages, posts, labour etc. for dug belling and making -fhe profile will have to be supplied by the contractor the cost of which should be included in the earthwork rate of the contractor

7.5 **Produce of Building up embankment with earth**

Earth obtained from the contractor's land in elsewhere will then have to be spread uniformly between the tee lines of the embankment in layers not exceeding 9" loose, depth, either by machine or manual labour through the full width further road embankment including side slopes, layers exceeding 9" in loose depth may be permitted only when the Engineer-in-Charge is satisfied that



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the specified compaction plan. But in no case the depth of layer will be allowed to exceed 12".

Provided further then when a shop foot roller is used the thickness of the loose layer shall not exceed the length of the trimming feet by more than 2". All lumps and hard lumps are to be thoroughly broken up to have a minimum size of 6.2 mm and compacted to 55% proctor's density at O.M.C. by using mechanical equipments as will be determined by actual test at site by the department in presence of contractor or his representative. The field density test will be carried out at an interval of 22' - 0", in a staggered way equally in four longitudinal strips depending on the width of the layer concerned. The above specification will apply to the subsequent layers also up to the final formation levels and slopes as shown in the plans and sections or as directed by the Engineer-in-Charge.

- 7.6 The compaction is to be done at optimum moisture content and accordingly the natural moisture content of the soil is to be determined previously and water is to be added by way of sprinkling, if necessary and left for at least 12 hours before compaction starts. Variation of water content should be 2 per cent on eight sides, in case of excessive moisture content in the soil drying of the soil as per direction of the Engineer-in-Charge is to be done by the contractor
- 7.7 The compaction control in the field will be exercised through frequent moisture content and density determination. The control of compaction through controlled compactive efforts (i.e. the number of the passes of compacting equipment) will not however be accepted as a substitute for control of compaction by moisture content and density determination.
- 7.8 The contractor will have to adjust his labour strength according to the scope of availability of the work, but no claim for idle labour shall be entertained in case sufficient areas are not available at any time. The quantities of earth work shown in the schedule are approximate and subject to wide variation where required and directed by the Engineer-in-Charge and no extra claim will be entertained for such variation. If there be any public road within the acquired area of the Highway. The condition at contractor's cost.
- 7.9 Ancillary works required for the same or as directed by the Engineer-in-Charge in writing, stumps, roots, brush, duds, rubbish, soffits clay or any other unsuitable matter must not be used for the construction of road embankments. Road



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embankment shall be constructed to line, grades and cross section as shown on the drawings or as ordered by the Engineer-in-Charge in writing embankment

shall have to construct systematically as far as possible from one end to the other and for full width of embankment. Earth work may be started from one or more changes at a time but these particular sections. No measurements of earth work however, will be taken for unfinished work which will not be completed upto formation level or any other levels as will be accepted by the Engineer-in-Charge and properly dressed to required slopes, grade and camber. While the excavation is being done and until the earthwork and the road embankment are specifically accepted by the Engineer-in-Charge the contractors shall be responsible for the maintenance of the embankment to prevent damage or loss of materials from the road way and shall replete at his own expense any portion which in the opinion of the Engineer-in-Charge have become displaced due to carelessness or negligence on the part of the contractors damage resulting from natural causes, such as storms floods burnt rains etc during the construction of roadway, the roadbed that shall be maintained by the contractors in such conditions that it will be drained at all time. No maintenance is required to be done by the contractor if the road embankment for any continuous stretch measuring half mile is completed in all respects upto formation level as per specification and accepted by the Engineer-in-Charge.

7.10 The contractor's rate earthwork, shall be inclusive of all leads and lifts including approaches to bridges within the acquired or arranged land or channels that will be necessary during actual excavation of earth work for the road embankment including slopes and sub-grades, approaches to structures (bridges culverts etc.) grade separations and to complete the backfilling of structures. The earthwork shall also include all excavation of soil whether hard soft or mixed foreign substance and water shaping and dressing to proper camber and also as per drawing or as directed by the Engineer-in-Charge. No separate payment will be made for any extra lead or lifts due to less acquisition of land in particular spots. It may be necessary to earth arranged by the contractor after crossing water channels or from standing water in tanks existing channels requiring approach roads pumping or grabbing (the cost of which should be included in the earthwork) be entertained. The contractor shall have to inspect and find out the actual leads and lifts involved and availability of acquired and arranged land by personal inspection at his own cost before submitting tenders and no subsequent claim will be entertained on this account.

7.11 Service Roads

The contractor shall have to construct a kutch service road on the acquired land between the embankment borrow pits throughout length of the road and properly maintain the same in conditions fit for movement of jeep within their rates for earthwork.



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7.12 Finishing operations

The embankment shall have finish in conformity with the alignment levels, cross section and dimension shown in the drawing. There are alignment of the road is survey the top of the embankment will be formed with the super elevation and crest width.


- 7.13 Finishing operations shall include the work of shaping the dressing the shoulders, road bed and the side slopes to conform to the crossing shown in the drawing. Both the upper and lower ends of the side slope shall be rounded off to improve appearance and the merge and embankment with the adjacent terrain. The cost for finishing operation should be included in the rate for earth of the contractor.

7.14 Mode of payment

The earth work for the road embankment will be paid on the basis of measurements of the roads embankments constructed from time to time strictly according to the above specification by method of average areas of section based on the level sections taken before the commencement and after completion of the embankment upto a height as per direction of the Engineer-in-Charge as per approved specification and distance no' more than 30 M (Thirty metre) sparts in presence of the contractor or their authorised representative. However final payment of road embankment completed will be made on completion of the finished Road embankment completed as per above specification upto formation level. The contractor should satisfy himself before commencement of their authorised representative before commencement of their authorised representative will have to sign the level books as taken of their acceptance of the levels for the preparation of the sections. If the contractors of their representatives fail to attend the levelling work when door notice will be sent to them, the levels taken by the department will have to be accepted by the contractors and no subsequent claim in this respect will be entertained.

The measurement of road embankment shall include only the net amount of earthwork in the embankments between the original ground surface and the surface of the finished road embankments completed accordingly to the drawing and above specifications or instructions of the Engineer-in-Charge. At the time of taken levels the contractors will have to arrange labours at their own cost.

The volume of compacted earthwork out put by 8-10 tons per roller working day of 8 (eight) hours will be a minimum of 8,000 dft. And a maximum of 12,000 eft.



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The contractor will remain bound to provide 85% proctor's density at O.M.C. in compacted soil in embankment. In case it appears that such density falls short and such shortage remains within 5% of the desired minimum results as stated above, the Engineer-in-Charge may allow such work accordingly to his discretion at a reduced rate of Rs, 5/- (Rupees five) per 28.317 m The top 300 mm (1'-0) of the compacted earth work in road embankment should be 100% minimum procure density at O.M.C

8. Embankment will have to be prepared for this contract mainly with Sand/Earth as per direction of Engineer-in-Charge. The sand used for the purpose shall be of Fine sand known as "Silver Sand". Sand should contain fine materials (passing 75 micron sieve) upto 2%. The sand shall be deposited in layers, each layer not exceeding 30 cm. in loose thickness compacted in saturated condition with road roller (8-10 ton) vibratory type of roller or suitable vibratory compactor or crawler mounted Dozer as may be approved by the Engineer-in-Charge. The compaction shall be continued till the specified density of 100% for the top 0.5m and at least 95% (for the lower portion) is obtained.

After compaction the compacted density should not be less than 90 1 b/cft. the volume of compacted fine sand output by 8-10 tons power roller (8 hrs. working) will be about 600 cft.

8.1 Method of measurement

All works relating to the formation of embankment will be measured in terms of volume on the basis of rework and post work cross sections of the Embankment at suitable intervals and the volume compacted by the method of average end areas

8.2 Soil Blanket

When the core of the embankment is formed with sand/Fly ash, the slopes on the sides will be provided with a blanket formed with soil. Such soil blanket shall be built up • in stages and simultaneously along the core of sand/Fly ash, Compaction of the blanket shall be carried out at each successive layers as the embankment is built up. The specification for this soil blanket work will be same as for all the embankment with the soil as stated earlier. After the blanket has been formed, it is to be dressed properly to the specified profile of the embankment or as directed by the Engineer-in-Charge.

8.3 Method of measurement

Soil blanket shall be measured in terms of finished work, this may be done by first working out the total volume of embankment (including the blankets) on the basis of rework and post work cross section and deducting there from the volume of the core, In the alternative, volume may be worked out on the basis



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of the surface area along the slopes and the average thickness as may be suitably determined.

8.4 Permitted tolerance

Surface Regularity of sand consolidation

The surface of compacted sub-base of fine sand is to be finished smoothly and proper grade and camber.

The tolerance both longitudinal and shall be maintained as *follows* :-

Direction

Long <i>profile max permissible</i> undulation with a 3m st. edge. sub base of fine sand	Cross profile max. permissible Variation with counter templete 18 mm 10 mm
--	---

8-5 Tube well with pump

The contractor at his own cost will have to sink tube well if necessary, to obtain sufficient quantity of water. Pumping arrangements shall also have to be made to pour watering in soil sand and sub-base consolidation' tanks.

8.6 Composition of carriageway pavement

For works covered by the contractor package, the pavement of the carriageway (i.e. portion of above sub-grade will be composed of)

a) Granular Sub – Base

Labour for construction of **Granular Sub-base** using approved quality of coarse aggregates and sand, including screening aggregates, mixing the graded aggregates using rotavator as per mix design, adding water to achieve the required OMC, spreading the mix in uniform layer using Motor Grader over prepared surface in proper grade and camber, compacting the layer to achieve the desired density, including lighting, guarding, barricading, including cost of all materials, machinery, tools and plants, complete including cost of quality control as per specification.

(a) **Close Graded GSB:**

(i) Grading – I

(ii) Grading – II

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(iii) Grading – III

To add cost at site of the following materials for complete rate

Close graded GSB :Grading -I		
37.5 mm aggregate	m^3	0.3450
22.4 mm aggregates	m^3	0.2940
11.2 mm aggregates	m^3	0.1280
5.6mm aggregates	m^3	0.1280
Sand	m^3	0.3830
Close graded GSB :Grading - II		
37.5 mm aggregate	m^3	0.1920
22.4 mm aggregates	m^3	0.1280
11.2 mm aggregates	m^3	0.1280
5.6mm aggregates	m^3	0.1530
Sand	m^3	0.6770
Close graded GSB :Grading - III		
13.2 mm aggregates	m^3	0.1280
11.2 mm aggregates	m^3	0.1280
5.6mm aggregates	m^3	0.3450
sand	m^3	0.6770

WET MIX MACADAM SUB-BASE / BASE COURSE

General Specification

Description:

This work shall consist of spreading and compacting clean crushed graded aggregate and granular material premixed with water to a dense mass on a prepared sub-grade / sub-base / base or existing pavement as the case may be in accordance with specification. The material shall be laid in one or more layers as necessary to lines, grades and cross sections as directed by the Engineer-in-Charge. The thickness of a single compacted wet mix layer shall not be less than 75 mm. when vibrating or other approved types of compacted equipment are used, the compacted depth of a single layer of the sub-base course may be



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increased to 200 mm upon approval of the Engineer-in-Charge. Physical Requirements of Coarse Aggregate for Wet Mix Macadam for Sub- Base/Base Courses


Test	Test Method	Requirements
(a) * Los Angles Abrasion Value or *Aggregate Impact Value	IS: 2386 (Part 4) IS: 2386 (Part 4) or IS: 5640	40 per cent Max. 30 per cent Max.
(b) Combined Flakiness and Elongation Indices (Total)	IS: 2386 (Part I)	30 per cent Max .

