NAME OF WORK : Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222.

Standard Contract Document

For

Road & Bridge Works

on National Highways

Volume –II

Version –1

Authenticated by

Shri K.T. Patil

Designation Executive Engineer

Signature

____________________

Copy No. ___________________
NAME OF WORK : Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222.

I N D E X

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<th>PARTICULARS</th>
<th>PAGE NO.</th>
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</thead>
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<td>General information of contract</td>
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<td>Section –II</td>
<td>Tender Data</td>
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<td>Section –III</td>
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<td>Schedules of work</td>
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</tr>
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<td></td>
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<td>ii) Schedule of Quantities and Rates</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
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</tr>
<tr>
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<td>Forms for Supplementary information F1 to F5</td>
<td></td>
</tr>
<tr>
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<td>Drawings</td>
<td></td>
</tr>
<tr>
<td>Section –XIII</td>
<td>i) Letter of Acceptance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) Work order</td>
<td></td>
</tr>
</tbody>
</table>
SECTION I

ISSUE OF TENDERS

Issued to Shri/ M/s.----------------------------------------------------------
Contractor registered in class --------------- vide Executive Engineer, National
Highway Division No.9, Nashik with reference to his / her application dated ----
----------Cost Rs.----------received vide Money receipt No. ----- dated---------

Divisional Accounts Officer
National Highway Division No.9, Nashik.

DETAILS OF WORKS

Name of Work: - Improvement to accident spot (hair pin bend) at Km. 245/050
and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222.

Estimated cost put to tender : - Rs. 46,45,045/-
Earnest Money : - Rs. 46500/-

Term Deposit Receipt of Scheduled Bank having branches Maharashtra
/Treasure
Challan should be attached with the tender at the time of submission.
Total Security Deposit : - Rs. 1,85,800/- (Rs One lakh eighty five thousand eight hundred only.)

(50 % in cash /Bank Guarantee /FDR/ TDR of any scheduled Bank ) duly
pledged in the name of Executive Engineer, National Highway Division No 9,
Nashik.

The Bank Guarantee shall be in the prescribed form as appended in the
tender document only on stamp paper of Rs. 100% at the time of Agreement
and 50% from R. A. Bills

Time Stipulated for Completion: - 12 (Twelve) Calendar Months which will
Include the monsoon period , if any.

TO BE FILLED BY THE CONTRACTOR.

I /We have quoted my / our offer in percentage rate in words as well as in
figures specifying below / above. I We further undertake to enter into contract
with Public Works Department.

Signature of Contractor
GOVERNMENT OF MAHARASHTRA  
Public works Department (National Highways) 

Tender Notification under e-Procurement  
(1st Call)  

Online tenders in form **B-1 Percentage basis** are invited on behalf of Governor of Maharashtra from qualified bidders for the following works under E-procurement procedure.

<table>
<thead>
<tr>
<th>System Tender No.</th>
<th>Notice No.</th>
<th>Name of Work</th>
<th>Approximate value of work (Rs.)</th>
<th>Earnest Money Deposit (Rs.)*</th>
<th>Cost of documents (Rs.)</th>
<th>Period of Completion</th>
<th>Class of contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222.</td>
<td>46,45,045/-</td>
<td>46500/-</td>
<td>1,000/-</td>
<td>12 (Twelve) months including monsoon.</td>
<td>Class V and above</td>
</tr>
</tbody>
</table>

**TENDER SCHEDULE :**  

Period of download of bidding document : From 09/07/2012 Time: 10.00 Hours  
To 23/07/2012 Time: 17.30 Hours  

Prebid conference date, time and venue : ------  

Last date and time for receipt of queries for prebid conference online : Time: 14.00 Hours  

Last date and time for online bid preparation and hash submission (technical & financial) : Date 30/07/2012 Time: 17.30 Hours  

Date and time for online bid data decryption and re-encryption (technical and financial) : From 31/07/2012 Time: 17.31 Hours  
To 06/08 /2012 Time: 15.00 Hours  

Receipt of bid security and tender document fees in original : Up to 06/08/2012 Time: 17.30 Hours  

Time and date of opening technical bids : Date: 08/08/2012 Time: 15.01 Hours  
In the Office of the Executive Engineer, National Highway Division No. 9 Nashik  

Time and date of opening financial bids : Date: 13/08/2012 Time: 15.01 Hours if possible  

Place of opening of bids : In the Office of the Executive Engineer, National Highway Division No. 9 Nashik
NOTICE INVITING TENDER

Tender Notice in Short : Tender Notice No. -

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Work</th>
<th>Estimated Amount Put to Tender</th>
<th>Earnest Money</th>
<th>Security Deposit (At the Time of Acceptance of Tender &amp; Form running bills)</th>
<th>Cost of form (Not refundable)</th>
<th>Period of Completion</th>
<th>Last date of issue of tender form</th>
<th>Last date and time of receipt of tender</th>
<th>Class of contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222.</td>
<td>46,45,045/-</td>
<td>46500/-</td>
<td>1. At the time of acceptance of Tender Rs 92900/- 2. Form running bills Rs 92900/-</td>
<td>1,000/-</td>
<td>12 (Twelve) months including monsoon.</td>
<td>Date 09/07/2012</td>
<td>Date 23/07/2012 Upto 17.30 Hrs</td>
<td>Class V and above</td>
</tr>
</tbody>
</table>

Validity of Offer : 120 Days

Pre Tender conference will be held at Office of the Chief Engineer, National Highways (P.W.) Maharashtra, 527, Fifth floor, Konkan Bhavan, Navi Mumbai.
GOVERNMENT OF MAHARASHTRA
PUBLIC WORKS DEPARTMENT
GENERAL INFORMATION OF CONTRACT

(To be filled in when the contract is drawn)

1) Name of Work: Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222.

2) Name of Contract: M/s Shri ---------------------------------------------

3) Date of receipt of Tender: ---------------------------------------------

4) Amount of Contract: Rs. 46,45,045/-

5) Agreement no.: ---------------------------------------------------------

6) No. & Date of work Order: ---------------------------------------------

7) Date of Commencement: ---------------------------------------------------

8) Time stipulated for: 12 (Twelve) Calendar months from the date of written order to start work including monsoon period.

9) Date of completion as per Agreement: ---------------------------------------------

10) Actual Date of Completion: ---------------------------------------------------

11) Reference to Sanction of Extension of Time:
    1) ---------------------------------------------
    2) ---------------------------------------------

Certified that the Volume II contains Page --------- to -----------, Fly Leaves -------
----- No. and Drawings -------------------No.
NOTICE INVITING TENDER

The Executive Engineer, National Highway Division No 9, Nashik invites sealed tenders in percentage rate form from eligible Contractors for the following Work.

1. **NAME OF WORK** : Improvement to accident spot (hair pin bend) at Km.245/050 and road safety measures in Km. 245/600 to 247/200 of Kalyan Ahemadnagar Pathardi Nanded Nirmal Road N.H. 222

2. **AMOUNT OF WORK PUT TO TENDER** : Rs. 46,45,045/-

3. **TIME LIMIT FOR COMPLETION OF WORK** : 12 calendar months including monsoon.

4. **AMOUNT OF EARNEST MONEY** : Rs. 46500/-

5. **TENDER VALIDITY** : 120 Days

6. **DATE OF ISSUE OF BLANK TENDER FORM** : From 09/07/2012 to 23/07/2012

7. **COST OF BLANK TENDER FORM** : Rs. 1,000/-

8. **DATE & VENUE OF PRE TENDER CONFERENCE** : Not applicable

9. **SECURITY DEPOSIT** : Rs. 1,85,800/-

10. **DATE AND TIME OF RECEIPT OF TENDER** : Online submission on or before 30/07/2012.

11. **DATE , TIME & PLACE OF OPENING OF TECHNICAL BID** : 08/08/2012 Office of the Executive Engineer, National Highways Division No. IX Nashik

12. **DATE , TIME & PLACE OF OPENING OF FINANCIAL BID** : Office of the Executive Engineer, National Highways Division No. IX Nashik on Date.13/08/2012 at 15.01 hrs.

13. **CLASS OF REGISTRATION** : Class V & above

14. **QUALIFICATION CRITERIA** : Qualification of the prospective tenderers shall be based on the Criteria described in the tender document. The offer of only those tenderers who satisfy the Qualification Criteria mentioned in the tender documents shall be opened and considered.

Note: The right to accept or reject any or all tenders without assigning any reason is reserved by the Government.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Brief details of document required</th>
<th>Whether enclosed or not</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Letter of Submission</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>List of all documents /forms /statements /which are attached in sequence should accompany the following documents</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Attested copy of valid Registration Certificate</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Earnest money in the form of term Deposit Receipt for a period of one year issued by Scheduled bank in the name of the Executive Engineer, National Highway Division No 9, Nashik from the last date of receipt of tender or Certificate for Exemption for Earnest Money if applicable.</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Attested copy of registered partnership deed / memorandum and articles of association as the case may be, if the tenderer is a partnership firm or joint venture company and certificate of Registration from Assistant Registrar of firm</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Power of Attorney of behalf of firm, in the name of person authorized to sign agreement/bills etc. and collect Cheques from department for the work done.</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>Attested copy of Sales Tax Clearance Certificate &amp; Certificate of Registration from Sales Tax Commissioner</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>Details of works of similar nature &amp; magnitude costing not less than Rs.35/- lakhs carried out by the tenderer.</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>Details of the other works tendered for and in hand as on the date of submission of his tender.</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>List of machinery available with the tenderer which will be used exclusively for this work.</td>
<td>Yes</td>
</tr>
<tr>
<td>11</td>
<td>List of Technical Personnel on roll of the tenderer at present and those likely to be appointed for this work in future.</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>The documents for qualifying criteria including annual turnover, bid capacity.</td>
<td>Yes</td>
</tr>
<tr>
<td>13</td>
<td>The documentary proof of owning the machineries like Hot Mix Drum Mix Plant, Vibratory roller, Paver finisher and self propelled mechanical sprayer, weight batcher etc.</td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td>Additional FDR /TDR as per the requirement of additional conditions for mobilization of Plant.</td>
<td>N.A.</td>
</tr>
<tr>
<td>15</td>
<td>Activities work schedule in form F-5</td>
<td>Yes</td>
</tr>
<tr>
<td>16</td>
<td>Sketch /map showing the distance between the work site and Plant site with Km. No. as certified by concerned Deputy Engineer</td>
<td>Yes</td>
</tr>
<tr>
<td>17</td>
<td>Special Condition</td>
<td>Yes</td>
</tr>
</tbody>
</table>
SECTION II
TENDER DATA

1.0 Scope of Tender.

1.1.1 Sealed tenders are invited for the works as defined in Section IV of this Volume by the Executive Engineer, National Highway Division No 9, Nashik on behalf of Governor of Maharashtra, from registered Contractors of eligible Class of the Public Works Department and Irrigation Department of Maharashtra State, estimated to cost as noted against the work and detailed in Section II, III and IV of this Volume.

The conditions in Volume II will supercede the conditions in Volume I

2.0 Qualification Criteria :-

2.1 To be qualified for opening of Envelope No. 2 i.e. offer, each Tenderer should fulfill qualification criteria mentioned below in all respect.

2.1.1 The Tenderer should have achieved the Average annual turnover of Rs.18.60 Lakhs during last three years. (In case of Civil Engineering Works only)

Note: This annual turnover shall be certified by the Chartered Accountant. Government or Semi Government works mentioned in Form F-1 shall be considered for annual turnover during respective years.

2.1.2 The tenderer should have successfully completed in his own name a single work of similar nature (Strengthening work, Improvement to Riding Quality work, Periodical Renewal work.) of magnitude costing not less than Rs.18.60 Lakhs in any one of the preceding three financial years.

2.1.3 The tenderer should have executed the following minimum quantities of work in any continuous 12 calendar months period during last five years.

| i)   | Earth work       : |
| i)   | G.S.B. : |
| iii) | Structural concrete : N.A. |
| iv)  | Hot Mix       |
| i)   | a) BUSG : |
| i)   | b) B.M. : |
| i)   | c) SDBC : |
| v)   | W.B.C.M./ W.M.M. : |
The details of quantity of each item executed and the works should be certified by the concerned Executive Engineer and should be attached in envelope No.1 of the time of submission.

Note:-

1. In case of Joint Venture the criteria under 2.1.2 above shall be satisfied by any one of the partners individually.
2. The joint venture of the partner/partners satisfying individually/jointly as the case may be, the criteria specified under clause 2.1.2 and clause 2.1.3 above shall only be considered as valid for qualification criteria.
3. In case of information for clause 2.1.2 & clause 2.1.3, a certificate from an officer not below the rank of Executive Engineer shall be furnished in Envelope No.1 only. Copy of these Certificates shall be got attested from an officer of P.W.D. or Irrigation Department of Maharashtra not below the rank of Deputy Engineer.

2.1.4 The tenderer should have the following machinery in his name or in the name of the firm.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particulars of Machinery.</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hot Mix Drum Mix Plant of DM 45 Type 60-80 Tonne</td>
<td>1 No.</td>
</tr>
<tr>
<td>2</td>
<td>Vibratory Roller (Tandem Type) with frequency and amplitude adjustment</td>
<td>1 No.</td>
</tr>
<tr>
<td>3</td>
<td>Static Roller (10 Tonnes.)</td>
<td>2 Nos</td>
</tr>
<tr>
<td>4</td>
<td>Sensor Paver/ Paver finisher(with sensor operated)</td>
<td>1 No.</td>
</tr>
<tr>
<td>5</td>
<td>Self propelled bitumen pressure sprayer six MY capacity.</td>
<td>1 No.</td>
</tr>
<tr>
<td>6</td>
<td>Non tilting concrete mixer (Minimum 2 Cement bar capacity) if requirement for concrete works.</td>
<td>2 No.</td>
</tr>
<tr>
<td>7</td>
<td>Screed Vibrator</td>
<td>1 No.</td>
</tr>
<tr>
<td>8</td>
<td>Vibratory Needles (60 mm dia)</td>
<td>4 No.</td>
</tr>
<tr>
<td>9</td>
<td>Tipper / tractor</td>
<td>3 No.</td>
</tr>
<tr>
<td>10</td>
<td>Bitumen sprayer</td>
<td>1 No.</td>
</tr>
</tbody>
</table>

Note:-

1. The tenderer shall produce the documentary evidence in support of ownership of plant and machinery.
2. No formal order of booking of such plant /machinery is acceptable.
3. If the Tenderer does not have the hot mix plant within 40 Km, distance from work site, a Performance security as detailed in contract data at Sr. No. 10 shall be furnished in Envelope No.1.
2.2 Bid Capacity: - N. A.

Note: 1. The statements showing value of existing commitments and on going works should be countersigned, by an officer not below the rank of Executive Engineer.

2. The tender is subject to be disqualified if the tenderer has made misleading or false representations in the forms, statements and attachments submitted as proof for the qualification requirement and/or record of past performance such as abandoning the works, not properly completing the contract, inordinate delays in completion litigation history or financial failure etc.

3. The updated current cost will be worked out as per the table below:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Year</th>
<th>Cost of Work</th>
<th>Updated Cost Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2011-2012</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>2010-2011</td>
<td></td>
<td>110</td>
</tr>
<tr>
<td>2</td>
<td>2009-2010</td>
<td>100</td>
<td>121</td>
</tr>
<tr>
<td>4</td>
<td>2008-2009</td>
<td>100</td>
<td>133</td>
</tr>
</tbody>
</table>
3.0 Joint Venture :-   **Deleted**

4.0 Name & Address of the Tenderer:
4.1 Tenderer Name
Address
Contact Numbers :   (Office )
                   (Residence )
                   (Mobile )
                   E- Mail id

4.2 Authorised Representative of the Tenderer.
Name
Address
Contact Numbers :   (Office )
                   (Residence )
                   (Mobile )

5.0 Formats :
Format No. F- 1 to F-5 annexed herewith shall be submitted with complete and true information in Envelope No. 1

6.0 **Sketch of Location of Hot Mix Plant** :
A sketch indicating the location of the Hot Mix plant and route thereto from the site duly signed by the tenderer shall be enclosed. It shall clearly indicate the distance from farthest point of site to the unit in kilometers. Also the distance shall be maximum as indicated at Sr. No. 12 of Contract Data Volume II.