*** To determine this combined proportion, the flaky stone from a representative sample should first be separated out. Flakiness index is weight of flaky stone metal divided by weight of stone sample. Only thee elongated particles by separated out from the remaining (non-flaky) stone metal. Elongation index is weight of elongated particles divided by total non-flaky particles. The value of flakiness index and elongation index so found are added up.*

Grading requirements of Aggregates for Wet Mix Macadam

The final gradation approved within the limits shown in Table below shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the higher limit on the adjacent sieve or vice versa. Table below

GRADING REQUIREMENTS OF AGGRIGATES OR WET MIX MACADUM



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Sieve designation	Percent by weight
53 mm	100
45 rpm	95-100
26.5 mm	-
22.4 mm	60-80
11.2 mm	40-60
4.75 mm	25-40
2.36 mm	15-30
600 micron	8-22
75 micron	0-8

Plasticity Index (P .1.) value of materials finer than 425 micron *shall* not exceed 6.

Construction operations:


Provision of Lateral confinement of aggregates

Before starting with Wet Mix Macadam construction, necessary arrangements should be made for the lateral confinement of wet mix. This shall be done by laying materials in adjoining shoulders alongwith that of Macadam layer.

Preparation of mix

Wet Mix Macadam shall be prepared in an approved mixing plant of suitable capacity having provision for controlled addition of water and forced / positive mixing arrangement like pug mill or span type mixer of concrete batching plant. For small quantity of wet mix work, the Engineer may permit mixing to be done in concrete mixers.

Optimum moisture for mixing shall be determined in accordance with IS: 2720 (Part VIII) after replacing the aggregate fraction retained on 22.4 mm. sieve with materials of 4.75 mm to 22.4 mm size. While adding water, due allowance should be made for evaporation losses. However, at the time of compaction, water in the wet mix should not vary from the optimum value by more than agreed limits. The mixed material should be uniformly wet and no segregation should be permitted.



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Spreading of mix

Immediately after mixing, the aggregates shall be spread uniformly and evenly upon the prepared sub-grade / sub-base / base in required quantities. In no case should these be dumped in heaps directly on the area where these are to be laid nor shall their hauling over a partly completed stretch be permitted.

The mix may be spread either by power finisher or motor grader. For portions where mechanical means cannot be used, manual means as approved by the Engineer shall be used. The motor grader shall be capable of spreading the material uniformly all over the surface. Its blade shall have hydraulic control suitable for initial adjustment and maintaining the same so as to achieve the specified slope and grade.

The surface shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregate as may be required. No segregation of larger and fine particles should be allowed. The aggregates as spread should be of uniform gradation with no pockets of fine materials.

Compaction

After the mix has been laid to the required thickness, grade and cross-fall / camber the same shall be uniformly compacted, to the full depth with suitable roller. If the thickness of single compacted layer does not exceed 100 mm, a smooth wheel roller of 80 to 100 KN weight may be used. For a compacted single layer upto 200 mm, the compaction shall be done with the help of vibratory roller of minimum static weight of 80 to 100 KN or equivalent capacity. The speed of the roller shall not exceed 5 Kmlh. The rolling shall be done as per standard procedure.


Rolling shall be continued until the specified density is achieved, or where no density is specified until there is no further movement under the roller.

After completion, the surface of any finished layer shall be well closed, free from movement under compaction equipment or any compaction planes, ridgers, cracks and loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of the layer and re- compacted.

After final compaction of wet mix macadam course, the road shall be allowed to dry for 24 hours.

General Specification

Rectification of Surface Irregularity



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Where the surface irregularity of the wet mix macadam course exceeds the permissible tolerances or where the course is otherwise defective due to sub-grade soil getting mixed with the aggregates, the full thickness of the layer shall be scarified over the affected area, reshaped with added premixed material or removed and replaced with fresh premixed material as applicable Andre- compacted as stated above. The area treated in the aforesaid manner shall not be less than 5 m long and 2 m wide. In no case shall depressions be filled up with unmixed and ungraded material or fines.

BITUMINOUS MACADAM

Description

This work shall consist of construction, in a single course, of 50 mm to 100 mm. thickness or multiple courses of compacted crushed aggregates premixed with a bituminous binder, laid immediately after mixing, on a base prepared previously in accordance with the requirements of the specifications, and in conformity with the lines, grades and cross-sections shown on the drawings or directed by the Engineer-in-Charge.

Binder Materials

The bitumen shall be paving bitumen of suitable penetration grade within the range S 35 to S 90 or A 35 to A 90 (30/40 to 80/100) as per Indian Standards Specification for "Paving Bitumen" IS:73.

The actual grade of bitumen to be used shall be decided by the Engineer-in-Charge appropriate to the region, traffic, rainfall and other environmental conditions.

Aggregates

(A) Course Aggregates

The aggregates shall consist of crushed stone, crushed gravel (shingle) or other stones retained on 2.36 mm sieve. They shall be clean, strong, durable of fairly cubical shape and free of disintegrated piece, organic and other deleterious matter, and adherent coatings. The aggregates shall preferably be hydrophobic and of low porosity. Where crushed gravel is used as aggregates, not less than 90% by weight of crushed materials retained on 4.75 mm sieve shall have at least two fractured faces.

The aggregates shall satisfy the physical requirements set forth in Table below.

Table B 10.4-1: PHYSICAL REQUIREMENTS FOR COARSE AGGREGATES FOR BITUMINOUS MACADAM

Property	Test	Specification
Cleanliness	Grain size analysis	Max 5% passing 0.075 mm sieve

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Particle shape	Flakiness & Elongation (combine	Max30%
Strength	Los Angeles Abrasion Aggregate Impact	Max40% Max 30%
Durability	Soundn Sodium Magnesium	Max 12% Max 18%
Water absorption	Water absorption	Max2%
Stripping	Coating & Stripping of Bitume Aggregates	Minimum retained coating 95%
Water Sensitivity	Retained Tensile	Min 80%

(B) Fine Aggregates:

Fine aggregates shall consists of crushed or naturally occurring material, or a combination of the two, passing 2.36 mm sieve and retained on 75 micron sieve. They shall be clean, hard, durable ,dry and free from dust, and soft or friable matter, organic or other deleterious matter.

B-10.4.4 Aggregate grading & binder content

When tested in accordance with IS: 2386 Part 1 (wet sieving method), the combined aggregate

grading for the particular mixture shall fall within the limits shown in Table B 10.4-2 for the grading specified in the Contract. The type and quantity of bitumen, and appropriate thickness, are also indicated for each mixture type.

Proportioning of materials

The aggregates shall be proportioned and blended to produce a uniform mixture complying with the requirements of Table above The binder content shall be within a tolerance of ± 0.3 % by

weight of total mixture when individual specimens are taken for quality control tests in accordance with the provisions of *Clause given*. The quantities of aggregates to be used shall be sufficient to yield the specified thickness after compaction.

Construction Operations

(A) Weather and seasonal limitations

The work of laying Bituminous Macadam shall not be taken up during rainy or foggy weather or

when the base course is damp or wet or during dust storm or when the atmospheric temperature in shade is 10°C or less.

(B) Preparation of base

The base on which bituminous macadam is to be laid shall be prepared, shaped and compacted to the specified profile in accordance with *Clause given* A prime coat where needed shall be



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applied

as per relevant IRC-Specification.

COMPOSITION OF BITUMINOUS MACADAM

Mix designation	Grading 1	Grading 2
Nominal aggregate size	40mm	19 mm
Layer thickness	80-100 mm	50 -75 mm
I.S. Sieve (mm)	Cumulative % by weight of total aggregate passing	
45	100	-
37.5	90-100	-
26.5	75-100	100
19	-	90-100
13.2	35-61	56-88
4.75	13-22	16-36
2.36	4-19	4-19
0.3	2-10	2-10
0.075	0-8	0-8
Bitumen content, % by weight of total mixture	3.1 - 3.4	3.3 - 3.5
Bitumen Grade	35 to 90	35 to 90

(C) Tack coat

A tack coat as per *Clause B-10.3* shall be applied as required by the Contract documents, or as

directed by the Engineer-in-Charge.

(D) Preparation and transport of mix

Bituminous Macadam Mix shall be prepared in a Hot Mix Plant of adequate capacity and capable

to yield a mix of proper and uniform quality with thoroughly coated aggregates. Hot Mix Plant shall be of suitable capacity, preferably of batch mix type. Total system for crushing of stone aggregates and feeding of aggregate fractions in required proportions to achieve the desired mix,

deployed by the Contractor must be capable of meeting the overall specifications



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requirements

under stringent quality control. The plant shall have the following essential features:

(i) *General*

- (a) The plant shall have coordinated set of essential units capable of producing uniform mix as per the job mix formula.
- (b) Cold aggregate feed system with minimum 4 bins having belt conveyor arrangement for initial proportioning of aggregates from each bin in the required quantities. In order to have free flow of fines from the bin, it is advisable to have vibrator fitted on bin to intermittently shake it.
- (c) Belt conveyors below each bin should have variable speed drive motors. There should be electronic load sensor on the main conveyor for measuring the flow of aggregates.
- (d) Dryer unit with burner capable of heating the aggregate to the required temperature without any visible un-burnt fuel or carbon residue on the aggregate and reducing the moisture content of the aggregate to the specified minimum.
- (e) The plant shall be fitted with suitable type of thermometric instruments at appropriate places so as to indicate or record/register the temperature of heated aggregate, bitumen and mix.
- (f) Bitumen supply unit capable of heating, measuring/metering and spraying of bitumen at specified temperature with automatic synchronization of bitumen and aggregate feed in the required proportion.
- (g) A filler system suitable to receive bagged or bulk supply of filler material and its incorporation to the mix in the correct quantity wherever required.
- (h) A suitable built-in dust control system for the dryer to contain/recycle permissible fines in to the mix. It should be capable of preventing the exhaust of fine dust into atmosphere for environmental control wherever so specified by the Engineer-in-Charge.
- (i) The plant should have centralized control panel/cabin capable of presetting, controlling/synchronizing all operations starting from feeding of cold aggregates to the discharge of the hot mix to ensure proper quality of mix. It should have indicators for any malfunctioning in the operation. Print out of the details of hot mix and all operations as stated above in each day shall be available as and when required.
- (j) Every hot mix plant should be equipped with siren or horn so that the operator may use the same before starting the plant every time in the interest of safety of staff.

(ii) *For Batch Type Plant*

- (a) Gradation control unit having minimum four deck vibratory screens for accurate sizing of hot aggregate and storing them in separate bins. This unit should be fully covered to reduce the maintenance cost and for better environmental condition.

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- (b) Proper arrangement for accurate weighing of each size of hot aggregate from the control panel before mixing.
- (c) Paddle mixer unit shall be capable of producing a homogeneous mix with uniform coating fall particles of the mineral aggregate with binder.

(iii) *For Continuous Type Plant*


- (a) Gradation control unit having vibratory screens for accurate sizing of hot aggregate and storing them in separate bins. This unit should be fully covered to d\reduce the maintenance cost and for better environmental condition.
- (b) There should be appropriate arrangement for regulating and volumetric control of the flow of hot aggregate form each bin to achieve the required proportioning.

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- (c) Paddle mixer unit shall be capable of producing a homogeneous mix with uniform coat moral particles of the mineral aggregate with binder.

(iv) *For Drum Mix Plant*

- (a) It is a prerequisite that only properly screened and graded materials are fed to the bins. If required, a vibratory screening unit shall be installed at the plant site to ensure the same,
- (b) Belt conveyors below each bin should have variable speed drive motors. There should be electronic load sensor on the main conveyor for measuring the flow of aggregate.
- (c) There should be arrangement to measure moisture content of the aggregate (s) so that moisture correction may be applied for working out requirements of binder and filler.
- (d) The temperature of binder at the time of mixing and that of the aggregate shall provided that the difference in temperature between the binder and aggregate at no time exceeds 14°C.
- (e) Mixing shall be thorough to ensure that a homogeneous mixture is obtained in which all particles of the aggregates are coated uniformly, and the discharge temperature of mix shall be between 130°C to 160°C.
- (f) The mixture shall be transported from the mixing plant to the point of use in suitable tipper vehicles. The vehicles employed for transport shall be clean and be covered in transit if so directed by the Engineer-in-Charge. Any tipper causing excessive segregation of materials by its spring suspension or other contributing factors or that which show as undue delay shall be removed from the work until such conditions arc corrected.



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(E) Spreading

The mix transferred from the tipper at work site to the pave shall be spread immediately by means of a self propelled mechanical paver with suitable screeds capable of spreading, tamping and finishing the mixture to the specified lines, grade and cross-sections.

The paver finisher shall have the following essential features:

- (a) Loading hoppers and suitable distributing mechanism.
- (b) All drives having hydrostatic drive / control.
- (c) The machine shall have a hydraulically extendable screed for appropriate width requirement.
- (d) The screed shall have tamping and vibrating arrangement for initial compaction to the layer as it is spread without rutting or otherwise marring the surface. It shall have adjust able amplitude and variable frequency.
- (e) The paver shall be equipped with necessary control mechanism so as to ensure that the finished surface is free from surface blemishes.
- (f) The paver shall be fitted with an electronic sensing device for automatic levelling and profile control within the specified tolerances.
- (g) The screed shall have the internal heating arrangement.
- (h) The paver shall be capable of laying either 2.5 to 4.0 m width or 4.0 to 7.0m width has stipulated in the Contract.
- (i) The paver shall be so designed as to eliminate skidding / slippage of the tyres during operation. However, in restricted locations and in narrow widths, where the available plants cannot operate in the opinion of the Engineer-in-Charge he may permit manual laying of the mix.

The temperature of mix at the time of laying shall be in the range 120°C to 135°C.

In multi layer construction, the longitudinal joint in one layer shall off set that in the layer below by about 150 mm. However, the joint in the topmost layer shall be at the centre line of the pavement.

Longitudinal joints and edges shall be constructed true to the delineating line parallel to the centre line of the road. All joints shall be cut vertical to the full thickness of the previously laid mix and the surface painted with hot bitumen before placing fresh material.

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After the spreading of mix, rolling shall be done by 8 to 10 tonne power rollers or other approved

plant. Rolling should start as soon as possible after the material has been spread. Rolling shall be done with care to keep from unduly roughening the pavement surface. Rolling of the longitudinal joint shall be done immediately behind the paving operation. After this the rolling shall commence at the edges and progress towards the centre longitudinally except that on super elevated portions it shall progress from the lower to the upper edge parallel to the centre line of the pavement. The initial of break-down rolling shall be done with 8-10 tonne static weight smooth wheel roller(3 wheels or tandem), as soon as it is possible to roll the mix without cracking the surface or having the mix pick up on the roller wheels. The second or intermediate rolling shall follow the break- down rolling with vibratory roller of 8-10 tonne static weight or pneumatic tired roller 15-25 tonne weight, with minimum 7 wheels and minimum tyre pressure of 0.7 MPa as closely as possible to the paver and be done while the paving mix is still at a temperature that will result in maximum density. The final rolling shall be done while material is still workable enough for removal of roller marks, with 6-8 tonne tandem roller. During the final rolling, vibratory system shall be switched off. The joints and edges shall be rolled with 8-10 tonne static roller.

When the roller has passed over the whole area once, any high spots or depressions which become apparent shall be corrected by removing or adding mix material. The rolling shall then be continued till the entire surface has been rolled properly and as per the direction of Engineer-in-Charge, so that, there is no crushing of aggregates and all roller marks have been eliminated. Each pass of the roller shall uniformly overlap not less than one-third of the track made in the preceding pass. The roller wheel shall be kept damp if necessary to avoid bituminous material from sticking to the wheels and being picked up. In no case fuel, lubricating oil shall be used for this purpose. Excessive pouring of water on the wheels should be avoided.

All manufacturing & rolling temperatures of mix shall conform to Table

Rollers shall not stand on newly laid material while there is a risk that it will be deformed thereby.


The edges along & transverse of the bituminous macadam laid and compacted earlier shall be cut to their full depths so as to expose fresh surface which shall be painted with a thin surface coat of appropriate binder before the new mix is placed against it.

Surface Finish and Quality Control of Work

The surface finish of the completed construction shall conform to the requirement of *Clause above*. For control on the quality of materials and the works carried out, the relevant provisions

of quality control of road works shall apply.

Protection of the Layer



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The bituminous macadam shall be covered with either the next pavement course or wearing course, as the case may be within a maximum of forty-eight hours. If there is to be any delay, the course shall be covered by a seal coat before allowing any traffic over it.

Arrangements for Traffic:

The provision of *Clause above* shall apply as regards the flow or traffic during construction.

Measurement for Payment:

Bituminous Macadam work shall be measured as finished work in square meters.

DENSE BITUMINOUS MACADAM

Scope

The work shall consist of construction in a single course of 50 to 100 mm. thick base/binder course

to the following specifications on a previously prepared base.

Materials

(a) Binder

Clause above, Sub-paragraph (a) shall apply.

(b) Coarse aggregates

The coarse aggregates shall consist of crushed rock, crushed gravel or other hard materials retained on 2.36 mm sieve. They shall be clean, hard, and durable, of cubical shape, free from dust and soft or friable matter, organic or other deleterious matter. Where the Contractor's selected source of aggregates has poor affinity for bitumen, as a condition for the approval of that source, the bitumen shall be treated with an approved anti-stripping agent, as per the manufacturer's recommendations, without additional payment. Before approval of the source, the aggregates shall be tested for stripping. The aggregates shall satisfy the physical requirements specified in Table below for dense bituminous macadam.

PHYSICAL REQUIREMENT FOR COARSE AGGREGATES FOR DENSE BITUMINOUS MACADAM



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Property	Test	Specification
Cleanliness (dust)	Grain size analysis	Max 5% passing 0.075 mm sieve
Particle shape	Flakiness & Elongation Index (combined)	Max 30%
Strength*	Los Angeles Abrasion Value Aggregate Impact Value	Max 35% Max 27%
Durability	Soundness Sodium Sulphate Magnesium Sulphate	Max 12% Max 18%
Water Absorption	Water absorption	Max 2%
Stripping	Coating & Stripping of Bitumen Aggregate Mixtures	Minimum retained coating 95%
Water Sensitivity**	Retained Tensile Strength	Min 80%

**

Aggregates may satisfy requirements of either of the two tests.

The water sensitivity test is only required, if the minimum retained coating in the stripping test is less than 95%.

Where crushed gravel is proposed for use as aggregate, not less than 90% by weight of the crushed material retained on the 4.75 mm sieve shall have at least two fractured faces.

(c) Fine aggregates

Fine aggregates shall be crushed or naturally occurring material, or a combination of the two, passing 2.36 mm sieve and retained on 75 micron sieve. They shall be clean, hard, durable, uncoated, dry and free from dust and soft or friable matter, organic or other deleterious substances. The fine aggregates shall have a sand equivalent value of not less than 50 when tested in accordance with the requirement of IS: 2720 (Part 37).

The plasticity index of the fraction, passing the 0.425 mm sieve shall not exceed 4, when tested in accordance with IS : 2720 (Part 5).

(d) Filler:

The filler shall consist of finely divided mineral matter such as rock dust, hydrated lime or cement

as approved by the Engineer-in-Charge. The filler shall be graded within the limits indicated in Table below



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TABLE FOR GRADING REQUIREMENT FOR MINERAL FILLER

IS Sieve (mm)	Cumulative per cent passing by weight of total aggregate
0.60	100
0.30	95-100
0.075	85-100

The filler shall be free from organic impurities and have a Plasticity Index not greater than 4.

The

Plasticity Index requirement shall not apply if filler is cement or lime. When the coarse aggregate is gravel, 2% by weight of total aggregate, shall be Portland cement or hydrated lime and the percentage of fine aggregate reduced accordingly. Cement or hydrated lime is not required when


the limestone aggregate is used. Where the aggregates fail to meet the requirements of the water sensitivity test in Table above, then 2% by total weight of aggregate, of hydrated lime shall be added without additional cost.

Aggregate grading and Binder content

The combined grading of the coarse and fine aggregates and added filler for the particular mixture shall fall within the limits shown in Table B 10.7-3 for dense bituminous macadam grading 1 or 2 as specified in the Contract. The type and quantity of bitumen, and appropriate thickness, are also indicated for each mixture type.

TABLE B FOR COMPOSITION OF DENSE BITUMINOUS MACADAM

Grading	1	2
Nominal aggregate	40 mm	25mm
Layer Thickness	80 -100 mm	50-75mm
IS Sieve) (mm)	Cumulative % by weight of total aggregate passing	
45	100	--
37.5	95-100	100
26.5	63-93	90-100
19	--	71-95
13.2	55-75	56-80
9.5	--	--


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4.75	3S-54	3S-54
2.36	2S-42	2S-42
1.18	--	--
0.6	--	--
0.3	7-21	7-21
0.15	--	--
0.075	2-S	2-S
Bitumen content % by mass of total mix ²	Min4.0	Min4.5
Bitumen Grade (penetration)	65 or 90	65 or 90

TABLE FOR REQUIREMENT OF DENSE BITUMINOUS MACADAM MIX

1.	Minimum Stability (kN at 60° C)	9.0
2	Minimum flow (mm)	2
3	Maximum flow (mm)	4
4	Compaction level (Number of blows)	75 blows on each of the two faces of the
5	Per cent air voids	3-6
6.	Per cent voids in mineral aggregate	As per Table GIVEN
7.	Per cent voids filled with bitumen	65-75

Notes:

1. The combined aggregate grading shall not vary from the low limit on one sieve to the high limit on the adjacent sieve.
2. Determined by the Marshall method.

Mix Design**(a) Requirement of mixture**

Apart from conformity with grading and quality requirements for individual ingredients, the mixture shall meet the requirements set out in Table ABOVE

(b) Job mix formula

The Contractor shall intimate to the Engineer-in-Charge in writing, at least 20 days before the start of the work, the job mix formula proposed to be use by him for the work and shall give the

following details:

(i) Source and location of all materials;

(ii) Proportions of all materials expressed as follows where each is applicable:

(a) Binder, as percentage by weight of total mix.

(b) Coarse aggregate / Fine aggregate / Mineral filler as percentage by weight of

total



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aggregate including mineral filler.

(iii) A single definite percentage passing each sieve for the mixed aggregate.

(iv) The results of tests enumerated in Table GIVEN as obtained by the Contractor.

(v) Test results of physical characteristics of aggregates to be used.

(vi) Mixing temperature and compacting temperature.

(vii) Where the mixer is a batch mixer, the individual weights of each type of aggregate, and binder per batch.

While working out 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 mixture and its different ingredients satisfy the physical and strength requirements of these Specifications.

Approval of the job mix formula shall be based on independent testing by the Engineer-in-Charge

for which samples of all ingredients of the mix shall be furnished by the Contractor as required by the former.

The approved job mix formula shall remain effective unless and until modified by the Engineer-in-

Charge. Should a change in the source of materials be proposed, a new job mix formula shall be

established and got approved from the Engineer-in-Charge before actually using the materials.

TABLE FOR MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE (VMA)

Nominal Particle Size' (mm)	Minimum VMA, percent related in Design Air Voids ² (%)		
	3.0	4.0	5.0
9.5	14.0	15.0	16.0
12.5	13.0	14.0	15.0
19.0	12.0	13.0	14.0
25.0	11.0	12.0	13.0

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37.5	10.0	11.0	12.0
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1 - The nominal maximum particle size is one size larger than the sieve to retain more than 10%.

2 - Interpolate minimum voids in the mineral aggregates (VMA) for designs air voids values between those listed.

(C) Permissible variation from job mix formula

It shall be the responsibility of the Contractor to produce a uniform mix conforming to the approved job mix formula subject to the permissible variations of the individual percentage of the

various ingredients in the actual mix from the job mix formula to be used within the limits as specified in the Table GIVEN. These variations are intended to apply to individual specimens taken for quality control tests vide Section B-9.