7.0 **Documents to be enclosed** :
The documents as indicated in Clause 15.2.2 and Section I Volume- I are Mandatory and shall be enclosed with the tender. The following documents are however not mandatory for submission in the tender of present work.
1.
2.
3.
4.
5.
8.0 Pre Tender Conference
i) Place : ------------------
ii) Time : ------------------
iii) Authority for Replies : ------------------

9.0 Deadline for Hash submission of Tender :
The deadline for submission of tender shall be as per that indicated in N. I. T. (Sub Section of Section I of Volume II)

**This date is on or before 30 / 07 /2012 up to 17.30 Hrs.**

10.0 Tender Opening Authority : The Executive Engineer, N H. Dn 9 Nashik
Place : Office of the Executive Engineer National Highway Division No. 9 Nashik
Time : 13 /08 /2012 Hrs.(If possible)

11.0 Authority to sign the Agreement :
On behalf of Governor of Maharashtra the agreement will be signed by
The Executive Engineer, National Highway Division No.9, Nashik
## SECTION III

### CONTRACT DATA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Clause No.</th>
<th>Particulars</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Chief Engineer is : Chief Engineer (National Highways) P.W. Maharashtra, 5th floor, Konkan Bhavan Navi Mumbai Telephone no. (022) 27574303 Fax No. (022) 27574272 E- Mail id. : <a href="mailto:nhmumbai.ce@mahapwd.com">nhmumbai.ce@mahapwd.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superintending Engineer is : Superintending Engineer, Public Works Circle, Jalgaon.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Executive Engineer is : Executive Engineer, National Highway Division No 9, Nashik</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>a) Estimated cost put to Tender : Rs. 46,45,045/-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Earnest Money : Rs.46500/-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Security Deposit i) Cash (Not less than amount of Rs. 92,900/- Earnest Money ) ii) To be deducted from Running Account Bills Rs. 92,900/- Rs. 1,85,800/-</td>
</tr>
<tr>
<td></td>
<td>2 Section –I</td>
<td>d) Percentage if any to be deducted from bills so as to make up the total amount required as Security Deposit by time, half the work as measured by the cost is done.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e) Time allowed for the work from date of written order to commence 12 (Twelve) Calendar Month Including Monsoon.</td>
</tr>
</tbody>
</table>
### Section III

#### Levy of Compensation:

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Cumulative physical target to be achieved</th>
<th>If not achieved the compensation payable per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 120 Days</td>
<td>37 %</td>
<td>Rs. 1,000 per day</td>
</tr>
<tr>
<td>2 240 Days</td>
<td>62 %</td>
<td>Rs. 2,000 per day</td>
</tr>
<tr>
<td>3 365 Days</td>
<td>100 %</td>
<td>Rs. 3000 per day</td>
</tr>
</tbody>
</table>

(Compensation is not cumulative)

#### Defect Liability period:

- **36 (Thirty Six months)** from date of completion of works in all respect.

#### Cost of work as put to Tender:

Based upon schedule of rates applicable to the year in which the tenders were invited Rs. 46,45,045/-

#### Price Variation Clause:

1. **Labour Component**: N.A.
2. **Material Component other than Bitumen and cement**: N.A.
3. **POL Component**: N.A.
4. **Bitumen Component**: N.A.
5. **HYSD & Mild Steel Component**: N.A.
6. **Cement Component**: N.A.

Consumer Price Index (New Series) for Industrial workers -----Mumbai center.

Average price of H. S. D. for Mumbai Center.

Star Rates for

1. **Bitumen VG30 Rs**: N.A.
2. **Cement Rs**: N.A.
3. **Steel Rs**: N.A.

#### Grade of Bitumen:

- 60/70 grade and 80/100 grade.

#### Mobilisation Advance (Limit):

- **DELETED**.

Interest on Mobilisation Advance:

- **N.A.**
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>II D</td>
<td>Machinery Advance (Limit)</td>
<td><strong>DELETED</strong></td>
</tr>
<tr>
<td></td>
<td>Interest on Machinery Advance</td>
<td><strong>N.A.</strong></td>
</tr>
<tr>
<td>I F</td>
<td>Performance Security</td>
<td>i) Performance Security for mobilisation of Plant : <strong>--</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) Performance Security for Maintenance : <strong>5%</strong></td>
</tr>
<tr>
<td>II F</td>
<td>Deductible amount for Non-provision of Amenities.</td>
<td>i) Communication Facility : Rs. /day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) Inspection Vehicle : Rs. /day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii) Field Laboratory : Rs. /day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iv) Site Office : Rs. /day</td>
</tr>
<tr>
<td>V BI</td>
<td>v) Whether the Government land for establishing field laboratory &amp; Site office will be made available ?</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>vi) In case field laboratory and site office (along with equipment, furniture and amenities) is established at Govt. land by the Contractor. Whether it will be the property of Government ?</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>vii) Whether the Roughness Index test is intended to be carried out by the Contractor ?</td>
<td>Yes.</td>
</tr>
<tr>
<td>I</td>
<td>Distance of Hot Mix Plant from the farthest point of work site.</td>
<td>40 Km.</td>
</tr>
</tbody>
</table>
### Introduction
Kalyan- Ahemadnagar-Pachegaon- Mazalgaon- Parbhani- Nanded- Nirmal National Highway No. 222 start from junction of NH 3 near Kalgaon and link Bhivandi Malshej Alephata Ahmednagar Pathardi Koradgaib Babded abd terminates at its junction with N.H..7 near Nirmal in Andhra Pradesh.

### Site location/ Site data
Subjected work length start at Km. 242/600 @ start of Karanji Ghat and ends at Km. 247/200 i.e. near village karanj i on N.H. 222.

### Brief Description of work
The scope of work shall cover Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 242/600 to 247/200 of Kalyan- Ahemadnagar -Pathardi- Nanded- Nirmal Road section of N.H. 222 in the state of Maharashtra.

1. Improvement of existing grade and super elevation in Km. 245/050 to 245/105 at hair pin bend of NH standard by providing earth work embankment, as well as cutting at hill/ side.

2. Providing, laying granular sub base 150 mm thick, grade II size 150 mm thick, grade III 75mm thick, BUSG 75 mm thick (2200 Sqm.) B.M. 50 mm thick and 25 mm thick SDBC.


5. Providing and fixing Informatory and Cautionary sign boards.

### Obligatory Conditions in the Proposed Work if any
Contractor shall take all necessary measures for the safety of traffic during construction and provide barricades, signs markings, flags, lights and flagmen as may be required in a manner creating least in the reference to the flow of traffic while consistent with the satisfactory execution of the same.

### Other Features
Nil-

### Schedule of Handing Over of Site
The site will be deemed to be handed over the contractor on the date of the work order and contractor is having whole and sole responsibility to maintain the site of work from this date till completion of defect liability period at his own cost No extra payment on account of any repair carried out will be paid during this period.

### Specific Condition of Maintenance
Refer Clause 26 of Section II Volume I.
I/ We hereby tender for the execution, for the Governor of Maharashtra (here in before and here in after referred to as “Government”) for the work specified in the under written memorandum within the time specified in such memorandum at in figure % above/ below in Words ----------------------------
percent above / below ) the estimated rats entered in Schedule of quantities and rates (Memorandum showing items of work to be carried out ) and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in tender documents.

Signature of Contractor & Seal

-------------------------------------------------------------------------------

OPENING OF TENDER

Tender is opened in the office of Executive Engineer National Highway Dn. No. IX Nashik on dated 13/08/2012 at 15.01 Hrs. in presence of Contractor /Representatives / Officers signed on the attendance sheet.
Offer read out as % above / below / at par with Schedule of quantities and
Rates ( In Words )

Divisional Accounts Officer Executive Engineer / Chief Engineer
(If several sub-works are included they should be detailed in a separate list)

a) Estimated Cost : Rs. 46,45,045/-
b) Earnest Money : Rs. 46500/-
c) Security Deposit : Rs. 1,85,800/-

This will be deposited as under
i) In Cash Rs. 92,900/-
ii) To be deducted from R. A. bills Rs. 92,900/-

d) Give schedule (where necessary) of dates by which various items are to be completed. : Time allowed for the work from date of written order to commence -

12 (Twelve) Calendar Months including Monsoon.

Should this tender be accepted, I /We hereby agree that this offer shall remain open for acceptance for a minimum period of 120 days from the date fixed for opening the same and thereafter until it is withdrawn by me /us by a notice in writing duly addressed to the authority opening the tenders and sent by registered post A. D. or otherwise delivered at the office of such authority.

Treasury Challan No. -------Dated -------- or Term Deposit receipt, for a period of one year issued by a scheduled bank and duly endorsed in the name of Executive Engineer National Highway Division No.9, Nashik
sum of Rs. 46500/- representing the earnest money is herewith forwarded. The amount of earnest money shall not bear interest and shall be liable to be forfeited to the Government. Should I / We fail to (1) abide by the stipulations to keep the offer open for the period mentioned above or (2) sign and complete the contract documents as required by the Engineer and furnish the security deposit as specified in item (c) of memorandum contained in Paragraph 1 above within the time of limit laid down in clause (d) above. The amount of earnest money may be adjusted towards the security deposit or refunded to me/us if so desired by me/ in writing unless the same or any part thereof has been forfeited as aforesaid.

I / We have secured exemption from payment of earnest money after executing the bond in favour of the Government a necessary true copy of which is enclosed herewith, should any occasion for forfeiture of earnest money for this work arise due to failure on my/our part to (1) abide by the stipulation to keep the offer open for the period mentioned above or (2) sign and complete the contract documents and furnish the security deposit as specified in item (c) of the memorandum contained in paragraph 1 above within the time limit laid down in clause (d) above, the amount payable by me/us may, at the option of the Engineer, be recovered out of the amount deposited in lump sum for securing exemption in so far as the same may extend in terms of the said bond and in the event of the deficiency out of any other money which are due or payable to me/us by the Government under any other contract or transaction of any nature whatsoever or otherwise.

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

Receipt No. ------- and dated -------------- from the Government Treasury at ------------------------ in respect of the sum of Rs. 46500/-
is herewith forwarded representing the earnest money (a) the full value of which is to be absolutely forfeited to Government should I/we not deposit the full amount of Security deposit specified in the above memorandum, in accordance with Clause 1(A) of the said conditions of the contract, otherwise the said sum of Rs. 46500/- shall be refunded.

Contractor (Address) +Signature of Contractor
Before submission of Tender

Dated the day of 2012
Witness

(Address) + Signature of Officers
By whom accepted

The above tender is hereby accepted by me on behalf of Governor of Maharashtra.

Executive Engineer,
National Highway Division No 9,
Nashik.
(or his duly authorized Assistant)

Dated the day of 2012
SECTION VII

DECLARATION OF THE CONTRACTOR

I/ We hereby declare that I/We have made myself/ourselves thoroughly conversant with the local conditions regarding all materials and labour on which I/ We have based my / our rates for this tender. The specifications, local existing condition and lead of materials on this work have been carefully studied and understood by me / us before submitting this tender. I / We undertake to use only the best materials approved by the Engineer –in-Charge or his duly authorized representative, before starting the work and to abide by his decision. I/We shall maintain / rectify the entire works as per M. O. R. T. & H. specification as soon as the damage occurs up to the expiry of defect liability period without putting forth any reasons for the failure.

Signature of contractor
SECTION VIII

Condition for the site Office cum Laboratory:
(Laboratory cum site Office for Engineer and other supervisory staff)
CONDITION FOR THE FIELD LABORATORY AND EQUIPMENTS

The contractor is expected to establish a field laboratory with all required equipment as mentioned below as a part of work (for which he will not be paid separately)

(ROAD WORK)

The laboratory of the contractor will have to be equipped with the following instruments.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Equipment</th>
<th>Number required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Set of IS sieves 45 cm. dia G.I. frame, 125 mm, 100mm, 90mm, 80mm, 63mm, 53mm, 50mm, 45mm, 37.5mm, 26.5mm, 25 mm., 22.4 mm, 20mm, 19mm, 13.2mm, 9.50 mm. 5.6mm, 4.75 mm., 4.25mm, 6.3mm, 6mm with lid and pan (coarse sieve)</td>
<td>1 set 23 Nos.</td>
</tr>
<tr>
<td>2)</td>
<td>Set of IS Fine sieves with 20cm. dia brass frame 2.8mm, 2.36mm, 1.18mm, 0.60 mm., 0.30mm., 0.15 mm. 0.075 mm. 710micron 600micron, 425micron, 300micron, 180micron, 150micron, 90micron, 75micron with lid and pan.</td>
<td>1 set 11 Nos.</td>
</tr>
<tr>
<td>3)</td>
<td>Pan balance 15 Kg capacity with set of all weights</td>
<td>1 set</td>
</tr>
<tr>
<td>4)</td>
<td>C.B.R. moulds</td>
<td>9 Nos.</td>
</tr>
<tr>
<td>5)</td>
<td>Field density kit (sand Replacement method).</td>
<td>2 Nos.</td>
</tr>
<tr>
<td>6)</td>
<td>Field Density kit (core cutter method )</td>
<td>2 Nos.</td>
</tr>
<tr>
<td>7)</td>
<td>L.L./P.L. Equipment</td>
<td>1 No.</td>
</tr>
<tr>
<td>8)</td>
<td>Impact Test equipment</td>
<td>1 No.</td>
</tr>
<tr>
<td>9)</td>
<td>Flakiness Index equipment</td>
<td>2 Nos.</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Name of Equipment</td>
<td>Number required</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>10)</td>
<td>Marshall Stability Test apparatus, a complete set with all accessories:</td>
<td>1 No.</td>
</tr>
<tr>
<td></td>
<td>i) Proving Ring 5 Tonnes &amp; 2 Tones capacity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) Dial gauges</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii) Constant temp. Water bath.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iv) Pedestal v) Rammer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vi) Moulds with collar and base plate.</td>
<td></td>
</tr>
<tr>
<td>11)</td>
<td>Extraction Test apparatus,</td>
<td>1 Nos.</td>
</tr>
<tr>
<td></td>
<td>For bitumen Hand operated.</td>
<td></td>
</tr>
<tr>
<td>12)</td>
<td>Filter papers (Box)</td>
<td>1 Nos.</td>
</tr>
<tr>
<td>13)</td>
<td>Benzene</td>
<td>20 ltrs.</td>
</tr>
<tr>
<td>14)</td>
<td>Measuring cylinders</td>
<td>1 No. Each</td>
</tr>
<tr>
<td></td>
<td>500 ml., 250 ml., 100 ml.</td>
<td></td>
</tr>
<tr>
<td>15)</td>
<td>Thermometers Ring 0 to 250° C.</td>
<td>12 Nos.</td>
</tr>
<tr>
<td>17)</td>
<td>Moisture boxes</td>
<td>30 Nos.</td>
</tr>
<tr>
<td>18)</td>
<td>Field Oven (electric)</td>
<td>1 No.</td>
</tr>
<tr>
<td>19)</td>
<td>Sand (standard)</td>
<td>75 kg.</td>
</tr>
<tr>
<td>20)</td>
<td>Cube moulds.</td>
<td>6 Nos.</td>
</tr>
</tbody>
</table>

The above listed equipments conforming to relevant I.S. Specification are required to be supplied by the Contractor and installed at the field laboratory. The field laboratory shall be manned by adequately qualified technical staff. The field laboratory shall be provided with amenities like water supply, electric supply etc. The cost of the equipment and also the salaries of the personnel manning the laboratory shall be considered, as incidental to the work and no separate payment will be made for the same to the contractor. All instruments and apparatus shall
be calibrated by Government contractor and reports shall be submitted to Engineer in charge within 10 days after the letter of acceptance of bid. The laboratory and the instruments will be the property of contractor after completion of the work.