Table FOR PERMISSIBLE VARIATION FROM THE JOB MIX FORMULA

Description	Permissible variation	
	Base/binder course	Wear/finz course
Aggregate passing 19 mm sieve or larger	±8%	±7%
Aggregate passing 13.2 mm, 9.5 mm	±7%	±6%
Aggregate passing 4.75 mm sieve	±6%	±5%
Aggregate passing 2.36 mm, 1.18 mm, 0.6	±5%	±4%
Aggregate passing 0.3 mm, 0.15 mm	±4%	±3%
Aggregate passing 0.075 mm sieve	±2%	± 1.5%
Binder content	+0.3%	+0.3%
Mixing temperature	+ 10° e	+ 10° e

Once the plant trials have demonstrated the capability of the plant, and the trials are approved, the laying operation may commence. Over the period of the first month of production for laying of the works, the Engineer-in-Charge shall require additional testing of the product to establish the reliability and consistency of the plant.

(d) Laying Trials

Once the plant trials have been successfully completed and approved, the Contractor shall carry out laying trials, to demonstrate that the proposed mix can be successfully laid, and compacted. The laying trial shall be carried out on a suitable area which is not to form part of the works, unless specifically approved in writing, by the Engineer-in-Charge. The area of the laying trials shall be a minimum of 100 m² of construction similar to that of the project road, and it shall be in all respects, particularly compaction, the same as the project construction, on which the bituminous material is to be laid.



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The Contractor shall previously inform the Engineer-in-Charge of the proposed method for laying

and compacting the material. The plant trials shall then establish if the proposed laying plant, compaction plant, and methodology is capable of producing satisfactory results. The density of the finished paving layer shall be determined by taking cores, no sooner than 24 hours after laying, or by other approved method. /

Construction Operations

(a) Preparation of base

The base on which Dense Bituminous Macadam is to be laid shall be prepared, shaped and conditioned to the specified lines, grades and cross sections as directed by the Engineer. The surface shall be thoroughly swept clean free from dust and foreign matter using mechanical broom and dust removed or blown off by compressed air. In portions where mechanical means cannot reach, other approved method shall be used. Where the material on which the dense bituminous macadam is to be laid is other than a bitumen bound layer, a prime coat shall be applied.

(b) Tack Coat

Where the material on which the dense bituminous macadam is to be placed is a bitumen bound surface, a tack coat shall be applied.

(c) Equipment's

For details of Hot Mix Plant, Paver etc. please refer details in *Clause B-JO.6 Bituminous Macadam*.

(d) Spreading

The mix transported from the hot mix plant to the site shall be spread by means of a self-propelled paver with suitable screeds capable of spreading, tamping and finishing the mix to specified grade, lines and cross-section. In restricted locations and in narrow widths where the available equipment cannot be operated in the opinion of the Engineer-in-Charge, he may permit manual laying of the mix. Similarly for smaller jobs, mechanical paver may be used with the approval of the Engineer.

TABLE FOR Manufacturing & Rolling Temperatures

Bitumen	Bitumen Mixing (0C)	Aggregate Mixing (0C)	Mixed Material (0C)	Rolling (0C)	Laying (0C)
65	150-165	150-170	165 Max.	90 Min.	125 Min.
90	140-160	140-165	155 Max.	80 Min.	115 Min.

Appropriate mixing temperatures can be found in Table GIVEN; the difference in temperature between the binder and aggregate should at no time exceed 14° C. In order to ensure uniform



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quality of the mix and better coating of the aggregates, the hot mix plant shall be calibrated from time to time.

(e) Compaction

After spreading the mix by paver, it shall be thoroughly compacted by rolling with a set of rollers

moving at a speed not more than 5 Kmlh, immediately following the paver.

Generally the initial or breakdown rolling shall be done with 8-10 tonne dead weight smooth-wheeled roller. The intermediate rolling shall be done with 8-10 tonne dead weight or vibratory roller or with a pneumatic tyred roller of 12-15 tonne weight having nine wheels with a tyre pressure of at least 5.6 kg/cm'. The finish rolling shall be done with 6-8 tonne smooth wheeled tandem rollers.

All the compaction operations i.e. breakdown rolling and intermediate rolling can be accomplished

by using vibratory tandem roller of 8-10 tonne static weight.

During initial breakdown rolling and finish rolling, no vibratory compaction shall be resorted to.

The exact pattern of rolling shall be established after as a result of reversing of the direction of a

roller of from any other cause shall be corrected at once as specified and / or removed and made

good. The rollers shall not be permitted to stand on pavement which has not been fully compacted and where temperature is still more than 70° C. Necessary precautions shall be taken to pavement either when the rollers are operating or standing.

The wheels of roller shall be kept moist to prevent the mix from adhering to them. But in no case

shall fuel / lubricating oil be used for this purpose nor did excessive water pour on the wheels.


Rolling shall commence longitudinally from edges and proceed towards the centre, except that on super elevated and unidirectional cambered portions, it shall progress from the lower to upper edge parallel to the centre line of the pavement.

The roller shall proceed on the fresh material with rear or fixed wheel leading so as to minimise the pushing of the mix and each pass of the roller shall overlap the preceding one by half the width of the rear wheel.

Rolling shall be continued until the specified density is achieved, or where no density is specified,

until there is no further movement under the roller. Skin patching of an area that has been rolled

will not be permitted. Rolling operations shall be completed in all respects before the



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temperature

of the mix falls below as specified in Table GIVEN

Opening to Traffic

Traffic may be allowed at least 24 hours after completion of the final rolling.

Surface Finish and Quality Control of Work

The surface finish of the completed construction shall conform to the requirements of IRC Code.

Control on the quality of materials and works shall be exercised by the Engineer in accordance with

Arrangements for Traffic:

During the period of construction, arrangements for the traffic shall be done as per *Clause GIVEN* and as per direction of Engineer-in-Charge.

Primer Coat

Providing and applying bituminous **Primer Coat** for priming of base course with Cationic bituminous emulsion of approved grade and requisite quantity including preparation of the surface to be primed, through cleaning and sweeping, uprooting weeds, grass etc. dampening the surface beforehand spraying the primer using sprayer mounted on distributor truck or with hand sprayer using mechanical pump including cost and carriage of bitumen emulsion and all other incidental costs of work.

(a) For surfaces with low porosity ($@ 7.5 \text{ kg} / 10 \text{ m}^2$).


(b) For surfaces with medium porosity ($@ 10.5 \text{ kg} / 10 \text{ m}^2$).

TACK COAT

The work shall consist of application of hot liquid bitumen to the existing road surface preparatory to another bituminous construction.

Materials

The binder used for tack coat shall be bitumen of a suitable grade as directed by the Engineer – in – Charge and conforming to I.S. 73. 217 or 454.



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Preparation of base

The surface on which the tack coat / prime coat is to be applied shall be thoroughly swept and scraped clean of dusts any other extraneous materials before application of the binder

Application of binder

The binder shall be heated to temperature appropriate to the grade of bitumen used and approved by the Engineer – in – Charge. and shall be applied with the aid of sprayers just ahead of the on coming bituminous construction. In case of straight run bitumen the rate of spray shall be as under :-

- i) 4 Kg per 10 sq.m. area over water bound macadam surface.
- ii) 3 Kg. per 10 sq.m. area over existing bituminous surface.

Measurement for payment

The tack coat shall be measured in terms of surface area application in Sq. meter.

Corrective course

If there are depressions, damage or pot holes in any surface of the existing road or in any portion thereof, prior treatment of the surface shall have to be done by the Contractor before any ever lay is said there on. Bulges will have to be removed and depression filled up so as to bear the counter of the surface. And the desired profile.

Type of corrective course

The corrective course on existing black top surface, shall consist of a suitable bituminous treatment of varying thickness as directed by the Engineer – in – Charge. as required to bring the finished surface to correct lines and levels. For this purpose the existing blacktop surface is to be initially cleaned if all foreign matter and extraneous deposits (if any) the surface picked up at intervals of suitable roughened as directed. A tack coat of Bitumen as per specification is to be provided on the surface thus prepared. Lean bituminous corrective course is there to be laid to requisite varying thickness with due allowance for deduction of thickness when compacted. The specification adopted for this bituminous corrective course shall be the same as that of bituminous macadam impact that the maximum side of the aggregate will have to suitably adjusted as per direction and approval as directed by the Engineer – in – Charge according to the thickness of the corrective course at different places of the area.



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The corrective course requiring thickness of more than 75 mm on existing black top surface shall be provided with compaction jhama metal consolidation. The existing surface shall have to be cleaned, scraped and to be picked up to ensure proper bending with the corrective course.

Mode of measurement and payment

The payment shall be made on the basic of loose volume of major aggregate after deduction of shrinkage and / or shrinkage allowance actually consumed in the work for corrective course. The materials supplied at the spot of such work shall first be measured and be recorded jointly by the contracts, and the KMDA personnel and after consumption. The balance of materials shall be properly stacked, measure and recorded jointly by the contractor and the KMDA personnel. The difference of volume of such materials after deduction of shrinkage and / or shrinkage allowances shall be the loose volume of materials actually consumed in the work.

PREMIX CARPET

Description

This work shall consist of laying and compacting an open graded carpet of 2 cm thickness in a single course composed of suitable small sized aggregates premixed with a bituminous binder on a previously prepared base, in accordance with the requirements of these specification to serve as a wearing course.

Materials


Binder

The binder shall be bitumen of a suitable grade appropriate to the region, traffic, rainfall and other environmental condition as directed by the EIC, and satisfying the requirements of IS : 73,217,454 or other approved cutback as applicable.

Aggregates

The aggregates shall consists of crushed stone, crushed gravel / shingle or other stones. This shall be clean, durable, fairly cubical in shape and free from disintegrated piece organic or other deleterious matters and adherent coatings. They shall preferably be hydrophobic and of low porosity.

Proportioning of materials



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The materials shall be proportioned as per quantities given in the following table :

Quantities of Materials required for 10 sq.m. of Road surface for 2 cm thick open graded premix carpet

Aggregates for carpet

a)	Stone chippings 13.2 mm size stone passing 22.4 mm sieve and retained on 11.2 mm sieve	0.18 M ³
b)	Stone chippings 11.2 mm size passing 13.2 mm sieve and retained on 5.6 mm sieve	0.09 M ³
	Total		0.27 M ³

Binder for premixing (quantities in terms of straight run bitumen)

a)	For 0.18 M ³ of 13.2 mm size stone chippings at 52 Kg per M ³	...	9.5 Kg
b)	For 0.09 M ³ of 11.2 mm size stone chippings at 56 Kg per M ³	...	5.1 Kg
			Total 14.6 Kg


Preparation of base

The underlying base on which the bituminous carpet is to be laid shall be prepared shaped and conditioned to the specified lines, grade and cross section in accordance with the specifications as directed by the EIC. The surface shall be well cleared by removing caked earth and other foreign matter with wire brushes, sweeping with brooms and finally dusting with sacks, as necessary.

12.0 BITUMEN MASTIC

12.1 This work shall consist of constructing a single layer of 25 mm to 50 mm thick Bitumen Mastic wearing course for road pavements and bridge decks. The

bitumen mastic shall be laid over a Dense Bituminous Macadam base in case of road pavements and over a Cement Concrete base in bridge decks.



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- 12.2 The Bitumen Mastic is an intimate homogeneous mixture of selected well-graded' aggregates and bitumen in such proportions as to yield a plastic and void less mass, which when applied hot can be towelled and floated to form a very dense impermeable surfacing.

13 MATERIALS

13.1 Bitumen


The binder shall be straight-run-bitumen of a suitable grade satisfying the requirements of IS : 73 or industrial bitumen as per IS : 702. It shall be paving bitumen of Grade S 35 (30/40 penetration made) or any other appropriate grade as directed by the Engineer. The requirements of physical properties of bitumen are as given in Table below :-

TABLE SHOWING REQUIREMENT OF PHYSICAL PROPERTIES OF BITUMEN

Sl. No.	Characteristics	Requirement	Method of tests
1.	Penetration at 25°C (in 1/100 mm)	20 to 40	IS :1203
	Softening point (Right and Ball Method)	50°C to 90°C	IS 1205
	Ductility at27°C (Minimum)	10 cm	IS 1208
	Loss on heating (Maximum)	3 percent	IS : 1212
	Solubility in CS2 (Minimum)	99 per cent	IS : 1213

13.2 Coarse aggregate

The coarse aggregates shall consist of hard durable crushed stones, which shall be clean, strong, free of disintegrated pieces, organic and other deleterious **matter** and adherent coatings. They shall be hydrophobic and of low porosity and shall satisfy the physical requirements given specifications to



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Road and Bridge works published by IRC except that the maximum value of water absorption shall

The percentage and grading of the coarse aggregates to be incorporated in the bitumen mastic depending upon the thickness of the finished course shall be as in Table below:

Sl. No.	Type of work	Thickness of finished Course (mm)	Percentage of coarse Aggregates	Grading of Coarse Aggregates	
				Passing I.S. Sieve	Percentage
1.	Wearing course for pavement & bridge deck	(a) 25 - 40	(a) 30 - 40	19 mm	100
				13.2 mm	88-96
		(b) 41 - 50	(b) 40 - 50	2.36 mm	0-5

13.3 Fine aggregates

The fine aggregates shall be the fraction passing 2.36 mm and retained on 75 micron sieve consisting of crusher run screening, natural sand or a mixture of both. These shall be clean, hard, durable, uncoated, dry and free from any injurious soft or flaky pieces and organic or deleterious substances.

13.4 Filler

The filler shall be limestone passing 75 micron sieve and shall have a calcium , carbonate content of not less than 80 percent by weight when determined in accordance with IS : 1195.

The grading of the fine aggregates inclusive of filler shall be as given in Table below :-**TABLE SHOWING GRADING OF FINE AGGREGATES (INCLUSIVE OF FILLER)**

Sl. No.	I.S. Sieve Passing	I.S. Sieve Retained	Percentage by Weight
1.	2.36 mm	600 micron	0-25


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2.	600micron	2-12 micron	5-35
3.	212 micron	75 micron	10-20
4.	75micron		30-50
5.	Bitumen Binder		

14. MIX DESIGN

14.1 Hardness number

The bitumen mastic shall have a hardness number of 60 to 80 at 25°C without coarse aggregates and 10 to 20 at 25°C after adding coarse aggregates. The hardness number shall be determined in accordance with the method specified in IS : 1195.

14.2 Binder content

The binder content shall be so fixed as to achieve the requirements of the mix seal forth and shall be in the range of 14-17 percent by weight of total mix as indicated in Table above.

14.3 Job mix formula

The Contractor shall intimate the Engineer in writing at least 20 days before the start of the work, the job mix formula proposed to be used by him for the work, indicating the source and location of all materials, proportions of all materials such as binder and aggregates, single definite percentage passing each sieve for the mixed aggregates and results of the tests recommended in various Tables . and Clause of this specification.

15. CONSTRUCTION OPERATIONS

15.1 Weather, and seasonal limitations As per IRC Specifications



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Tender Inviting Authority*

Signature of the Tenderer

*Signature of the
Tender Accepting Authority*

15.2 **Preparation of the base**

The base on which bitumen mastic is to be laid shall be prepared, shaped and conditioned to the specified levels, grade and cross fall (camber) in accordance with Clause 501 or as directed by the Engineer. In case of a cement concrete base, the surface shall be thoroughly swept and scraped clean and free of dust and other deleterious matter. Under no circumstances shall bitumen mastic be spread on a base containing a binder which will soften under high application temperature. If any such spots or area are there the same shall be cut out and repaired before the bitumen mastic is laid.

15.3 **Preparation of bitumen mastic**

Preparation of bitumen mastic consists of two stages. The first stage shall be mixture of filler and fine aggregates and then heating the mixture to a temperature of 170°C to 200°C. Required quantity of bitumen shall be heated to 170°C to 180°C and added to the heated aggregate. They shall be mixed and cooked in an approved type of mechanically agitated mastic cooker for some time till the materials are thoroughly mixed. Initially the filler alone is to be heated in the cooker for an hour and then half the quantity of binder is added. After heating and mixing for some time, the fine aggregates and the balance of binder are to be added and further cooked for about one hour. The second stage is incorporation of coarse aggregates and cooking the mixture for a total period of 3 hours. During cooking and mixing care shall be taken to ensure that the contents in the cooker are at no time heated to a temperature exceeding 200°C.

In case where the material is not required for immediate use it shall be cast into blocks with filler, fine aggregates and binder, weighing about 25 kg each. These blocks when required to be used, have to be reheated in the mechanically agitated cooker, to a temperature of not less than 170°C and not more than 200°C. The mixture shall be thoroughly incorporated with the requisite quantity of coarse aggregates and mixed continuously for not less than an hour. Mixing shall be continued until laying operations are completed so as to maintain the coarse



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aggregates in suspension. At no stage during the process of mixing shall the temperature exceed 200°C.

The bitumen mastic blocks (without coarse aggregates) shall show on analysis a composition within the limits as given in Table

TABLE SHOWING COMPOSITION OF BITUMEN MASTIC BLOCKS WITHOUT COARSE AGGREGATES

I.S. Sieve Passing	I.S. Sieve Retained	Percent age by weight	
		Minimum	Maximum
2.36 mm	600 micron'	0	22
600 micron	212 micron	4	30
212 micron	75 micron	8	18
75 micron	—	25	45
Bitumen Content		14	17

The mix shall be transported to the laying site in a towed mixer transporters having arrangement for stirring and keeping the mix hot during transportation

15.4 Spreading

The bitumen mastic shall be deposited directly on the prepared base immediately in front of the spreader where it is spread uniformly by means of wooden floats to the required thickness. The mix shall be laid in one metre width contained between angle iron of sizes suitable to retain the required thickness. The temperature of the mix at the time of laying shall be



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around 170°C. In case blowing takes place while laying the bitumen mastic, the bubbles shall be punctured while it is hot and the surface treated well

15.5 Joints

It shall be ensured that all construction joints are properly and truly made. These joints shall be made by warming existing bitumen mastic by the application of excess quantity of the bitumen mastic mix which afterwards shall be trimmed off to make it flush with the surfaces on either side.

15.6 Surface finish

the bitumen mastic surface can be slippery after floating; in order to provide resistance to skidding, the bitumen mastic after spreading, while still hot, and in plastic condition shall be covered with a layer of stone aggregates of 9.5 mm size (passing 13.2 mm sieve and retained on 6.7 mm sieve). Hard stone chips of approved quality percolated with bitumen at the rate of two percent of S-65 to S-90 penetration grades at 25°C at the rate of 0.005 cu.m. per 10 sq.m. shall be rolled or otherwise passed into the surface of the mastic layer when the temperature of bitumen mastic is between 80°C and 100°C.



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Signature of the Tenderer

*Signature of the
Tender Accepting Authority*



Price Rs. 10/- (Rupees Ten only)

Tender No. _____ Date _____

Issued to _____

Date of Opening _____ Hours _____

KOLKATA METROPOLITAN DEVELOPMENT AUTHORITY

TENDER FORM - I

Item Rate Tender & Contract for Works

KOLKATA METROPOLITAN DEVELOPMENT AUTHORITY

No.

of

ITEM RATE TENDER AND CONTRACT FOR WORKS

GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF CONTRACTORS

1. All works proposed for execution by contract will be notified in a form of invitation to tender posted in the public places and signed by the Officer-in-charge.

This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out of the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit to be deposited by the successful tendered and percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work, signed for the purpose of identification by the Officer-in-charge shall also be opened for inspection by the contractor at the office of the Officer-in-charge during office hours.

2. In the event of the tender being submitted by a firm, it must be signed separately by each member thereof or, in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of-attorney authorising him to do so. Such power-of-attorney must be produced with tender, and say in the case of a firm carried on by one member of joint family, it must disclose that the firm is duly registered under the Indian Partnership Act.

3. Receipts for payments made on account of a work, when executed by a firm must also be signed by the several partners except where the contractors are described in their tenders as a firm, in which case the receipts must be signed in the name of the firm by one of the partners or by some other person having authority to give effectual receipts for firm.

4. Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work or which contain any other conditions of any sort, will be liable to rejection. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit a tender for each. Tenders shall have the name and numbers of the work to which they refer written outside the envelope.

5. The Officer-in-charge, or his duly authorised assistant will open tenders in the presence of any intending contractors who may be present at the time and will enter the amount of the several tenders in a Comparative Statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money forwarded therewith shall thereupon be given to the contractor, who shall thereupon for the purpose of identification sign copies of the specification and other documents mentioned in Rule - 1. In the event of tender being rejected, the earnest money forwarded with such unaccepted tender shall be refunded within 10 days from the date on which the tender is decided; provided the contractor(s) present himself/themselves before the Officer-in-charge to take the refund.

6. The accepting authority reserves the right to reject any or all the tender without assigning any reasons and he will not bound to accept either the lowest tender, or any of the tender.

7. The receipt of any accountant or clerk for any money paid by the contractor will not be considered as any acknowledgement of payment to the officer and the contractor shall be responsible for seeing that he procures a receipt signed by the Officer-in-charge, or duly authorised Cashier.

8. The memorandum or work tendered for, and the schedule of materials to be supplied by the KMDA and their issue rates, shall be filled in and completed in the office of the Officer-in-charge before the tender form issued. If a form is issued to an intending contractor without having been so filled in and completed, he shall request the office to have this done before he completes and delivers this tender.

TENDER FOR WORKS

I/We hereby tender for the execution for the KMDA of the work specified in the under written memorandum within the time specified in such memorandum at the rates specified therein, and accordance in all respects with the specifications, designs, drawings, and instructions in writing referred to in Rule -1 hereof and in clause II of the annexed conditions and with such materials are provided for by and in all other respects in accordance with such conditions as far as applicable.

MEMORANDUM

(a) General description

(a) If several sub work are included they should be detailed in a separate list

- (b) Estimated Amount ... Rs.
- (c) Earnest Money deposited in details ... Rs.
- (d) Security Deposit (including earnest money) ... Rs.
- (e) Percentage, if any, to be deducted from bills ... %
(... Percent)
- (f) Time allowed for the work from date of written order to commence ... days / months

Item No.	Item of work	Unit	Per	Rate tendered	
				In figures	In words

Note : To be continued on additional sheets, if necessary

Should this tender be accepted I / We hereby agree to abide by and fulfill all the terms and provisions of the said conditions of contract annexed hereto so far as applicable, or in default thereof to forfeit and pay to the KMDA or his successors in office the sums of money mentioned in the said conditions.

The sum of Rs.....* is herewith forwarded as earnest money the full value of which is to be absolutely forfeited to the KMDA or its successors in office, without prejudice to any other rights or remedies of the said KMDA or its successors in office, should I / We fail to commence the work specified in the above memorandum otherwise the said sum of Rs.....shall be detained by KMDA on account of the security deposit specified in Clause No. 1 of the said conditions of the contract.

* Give particulars and numbers

Dated, the _____ day of 200 †

Witness ±

Address

Occupation

The above tender is hereby accepted by me on behalf of the KMDA

Dated, the _____ day of 200 \$

† Signature of contractor before submission of tender

± Signature of Witness to Contractor's signature

\$ Signature of the officer by whom accepted

CONDITIONS OF CONTRACT

Clause 1 - The person/persons, whose tenders may be accepted (hereafter called the contractors) shall permit the KMDA at the time of making any payment to him for work done under the contract to deduct such sum as along with the sum..... already deposited as earnest money will amount to 10% of the Tendered amount.

Security deposit

Such deductions to be held by KMDA by way of security deposit provided always that the KMDA for this purpose shall be entitled to recover 8 % of the amount of each running bill till the balance of the amount of security deposit is realised. All compensation or other sums of money payable by the contractor under terms of this contract may be deducted from or paid by the sale of a sufficient part of his security deposit, or from the interest arising there from or from any sums which may be due to or may become due to the contractor by KMDA on any account whatsoever and in the event of his/their security deposit being reduced by reason of any such deductions or sale as foresaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the Sate Bank of India or by Scheduled/Nationalized Banks of Government securities (if deposited for more than 12 months) endorsed in favour of the KMDA any sum or sums which may have been deducted from, or raised by sale of his/their security deposit or any part thereof. The security deposit shall be collected from the running bills of the contractor at the rates mentioned above and the earnest money, if deposited in cash at the time of tenders, will be treated as part of the security deposit.