**Condition for supply of inspection Vehicles for the Engineer.**

The Contractor shall arrange to provide and maintain a brand hard top jeep like Tata sumo/Bolero / quails for use by the Engineer – In – charge. The jeep shall be petrol or Diesel driven. The contractor shall provide the vehicle, along with driver and fuel for the entire period of contract including valid extension / compensation if any. The average run of the vehicle per month will however be limited to 2500Km.

Failure to supply fuel for the vehicle will entitle the department to recover an amount of Rs. 10000/- per month.

It shall be seen by the contractor that the vehicle is maintained in good condition. Repairs of the vehicle should be attended by the contractor within 3 days of communication of the same to him by the Engineer –In – Charge to carry out repairs at his cost and recover the expenditure incurred thereof from his immediate forthcoming bill. An amount of Rs. 750/- per day for every day that the vehicle remains under repairs or for every day that the vehicle is not supplied by the contractor will be recovered from contractors immediate forthcoming bill or any other dues payable to him. The vehicle shall be supplied by the contractor within 7 days of issue of work order. After completion of the whole work the contractor take vehicle back to him.

**E) ADDITIONAL CONDITION RELATING TO INSURANCE OF CONTRACT WORKS**

1) Contractor shall take out necessary insurance Policy/Policies (Viz. Contractor’s AI Insurance Policy, erection All Risks Insurance Policy et. As directed by the Directorate Insurance ) so as to provide adequate insurance cover for execution of the awarded contract work for total contract value and complete contract period compulsorily form the "Directorate of insurance, Maharashtra State, Mumbai" only. Its postal address for correspondence is “264, MHADA, First Floor, Opp. Kalanagar, Bandra (E), Mumbai 400051.”(Telephone Nos. 26590403/ 26590690 and Fax Nos. 26592461/ 26590403) Similarly all workmen’s appointed to complete the contract work are required to insure
workmen’s compensation insurance Policy Insurance Policy / policies taken out from any other company will not be accepted. If any Contractor has effected insurance with any insurance Company, the same will not be accepted and the amount of premium calculated by the government insurance Fund will be recovered directly from the amount payable to the Contractor for the executed contractor work and paid to the Directorate of Insurance Fund, Maharashtra State, Mumbai. The director of insurance reserves the distribute the risks of insurance among the other insurance.

ii) The challans of royalty should be submitted by the Agency with every bill. The amount paid towards toyalty will be compared with the work done and shortfall if any will be recovered at the general rate till the ultimate settlement of final bill.
AMENDMENTS TO PROVISION IN VOLUME-I

(Note – Amendments if any to provisions in Volume-I to be included here)

SPECIAL POINT TO BE NOTED BY THE INTENDING BIDDERS.

1) A certificate (in the enclosed format form No. F6) from the concerned Executive Engineer, that the contractor has completed the entire rectification work as per MORT&H specifications during and up to the expiry of the defect liability period for all road works on National Highway completed after 3/03/2009 must be submitted in envelope No.1 failing which contractor will be disqualified and his envelope No.2 will not be opened.

2) Although the tendering bidders will be considered for bidding based on the production of certificate of their plant confirming to the relevant MORT & H specifications from the Assistant Chief Engineer, (Mechanical) P.W.D. the successful bidder will have to submit certificate of this entire machinery (Hot Mix Plant, Sensor Paver, Vibratory Roller, Crusher, and Pressure Sprayer) confirming to relevant MORT & H specification from Superintending Engineer (Mechanical) Bangalore, within 15 days of issue of work order in exceptional case where Superintending Engineer (Mechanical) Bangalore fails to turn up for inspection in time (supported by valid reasons and duly substantiated by relevant documents) a revised certificate of the entire machinery confirming to relevant MORT & H specification from Assistant Chief Engineer (M) P.W.D. will be accepted. By Engineer in charge. However decision of the Superintending Engineer in charge will be final in this regard.

3) The work should be done with the approved plant and approved machinery, and by the agency proper only and no other machinery of agency would be allowed to carry out the work. In case it is found, that the contractor in whose name the work has been allotted has permitted other contractor to carry out the work with some other machinery, the work done would be rejected out right and the payment for such work would not be made at all.
4) The contractor will be responsible for maintenance of the road in all respects right from the day of work order till the date of expiry of defect liability period at his own cost. No extra payment will be paid on account of this by the Department.

5) The Contractor will have to fill up the potholes formed on the surface within 24 hours of their formation and cover the entire damaged / stripped surface with specified wearing coat within 15 days during and immediately after the end of monsoon. If he fails to carry out the same within the period specified above, the same will be done departmentally or by other agency with the cost and the cost so incurred will be recovered from him from any amount payable to him by government or, even as arrears of land revenue, if necessary.

6) The work should be carried out with sensor paver only. The longitudinal profile should be carried in such a way that average thickness of B.M. as mentioned in relevant item is available everywhere. Cross sectional profile should be corrected 100% keeping a camber of 2.75%.

7) The Bituminous mix of only specification shall be prepared and delivered as per MORT&H specifications for this National Highway work only through the day. No other mix will be permitted to be prepared and delivered to any other work, in order to avoid any sort of disturbance in the specification of work.

8) The additional tests for Thermoplastic pavement marking should be as stated below (In addition to section of quality control in Volume I)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of Construction</th>
<th>Tests to be performed in V.Q.C. lab.</th>
<th>Frequency.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Thermoplastic pavement marking.</td>
<td>i) Glassbead contents and grading analysis. ii) Flowability (Percentage residue) iii) Softening point. iv) Drying time. v) Reflectance &amp; Yellowness index.</td>
<td>One for 3 Km. work. One for 3 Km. work. One for 3 Km. work. One for 3 Km. work.</td>
</tr>
</tbody>
</table>

9) All the test at plant as well as on laying site shall be performed by a contractor’s qualified civil engineer and the results of the tests should also be recorded by him only in presence of field officers of the department.

10) Weight slip of each load of mix material obtained from approved weight bridge shall be maintained. The weight bridge shall have to be approved by Engineer in charge.
1. The contractor shall make his own arrangement for supply of materials including bitumen 80/100 and 60/70 and 30/40 grade. (as the case may be) emulsion and RCC pipes, collars. The contractor shall be responsible for all transportation and storage of the materials at the site and shall bear all the related costs. The Engineer shall be entitled at any time, to inspect or examine all such materials. The contractor shall provide reasonable assistance for such inspection or examination as may be required.

2. The contractor shall keep an accurate record of use of materials like bitumen 80/100, 60/70 and 3/40 grade, cement and Steel used in the works in a manner prescribed by the Engineer and as per I.R.C. specifications.

3. After receiving bitumen the authorized challan/ gate pass should be obtained from the Ex-refinery mentioning the quantity of bitumen, grade of bitumen, date and time of delivery etc. and it should be handed over to Department for each consignment.

Bitumen of required category shall be procured only from HPCL, BPCL or IOC refinery. The procurement from any dealer, Sub dealer or agent shall not be allowed.

4. The bouzer should be selected at Ex- refinery by the authorized person of refinery. This seal should be broken in front of authorized person of the Dept. before decaning.

5. While transportation of Bouzer, transport pass should be obtained from the Corporation / Municipality through which the Bouzer is passed and the same should be weighted from authorised weight bridge before decanting at Plant/ work site or handed over to the authorized person of Department.

6. If there is any doubt regarding the materials received the same should be kept aside first and shall be got tested from the Govt. laboratory at the cost of the contractor, and if the results are sub standard, the materials or the work executed with such materials will be rejected.

7. The day-to-day record of the receipt / utility / balance of materials should be kept by the contractor at Plant site/ site of work / store and the same will be checked by the Engineer-in-charge or authorized Engineer at any time.

8. The testing charges shall be born by the contractor.
The contractor shall get the materials approved by Engineer in charge and shall use the materials only after job mix results have been obtained.

The source of aggregates should not be changes for any of the bituminous work. The source of materials shall be sample quantity of material to avoid change in gradation in time for completion of work.

The quantity source and the material to be used for the work shall be got approved in advance before commencement of work.
i) Schedule of materials.

ii) Schedule of quantities and rates.

iii) Schedule of specification.

iv) Schedule of execution of work (Bar Chart)
**NAME OF WORK :-** Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item of work</th>
<th>Approximate Quantity to be brought</th>
<th>Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bulk Bitumen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) 60/70 Grade</td>
<td>9.90</td>
<td>One Metric Tonne</td>
<td>Quantity to be brought by the Contractor at his own cost to the site of work.</td>
</tr>
<tr>
<td></td>
<td>2) 80/100 Grade</td>
<td>15.10</td>
<td>One Metric Tonne</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Cement</td>
<td>49.35</td>
<td>One Metric Tonne</td>
<td>Quantity to be brought by the Contractor at his own cost to the site of work.</td>
</tr>
</tbody>
</table>
### SCHEDULE ‘A’
(Schedule of Materials to be supplied by the Department)

**NAME OF WORK:** Improvement to accident spot (hair pin bend) at Km. 245/050 and road safety measures in Km. 245/600 to Km. 247/200 of Kalyan Ahmednagar Pathardi Nanded Nirmal Road N.H. 222

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item of Material</th>
<th>Approximate Quantity to be supplied</th>
<th>Unit</th>
<th>Rate at which the materials will be charged to the contractor</th>
<th>place of delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In Figure</td>
<td>In Words</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1) The persons or firm submitting the tender should see that the rates in the above schedule are filled up by the Executive Engineer on the issue of the form prior to submission of the tender.
2) Contractors will have to make arrangements themselves for securing structural steel under the permit to be obtained by themselves. Department will however tender necessary help to contractor.
3) Empty Tar drums are the property of the department. If the Contractor has not returned empty Tar drums to the department recovery at the rate of Rs. 50/- per drum will be made from the Contractor.
4) 40% of the empty cement bags issued to the contractor are to be returned to the department. Otherwise recovery at the rate of Rs. 5/- per bag will be made from the contractor.
Name of Work: IMPROVEMENT TO ACCIDENT SPOT (HAIR PIN BEND) AT K.M. 245/050 AND ROAD SAFETY MEASURES IN K.M. 245/600 TO 247/200 OF KALYAN - AHMEDNAGAR PATHARDI NANDED NITMAL ROAD. SECTION OF N. H. 222, IN THE STATE OF MAHARASHTRA.

SCHEDULE 'B'