Clause 2 - The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor and shall be reckoned from the date on which the order to commence work is given to the contractor. The work shall throughout the stipulated period for contract be proceeded with all due diligence (time being deemed to be the essence of the contract, on the part of the contractor) and the contractor shall pay as compensation all amount equal to one per cent, or such smaller amount as the Superintending Engineer/Chief Engineer (whose decision in writing shall be final) may decide on the amount of the tender, amount of the whole work as shown in the tender, for everyday that the work remains uncommenced or unfinished after the proper dates. The contractor shall commence execution of such part of the work as may be notified to him within.....days from the date of order for commencement of work and deligently continue such work and further to ensure good progress during the execution of the work and he shall be bound in all cases in which the time allowed for any work exceeds one month, complete one-fourth of the whole of the work, before one-fourth of the whole time allowed under the contract has elapsed, one-half of the work, before one-half of such time has elapsed, and three-fourth of the work before three-fourth of such time has elapsed.

Compensation for delay

In the event of the contractor failing to comply with any of the conditions herein he shall be liable to pay as compensation an amount equal to one per cent or such smaller amount as the Superintending Engineer/Chief Engineer (whose decision in writing shall be final) may decide on the said tender amount of the whole work for every day that the due quantity of work remains incomplete PROVIDED ALWAYS that the entire amount of compensation to be paid under provisions of this clause shall not exceed ten per cent of the tendered amount of work as shown in the tender.

Action when
whole of security
deposit is
forfeited

Clause 3 - In any case in which under any clause or clauses of this contract the contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit (whether paid in one sum or deducted by instalment) the Executive Engineer, on behalf of the KMDA shall have power to adopt any of the following course as he may deem best suited to interest of KMDA.

- a) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the Executive Engineer shall be conclusive evidence) and in which case the security deposit of the contractor shall stand forfeited, and be absolutely at the disposal of KMDA.
- b) To employ labour paid by KMDA and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and the price of the materials (for the amount of which cost and price a certificate of the Executive Engineer shall be final and conclusive against the contractor) and crediting him with the value of the work done in all respects in the same manner and the same rates as if it had been carried out by the contractor under the terms of this contract; the certificate of the Executive Engineer as to the work done shall be final and conclusive against the contractor.
- c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted out of his hands and to give it to another contractor to complete, in which case any expense which may be incurred in excess of the sum which have been paid to the original contractor, if the whole work had been executed by him of the amount of which excess the certificate in writing of the Executive Engineer shall be final and conclusive, shall be borne and paid by the original contractor and may be deducted from any money due to him KMDA under the contract or otherwise, or from his security deposits or the proceeds of sale thereof, of a sufficient part thereof.

In the event of any of the above course being adopted by the Executive Engineers the contractor shall have no claim to compensation for any loss sustained by him reason of his having purchased, or procured any materials, or entered into any engagement or made any advances on account of or with a view to executing of the work or the performance of the contract. (And in case the contract shall be rescinded under the provision aforesaid) the contractor shall not be entitled to cover or be paid any sum for any work thereof actually performed under this contract, unless and until the Executive Engineer will have certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

Contractor
remains liable to
pay compensation
if action not taken
under Clause-3

Clause 4 - In any case in which any of the powers conferred upon the Executive Engineer by Clause 3 hereof, shall have become exercisable and the same shall not be exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such power shall notwithstanding be exercisable in the event of any future case of default by the contractor for which by any clause or clauses hereof he is declared liable to pay compensation

amounting to the whole of his security deposit, and the liability of the contractor for past and future compensation shall remain unaffected in the event of the Executive Engineer putting in force either of the powers (a) or (b) vested in him under the preceding clause, he may, if so desire, take possession of all or any tools, plants, materials and stores, in or upon the works, or the site thereof or belonging to the contractor, or procured by him and intended to be used for the execution of the work or any part thereof, paying or allowing for the same in account at the contract rates or in case of these not being applicable a current market rates to be certified by the Executive Engineer whose certificate thereof shall be final, otherwise the Executive Engineer may by notice in writing to the contractor or his clerk of the works, foreman or other authorized agent required him to remove such tools, plant, materials or stores from the premises (within a time to be specified in such notice) and in the event of the contractor failing to comply with any such requisition the Executive Engineer may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor at his risk in all respects and the certificate of the Executive Engineer as to the expense of any such removal and the amount of the proceeds and expense of any such sale shall be final and conclusive against the contractor.

Power to take possession of, or require removal of or sell contractors plant

Clause 5 - If the contractor desires an extension of the time for completion of the works on the grounds of his having been unavoidable hindered in its execution, the contractor shall give an immediate report of such hindrance to the Executive Engineer in writing and if he desires an extension of time for completion of the work on the ground thereof, he shall apply in writing to the Executive Engineer within 7 days of the date of cessation of such hindrance on account of which he desires such extension as aforesaid and the Executive Engineer shall (if in his opinion which shall be final reasonable grounds be shown thereof) recommend such extension of time, as may, in the opinion, be necessary or proper to the final authority i.e.C.E.O./KMDA through S.E./C.E. as the case may

Extension time

Clause 6 - On completion of the work, the contractor shall be furnished with a certificate by the Executive Engineer (hereunder called the Engineer-in-charge) of such completion, nor shall the work be considered to be completed until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials and rubbish and cleaned of the dirt from all wood-work, door, windows, walls, floors, or other parts of any building, in, upon or about which the work is to be executed, or of which he may have had possession for the purpose of the execution thereof not until the work shall have been measured by the Engineer-in-charge whose measurement shall be binding and conclusive against the contractor. If the contractor shall fail to comply with the requirements of this clause as to removal of scaffolding, surplus materials and cleaning of dirt on or before the date fixed for the completion of the work, the Engineer-in-charge may at the expense of the contractor remove such scaffolding, surplus material and rubbish, and dispose off the same as he thinks fit and clean of such dirt as aforesaid and the contractor shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realised by the sale thereof.

Final Certificate

Clause 7 - No payment shall be made for work estimated to cost less than Rupees one thousand, till after the whole of the works have been completed and a certificate of completion given. But in the case of works estimated to cost more than Rupees one thousand, the contractor shall on submitting the bill thereof be entitled to receive a monthly payment proportionate to the part thereof, then approved and passed by the Engineer-in-charge whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor. But all such intermediate payments shall be regarded as payment by way of advance against the final payment only and not as payment for work actually done and completed, and shall not preclude the requiring of bad, unsound, and imperfect or unskilful work to be removed and taken away and reconstructed, or re-erected, or be considered as an admission of the due performance of the contract, or any part thereof in any respect of the accruing of any claim nor shall it conclude, determine, or affect in any way the powers of the Engineer-in-charge under these conditions or any of them as the final settlement and adjustment of accounts or otherwise or in any other way very effect of the contract. The final bill shall be submitted by the contractor within one month of the date fixed for completion of the work, otherwise the Engineer-in-charge's Certificate of the measurement and of the total amount payable for the work accordingly shall be final and binding on all parties.

Payment on intermediate certificate to be regarded as advance

Bills to be
submitted
monthly

Clause 8 - A bill shall be submitted by the contractor each month on or before the date fixed by the Engineer-in-charge for all work executed in the previous month and the Engineer-in-charge shall take or cause to be taken the requisite measurement for the purpose of having the same verified and claim, as far admissible, adjusted if possible, before expiry of ten days from the presentation of the bill. If the contractor does not submit the bill within the time fixed as aforesaid, the Engineer-in-charge may depute, a subordinate to measure up the said work in the presence of the contractor, counter signature to the measurement list will be sufficient warrant and the Engineer-in-charge may prepare a bill from such list which shall be binding on the contractor in all respect.

Bills to be on
printed forms

Clause 9 - The contractor shall submit all bills on the printed forms to be had on application at the office of the Engineer-in-charge, and the charges in the bills shall always be entered at the rates specified in the tender or in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender at the rates here-in-after provided for such work.

Payment on
contractor's bill
to Bank

Clause 9A - (1) Payment due to the contractor may, if so desired by him be made to his Bank instead or direct to him, provided that the contractor furnishes to the Engineer-in-charge ;

- (1) an authorisation in the form of a legally valid document irrevocable power or attorney conferring authority or the Bank to receive payment ; and
- (ii) his own acceptance of the correctness of the account made out as being due to him by KMDA or his signature on the bill or other claim preferred against Government before settlement by the Engineer-in-charge of the account or claim by payment to the Bank.

While the receipt given by such Bank shall constitute a full and sufficient discharge for the payment, the contractor should, wherever possible, present his bills duly received and discharged through Bankers.

(2) In the case of bills which the contractor present for payment direct and which are not endorsed in favour of the Bank, while efforts will be made to secure payment to the financing Bank, payments made to the contractor should be accepted as full acquittance so far as KMDA is concerned. As part of the arrangement the financing Bank should give KMDA a letter to this effect.

Note 1 — The procedure will not effect the usual rights of KMDA to deduct from contractor's bill (whether endorsed in favour of a Bank or not) any sum due to KMDA in account of penalties, overpayment etc. on this or any other contract with the KMDA.

Note 2 — Nothing herein contained shall operate to create in favour of the Bank any rights or equities vis-a-vis the Chairman, KMDA.

Stores supplied
by KMDA

Clause 10 - If the specification or estimate of the work provides for the use of any special description of materials to be supplied to the Engineer-in-charge's store, or if it is required that the contractor shall use certain stores to be provided by the Engineer-in-charge (such materials and stores and the prices to be charged therefor as hereinafter mentioned being so far as practicable for the convenience of the contractor, but not so as in any way to control the meaning or effect of this contract specified in the schedule or memorandum hereto annexed). The contractor shall be supplied with such materials and stores as required from time to time used by him for the purposes of the contract only, and the value of the full quantity of materials and stores so supplied at the rates specified in the said schedule memorandum may be set off or deducted from any sum then due or thereafter to become due to the contractor under the contract or otherwise, or against or from the security deposit, or the proceeds of sale thereof if the same is held in KMDA securities, the same or sufficient portion thereof being in this case sold for the purpose. All materials supplied to the contractor shall remain the absolute property of KMDA and shall not on any account be removed from the site of the work, and shall at all times be open to inspection by the Engineer-in-charge. Any such material unused and in perfectly good condition at the time of completion or determination of the contract shall be returned to the Engineer-in-charge's store, if by a notice in writing under his hand; he shall so require. But the contractor shall not be entitled to return any such materials unless with such consent, and shall have no claim for compensation on account of any such materials so supplied to him as aforesaid being unused by him, for any wastage in or damage to any such materials.

Clause 11 - The contractor shall execute the whole and every part of work in the most substantial and workmanlike manner and both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also confirm exactly, fully faithfully to designs, drawings and instructions, in writing relating to the work signed by the Engineer-in-charge and lodged in his office and to which the contractor shall be entitled to have access as such office, or in the site of the work for the purpose of inspection during office hours, and the contractor shall if he so require, be entitled at his own expense to make or cause to be made copies of the specification, and of all such designs, drawings, and instructions as aforesaid.

Works to be executed in accordance with specifications, drawing, orders etc.

Clause 12 - The Engineer-in-charge shall have power to make any alteration in, omissions from, additions to or substitutions for the original specifications, drawings, designs and instructions, that may appear to him to be necessary or advisable during the progress of the work, and the contractor shall be bound to carry out the work in accordance with any instruction which may be given to him in writing signed by the Engineer-in-charge, and such alterations, omissions, additions or substitutions shall not invalidate the contract, and any altered, additional or substituted work which the contractor may be directed to do in the manner above specified as part of the work, shall be carried out by the contractor on the same conditions in all respect on which he agreed to do the main work on the same basis of rates as are specified in the tender for the main work. The time for the completion of the work shall be extended in the proportion that the altered, additional or substituted work bears to the original contract work and the certificate of the Engineer-in-charge shall be conclusive as to such proportion. If the altered, additional or substituted work includes any class of work, for which no rate is specified in this contract, that class of work shall be carried out at the rates entered in the schedule of rates of the Presidency Circle. P. W. D./P.W.D. (Roads), Govt. of West Bengal the contract specified in the documents minus/plus the percentage which the total tendered amount bears to the estimated cost of the entire work put to tender and if the altered, additional or substituted work is not entered in the said schedule of rates, then the contractor shall within seven days of the date of his receipt of the order to carry out the work inform the Engineer-in-charge of the rate which is his intention to charge for such class of work. If the Engineer-in-charge does not agree to this rate he shall, by notice in writings, be at liberty to cancel his order to carry out such class or work and arrange to carry it out in such manner as he may consider advisable providing always that if the contractor shall commence work or incur any expenditure in regard thereto before the rate shall have been determined as lastly hereinbefore mentioned then and in such case he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate as shall be fixed by the Engineer-in-charge. In the event of the dispute, the decision of the Superintending Engineer/Chief Engineer shall be final.

Alteration in specification and designs

Do not invalidate contractor

Extension of time in consequence of alteration

Rates for works not in estimated schedule

Clause 13 - If at any time after the commencement of the work the KMDA shall for any reason whatsoever not require the whole thereof as specified in the tender to be carried out, the Engineer-in-charge shall give notice in writing of the fact to the contractor who shall have no claim to any payment or compensation, whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the full amount of the work not having been carried out, neither he has any claim for compensation by reason of any alteration having been made in the original specification, drawings, designs, and instructions which shall involve any curtailment of the work as originally contemplated.

No compensation for alteration in or restriction of work to be carried out

Clause 14 - If it shall appear to the Engineer-in-charge or his Subordinate-in charge of the work that any work has been executed with unsound, imperfect or unskilful, workmanship or with materials of any inferior description, to that any materials or articles provided by him for the execution of the work are unsound, or of a quality inferior to that contracted for or otherwise not in accordance with the contract the contractor shall on demand in writing from the Engineer-in-charge specifying the work materials or articles complained of notwithstanding that the same construct the work so specified in whole or in part, as the case may require, or as the case may or article at his own proper charge and cost and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in his demand aforesaid then the contractor shall be liable to pay compensation at the rate of one per cent of the amount of the estimate for everyday not exceeding 10 days which his failure to do so shall continue and in the case of any such failure the Engineer-in-charge may rectify or remove, and re-execute the work or remove and replace with others the materials or articles complained of, as the case may be at the risk and expense in all respect of the contractor.

Action and compensation payable in case of bad work

Work to be open
to inspection

Clause 15 - All works under or in course of extension or executed in pursuance of the Contract shall at all times be open to the inspection and supervision of the Engineer-in-charge and his subordinates and the contractor shall at all times during the usual working hours and at all other times at which reasonable notice of the mention of Engineer-in-charge and his subordinates to visit the work shall have been given to the contract, either himself be present to receive order and instructions or have a responsible agent duly accredited in writing present for that purpose. Orders given to the agent shall be considered to have the same force as if they had been given to the contractor himself.

Contractor of
responsible agent
to be present

Clause 16 - The Contractor shall give not less than five days notice in writing to the Engineer-in-charge or his subordinate-in-charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured, and correct dimensions thereof be taken before the same is so covered up or placed beyond the reach of measurement and shall not covered up or placed beyond the reach of measurement without such notice having been given or consent obtained the same shall be uncovered at the contractor's expense, or in default thereof no payment of allowance shall be made for such work or the materials with which the same was executed.

Notice to be given
before work is
cover up

Contractor liable
for damage done
and for
imperfections for
three months after
certificate

Clause 17 - If the contractor or his workmen or servants shall break, deface, injure or destroy any part of a building, in which they may be working or any building, road, road kerbs, enclosure, water pipes, 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 of it is being executed or if any damage shall happen to the work, while in progress from any cause whatsoever or any imperfections become apparent in it within three months (six months in the case of a road work) after a certificate final or otherwise of its completion shall have been given by the Engineer-in-charge as aforesaid, the contractor shall make the same good at his other workmen and deduct the expense (of which the certificate of the Engineer-in-charge) shall or from his security deposit, or the proceeds of the sale or of thereof a sufficient portion thereof.

The Security deposit of the contractor made in the manner provided in clauses thereof shall be refundable on the expiry of 3 months (6 months in the case of a road work) after the issue of the certificates final or otherwise of the completion of the work, subject to the condition that no such refund of security deposit shall be allowed till the final bill has been prepared and passed. Provided, however, that in the case of a road work if in the opinion of the Engineer-in-charge, half of the security deposit is sufficient to meet all the liabilities of the contractor under this contract, half of the security deposit may be refunded after 3 months of the issue of the said certificate of completion. Provided further that in the case of any work (whether road, building, bridge, electrical, sanitary and plumbing etc.) where the Engineer-in-charge is satisfied that the contractor after completion of the major portion of the contract is unable to execute remaining part of the work for reason beyond his control, the Engineer-in-charge in his discretion may make a proportionate refund of the security deposit to the contractor.

The contractor shall be responsible for the rectifying defects in asphaltic work noticed within year from the date of the completion of the work and the portion of the security deposit relating to asphaltic work shall be refunded after the expiry of this period.

Contractor to
supply plant,
ladders
scaffolding etc.

Clause 18 - The contractor shall supply at his own cost, material (except such special materials, if any, as may in accordance with the contract be supplied from, the Engineer-in-charge's Stores), plant, tools, appliances, implements ladders, cordage, tackle, scaffolding and temporary works requisite for the proper execution of the work whether original altered or substituted and whether included in the specification or other documents forming part of the contract referred to in this condition or not or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-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 person with the means and materials necessary for the purpose of setting out works and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work of materials. Failing his so doing the same may be provided by the Engineer-in-charge at the expense of the contractor and the expense may be deducted from any money due to the contractor under the contract, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The contractor shall also provide all necessary fencing and lights required to protect the public from accident, and shall be bound to bear the expenses of defence of every suit action of other proceeding at law that may be brought by any person for injury sustained owing to the neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of contractor be paid to compromise any claim by any such person.

And is liable for damage arising, from non-arising, from non-provision of light, fencing etc.

Clause 18A - Contractor shall be responsible for and shall take proper care and caution in respect of all rollers, machinery, tools and implements as may be made over by the KMDA to the contractor for use in the execution of the works under this contract and shall be liable for any loss or any damage caused to the said rollers, machinery, tools and implements by reason, whatsoever, during the period the same are in possession of the contractor and shall on demand pay to KMDA of such amount as may be fixed by the KMDA for such loss and damage, the decision of the KMDA in that respect being final, should the contractor fail or neglect to pay such amount on demand the KMDA shall have the right and be entitled, in addition to the other rights and remedies available to it to deduct such amount from the amount of security deposited by the contractor and/or any amount remaining payable to the contractor for any work done by the contractor.

Clause 18B - In every case in which by virtue of the provisions of Section 12, Sub-section (1) of the Workmen's Compensation Act, 1923 KMDA is obliged to pay compensation to a workman employed by the contractor, in execution of the works, KMDA will recover from the contractor the amount of the compensation so paid, and without prejudice to the right KMDA under Section 12, Sub-section (2) of the said Act, KMDA shall be at liberty to recover such amount or any part thereof by deduction it from the security deposit or from any sum due by the KMDA to the contractor whether under this contract or otherwise.

KMDA shall not be bound to contest any claim made against Section 12 Subsection (i) of the said act, except on the written request by the contractor and upon his given to KMDA full security for all costs for which KMDA might become liable in consequence of contesting such claim.

Clause 19 - No female labour shall be employed within the limits of a cantonment.

Labour

Clause 19A - No labour below the age of 12 years shall be employed on the work.

Clause 19B - Payment of wages of labour -

- (a) "The contractor shall pay to labour employed by him either directly or through sub-contractor, wages not less than fair wages as defined in CPWD contractor's Labour Regulations in so far as such regulations have application within the State of West Bengal or as per the provision of the Contract Labour (Regulation and Abolition) Act, 1970 and the Contract Labour (Regulation and Abolition) Central Rules 1971 wherever applicable.
- (b) The Contractor shall notwithstanding the provision of any contract of the contrary cause to pay fair wages to labour indirectly engaged on the work, including one engaged by his sub-contractors in connection with the said work, as if the labour has been employed by him.

Clause 24 - All works to be executed under the contract shall be executed under the direction and subject to the approval in all respect of the Chief Engineer/ Superintending Engineer for the time being, who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to be carried on.

Work to be under direction of Chief Engineer / Superintending Engineer

Clause 25 - The contractor shall obtain from the stores of the Engineer-in-charge all stores and articles of Foreign manufacture which may be required for the work, or any part thereof or in making up articles required thereof in connection therewith, unless he has obtained permission in writing from the Engineer-in-charge to obtain such stores and articles elsewhere. The value of such stores and articles as may be supplied to the contractor by the Engineer-in-charge will be debited to the contractor in his account at the rates shown in the schedule attached to the contract and if they are not entered in the schedule, they will be debited at the cost price which for the charge, the cost being recoverable in addition and all other expenses whatsoever, which shall have been incurred in obtaining delivery of the same at the store aforesaid.

Stores of Foreign manufacture to be obtained from KMDA

Clause 26 - When the estimate on which the tender is made includes lump sums in respect of part of the work, the contractors shall be entitled to payment in respect of the items of work involved or the parts of the work in question the same rates as are payable under this contract for such item, or if the part of the work in question is not, in the opinion of the Engineer-in-charge, capable of the measurement, the Engineer-in-charge may at his discretion pay the lump sums amount entered in the estimate, to the contractor with regard to any sum or sums payable to him under the provisions of the clause.

Lump sums in estimates

Clause 27 - In the case or any class of work for which there is no such specification mentioned as in Rule 1, such work shall be carried out in accordance with the Specification and in the event of there being no specification then in such case the work shall be carried out in all respect in accordance with the instructions and requirement of the Engineer-in-charge.

Action where no specification

Clause 28 - The expression "work of works" where used in the conditions shall unless there be something either in the subject or context repugnant to such construction be construed, and taken to meant the works by or by virtue of the contract contracted to be executed, whether temporary or permanent and whether original, altered, substituted or additional.

Defination of work

Clause 29 - The contractor(s) shall at his/their own cost provide his/their labour with hutting on an approved site, and shall make arrangement for conservancy and sanitation in the labour camp to the satisfaction of the local Public Health and Medical Authorities. He/They shall also at his/their own cost make arrangements for the laying of pipelines for water supply to his/their labour camp from the existing mains wherever applicable, and shall pay all fees, charges and expenses in connection therewith and incidental thereto.

Schedule showing (approximate) materials to be supplied by the KMDA under Clause 10 and 25 work contracted to be executed and the rates at which they are to be charged for

Particulars	Rate at which the materials will be charged to the contractor			Place of delivery
	Unit	Rs.	P.	

Note 1 : The person or firm submitting the tender should see that the rates in the above schedule are filled up by the Engineer-in-charge.