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item of work</th>
<th>Quantity</th>
<th>Estimated Rate in Word</th>
<th>Unit</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item No.1: Excavation for roadway by mechanical means in earth soil of all</td>
<td>1201.26</td>
<td>Rupees twenty-three and</td>
<td>One Cubic metre.</td>
<td>27761.12</td>
</tr>
<tr>
<td></td>
<td>sorts sand, gravel, soft murum, hard murum, hard murum and boulders</td>
<td></td>
<td>pais eleven only</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>including dressing section to the required grade camber and side slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and conveying the excavated materials with all lifts and lead and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>spreading for embankment or stacking etc as directed by engineer in charge.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Item No.2: Excavation for catch/side water gutter in Hard murum, Hard</td>
<td>103.95</td>
<td>Rupees thirty-seven and</td>
<td>One Cubic metre.</td>
<td>3864.86</td>
</tr>
<tr>
<td></td>
<td>Murum &amp; Boulders strata to the specified section including stacking the</td>
<td></td>
<td>pais eighteen only</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>excavated stuff in a regular bund and disposing of unsuitable or excess</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>stuff with all lead from place of excavation as directed by Engineer in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>charge by mechanical means and sectioning manually for road side gutter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>including all leads and lifts etc. complete.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Item No.3: Providing earth work in embankment with approved materials</td>
<td>2410.65</td>
<td>Rupees three hundred</td>
<td>One Cubic metre.</td>
<td>757233.38</td>
</tr>
<tr>
<td></td>
<td>obtained from excavation by mechanical means from private land including</td>
<td></td>
<td>fourteen and paisse</td>
<td></td>
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<td></td>
<td>all lifts and leads, laying in layers of 20 Centimetre to 30 Centimetre</td>
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<td>twelve only</td>
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<td>thickness breaking clods, dressing to the required lines, curves, grade</td>
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<td></td>
<td>and section, watering and compaction with vibratory roller to 100%</td>
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<td></td>
<td>of standard proctor density etc. Complete as directed by Engineer in charge.</td>
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<td>Sr. No.</td>
<td>Item of work</td>
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<td>Estimated Rate in Unit</td>
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<td>4</td>
<td>Item No.4: Providing and laying granular sub base in 15 Centimetre compacted layers giving soaked C.B.R. of not less than 30 % consisting of sand, gravel, hard murum, metal, laterite, kankar or combination thereof as per designed mix with manual mixing including lifts, spreading, sectioning, watering with sprayer and compacting in layers with vibratory roller with all leads and lifts etc. complete.</td>
<td>491.250</td>
<td>Rupees seven hundred seventy-seven andpais eight-six only</td>
<td>382123.73</td>
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<tr>
<td>5</td>
<td>Item No.5: Providing, laying, spreading and compacting stone aggregates of Grade II sizes to water bound macadam specification including spreading in uniform thickness hand packing rolling with vibratory roller in stages to proper grade and camber applying and brooming murum as screening / binding materials to fill up the interstices of coarse aggregates, watering and rolling, making necessary earthen bund to protect edges lighting, guarding, barricating, maintenance of diversion etc and including all leads and lifts etc complete.</td>
<td>341.25</td>
<td>Rupees nine hundred eighty-three and pais two only</td>
<td>335455.58</td>
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<td>6</td>
<td>Item No.6: Providing, laying, spreading and compacting stone aggregates of Grade III sizes to water bound macadam specification including spreading in uniform thickness hand packing rolling with vibratory in stages to proper grade and camber applying and brooming murum as screening / binding materials to fill up the interstices of coarse aggregates, watering and rolling making necessary earthen bund to protect edges lighting, guarding, barricating, maintenance of diversion etc and including all leads and lifts etc complete.</td>
<td>165.00</td>
<td>Rupees one thousand one hundred forty-eight and pais eighty-five only</td>
<td>189560.25</td>
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<td>Sr. No.</td>
<td>Item of work</td>
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<td>Unit</td>
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<td>7</td>
<td>Item No.7: Providing and laying 75 millimeter thick built-up spray grout over existing water bound macadam surface including thoroughly cleaning the water bound macadam surface by using mechanical broom or approved equipment applying tack coat of 80/100 bulk bitumen at the rate of 0.5 kilogram per square meter spreading coarse aggregate at the rate of 0.05 Cubic meter per square meter area and compacting metal layer to desired degree of compaction so that the surface is uniform and free from deformities applying binder bulk bitumen of 60/70 grade at the rate of 1.5 kilogram per square meter in uniform manner with the help of mechanical sprayer then spreading coarse aggregate of second class at the rate of 0.05 Cubic meter per square meter area and compacting applying binder bulk bitumen of 60/70 grade at the rate of 1.5 kilogram per square meter in uniform manner with the help of mechanical sprayer then spreading key aggregate at the rate of 0.013 Cubic meter per square meter area immediately after second spray of binder and rolling until the entire coarse in thoroughly compacted and key aggregate firmly in position etc complete.</td>
<td>2200.00</td>
<td>224.89 Rupees two hundred twenty-four and paisa eighty-nine only</td>
<td>One Square metre.</td>
<td>494758.00</td>
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<td>8</td>
<td>Item No.8: Providing and laying hot mix hot laid bituminious macadam with bitumen of 60 / 70 grade and 50 millimeter average thickness with 3.3 % bitumen by weight of total mix including diversion of traffic, supply of all materials, heating bitumen and chips, mixing bitumen and chips in modern drum mix plant, laying bituminious macadam by sensor paver finisher including compaction, including 80/100 grade bulk bitumen tack coat etc complete.</td>
<td>110.00</td>
<td>5498.09 Rupees five thousand four hundred ninety-eight and paisa nine only</td>
<td>One Cubic metre.</td>
<td>604789.90</td>
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<td>9</td>
<td>Item No.9: Providing and laying hot mixed hot laid semi dense bituminous concrete 25 millimeter thick with 60/70 grade of bitumen 5% by weight of total mix, including supplying all materials heating bitumen and chips in modern drum mix plant laying semi dense carpet bituminous concrete with sensor paver finisher and applied tack coat of 80/100 grade bitumen at rate of 0.5 kilogram per square meter including compaction etc complete.</td>
<td>2200.00</td>
<td>224.00 Rupees two hundred twenty-four and paisa nil only</td>
<td>492800.00</td>
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<td>10</td>
<td>Item No.10: Addition cost to effect adjustment of bitumen over and above 5.00% asphalt for 0.50% per square metre for 25 millimetre Semi dense bituminous concrete as per job mix.</td>
<td>2200.00</td>
<td>13.85 Rupees thirteen and paisa eighty-five only</td>
<td>30470.00</td>
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<td>11</td>
<td>Item No.11: Providing and laying hard murum/kankar at the road side, including conveying and stacking spreading and compacting hard murum side widths with power roller including artificial watering etc complete.</td>
<td>108.00</td>
<td>334.26 Rupees three hundred thirty-four and paisa twenty-six only</td>
<td>36100.08</td>
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<td>12</td>
<td>Item No.12: Providing &amp; applying thermo plastic reflective paint of approved colour or compound for traffic lane strips of 3 mm thick of pigment 10%, on clean, dry and good road surface with 30-40% glass beads, 20% binder and 40% of filler materials etc complete.</td>
<td>75.00</td>
<td>472.35 Rupees four hundred seventy-two and paisa thirty-five only</td>
<td>35426.25</td>
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<tr>
<td>13</td>
<td>Item No.13: Providing and fixing Cautionary/Warning sign board having shape of equilateral triangle of 90 centimeters sides made out 12 gauge (3 millimeter) thick aluminium sheet including frame of 35x35x3 millimeter Mild Steel angle with grey stove enamel/powder coating on back side and front side bonded with white retroreflective sheeting of high intensity grade encapsulated lense type (honey comb design) having pressure sensitive heat activated adhesive, high intensity grade retroreflective red coloured border, black coloured cutout symbols of non reflective having pressure sensitive adhesive including one mild steel angle iron post of size 65x65x65 millimeter, 3.65 meters long, painted with one coat of epoxy primer and two coats of epoxy finish paint having black and white bands of 25 centimeter width including galvanised iron fixtures etc and fixing the boards in 1:4:8 cement concrete block of size 60 centimeter x 60 centimeter x 75 centimeter including transportation etc complete.</td>
<td>4</td>
<td>5193.84 Rupees five thousand one hundred ninety-three and paisa eighty-four only</td>
<td>20775.36</td>
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<td>1</td>
<td>Retroreflective sheeting should be with seven years written warranty from the manufacturer / Authorised sole distributor for satisfactory field performance including stipulated retroreflectance of retroreflective sheeting and written warranty in original should be submitted to the Engineer in charge.</td>
<td>3</td>
<td>4.32 12602.70</td>
<td>Rupees twelve thousand six hundred two and paise seventy only</td>
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<tr>
<td>14</td>
<td>Item No.14: Providing and fixing informatory sign boards in square or rectangular shape of any size made out 12gauge (3 millimeter) thick aluminium sheet with grey stove enamel/ powder coating on back side and front side bonded with green retroreflective sheeting high intensity grade encapsulated lense type (honey comb design) having pressure sensitive heat activated adhesive, high intensity grade white retroreflective cutout border and messages having pressure sensitive adhesive including one Mild Steel angle iron frame of size 35millimeter x 35millimeter x 3 millimeter and two Mild Steel angle iron post of size 65 millimeter x 65 millimeter x 6 millimeter, 3.60 meter long properly cross braced with angle iron of size 50 millimeter x 50 millimeter x 5 millimeter duly painted with one coat of epoxy primer and two coats of epoxy finish paint having alternate black and white bands of 25 centimeter width including Galvanized Iron fixtures etc and fixing the boards in 1:4:8 concrete block of size 60 centimeter x 60 centimeter x 75 centimeter including transportation etc. complete. Retroreflective sheeting should be with seven years written warranty from the manufacturer / Authorised sole distributor for satisfactory field performance including stipulated retroreflectance of retroreflective sheeting and written warranty in original should be submitted to the Engineer in charge.</td>
<td>4.32 54443.66</td>
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<td>15</td>
<td>Item No.15: Providing dry/ trap/ granite/ quartzite/ gneiss rubble stone masonry etc. complete. Spec.No. : Rd.74 Page No. 247</td>
<td>527.62 824.50</td>
<td>Rupees eight hundred twenty-four and paise fifty only</td>
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<td>16</td>
<td>Item No.16: Providing and laying in situ cement concrete of proportion with trap metal in foundation including necessary compacting, covering newly laid concrete by gunny bag, plastic or tarpaulin and curing including formwork etc. complete.</td>
<td>184.92 3007.97</td>
<td>Rupees three thousand seven and paise ninety-seven only</td>
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<td>Sr. No.</td>
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<td>1</td>
<td>Item No.17: Providing cement concrete M15 grade for head walls, abutment</td>
<td>28.35</td>
<td>3661.60</td>
<td>Rupees three thousand six hundred sixty only</td>
<td>103806.36</td>
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<td>with or without circular or other shaped opening for waterway including</td>
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<td>One Cubic metre.</td>
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<td></td>
<td>necessary scaffolding, formwork, compaction, finishing, covering newly laid</td>
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<td></td>
<td>concrete by gunny bags, plastic or trpaulin and curing etc. complete.</td>
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<td>18</td>
<td>Item No.18: Milling the road surface in Bituminous pavement upto a depth of</td>
<td>2000.00</td>
<td>42.21</td>
<td>Rupees forty-two and paise twenty-one only</td>
<td>84420.00</td>
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<td>55 mm including disposing off the excavated stuff within 2 km. lead and</td>
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<td>One Cubic metre.</td>
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<td>spreading the same or stacking as directed including line &amp; level compacting</td>
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<td>with power roller etc.</td>
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<td><strong>Total</strong></td>
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<td>4645045.03</td>
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<td><strong>Say Rs.</strong></td>
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<td>4645045.00</td>
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Total Rs. 46,45,045 = 00 (Rupees Fourty Six Lakh Fourty Five Thousand Fourty Five and Paise Nil only.)
Name of Work :- IMPROVEMENT TO ACCIDENT SPOT( HAIR PIN BEND ) AT K.M. 245 / 050 AND ROAD SAFETY MEASURES IN K.M 245 / 600 TO 247 / 200 OF KALYAN - AHMEDNAGAR PATHARDI NANDED NITMAL ROAD. SECTION OF N. H. 222, IN THE STATE OF MAHARASHTRA.

SCHEDULE "C" FOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item of work</th>
<th>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</th>
<th>Additional Specifications</th>
</tr>
</thead>
</table>
| 1       | Item No.1: Exavation for roadway by mechanical means in earth soil of all sorts sand, gravel, soft murum, hard murum, hard murum and boulders including dressing section to the required grade camber and side slopes and conveying the excavated materials with all lifts and lead and spreading for embankment or stacking etc as directed by engineer in charge. | Rd.2 Page No.180 Cl.No.301, 309, 101 to 118, 125, 126 of MORT&H 2001 (4th Revision) Specifications. | 1) The excavation should be done in 2.5% slope to achieve proper camber at top layers.  
2) The excavated bottom surface should be in 2.5% slope and shall be compacted with roller. Compaction is incidental to the work for which no extra payment will be done.  
3) The work shall be carried out as per direction of Engineer-in-Charge.  
4) The material shall be neatly stacked at a suitable distance as per direction of Engineer in charge.  
5) The unit rate of payment shall be one cubic metre of work executed and computed by taking cross section & plotting the levels before and after execution of item.  
6) Initial and Final levels along with Cross Section of at every 10 metres interval along with Longitudinal Section showing initial and final levels should be submitted along with bill for payment of this item. No payment on tape measurement basis will be entertained. |
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item of work</th>
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<th>Additional Specifications</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td><strong>Item No.2 :</strong> Excavation for catch/ side water gutter in Hard murum, Hard Murum &amp; Boulders strata to the specified section including stacking the excavated stuff in a regular bund and disposing of unsuitable or excess stuff with all lead from place of excavation as directed by Engineer in charge by mechanical means and sectioning manually for road side gutter including all leads and lifts etc. complete.**</td>
<td>1) The Cross Section at every 10 metres interval and L.section should be plotted showing Initial &amp; final levels shall be submitted along with every bill for payment of this item by the contractor and should be got checked by Engineer in charge. 2) Invert levels of the work of gutters should be got checked by Engineer in charge. 3) The work shall be carried out as per direction of Engineer in charge. 4) The material shall be neatly stacked at a suitable distance as per direction of Engineer in charge. 5) The rate of payment shall be as per one cubic meter of work executed.</td>
</tr>
<tr>
<td>2</td>
<td>Item No.3: Providing earth work in embankment with approved materials obtained from excavation by mechanical means from private land including all lifts and leads, laying in layers of 20 Centimetre to 30 Centimetre thickness breaking clods, dressing to the required lines, curves, grade and section, watering and compaction with vibratory roller to 100% of standard proctor density etc. Complete as directed by Engineer in charge.</td>
<td><strong>Item No.3: Providing earth work in embankment with approved materials obtained from excavation by mechanical means from private land including all lifts and leads, laying in layers of 20 Centimetre to 30 Centimetre thickness breaking clods, dressing to the required lines, curves, grade and section, watering and compaction with vibratory roller to 100% of standard proctor density etc. Complete as directed by Engineer in charge.</strong></td>
<td><strong>1) Unless 100% standard proctor density is achieved rolling should not be discontinued. 2) Standard proctor density register should be recorded by the contractor after performing the test as per requirements prescribed in section 900 of MORT &amp; H Specification book. 3) The side slopes should be achieved as per drawing. (i.e 5% Slope) 4) The work shall be carried out as per direction of Engineer in charge.</strong></td>
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</table>