Signature of Contractor

Signature of Chief-Engineer /
Superintending Engineer/Executive Engineer

ADDITIONAL CONDITIONS

1. Cement found surplus after the completion of a work should be returned to the Engineer-in-charge, the value of the cement returned to the KMDA will be credited to the contractor. If any contractor is found to have used the surplus cement for his own purpose or otherwise disposed of it without the written consent of Engineer-in-charge or his nominee, he may be held guilty of theft. In this connection, the provision of Clause 10 may be referred to where it is clearly stated that all materials issued to the contractors shall remain the property of KMDA.
2. The contractor shall have to make his own arrangements for water, both for the work and use by his coolie etc. for road-rollers and for all tools and plants, etc. required on the work.
3. Contractor will be responsible for the payment of all water charges, payable to the Kolkata Municipal Corporation or any other water works authority including Government department concerned.
4. If the contractor shall desire an extension of the time for completion of the work under Clause 5 of the contract, an application for such extension will not be entertained if it is not received in sufficient time to allow the Engineer-in-charge to consider it and the contractor will be responsible for the consequences arising out of the negligence in this respect.
5. The contractor will have to leave ducts in walls and floors to run conduit or cables, where necessary and he will not be entitled to any extra payment on this account.
6. Contractors in the course of their work should understand that all materials (e.g. stores and other materials) obtained in the work of dismantling excavation etc. will be considered as KMDA property and will be disposed of to the best advantage of KMDA.
7. Owing to difficulty obtaining certain materials in the open market due to scarcity KMDA have undertaken to supply materials specified in the Schedule on page 12 of the Tender Form at rates stated therein. There may be delay in obtaining the materials by the department and the contractor is, therefore, required to keep himself in touch with the day-to-day position regarding the supply of materials from the Engineer-in-charge and do adjust the progress of the work so that their labour may not remain idle nor may there be any other claim due to or arising from delay in obtaining the materials. It should be clearly understood that no claim whatsoever shall be entertained by the KMDA Government on account of delay in supplying materials.
8. The minimum period for which a road - roller is required to be used by a contractor shall be determined by the Executive Engineer on the basis of the quantity of metal that can be consolidated by a roller per day and the Executive Engineer's decision shall be final. If the roller be required to work for a longer period due to bad arrangement of the contractor-shortage of water, etc. additional hire charges shall be levied at the rates specified below under "A-Hire charges" for the additional period of the roller work.
9. No compensation for any damage done by rain or traffic during the execution of the work will be made.
10. Whenever a work is carried out in a Municipal area electric lights or electric danger signals wherever applicable shall be provided by the contractors on the barriers as paraffin lights. Facilities for the electric connection will be made by KMDA but the contractor will bear all the expenses.
11. The contractor should quote through rate inclusive of cost of materials and carriage to place of working.
12. The contractor should give complete specifications showing the method of execution and the quantity and quality of materials be intend to use.

13. In case where canal water is used by the contractor, he will be required to deposit in advance with the Engineer-in-charge the charges for water which are to be calculated in accordance with the schedule of miscellaneous rates in the Canal Act.

14. It must be clearly understood by the contractor that no claim on account of enhanced rates and those already accepted due to war fluctuations will be entertained during the currency at this contract for the work as per schedule attached to the agreement and the additional work, if any, under Clause 12 of the contract, if such additional work shall consist of items which have already been quoted for, or items not quoted for but appear in the said schedule.

15. In the event of emergency the contractor will be required to pay his labour every day and if this is not done, KMDA shall make the requisite payment as would have been paid by the contractor and recover the cost from the contractor.

INCONVENIENCE TO THE PUBLIC

16. The contractor(s) shall not deposit materials on any site which will seriously inconvenience to the public. The Engineer-in-charge may require the contractor(s) to remove any of the materials, which are considered by him to be a danger or inconvenience to the public or cause them to be removed at the contractor's cost.

17. The contractor undertakes to have the site clean, free from rubbish to the satisfaction of the Engineer-in-charge. All surplus materials, rubbish etc. will be removed to the place fixed by the Engineer-in-charge and nothing extra will be paid.

18. The contractor shall not allow any rubbish or debris to remain on the premises during or after repairs, but shall remove the same and keep the place neat and tidy during the progress of the work. The Engineer-in-charge may get the site or premises cleared of debris etc. and recover the cost from the bill of the contractor, if the latter shows slackness in observing this clause.

19. Material brought at site shall not be stacked at random. The contractor shall stack all these materials as directed by the Engineer-in-charge.

ADDITIONAL CONDITIONS WHEN ROAD-ROLLERS ARE SUPPLIED BY THE KMDA / GOVERNMENT

Road-Rollers, if available, shall be supplied by the KMDA/Government upon payment of hire charges at the rates and on the conditions specified below. The contractor should requisition Road-Rollers at least two weeks before the date on which the same are required mentioning the date on which delivery is desired. In case, rollers cannot be made available to the contractor on that date, requisite extension of time shall be granted to the contract or for completion of the work, but the contractor shall not be entitled to claim any compensation for loss of labour or any other cause whatsoever.

A-HIRE CHARGES

(1) Petrol, diesel or steam Road-Rollers 8 tons or over at the rates as per prevailing Schedule rate (enclosed).

The departmental crew (i.e. a driver and a fireman or cleaner) for each roller ordinarily provided by the department and their pay will be recovered extra from the contractor at the rates as per prevailing schedule rate (enclosed).

1. (a) The Road-Roller will be made over and taken back at the site of the work. The roller charges (which included the hire charges and the wages of the departmental crew) shall be recovered at the prescribed rates from the date of roller is made over till the date it is taken back even though the rollers may not have been working. If however, any roller remains idle for two or more days at a stretch for any of reason or reasons mentioned below and provided the contractor

submits within a week of the date of occurrence of the contingency, an application through the Asstt. Engineer's Office to the Engineer-in-charge, praying for exemption from payment of roller charges (showing reasons and particulars for exemption), the Engineer-in-charge may at his discretion and if he is satisfied that there were sufficient reasons, allow exemption from payment of the said roller charges for such days as he may consider reasonable under the circumstances.

THE REASONS FOR WHICH EXEMPTION BE ALLOWED ARE

- (i) Continued unfavorable weather condition for carrying out particulars type of work on which the roller is engaged.
- (ii) Lack of roller work for reasons beyond the control of the contractors.
- (iii) Diversion of the roller by the Engineer-in-charge to other works.
- (iv) Any other reasons precluding the work of the roller.

The contractor shall not in any event be entitled to claim any compensation for loss of labour or for any other loss whatsoever which may have been incurred by him during the period for which exemption from payment or the charges is allowed.

(b) The rollers and other equipments shall be fully utilized for the purpose for which the same are made over and shall not be allowed to remain idle when they are in working condition. The time limits for the working-days for each type of rolling shall be fixed according to the limits of work output given in Statement I & II below. If the actual number of days of roller work exceed the limit, the hire charges and the wages of the departmental crew shall charges at double the prescribed rates. If the actual number of days of roller work is less than the number of days calculated on the specified floor limit for the number of days in excess of such limit, the hire charges and the wages of the departmental crew shall be charge at double the prescribed rates. If the actual number of days of roller work is less than the number of days calculated on the specified ceiling limit, the hire charges for the roller and the wages of the departmental crew shall be recovered of number of days claculated on the specified ceiling limit. In the all cases part of a day shall be counted as full day.

2. The departmental crew shall be on operational charges of the roller, but the guarding of the machinery will have to be arranged by the contractor at his own cost.

3. The roller issued to the contractor is to work for 6 days in a week with stoppage of work on the seventh day for general cleaning and petty repairs. Contractors will pay for hire charges as well as for wages of the departmental crew for the whole week i.e. 7 days.

4. Clean water for operating and washing the rollers shall be supplied by the contractor at his cost.

5. Fuel, (petrol, diesel or steam coal) and ancillaries such as match boxes, kerosine oil, fire wood and cotton waste for work in lighting up, cleaning etc., of road-rollers shall have to be supplied by the contractor at the expenses, steam coal for steam road-rollers and diesel oil for diesel road-roller may however be supplied by the department at the rates specified in the agreement and cost debited to the contractor's account accordingly.

6. The grease and lubricating oil required for operating and maintenance of the rollers shall be supplied by the department free of cost.

SPECIFICATION COVERING ISSUE OF ROAD-ROLLERS

The number of working days to be allowed for finishing each individual item of work shall be calculated on the basis of limits of work output specified in Statement I & II.

STATEMENT - I

(A) FOR PETROL, DIESEL OR STEAM ROAD-ROLLERS 8 TONS OR OVER

TABLE

WORK OUT-PUT PER WORKING DAY OF 8 HOURS

Sl. No.	Item of work	Floor limit (Maximum)	Ceiling limit (Maximum)
1.	Rolling Sub-Grade	1490 Sq. M.	2230 Sq. M.
2.	Rolling over bricket soling	800 Sq. M.	1200 Sq. M.
3.	Rolling Boulder soling		
	(a) Stone (except laterite or slag boulders)	560 Sq. M.	930 Sq. M.
	(b) Leterite boulders	740 Sq. M.	1120 Sq. M.
4.	Consolidation of ballast (size within the range of 75 to 125 mm)		
	(a) Broken stone (Pakur or Rajmahal or Chandil or similarly hard stone)	23 Cu. M.	35 Cu. M.
	(b) Broken stone or varieties softer than (a) above	25 "	40 "
	(c) Broken slag metal	25 "	40 "
	(d) Leterite or jhama metal	35 "	50 "
	(e) Unbroken stone (e.g. single)	35 "	50 "
	(f) Brick bats	35 "	50 "
5.	Consolidation of metal (size within the range of 40 of 75 mm)		
	(a) Broken stone metals (Pakur or Rajmahal of Chandil or similarly hard stone)	14 Cu. M.	23 Cu. M.
	(b) Broken stone metals of varieties softer than (a) above	17 "	30 "
	(c) Broken slag metal	17 "	30 "
	(d) Leterite or jhama metal	30 "	45 "
	(e) Unbroken Stone (e.g. single or gravel)	35 "	50 "
6.	Consolidation of Moorum	35 Cu. M.	50 Cu. M.
7.	Consolidation of Cinder	120 Cu. M.	180 Cu. M.
8.	Rolling dry chips/Bajri/Graval in surface dressing works		
	(a) On water bound surface	560 Sq. M.	1120 Sq. M.
	(b) On Back top surface	650 Sq. M.	1300 Sq. M.
9.	Rolling premixed bituminous macadam		
	(a) 50 mm thick	185 Sq. M.	370 Sq. M.
	(b) 75 mm thick	140 Sq. M.	280 Sq. M.
10.	Rolling premixed carpet with Chips/Bajri/Gravel		
	(a) in 20 mm (nominal) thick carpet	370 Sq. M.	740 Sq. M.
	(b) in 25 mm (nominal) thick carpet	325 Sq. M.	650 Sq. M.
	(c) in 40 mm (nominal) thick carpet	235 Sq. M.	470 Sq. M.
11.	Repairing potholes	14 Cu. M.	25 Cu. M.

N.B. - In case of items not covered by the above or by any stipulation of a particular contract, the limits will be decide by the Engineer-in-charge.

STATEMENT - II**(B) FOR PETROL, DIESEL OR STEAM ROAD-ROLLERS 6 TONS OR LESS**

The limit of work out-put to be allowed for Petrol, Diesel or steam Road-Roller of 6 tons or less 25% less than the limit for the corresponding items in Statement - I above.

TAR AND BITUMEN

1. The contractor undertakes to make arrangements for the supervision of the work by the firm supplying tar or bitumen used.
2. The contractor shall collect the total quantity of tar-or bitumen required for the work as per standard formula, before the process of painting is started and shall hypothecate it to the Engineer-in-charge against money advanced by KMDA. If any bitumen or tar remain unused on completion of the work on account of lesser used of materials in actual execution, for reasons other than authorised charges in specification and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-charge shall be made and the materials returned to the contractor, although the materials are hypothecated to KMDA, the contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not removed from the site of work without the consent of the Engineer-in-charge in writing.

ADDITIONAL CLAUSE

1. In case where the responsibility of despatch of stores rests with the suppliers but the freight is payable by the purchaser, the supplier should despatch the stores by the most economical method, using the full wagon load whenever it is possible and economical to do so, falling which the supplier will render himself liable for the whole or part of any avoidable expenditure caused by such default.
2. The contractor will have to make his own arrangement for the carriage of Materials.
3. Imported labour may be allotted to contractors at the market rate for labour employed in the locality in the case where the employment of this labour by the contractors as of mutual advantages to KMDA and the contractor.

But in case where the contractor has failed to secure his own labour, imported labour may be forced on him at rate to be decided by the Chief Engineer/Superintending Engineer. The decision of the Chief Engineer/Superintending Engineer to the circumstances in which the employment of imported labour is of mutual advantage will be final and binding on all parties to the contract.

In other cases imported labour need not be forced on contractor but the Engineer-in-charge should at once given in writing to all contractors that if they object to taking labour from the Government now but latter require labour to complete their work in time, will be allotted Government labour as available and will be charged full cost at the rate/ rates specified in the said written notice.