**Additional Specifications**

1. The Cross Section at every 10 metres interval and L.section should be plotted showing Initial & final levels shall be submitted along with every bill for payment of this item by the contractor and should be got checked by Engineer in charge.
2. Invert levels of the work of gutters should be got checked by Engineer in charge.
3. The work shall be carried out as per direction of Engineer in charge.
4. The material shall be neatly stacked at a suitable distance as per direction of Engineer in charge.
5. The unit rate of payment shall be as per one cubic meter of work executed.
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<td>1</td>
<td></td>
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<td>5) The unit rate of payment shall be as per one cubic meter of work executed and computed by taking cross section and plotting the levels before and after the execution of work by the contractor for which no extra payment shall be allowed.</td>
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<td>2</td>
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<td>6) Necessary royalty charges shall be borne by the contractor and the challan should be submitted to the department.</td>
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<td>3</td>
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<td>7) The Cross Section of every interval showing initial and final levels and Longitudinal section showing initial and final levels along with bill for payment of this item.</td>
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<td>4</td>
<td>Item No.4: Providing and laying granular sub base in 15 Centimetre compacted layers giving soaked C.B.R. of not less than 30 % consisting of sand, gravel, hard murum, metal, laterite, kankar or combination thereof as per designed mix with manual mixing including lifts, spreading, sectioning, watering with sprayer and compacting in layers with vibratory roller with all leads and lifts etc. complete.</td>
<td>MORT&amp;H-2001 (4th revision) Cl.No.401 &amp; Section 900 for Quality Control.</td>
<td>1) The percentage of ingredients of granular sub base should be as per Job mix formula which the contractor has to obtain from V.Q.C.C. district lab &amp; should get it approved from Engineer in charge.</td>
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<td>2) The measurements shall be taken for completed item only.</td>
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<td>3) The work shall be carried out as per direction of Engineer in charge.</td>
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<td>4) The Initial &amp; final levels before and after G.S.B. item would be taken by the contractor and should get it checked from Engineer in charge. He should also produce cross section of the same and no extra payment will be made on this account.</td>
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<td></td>
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<td>5) Necessary royalty charges shall be borne by the contractor and the challan should be submitted to the department.</td>
</tr>
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<td>Sr. No.</td>
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<tr>
<td>2</td>
<td>Item No.5: Providing, laying, spreading and compacting stone aggregates of Grade II sizes to water bound macadam specification including spreading in uniform thickness hand packing rolling with vibratory roller in stages to proper grade and camber applying and brooming murum as screening / binding materials to fill up the intersties of coarse aggregates, watering and rolling, making necessary earthen bund to protect edges lighting, guarding, barricating, maintenance of diversion etc and including all leads and lifts etc complete.</td>
<td>MORT&amp;H-2001 (4th revision) Cl.No.404 &amp; Section 900 for Quality Control.</td>
<td>1) The Initial levels &amp; final levels should be taken by the contractor and should be got checked by Engineer in charge. No extra payment will be made on this account. 2) The metal quantity should be got cross checked before spreading of the same another Deputy Engineer. 3) The necessary stacking of metal and blindage shall be carried out before execution. 4) The screening shall be used to fill up the voids in water bound macadam as per Ministry of Road Transport and highway Specification. 5) The work shall be carried out as per direction of Engineer in charge. 6) Necessary royalty charges shall be borne by the contractor and the original challan should be submitted to the Engineer in Charge.</td>
</tr>
<tr>
<td>3</td>
<td>Item No.6: Providing, laying, spreading and compacting stone aggregates of Grade III sizes to water bound macadam specification including spreading in uniform thickness hand packing rolling with vibratory in stages to proper grade and camber applying and brooming murum as screening / binding materials to fill up the intersties of coarse aggregates watering and rolling making necessary earthen bund to protect edges lighting, guarding, barricating, maintenance of diversion etc and including all leads and lifts etc complete.</td>
<td>MORT&amp;H-2001 (4th revision) Cl.No.404 &amp; Section 900 for Quality Control.</td>
<td>1) The Initial levels &amp; final levels should be taken by the contractor and should be got checked by Engineer in charge. No extra payment will be made on this account. 2) The metal quantity should be got cross checked before spreading of the same another Deputy Engineer. 3) The necessary stacking of metal and blindage shall be carried out before execution. 4) The screening shall be used to fill up the voids in water bound macadam as per Ministry of Road Transport and highway Specification. 5) The work shall be carried out as per direction of Engineer in charge. 6) Necessary royalty charges shall be borne by the contractor and the original challan should be submitted to the Engineer in Charge.</td>
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<td>2</td>
<td>Item No.7: Providing and laying 75 millimeter thick built-up spray grout over existing water bound macadam surface including thorough cleaning the water bound macadam surface by using mechanical broom 101 to 121, 125, 126, 502, 503, or approved equipment applying tack coat of 80/100 bulk bitumen at 504, 505, 513 &amp; Section 900, 902 for Quality Control.</td>
<td>1) Item includes cleaning the WBM surface by wire brooming or by air compresor to entire satisfaction of the Engineer in Charge.</td>
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<td>2) The work shall be carried out as per direction of Engineer in charge.</td>
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<td>3) Dowelling for B.T.with hard murum shall be the sole responsibility of the contractor for which no extra payment will be admissible.</td>
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<td>4) The 80/100 grade bitumen for tack coat and 60 / 70 grade bitumen for layers shall be applied. The tack of distributor should either self propelled or towed bitumen pressure sprayer equipped for spraying the bitumen uniformly at the specified rate. The bitumen mini bouzer should be minimum 3.00 metric tonne capacity and spray bar with nozzles having constant volume / pressure system capable of spraying bitumen of specified rate &amp; temperature so as to provide a uniformly unbroken spread of bitumen.</td>
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<td>6</td>
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<td>5) The original challan obtained from refinery for bitumen shall be submitted to the Engineer in Charge along with every bill proposed for payment.</td>
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<td>6) For the controlling traffic &amp; maintaining diversion no extra payment will be made.</td>
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<td>7) The account of bitumen shall be maintained on site by the contractor in the proforma prescribed by the Engineer in charge. The reprentative of the contractor should sign the register daily in token of his acceptance and shall show it to the field officer.</td>
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<td>9</td>
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<td>8) The bitumen shall be procured from HPCL, IOCL, BPCL refinery only.</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Item of work</td>
<td>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</td>
<td>Additional Specifications</td>
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<td>8</td>
<td>Item No.8: Providing and laying hot mix hot laid bituminous macadam with bitumen of 60 / 70 grade and 50 millimeter average thickness with 3.3 % bitumen by weight of total mix including diversion of traffic, supply of all materials, heating bitumen and chips, mixing bitumen and chips in morden drum mix plant, laying bituminious macadam by sensor paver finisher including compaction, including 80/100 grade bulk bitumen tack coat etc complete.</td>
<td>1) The mode of measurements shall be as one cubic metre of work done, worked out by taking initial and final levels and plotting the levels on the existing profile by the contractor. 2) The bitumen to be used shall be of 60/70 grade for mix and 80/100 to tack coat. 3) The bitumen challan from the refinery shall be submitted in original to the Engineer in charge along with every bill proposed for Payment. 4) For the controlling traffic &amp; maintaining diversion no extra payment will be made. 5) The account of bitumen shall be maintained on site by the contractor in the proforma prescribed by the Engineer in charge. The representative of the contractor should sign the register daily in token of his acceptance and shall show it to the field officer. 6) The Modern mix plant should be used and capable of producing a mix of proper and uniform quality in accordance with clause No.504.3.4 of MORT &amp; H specification of 2001 edition (4th Revision). 7) Paver finisher with electronic sensing device confirming to clause 504.3.5 of MORT &amp; H specification of 2001(4th Revision) shall be used for the work.</td>
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<td>Sr. No.</td>
<td>Item of work</td>
<td>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</td>
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<td>8)</td>
<td>The contractor shall work out the superelevation required before laying. The bituminous layer shall provide the required superelevation accordingly failure to provide required superelevation with entitled the the Government to deduct the corresponding amount from the contractors immediate forthcoming bill.</td>
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<td>9)</td>
<td>Dowelling for bituminous work with hard murum shall be the sole responsibility of the contractor for which no extra payment will be admissible.</td>
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<td>10)</td>
<td>The bitumen shall be procured from HPCL, IOCL, BPCL refinery only.</td>
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<td>11)</td>
<td>The composition of bituminous macadam shall comply with the requirements of grading - II with 19 millimeter nominal size of aggregates as per table 505.4, page no.162 for 50 millimeter thickness.</td>
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<td>12)</td>
<td>The 80/100 grade bitumen for tack coat shall be applied. The tack of distributor should either self propelled or towed type pressure sprayer equipped for spraying the bitumen uniformly at the specified rate. The bitumen mini bouzer should be of minimum 3.00 metric tonne capacity and spray bar with nozzles having constant volume / pressure system capable of spraying bitumen of specified rate &amp; temperatur so as to provide a uniformaly unbroken spread of bitumen.</td>
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<td>Sr. No.</td>
<td>Item of work</td>
<td>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</td>
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<td>9</td>
<td>Item No.9: Providing and laying hot mixed hot laid semi dense bituminious concrete 25 millimeter thick with 60/70 grade of bitumen 5 % by weight of total mix, including supplying all materials heating bitumen and chips in modern drum mix plant laying semi dense carpet bituminious concrete with sensor paver finisher and applied tack coat of 80/100 grade bitumen at rate of 0.5 kilogram per square meter including compaction etc complete.</td>
<td>MORT&amp;H-2001 (4th revision) Cl.No.504, 501, 502 with 503, 112, 113 &amp; Section No. 900 for Quality Control Clause No. 901, 902 &amp; 903.</td>
<td>1) The contractor shall obtained Job mix formula as per table 500.21 page No.187 of MORT &amp; H specification of 2001 edition (4th Revision) at his own cost &amp; shall get the same approved from the Engineer in charge. 2) For the controlling traffic &amp; maintaining diversion no extra payment will be made. 3) The bitumen to be used shall be of 60/70 grade considered for mix and 80/100 grade considered to tack coat.</td>
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<td>9</td>
<td>Minimum three roller (one vibratory and two static) shall be used for compaction.</td>
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<tr>
<td>Sr. No.</td>
<td>Item of work</td>
<td>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</td>
<td>Additional Specifications</td>
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<tr>
<td>10</td>
<td>Item No.10: Addition cost to effect adjustment of bitumen over and above 5.00% asphalt for 0.50 % per square metre for 25 millimetre Semi dense bituminious concrete as per job mix.</td>
<td>If the percentage of the bitumen 60/70 grade as per job mix is more or less than 5.00% then the rate shall increased or decreased accordingly at the rate of Rs.13.85 (Rs.Thirteen and paise eighty five only) per 0.50% of 60/70.</td>
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</tbody>
</table>
| 11     | Item No.11: Providing and laying hard murum/kankar at the road side, including conveying and stacking spreading and compacting hard murum side widths with power roller including artificial watering etc. complete. | 1) As directed by Engineer-in-Charge.  
2) The hard murum should got tested from V.Q.C. district lab for it's P.L., L.L. tests.  
3) Necessary royalty charges shall be borne by the contracotor and the original challan should be submitted to the Engineer in Charge along with every bill proposed for payment for this item. |
| 12     | Item No.12: Providing & applying thermo plastic reflective paint of approved colour or compound for traffic lane strips of 3 mm thick of pigment 10%, on clean, dry and good road surface with 30-40% glass beads, 20% binder and 40% of filler materials etc complete. | 1) The material of this item should be got tested from V.Q.C.C. district lab for every 3.00 kilometre length. The tests to be performed are mentioned in section X @ Sr.No. 8 of Vol. II.  
2) The thickness of thermoplastic pavement marking should be 3.00 millimeter minimum.  
3) The defect liability period shall be of 4 years.  
4) The proportion of thermoplastic material should be in accordance with ASTMD - 36/BS - (Part -1) failing in which the material will be rejected.  
5) The work shall be executed as per IRC-35-1977. |
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item of work</th>
<th>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</th>
<th>Additional Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>1) Item No.13: Providing and fixing Cautionary/Warning sign board having shape of equilateral triangle of 90 centimeters sides made out of 12 gauge (3 millimeter) thick aluminium sheet including frame of 35x35x3 millimeter Mild Steel angle with grey stove enamel/powder coating on back side and front side bonded with white retroreflective sheeting of high intensity grade encapsulated lense type (honey comb design) having pressure sensitive heat activated adhesive, high intensity grade retroreflective red coloured border, black coloured cutout symboles of non reflective having pressure sensitive adhesive including one mild steel angle iron post of size 65x65x6 millimeter, 3.65 meters long, painted with one coat of epoxy primer and two coats of epoxy finish paint having black and white bands of 25 centimeter width including galvanised iron fixtures etc. and fixing the boards in 1:4:8 cement concrete block of size 60 centimeter x 60 centimeter x 75 centimeter including transportation etc complete.</td>
<td>Retroreflective sheeting should be with seven years written warranty from the manufacturer / Authorised sole distributor for satisfactory field performance including stipulated retroreflectance of retroreflective sheeting and warranty in original should be submitted to the Engineer in charge.</td>
<td>1) The specific guarantee bond for the guarantee period specified by the MORT &amp; H specification 2001 (4th Revision) shall be obtained from manufacturer and submitted duly signed by the contractor to the department before installing of boards Retroreflective sheeting should be with seven years written warranty from the Manufacturer/Authorised sole distributor for satisfactory field performance including stipulated retroreflectance of retroreflective sheeting and warranty in original should be submitted to the Engineer in charge. 2) The concrete block should be 20 centimetre above ground level and balance should be kept below ground level. 3) As directed by Engineer in charge.</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Item of work</td>
<td>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</td>
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<tr>
<td>14</td>
<td>Item No.14: Providing and fixing informatory sign boards in square or rectangular shape of any size made out 12 gauge (3 millimeter) thick aluminium sheet with grey stove enamel/ powder coating on back side and front side bonded with green retroreflective sheeting high intensity grade encapsulated lense type (honey comb design) having pressure sensitive heat activated adhesive, high intensity grade white retroreflective cutout border and messages having pressure sensitive adhesive including one Mild Steel angle iron frame of size 35 millimeter x 35 millimeter x 3 millimeter and two Mild Steel angle iron post of size 65 millimeter x 65 millimeter x 6 millimeter, 3.60 meter long properly cross braced with angle iron of size 50 millimeter x 50 millimeter x 5 millimeter duly painted with one coat of epoxy primer and two coats of epoxy finish paint having alternate black and white bands of 25 centimeter width including Galvanized Iron fixtures etc and fixing the boards in 1:4:8 concrete block of size 60 centimeter x 60 centimeter x 75 centimeter including transportation etc. complete. Retroreflective sheeting should be with seven years written warranty from the manufacturer / Authorized sole distributor for satisfactory field performance including stipulated retroreflectance of retroreflective sheeting and warranty in original should be submitted to the Engineer in charge.</td>
<td>Rd.23 Page No.202, Rd.28,31,36,37 Page No.206 to 209 &amp; Rd.40 Page No.211, MORT&amp;H-2001 (4th revision) Cl.No.407.</td>
<td>1) The specific guarantee bond for the guarantee period specified by the MORT &amp; H specification 2001 (4th Revision) shall be obtained from manufacturer and submitted duly signed by the contractor to the department before installing of boards Retroreflective sheeting should be with seven years written warranty from the Manufacturer/Authorized sole distributor for satisfactory field performance including stipulated retroreflectance of retroreflective sheeting and warranty in original should be submitted to the Engineer in charge. 2) The concrete block should be 20 centimetre above ground level and balance should be kept below ground level. 3) As directed by Engineer in charge.</td>
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<tr>
<td>15</td>
<td>Item No.15: Providing dry/ trap/ granite/ quartzite/ gneiss rubble stone masonry etc. complete.</td>
<td>Spec.No. : Rd.74 Page No. 247</td>
<td>1) As directed by Engineer-in-Charge. 2) Necessary royalty charges shall be borne by the contractor and the original challan should be submitted to the Engineer in Charge.</td>
</tr>
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<td>16</td>
<td>Item No.16: Providing and laying in situ cement concrete of 1:3:6 proportion with trap metal in foundation including necessary compacting, covering newly laid concrete by gunny bag, plastic or tarpaulin and curing including formwork etc. complete.</td>
<td>Clause No.112 Section 100</td>
<td>1) The Initial &amp; final levies shall be submitted along with bill by the contractor and should be got checked by Engineer In charge. 2) All levels of the work should be got checked by Engineer In charge.</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Item of work</td>
<td>Standard Specifications as per Red Book / MORT &amp; H 2001 (4th Revision) Specifications</td>
<td>Additional Specifications</td>
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| 17      | Item No.17: Providing cement concrete M 15 grade for head walls, abutement with or without circular or other shaped opening for waterway including necessary scaffolding, formwork, compaction, finishing, covering newly laid concrete by gunny bags, plastic or tarpaulin and curing etc. complete. | CD.8 Page No.163/IS 456 (2000) & Section No.2900 Clause & H specification.         | 1) The Initial & final leves shall be submitted alonge with by the contractor and should be got checked by Engineer in charge.  
2) All levels of the work should be got checked by Engineer in charge. |
| 18      | Item No.18: Milling the road surface in Bituminous pavement upto a depth of 55 mm including disposing off the excavated stuff within 2 km. lead and spreading the same or stacking as directed including line & level, compacting with power roller etc. | CD.14 Page No.167                                                               | As directed by Engineer-in-Charge. |
Bar Chart.

Attached separately.
1. The work shall be carried out as per the M.O.R.T. & H. specification for roads and bridges published vide fourth revision on August 2001 and reprinted in March.

2. The stability & design of counterfort retaining wall shall be calculated & got approved from the competent authority before execution of work as per the guidelines of I.R.C. 78-2000 Standard Specifications & Code of Practice for Road Bridges Section VII Foundation & Sub Structure.
SECTION XI

Forms of Supplementary Information F1 to F5
FORM F-1
DETAILS OF WORKS OF SIMILAR NATURE & MANGINTUDE AMOUNTING TO RS. (AS SPECIFIED IN TENDER DATA VOLUME II) CARRIED OUT BY TENDERER

NAME OF TENDERER

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Work</th>
<th>Name and Address of Organisation for whom the work is done</th>
<th>Place</th>
<th>Tendered Cost</th>
<th>Time in which completed</th>
<th>Date of completion</th>
<th>Principal features in brief</th>
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FORM F-2
DETAILS OF OTHER WORKS TENDERED FOR AND IN HAND AS ON THE DATE OF SUBMISSION

NAME OF TENDERER :-

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of Work</th>
<th>Name and Address of Organisation</th>
<th>Place</th>
<th>Tended Cost</th>
<th>Work in hand (cost of remaining Work)</th>
<th>Anticipated date of Completion</th>
<th>Estimated Cost</th>
<th>Works tendered where decision is expected</th>
<th>Stipulated date of period of completion</th>
<th>Remarks</th>
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# FORM F-3

LIST OF MACHINERY AVAILABLE WITH THE TENDERED WHICH WILL BE USED FOR EXECUTION OF THE CONTRACT

**NAME OF TENDERER**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Equipment</th>
<th>No. of Units</th>
<th>Kind and make</th>
<th>Capacity</th>
<th>Age of Machinery</th>
<th>Present condition of Machinery</th>
<th>Present Location address of organization where machinery is in use</th>
<th>Whether the machinery is hypothecated to any bank or institution</th>
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<tbody>
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FORM F-4
STATEMENT SHOWING TECHNCIAL PERSONNEL AVAILABLE WITH CONTRACTOR WHICH CAN BE SPARED EXCLUSIVELY FOR THIS WORK

NAME OF TENDERER :-

<table>
<thead>
<tr>
<th>SR. NO.</th>
<th>Designation</th>
<th>Name</th>
<th>Qualification</th>
<th>Professional experience of work carried out</th>
<th>Remarks</th>
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</table>
FORM F-5

ACTIVITY (WORK) SCHEDULE.

Name of Work :-

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Item of work</th>
<th>Amount</th>
<th>TIME PERIOD</th>
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<td></td>
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<td></td>
<td>Mile Stone I  Mile Stone II  Mile Stone III</td>
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<td>1st  2nd  3rd  4th  5th  6th  7th  8th  9th  10th  11th  12th</td>
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</table>
100 Rs. Bond

नमुना सत्यप्रतिज्ञा लेख (Affidavit)

मी ............................................. वय वर्ष ........ ....राहणार

......................................................... या सत्यप्रतिज्ञा लेखाद्वारे लिहून देतो तो, मी ......................................................... या फर्मचा/कंपनीचा प्रोप्रायटर असून ................................................................. या कामासाठी निविदा सादर केली आहे. त्या निविदेच्या मध्ये जो कागदपत्र सादर केली आहेत ती खरी, बनावर व पूर्ण आहेत. यामध्ये कोणत्याही जटील, चुका नाहीत असे शपथपूर्वक मान्य करून आहे. या कागदपत्रांत्यात काही चुकीची, दिशाभूमी करणारी, खोटी व तसेच अपूर्ण माहिती आढळल्यास मी कायदेशीर कार्यवाहीस पात्र आहे व राहील.

कंत्रातदाराची सही
SECTION - XII

DRAWINGS
SECTION -XIII

LETTER FOR ACCEPTANCE AND WORK ORDER
LETTER OF ACCEPTANCE

NO.-------------------------------------
Office of the Executive Engineer,
National Highway Division No 9,
Nashik

To,

M/s ----------------------------
-----------------------------------
-----------------------------------
Subject: - Acceptance of tender for the [Name of Work]
----------------------------------------------------------------------------------------
Reference: - Your tender dated -----------

Dear Sir,

Your Tender for the work cited under subject above as quoted by -----------% above/below/at par with schedule of rates is hereby accepted by ---------------

It is requested to deposit the security deposit amount of Rs. ----------- in the form of Term Deposit receipt/cash or in the form of Bank Guarantee within 10 day from the receipt of this acceptance letter.

Failure to deposit the Security Deposit within the time stipulated will be treated as non response and subsequently will lead to forfeiture of earnest money.

D. A. Nil                                      Executive Engineer
                                                National Highway Division No 9,
                                                Nashik
WORK ORDER

No.-------------------------------------
Office of the Executive Engineer,
National Highway Division No 9,
Nashik

To,
M/s  -------------------------------------
----------------------------------------
----------------------------------------
Subject: Work Order Tender for the Work of  ---------------------------------------------
---------------------------------------------------------------------------------------------
i) Estimated Cost Rs.-----------------
ii) Tendered cost Rs. ---------------
Reference: i) Your tender dated ---------------
ii) Your letter No.------------------

Dear Sir,

With reference to this office letter cited above, you have deposited -------
---% initial security deposit of Rs. -------------------------------------- Rs.-----------------
---------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------
in form of --------------------------------------
---------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------

Your tender for the above work Rs.---------------------------------------------
---------------------------------------------------------------------------------------------
(Rs. --------------------------------------) has been accepted by -------------- vide letter No. --------------------- dated --------------

Hence the tender is hereby accepted on behalf of Governor of Maharashtra, subject to confirmation of Bank Guarantee.

Your are requested to submit your work programme within ------------days
and start the work forthwith i. e. effect from ------------ under the guidance / supervision of Deputy Engineer, N. H. Sub Division, Pathardi & complete the work within the stipulated period ie time ---------------Months / year.

A copy of Agreement registered under No. ---------- Please acknowledge the receipt,

D. A. : Certified copy of Agreement  
Executive Engineer,
National Highway Division No 9
Nashik

1) Copy submitted to Accountant General Mah –II (A &E), Nagpur for information.
2) Copy submitted to Superintending Engineer, Public Works Circle Jalgaon-for information
3) Copy forwarded to Deputy Engineer N. H. Sub Division No.Pathardi for information and necessary action along with true copy of Agreement
4) Copy to Auditor at Division Office along with true copy of Agreement
### SECTION XI

**FORM P-5**

**Name of work:** Improvement to accident spot (hair pin bend) at Km. 240/050 and road safety measures in Km. 244/000 to Km. 247/000 of Kalyan Ahmadi Nagpur Pathardi-Kaved Nirmal Road section of N.H. 122.

**BAR CHART SHOWING PROGRAMME OF EXECUTION OF WORK**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Item of Work</th>
<th>Mile Stone I</th>
<th>Mile Stone II</th>
<th>Mile Stone III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earth work and excavation for roadway, Excavation of guter, Milling the surface</td>
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<td><strong>Cumulative Expenditure (in Rs)</strong></td>
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<td><strong>Cumulative Expenditure (%)</strong></td>
<td>37%</td>
<td>62%</td>
<td>100%</td>
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**Technically Checked**

Contractor: [Signature]

No. of Corrections: [Signature]

Executive Engineer: [Signature]
GOVERNMENT OF MAHARASHTRA
PUBLIC WORKS DEPARTMENT

Standard Contract Document
For Road & Bridge Works
on National Highways
(Non Variable Document)

Volume-I
(Version - 1)
Standard Contract
Document For
Road & Bridge
Works on National Highway
Volume-I
Version - I
(Non Variable)

Authenticated by
Shri _________________________
Designation___________________
Signature_____________________

Copy No._____________________

VERSION - 01    DT. 04/07/2005
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INSTRUCTIONS TO TENDERERS (I.T.T.)

A. GENERAL

1. **Scope of work**
   As per Section IV of Volume II.

2. **Eligible Tenderers**
   This invitation to tender is open to Tenderer meeting the requirements as stipulated in Notice Inviting Tender (N.I.T.) and Tender Data Volume II.

3. **Qualification of Tenderer**
   3.1 To be eligible for award of Contract the Tenderers shall provide satisfactory evidence to the Government of their eligibility, capability and adequacy of resources to carry out the Work/Contract effectively. For this purpose all the tenders submitted shall include the information in the relevant formats.

   3.2 For the purpose of this Contract, the Tenderer shall meet the qualifying criteria as mentioned in **Tender Data Volume II**.

   3.3 In case of joint venture the Tenders submitted by joint venture of two or more firms shall comply with the requirements as mentioned in **Tender Data Volume II**.

   3.4 In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof and in the event of absence of any partner, it shall be signed on his behalf by a person holding a power of attorney authorising him to do so.

4. **Cost of Tendering**
   The Tenderer shall bear all cost associated with the preparation and submission of his tender. Government in no case shall be responsible or liable for these costs, regardless of the conduct or outcome of the tendering process.

5. **Site Visit**
   5.1 The Tenderer shall be deemed to have carefully examined the work and site conditions including labour, the general and the special conditions, the specifications, schedules and drawings and shall be deemed to have visited the site of the Work and to have fully informed himself regarding the local conditions and carried out his own investigation to arrive at the rates quoted in the tender. In this regard he will be given necessary information to the best of knowledge of Department but without any guarantee about it.

   5.2 The site visit and collection of required information/data shall be at the Tenderer's own expense. A declaration to this effect will have to be signed by the Tenderer in the format (Declaration of the Tenderer) in **Section VII of Volume II**. (Refer sample form of Declaration in Section VI of this Volume)
B. TENDER DOCUMENT

6. Contents of Tender Documents

6.1 The document will consist of Volume I (Non Variable Document) and Volume II (Variable Document) together with any addendum issued in accordance with any common set of deviation issued in accordance with clause 7 of this section.

6.2 The Tenderer is expected to examine carefully all instructions, conditions, terms, specifications and drawings contained in Volume I and Volume II, addendum/common set of deviations which is a part of Contract documents.

6.3 The Non Variable Document (Volume I) and Variable Document (Volume II) shall be issued to the intending Tenderer.

6.4 All the above documents will form the part of the Contract.

6.5 The Variable Document i.e. Volume II states the work to be carried out, Tender Data, Contract Data, schedules, forms and amendments if any to provisions in Volume I. It also contains the design and drawings, work specific technical specifications, date for submitting and opening tenders, time period for carrying out the work, amount of earnest money to be furnished with the tender and the amount of Security Deposit to be deposited by the successful Tenderer and the percentage if any to be deducted from bills etc.

6.6 All Tenderers are cautioned that the tenders containing any deviations from the contractual terms and conditions, specifications or other requirements and conditional tenders will be rejected as non responsive.

7. Clarification of Tender Documents

7.1 In case any clarification is required by the Tenderer he may obtain it personally or in writing well in advance from Engineer-in-Charge. The clarification for which request has been received prior to pre-tender conference will be answered.

7.2 A Pre Tender Conference open to all prospective Tenderers who have purchased the tender document will be held at the time and place as per Tender Data Volume II wherein the prospective Tenderers will have an opportunity to seek clarifications regarding the tender conditions and the Work.

7.3 The prospective Tenderers attending the pre tender conference are free to ask any question as regards any additional information/clarification either in writing or orally and reply to the same will be given by the authority as mentioned in Tender Data Volume II in writing. This clarification shall be referred to as common set of deviations and shall form part of tender documents and will also be common and applicable to all Tenderers.
C. PREPARATION OF TENDERS

8. **Documents Comprising the Tender**

8.1 The tender to be prepared by the Tenderer shall comprise of the documents as mentioned in the clause 13.2.1 and clause 13.2.2 of this Section. The forms and the data provided in this documents shall be used without exception.

8.2 The Tenderer is expected to go through the conditions, specification and common set of deviations issued pursuant to clause 7 above while preparing the tender.

9. **Offer**

The Tenderer shall submit his/their offer in Volume II of the Contract document as per the procedure set in Sub Section D of this section.

a. The price quoted by the Tenderer shall include all the costs towards executing and completing the Works including remedying any defects therein. The offer shall provide for all superintendence, labour, material, plant, equipments and all other items required for work including all taxes, duties, royalties, octroi and such charges except for the exemption.

b. The Tenderer shall mention his offer indicating at what percentage above or below the rates specified in Schedule of quantities in Volume II (Schedules of Work showing items of work to be carried out), the Tenderer is willing to undertake the work. Only such percentage on all the estimated rates shall be mentioned.

c. The percentage quoted by Tenderer shall be valid for the original Contract period as well as during extensions if any duly granted and shall not be subject to any further adjustment by way of claim except as detailed in clause 54 of Conditions of Contract under section III.

d. The offer shall be inclusive of all quarry fees, royalties and ground rent for stacking material if any in pursuant to clause 36 of Conditions of Contract in Volume I under section III. The royalty under Minor Mineral Act, 1968 shall be paid directly to the Revenue Department by the Tenderer as and-when due as per rates in force.

10. **Validity of offer**

Validity of the tender will be **120 Days** from the date of opening of the tender until it is withdrawn by notice in writing duly addressed to the authority opening the tender. Such withdrawal after **120 Days** shall be effective from the date of receipt of notice by the Government.
11. **Earnest Money Deposit**

11.1 Earnest Money as specified in *Contract Data Volume II* should be attached with the tender and in the form of a Term Deposit Receipt/FDR for a period of one year issued by a branch located in State of Maharashtra of a Scheduled Bank only and duly endorsed in the name as specified in *Contract Data Volume II* from the date of issue/receipt of the tender.

11.2 Attested Earnest Money exemption certificate will be accepted in lieu of Earnest Money Deposit from the registered Tenderers of Maharashtra State only.

11.3 The amount will be refunded to the unsuccessful Tenderers on deciding about the acceptance or otherwise of the tender. In the event of his tender being accepted, subject to the provision of clause 11.4 below, the said amount of earnest money, if so requested by the Tenderer be appropriated towards the amount of Security Deposit payable by him under clause 22 of this section.

11.4 If after submitting the tender, the Tenderer withdraws his offer or modifies the same or if after the acceptance of his Tender, the Tenderer fails or neglects to furnish the balance of Security Deposit, without prejudice to any other rights and powers of the Government hereunder, or in law the Government shall be entitled to forfeit the full amount of the Earnest Money deposited by him.

11.5 In the event of his Tender not being accepted, the amount of Earnest Money deposited by the Tenderer shall, unless it is prior thereto, be forfeited under the provisions of sub-clause 11.4 above, be refunded to him on his passing receipt therefor.

11.6 Any tender not accompanied by the earnest money deposit or valid exemption certificate shall be rejected as non responsive.

12. **Format and signing of Tender**

12.1 All pages of tender documents in original shall be signed by a person or persons duly authorized to sign on behalf of the Tenderer. All pages of the tender where entries or amendments have been made shall be initialed by the person or persons signing the tender.

12.2 All corrections, all additions or pasted slips shall be initialed by the Tenderer.

12.3 The Tenderer (or in case of a firm, each partner thereof) shall sign or the signature/signatures shall be attested by a witness on pages of Memorandum in Volume II of the tender in the space provided for the purpose.

12.4 No corrections shall be made in the tender documents. Any corrections that are to be made by crossing the incorrect portion and writing the correct portion above shall bear the initials of the Tenderer.
D. SUBMISSION OF TENDER

13. Sealing and marking of Tenders

13.1 The tender shall be submitted in two sealed envelopes marked envelope No.1 and envelope No.2 and shall be again put together in one common cover and sealed. This sealed cover shall be marked on the left hand top corner "Tender for the work of (As per Notice Inviting Tender in Volume II)". The full name and address of the Tenderer and the name of authorized agent delivering the sealed cover containing the tender shall be written on the bottom left hand corner. If submitted by post, the sealed envelope marked as above shall be enclosed in another envelope properly addressed and shall be sent by registered post acknowledgement due. The date and time of receipt of tender shall strictly apply in all cases.

13.2 Manner of submission :

13.2.1 Envelope No.1 shall contain the following documents in the sequence mentioned below, subject to changes if any as indicated in Contract Data Volume II.

a. Letter of submission of tender.
b. Index page denoting the documents attached and their page numbers.
c. Attested copy of valid registration certificates.
d. Earnest Money in the form prescribed in clause 11 above.
e. Additional FDR/TDR as per the requirements mentioned in Contract Data Volume II for mobilization of hot mix plant.
f. Attested copy of registered partnership deed/ Memorandum and articles of association as the case may be if the Tenderer is a partnership firm or joint venture company and certificate of registration from Assistant Registrar of Firms.
g. Power of Attorney on behalf of firm in the name of person authorised to sign agreement/bills etc. and collect cheques from the Department for the work done.
h. Attested copy of valid Sales Tax Registration Certificate from Sales Tax Commissioner.
i. Details of works of similar nature and magnitude amounting to Rupees as prescribed in Tender Data Volume II carried out by the Tenderer in last three years (Form F-1 of Section VI).
j. Details of other works tendered for and in hand. (Form F-2 of Section VI) as on the date of submission of this tender. The certificates from the heads of office under whom the works are in progress should be enclosed.

The Tenderer should furnish a detailed statement of works in hand, the works completed showing the cost of work against each with certificate from head of the office concerned. The declaration in the form of affidavit to the effect that no other works than specified in the statement are in the hands of the Tenderer shall be enclosed. For wrong information / documents if noticed by the Department, the Tenderer shall be liable to be disqualified and his tender document in Envelope No. 2 shall not be considered for opening.

k. List of Machinery and plants available with the Tenderer which will be used exclusively for this work. (Form F-3 of section VI).
l. List of technical personal on roll of the Tenderer at present and those likely to be available for this work (Form F-4 of section VI).

m. The documents for qualification Criteria including annual turnover, bid capacity as mentioned in Tender Data Volume II.

n. The documentary proof of owning the machineries like Hot Mix Drum mix plant (Four Bin of minimum capacity 30 MT per hour) as specified in Tender Data Volume II, the paver finisher, the vibratory roller and the self propelled Mechanical sprayer, complying with MORT&H specification by way of original purchase bill or sale deed or attested copy thereof showing stamp duty if any.

o. Activities work schedule (Form F-5 of section VI)

p. A sketch map showing the distance between the work site and plant site with km. numbers.

13.2.2 The second envelope clearly marked as "Envelope No.2" shall contain:

   a) Volume I

   b) Volume II with offer (section V)

   c) Memorandum (section VI)

   d) Declaration (Section VII)

   e) Common set of deviations/ additional stipulations issued by the Department.

13.2.3. The Tenderer should quote his offer on form of tender as percentage of estimated cost mentioned in Schedule B at the appropriate place of Volume II, to be submitted only in Envelope No.2. He should not quote his offer anywhere directly or indirectly in Envelope No.1. The Tenderer shall quote for the work as per details given in the Volume II and also based on the Common set of deviations issued /additional stipulations made by the Department.

13.2.4 The tender shall be unconditional.

13.3 In the event of tender being submitted by firm, it must be signed separately by each partner thereof, and in the event of absence of any partner it shall be signed on his behalf by a person holding power of attorney authorising him to do so.

13.4 On receipt of blank Volume II, the Tenderer should ensure that no correction or overwriting or erasers is left out to be attested by the Engineer-in-Charge.

13.5 The offer in percentage should be written both in words and figures at appropriate place in Volume II.

14. Dead line for submission of tender

The tender shall be received by the authority and at the address mentioned in N.I.T. not later than (As per Tender Data Volume-II). The Engineer-in-Charge may at his discretion extend the deadline for submission of tender by issuing an addendum in which case, all rights and obligations of the Government and Tenderers previously subjected to the original dead line shall therefore be subjected to new deadline as extended.

15. Receipt of Tender After Deadline

No delay on account of any cause will be entertained for the late receipt of the tender. Tender offered or received after the date and time is over, will either not be accepted or if inadvertently accepted, will not be opened and shall be returned unopened to the Tenderer.
E. OPENING OF TENDERS AND EVALUATION

16. Opening of Tenders

16.1 The tenders will be opened in presence of Tenderers/their authorized representative who choose to remain present at the date, time and place stipulated in N.I.T. Volume II.

16.2 Following procedure shall be adopted for opening of tender.

16.2.1 Envelope containing Envelope No.1 and Envelope No.2 of all the tenders received will be arranged alphabetically and will be marked with number in fraction having denominator showing total number of tenders received and numerator showing serial number of tender arranged in alphabetical manner.

16.2.2 First of all Envelope No.1 of each tenderer will be opened serially as per the marking mentioned above. The contents in Envelope No.1 will be verified by the tender opening authority (stipulated in Tender Data Volume II) to check their validity as per requirements. If any particular document of any tender is either missing or does not meet the requirements specified in clause No.13.2.1 of Volume I then a note to that effect will be recorded by the tender opening authority.

16.2.3 The Envelope No.2 of the tenderer whose Envelope No.1 does not contain the specified documents or any of the specified document is missing or do not satisfy the requirements as regards qualification criteria stipulated in Tender Data Volume II, such tenders will be separated out. A note on the Envelope No.2 of such tenders indicating the nature of deficiency will be made. The Envelope No.2 of such tender shall not be opened and a note to that effect will be made on the Envelope No.2.

16.2.4 After the analysis and scrutiny of documents and evaluation with respect to qualification criteria is over, the tender opening authority shall intimate the date and time of opening of Envelope No. 2 to the qualified Tenderers. If possible, the Envelope No. 2 shall be opened immediately on the same day.

16.2.5 In pursuant to clause 16.2.4 above, the Envelope No.2 of qualified Tenderers shall be opened serially. The percentage above or below over the estimated cost put to tender by the Department, quoted by each qualified Tenderer shall then be read out by tender opening authority for information of those present.

17. Process to be confidential

17.1 The information relating to the examination, clarification, evaluation, comparison of tender and recommendations for the award of a Contract shall not be disclosed to Tenderer or any other person not officially concerned with such process until the award of the Contract to successful Tenderer has been announced.

17.2 Any effort by a Tenderer to influence the Government in the process of examination, clarification, evaluation, comparison of tenders and in decision concerning the award of Contract may result in rejection of tenders.
18. Clarification of offer

The Tenderer who quotes more than 15% below the estimated rates must submit an Additional Security Deposit equal to the amount below so quoted by him below 15% in the form of demand draft/FDR/ TDR from any Scheduled Bank having branches in Maharashtra in favour of the Executive Engineer, as specified in Tender Data Volume II for a period of one year / for the stipulated period of completion at the time of payment of Initial Security Deposit. Failing which, the work order will not be issued to the Tenderer and all his deposits for this work will be forfeited to the absolute disposal of Government.

19. Tender liable for rejection

19.1 Tender is liable for outright rejection if on opening it is found that –
   a) The Tenderer has not strictly followed the procedure laid down for submission of tender.
   b) The tender is conditional.
   c) Any corrections, additions or alterations are made by the Tenderer on any page of the tender.
   d) Any page or pasted slips are missing.
   e) Tenderer has not signed each page of tender.
   f) The Tenderer has not attached the documents as stated in clause 12.3 and clause 13.2 of Instructions To Tenderers.
   g) The available bid capacity of the Tenderer, assessed by the formula as per Tender Data Volume- II does not satisfy the required bid capacity. The available bid capacity shall be more than or equal to the amount of work put to tender.
   h) The Tenderer has furnished either incomplete information in Form F-1 to Form F-6 or the information is not furnished in prescribed form.
   i) The tender submitted without detailed information of all completed works, ongoing works and works tendered for (Form F-1 and Form F-2 of Section VI).
   j) The Tenderer has quoted his offer either in Envelop No.1 or anywhere else other than space provided therefor in Volume-II.

19.2 The tender accepting authority reserves the right to inspect the site or get the site inspected of completed and ongoing works to ascertain the correctness of information submitted by the Tenderer. If false information is found to have been submitted, the tender shall be liable for rejection.

19.3 The officer competent to dispose off the tender shall have the right of rejecting any or all of tenders without assigning any reason there for.

20. Corrections of Errors

20.1 If there is any discrepancy in percentage rate quoted in figure and in words, the lower of the two will be treated as the offer.

20.2 No erasers or any alternations in the text of the tender documents will be allowed and any such eraser or an alternation will be disregarded. If there is any error in writing, no overwriting should be done but the wrong words or figures should be struck off and the correct one written above or near it in an unambiguous way. Such corrections should be initialed and dated.
F. ACCEPTANCE OF TENDER

21. Acceptance

21.1 Subject to clause 18 and clause 19, the work will be awarded to a Tenderer whose offer has been found to satisfy all the requirements of tender document and who has quoted the lowest offer subject to further negotiations if any.

21.2 Prior to expiration of tender validity period or any such extended period, the Engineer-in-Charge as stipulated in Tender Data Volume II will inform the successful Tenderer in writing by registered letter that his tender has been accepted. This letter (hereinafter and in conditions of Contract called letter of acceptance) shall mention the accepted offer and amount of Security Deposit along with amount of additional security if any in pursuance to clause No. 18 to be deposited by the Tenderer as prescribed in Contract Data Volume II. This letter of acceptance will constitute formation of Contract.

22. Security Deposit

22.1 The successful Tenderer whose tender has been accepted will have to deposit a sum of Rupees (as per the Contract Data Volume II) towards initial Security Deposit in the form of Cash/ Bank Guarantee/ F.D.R./T.D.R. of Scheduled Bank from a branch located in Maharashtra. The Security Deposit shall be furnished within 10 Days from the date of issue of letter of acceptance, failing which the Tenderer will be liable for action as per clause 11.4 above. The Security Deposit submitted shall be valid for the period of Contract or any such extended period in pursuance to clause 6 of Conditions of Contract. The initial Security Deposit will constitute 50% amount of total Security Deposit.

22.2 Remaining 50% of Security Deposit will be recovered from running bills at the rate as specified in the Contract Data Volume II.

22.3 Additional Security Deposit, if any, shall be furnished as mentioned in clause 18.

23. Award of Contract

23.1 Immediately upon furnishing the Security Deposit and additional security pursuant to clause 18 the successful Tenderer or in case of firm the person authorized to sign the Contract document, shall sign the Contract documents.

23.2 Upon furnishing the Security Deposit and additional Security Deposit in accordance with clause 18 by the Tenderer, the order to start work will be given. This order hereinafter and in conditions of Contract will be called as Work Order. The Work Order shall be accompanied by the certified copy of agreement bearing the number under which it is registered in the office of the Executive Engineer mentioned in the Tender Data Volume II.
24. **Performance Security**

24.1 **Performance Security for mobilization of plant**

24.1.1 The Tenderer's Drum mix plant should be located within a distance as stated in **Contract Data Volume II**, from the farthest point of the work site. Otherwise, he shall have to submit the additional Performance Security as stipulated in the **Contract Data Volume II** in the form of F.D.R. /T.D.R. for a period of One year duly pledged in the name of Engineer-in-Charge, as per **Contract Data Volume II** and shall be furnished in the Envelope No.1. This additional Performance Security shall constitute, (as a Performance Security for mobilization and commissioning of the plant) with the undertaking that he/they shall have to mobilize the drum mix plant within the distance as stated above within 30 Days from issue of work order. Failing this, the work order will be cancelled and the Security Deposit and the Performance Security both shall be forfeited by Government.

24.1.2 The Performance Security shall be refunded after one month of successfully commissioning of the plant and the starting of the work to the satisfaction of Engineer-in-Charge.

24.2 **Performance Security for maintenance**

Performance Security Deposit towards maintenance pursuant to clause 26 in Section II (Maintenance) equal to 5% (five per cent) of amount of work done shall be deducted from each bill and the same will be refunded to the agency after satisfactory completion of Defect Liability Period.
GENERAL CONDITIONS OF CONTRACT

A. GENERAL

1. Definitions
   i) Chief Engineer:
The expression 'Chief Engineer' as used in the tender papers shall mean that Officer for the time being of the Maharashtra Government who is designated as such.

   ii) Completion Date:
The date of completion of the Works as certified by the Engineer-in-Charge in accordance with Clause 24 of this section.

   iii) Contract:
The 'Contract' is the Contract between the Government and the Contractor to execute, complete and maintain the Works. It consists of the documents listed in Clause 3 here under.

   iv) Contract Data:
The 'Contract Data' defines the documents and other information which comprise the Contract.

   v) Contractor:
The expression 'Contractor' as used in the tender paper shall mean the successful tenderer that is the tenderer whose tender has been accepted and who has been authorized to proceed with the Work.

   vi) Contract Amount:
The amount mentioned in the Work order.

   vii) Days:
'Days' are calendar days and months are calendar months.

   viii) Defect Liability Period:
The 'Defects Liability Period' is the period named in the Contract Data Vol. II and calculated from the Completion Date.

   ix) Department:
The 'Department' shall mean the office of the Engineer-in-Charge for the purpose of Contract.

   x) Engineer-in-Charge:
The expression 'Engineer-in-Charge' as used in the tender paper shall mean the Executive Engineer-in-Charge of the Work.
xi) Equipments:
'Equipment' is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

xii) Government:
The expression 'Government' as used in the tender papers shall mean the Public Works Department of the Government of Maharashtra.

xiii) Materials:
Materials are all supplies, including consumables, used by the Contractor for incorporation in the Works.

xiv) Plant:
The expression 'Plant' as used in the tender papers shall mean every temporary and accessory means necessary or considered necessary by the Engineer to execute, construct, complete and maintain the work and all altered, modified, substituted and additional works ordered in the time and the manner herein provided and all temporary materials and special and other articles and appliances of every sort, kind and description whatsoever intended or used therefor.

xv) Site:
The Site shall mean the land and/or other places on, under, in, through which the Work is to be executed under the Contract including any other land or places which may be allotted by the Engineer-in-Charge or used for the purpose of Contract.

xvi) Specification:
Specification means the Specification of the Works included in the Contract and any modification or addition made or approved by the Engineer-in-Charge.

xvii) Superintending Engineer:
The expression 'Superintending Engineer' as used in the tender papers shall mean officer of Superintending Engineer's rank(by whatever designation he may be known) under whose control the work lies for the time being.

xviii) Temporary Work:
Temporary Works are Works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.

xix) Works:
The Works are what the Contract requires the Contractor to construct, install and hand over to the Department as defined in the Scope of Work Volume II.
2. **Contract period**

The Contract period means the period from commencement date to the date up to defect liability period, after the date on which the whole of the Works have been completed as certified by the Engineer-in-Charge under Clause 24 of this section.

3. **Priority of Documents**

The documents forming the Contract are to be taken as mutually explanatory of one another. If there is an ambiguity or discrepancy in the documents, the Engineer-in-Charge shall issue any necessary clarification or instruction to the Contractor and the priority of the document shall be as follows.

i) The Contract Agreement


iii) Common Set of Deviations/Addenda issued by Department and correspondence relevant to this tender.


v) Conditions of Contract.

vi) The General Conditions of Contract.

vii) Special conditions of Contract/Supplementary Technical Information.

viii) Technical Specifications, & work specific technical specifications.

ix) Drawings

x) Schedules and other documents forming part of the Contract.
B. WORK METHODOLOGY

4. Working Method & Progress Schedule

4.1 Working Method

a) The Contractor shall submit within the time stipulated by the Engineer-in-Charge in writing, the details of actual methods that would be adopted by the Contractor for the execution, of any items as required by Engineer-in-Charge at each of the location, supported by necessary detailed drawings and sketches including those of the plant and machinery that would be used, their locations, arrangement for conveying and handling materials etc. and obtain prior approval of the Engineer-in-Charge well in advance of starting such items of Work.

b) The Engineer-in-Charge reserves the right to suggest modifications or make corrections in the method proposed by the Contractor, whether accepted previously or not at any stage of the Work, to obtain the desired accuracy, quality, safety and progress of Work which shall be binding on the Contractor. The Contractor shall take cognizance of such suggestions/objections and suitably modify his method of construction. No claim on account of such change in method of execution will be entertained by the Government so long as specification of the item remain unaltered.

4.2 Progress Schedule

a) The Contractor shall furnish within one month of the order to start the Work, a programme of Work in quadruplicate indicating the date of actual start, the monthly progress expected to be achieved and the anticipated completion date of each major item of Work to be done by him, also indicating dates of procurement of materials and setting up of plant and machinery. The programme is to be such as to be practicable of achievement towards the completion of the whole Work in the time limit and of the particular items, if any, on the due dates specified in the Contract. Planning and programme of Work shall be done by the mutual discussion between the Engineer-in-Charge and Contractor's representative in charge of Work.

b) The progress of work shall be reviewed at every milestone and revised programme shall be drawn up, if necessary. No revised programme shall be operative without the approval of Engineer-in-Charge in writing.

c) The Engineer-in-Charge is further empowered to ask for more detailed schedule or schedules say weekly for any item or items in case of urgency of Work as will be directed by him and the Contractor shall supply the same when asked for.

d) Acceptance of the programme or the revised programme, by the Engineer-in-Charge shall not relieve the Contractor of his responsibility to complete the whole of the Work by the prescribed time or the extended time if any.
4.3 a) The Contractor shall furnish sufficient plant, equipment and labour as may be necessary to maintain the progress schedule. The working and shift hours restricted to one shift a day for operations to be done under the Government supervision shall be such as may be approved by the Engineer-in-Charge. They shall not be varied without prior approval of the Engineer-in-Charge.

b) Night Work which requires supervision shall not be permitted except when specifically allowed by Engineer-in-Charge each time, if required by Contractor. The Contractor shall provide necessary lighting arrangement and other measures etc. for night Work as directed by Engineer-in-Charge without extra cost.

4.4 The Contractor shall submit reports on progress of Work in forms and statements etc. at periodical intervals in the form of progress charts, forms, statements and/or reports as may be approved by the Engineer-in-Charge. Forms for sending reports about the progress will be supplied by the Department.

4.5 The Contractor shall maintain programme chart, details regarding machinery, equipment, labours, materials, and periodical returns thereof in programme to be got approved from the Engineer-in-Charge.

4.6 Priorities of Works to be executed

Priorities for items to be executed shall be determined periodically as deemed fit by the Engineer-in-Charge keeping in view the final time limit allowed for the Work and all the time schedule fixed for intermediate stages of Work as directed by the Engineer-in-Charge.

5. Setting out

5.1.1 The Contractor shall be responsible for -

A) Accurate setting out of the Work in relation to original points, lines, and levels of reference given by the Engineer-in-charge, in writing.

B) The correctness of position, levels, dimensions and alignments of all parts of the Work.

C) The provisions of all necessary instruments, appliances, and labour in connection with the foregoing responsibilities.

5.1.2 If at any time during execution of Works any error appears in the position, levels, dimensions or alignment of any part of the Work, the Contractor, on being required so to do by the Engineer-in-Charge, shall, at his own cost, rectify such error to the satisfaction of the Engineer-in-Charge whatever the case may be as regards the error.

5.1.3 The checking of any setting out or of any line or level by the Engineer-in-Charge shall not in any way relieve the Contractor of his responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all benchmarks, pegs and other materials used in setting out the Works. The Contractor shall give a notice not less than 48 hours in advance of his intention to set out or layout for any part of the Works to the Engineer-in-Charge, so that checking can be made in time.
5.1.4 Layout of Work

i) Layout of the Work will be done by the Contractor in consultation with the Engineer-in-Charge, of the Department or his representative. Some permanent marks should however be established to indicate the demarcation of the structure or any component thereof made to this permanent marks in measurement books and drawing, signed by the Contractor and the departmental officer.

ii) All necessary Registers formatted as per instructions of Engineer-in-Charge, required for documentation of Work shall be supplied by the Contractor in duplicate before commencement of Work. Record shall be maintained by the Contractor and shall be got verified from time to time by the Engineer-in-Charge or his representative.

5.2 Road Works

i) The Contractor shall establish working bench marks in the area soon after taking possession of the Site. The reference bench mark for the area shall be as directed by the Engineer-in-Charge. The working bench marks shall be at the rate of four per Kilometer and also at or near all drainage structures, over bridges and underpass. The Working bench marks shall be got approved from Engineer-in-Charge. Checks must be made on these bench marks once every month and adjustment if any got approved from Engineer-in-Charge and recorded. An up-to-date record of all bench marks including approved adjustment, if any shall be maintained by the Contractor and also a copy be supplied to the Engineer-in-Charge for his record.

ii) The lines and levels of formation, side slopes, drainage, carriageways and shoulders shall be carefully set and frequently checked. Care shall be taken to ensure that correct gradients and cross sections are everywhere obtained.

iii) In order to facilitate the setting out of the Works, the center line of the carriage way or highway must be accurately established by the Contractor and approved by the Engineer-in-Charge. It must then be accurately referenced in a manner satisfactory to the Engineer-in-Charge at every 50 m. intervals in plain and rolling terrain and 20m. intervals in hilly terrain and at all curve points as directed by the Engineer-in-Charge with marker pegs and chainage boards set in or near the fence line, and a schedule of reference dimensions shall be prepared and supplied by the Contractor to the Engineer-in-Charge. These markers shall be maintained until the Works reach finished formation level and are accepted by the Engineer-in-Charge.

iv) On reaching the formation level stage, the center line shall again be set out by the Contractor and when approved by the Engineer-in-Charge shall be accurately referenced in a manner satisfactory to the Engineer-in-Charge by marker pegs set at the outer limits of the formation.

v) No reference peg or marker shall be removed or withdrawn without the approval of the Engineer-in-Charge and no earthwork or structural Work shall be commenced until the center line has been referenced.
vi) The Contractor will be solely responsible for safeguarding all survey monuments, bench marks, beacons etc. The Engineer-in-Charge shall provide the Contractor with the data necessary for the setting out of the center line. All dimensions and levels shown on the drawings or mentioned in documents forming part of or issued under the Contract shall be verified by the Contractor on the Site and he shall immediately inform the Engineer-in-Charge of apparent errors or discrepancies in such dimensions or levels. The Contractor shall after or in connection with the setting out of the center line, survey the terrain along the road and shall submit to the Engineer-in-Charge for his approval a profile along the road centerline and cross section at intervals as required by the Engineer-in-Charge.

vii) After obtaining approval of the Engineer-in-Charge, work on item of earthwork can commence and the profile and cross sections shall form the basis for measurement and payment. The Contractor is responsible for checking that all the basic traverse points are in place at the commencement of the Contract and if any are missing, or appear to have been disturbed, the Contractor shall make arrangements in reestablishing these points.

viii) A Survey File containing the necessary data will be made available for this purpose. If in the opinion of the Engineer-in-Charge design, modifications of the centerline or grade are advisable, the Engineer-in-Charge will issue detailed instructions to the Contractor and the Contractor shall perform the modification in the field, as required and modify the grade, levels on the cross sections accordingly as many times as required. There will be no separate payment for any survey Work performed by the Contractor. The cost of these services shall be considered as being included in the cost of the items of Work in the items as mentioned in Schedule of work.

ix) The Works of setting out shall be deemed to be part of general Works, preparatory to the execution of Work and no separate payment shall be made for the same.

5.3 Bridge Works

i) Immediately upon receipt of Work order, the Contractor shall at his own expenses clean the Site, and take up provisional and final setting out and lining out of the Work under the supervision of his responsible representative and shall provide necessary materials, labour, tools instruments etc. required for the same.

ii) One tentative abutment location will be indicated by the Engineer-in-Charge and center line of the bridge shall be defined by him. The Contractor will then have to fix up the location of the other abutment. The abutment location will then be verified by the Department and shall be adjusted, if necessary. Once the final location of abutment is so finalised, it will be the Contractor's responsibility to line out and locate the remaining foundations of piers.

iii) The Contractor shall be responsible for true and proper setting out of the Works and for the correctness of the positions, levels, dimensions and arrangements of all parts of Works, and for providing all necessary instruments, appliances and
labours in connection therewith at his own cost. The Department may assists the Contractor in proper setting out. Government instruments may be allowed to be used for setting out of Work for which no cost shall be recovered from the Contractor. If at any time during the progress of Work, any errors arise in regard to levels or dimensions or alignment of any part of the Work, rectification thereof, on being required to do so, will be carried out by the Contractor at his own cost, unless such errors are based on incorrect data, supplied in writing, by the Engineer-in-Charge or his authorised representative in which case the expenses of the rectification shall be refunded by Government.

iv) The checking of any setting out or checking of level by the Engineer-in-Charge or his authorised representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof. The Contractor shall carefully protect and preserve all bench marks, Site rails, pegs and other things used in setting out of Work.

5.4.1 Responsibility of Level and Alignment

The Contractor shall be entirely and exclusively responsible for the horizontal and vertical alignment, the levels and correctness of every part of the Work and shall rectify effectively any errors or imperfections therein. Such rectification shall be carried out by the Contractor at his own cost, when instructions are issued to that effect by the Engineer-in-Charge.

5.4.2 Levelling Instrument

If measurement of items of the Work are based on Volumetric measurements, calculated from levels taken before and after construction of the item, a sufficient number of levelling instruments, staves, tapes etc. will have to be kept available by the Contractor at the Site of Work for this purpose. Lack of such levelling instruments, staves, tapes etc. in required number may cause delay in measurement of the Work. The Contractor will have therefore to keep sufficient number of these instruments in Working condition readily available at the Work Site.

5.5 Ancillary Works

The Contractor shall submit to Engineer-in-Charge in writing the details of all ancillary Works including layout and specifications to be followed for its construction. Ancillary Work shall not be taken up in hand unless approved by Engineer-in-Charge. The Engineer-in-Charge reserves the right to suggest modifications or make complete changes in the layout and specifications proposed by the Contractor at any stage to ensure the safety on the Work Site. The Contractor shall carry out all such modification to the ancillary works at his own expenses as ordered by the Engineer-in-Charge.

All conditions of Clause 5 are incidental to Work & no extra payment will be made for this.

6. Agents and Work order book

i) The Contractor shall himself manage the Work or engage an authorised all time agent on the Work capable of managing, supervising and guiding the Work and
understanding the specifications and Contract conditions. A qualified and experienced engineer be provided by the Contractor as his agent for technical matters in case the Engineer-in-Charge considers this as essential for the Work and so directs the Contractor. Agent will take orders as will be given by the Engineer-in-Charge or his representative and shall be responsible for carrying them out. The agent and/or Site Engineer shall not be changed without prior intimation to the Engineer-in-Charge or his representative on the Work Site. The Engineer-in-Charge has the unquestionable right to ask for changes in the quality and strength of Contractors supervisory staff and to order removal from Work of any of such staff. The Contractor shall comply with such order and effect replacements to the satisfaction of the Engineer-in-Charge.

ii) A Work order book shall be maintained on Site and it shall be the property of Government and the Contractor shall promptly acknowledge the order given therein by the Engineer-in-Charge or his authorized representative or his superior officer and comply with them. The compliance shall be reported by Contractor to the Engineer-in-Charge within 15 days from the date of issue of instructions. The blank Work order book, with machine numbered pages in quadruplicate with perforated sheets (for three copies to be detached) will be provided by the Department for this purpose. The Contractor will be allowed to copy out the instructions therein from time to time.

7. Land for temporary use

Land for temporary Site office, Site laboratory, parking yard, store yard, labour camp, Workshop etc. shall have to be arranged by the Contractor at his own cost. The Department will extend help by providing recommendation letter etc. if necessary and so desired by the Contractor.

8. Assistance in procuring priorities permits etc.

8.1 The Engineer-in-Charge on written request by the Contractor, will, if in his opinion the request is reasonable and in the interest of Work and its progress, assist the Contractor in securing the police protection and the priorities for deliveries, transport, permits for controlled materials, permits for quarries and other similar permits including labour license etc. where such are needed. All cost in this behalf shall be borne by the Contractor. The Department will not, however, be responsible for the non-availability of such facilities or delays in this behalf and no claims on account of such failure or the Department shall allow delays.

The Contractor has to make his own arrangement for machinery required for the Work. However, if such machinery is conveniently available with the Department it may be spared on hire as per Department's rules in force, if requested by the Contractor in writing. The supply or non-supply of machinery shall not form a ground for any claim or extension of time limit for this Work.

8.2 Water Supply

i) Availability of adequate water for Work and sources thereof shall be confirmed by the Contractor before submitting the tender.
ii) Water for construction, curing or any other purpose shall be brought by the Contractor at his own cost.

iii) The Contractor shall make his own arrangements at his own cost for entering into Contract with concerned authorities for obtaining the connection and carry the water upto the Work Site as required by him. The location of the pipe line with respect to the road shall be decided by Engineer-in-Charge and shall be binding on the Contractor.

iv) The Contractor is advised to provide water storage tanks of adequate capacity to take care of possible shut down of water supply system.

8.3 Electricity

The Contractor will have to make his own arrangement at his own cost for obtaining or providing electric supply at Work Site. Electrical supply for the Department's use at Work Site shall be provided by the Contractor. No charges would be payable by the Department.

8.4 Telephone Facilities

Contractor will have to make his own arrangements at his own cost of telephone facilities at Work Site, if required.

9. Quarries

The Contractor will have to make his own arrangement of acquiring land for quarries. The Contractor shall carry out all quarrying operations without endangering the environment and natural beauty of surrounding. All excess and unuseful excavated materials shall be stacked at dumping places if available, identified by the Department as directed by the Engineer-in-Charge otherwise the Contractor has to make his own arrangement for the same.

10. Supervisory staff

The Contractor shall at his own expenses maintain sufficient experienced supervisory staff etc. required for the Work and shall make his own arrangement for housing such staff.

11. Co-Ordination

When several agencies, for different sub Works of the project are to work simultaneously on the project Site, the Contractor shall render full co-ordination for achieving proper co-ordination between different Contractors to ensure timely completion of the whole project smoothly. The scheduled dates for completion specified in each Contract shall, therefore, be strictly adhered to. Each Contractor may make his independent arrangements for water, power, access, housing etc. but he will be at liberty to come to mutual agreement with other Contracting agencies in this behalf and make joint agreement with the approval of the Engineer-in-Charge. The Contractor shall not take or cause to be taken any steps of action that may cause disruption, discontent or disturbance to Work, labour or other arrangements etc. of other Contractors in the project localities. Any action by the Contractors which the Engineer-in-Charge in his unquestioned discretion, may consider as infringement of the above code would be considered as a breach of the Contract conditions and shall
be dealt with accordingly. In case of any dispute or disagreement between the various Contractors, the Engineer-in-Charge's decisions regarding the coordination, cooperation and facilities to be provided by any of the Contractor shall be final and binding on the Contractor concerned and such a decision or decisions shall not vitiate any Contract nor absolve the Contractor of his obligations under the Contract, nor form the grounds for any claim or compensation.

12. **Relation with public authorities**

The Contractor shall comply with all rules, regulations, by laws and directions given from time-to-time by any local or public authority or body in connection with this Work and shall himself pay fees or charges which are leviable on him without any extra cost to Government.

13. **Work preliminaries**

The Contractor shall supply, fix and maintain at his own cost, during the execution of Works, all the necessary centering and scaffoldings, staging, planking, timbering, strutting, shoring, plumbing, fencing, hoarding, watering, lighting by night as well as the necessary equipment for protection of public and safety at any place adjacent to road and railway line. The Contractor shall remove any/or all such centering, scaffolding, staging, planking and equipment when ordered to do so by the Engineer-in-Charge and make good all matters and things disturbed during the execution of Work to the satisfaction of the Engineer-in-Charge.

14. **Treasure Trove**

In the event of discovery by the Contractor or his employees during the progress of Works of any treasure, fossils, minerals or any other articles of value or interest, the Contractor shall give immediate intimation thereof to the Engineer-in-Charge and along with make over to the Engineer-in-Charge or his representative such treasure or things which shall be the property of Government.

15. **Environmental Safeguards**

15.1 **NOC for pollution control**

It is obligatory on the part of agencies to obtain the [N.O.C.](#) regarding Water (Prevention and Control of Pollution) Act. 1974 and Air (Prevention and Control of Pollution) Act 1981 from the [Maharashtra Pollution Control Board](#) before starting Crusher/Hot Mix Plant for the Work.

15.2 **Environmental Safety**

The Contractor shall, throughout the execution and completion of the Work and remedying of any defects therein, take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes as a consequence of his methods of operation.
C. EXECUTION OF WORK

16. Authorities

16.1 Authority of Engineer-In-Charge

16.1.1 Save in so far as it is legally or physically impossible, the Contractor shall execute, complete and maintain the Works in strict accordance with the Contract under the directions and to the entire satisfaction of the Engineer-in-Charge and shall comply with and adhere strictly to the Engineer-in-Charge's instructions, and directions on any matter (whether mentioned in the Contract or not) pertaining to this Work.

16.1.2 The Engineer-in-Charge shall decide all questions which may arise as to quality and acceptability of materials furnished and Work executed, manner of execution, rate of progress of the Work, interpretation of the plans and specifications and acceptability of fulfillment of Contract on the part of Contractor. He shall determine the amount and quantities of Work performed and materials furnished and his decision and measurements shall be final. In all such matters and in any technical questions, which may arise touching the Contract, his decision shall be binding on the Contractor.

16.1.3 The Engineer-in-Charge shall have the power to enforce such decisions and orders if the Contractor fails to carry them out promptly. If the Contractor fails to execute the Work ordered by the Engineer-in-Charge, the Engineer-in-Charge may give notice to the Contractor specifying a reasonable period therein and on the expiry of that period proceed to execute such Work as may be deemed necessary and recover the cost thereof from the Contractor.

16.2 Authorities of the Engineer-In-Charge's Representative

16.2.1 The duties of the representative of the Engineer-in-Charge are to watch and supervise the Work and to test and examine and materials to be used for Workmanship employed in connection with the Works.

16.2.2 The Engineer-in-Charge may from time to time, in writing, delegate to his --representative any of the powers and authorities vested in the Engineer-in-Charge and shall furnish to the Contractor a copy of all such delegations of powers and authorities.

16.2.3 Any written instruction of approval given by the representative of the Engineer-in-Charge to the Contractor within the terms of such delegations (but not otherwise) shall bind the Contractor and the Department as though, it had been given by the Engineer-in-Charge, provided always as follows:

a) Failure of the representative of the Engineer-in-Charge to disapprove any Work or materials shall not prejudice the power of the Engineer-in-Charge thereafter to disapprove such Work or materials and to order its pulling down, removal or breaking up thereof.

b) If the Contractor is dissatisfied with any decision of the representative of the Engineer-in-Charge, he shall be entitled to refer the matter to the Engineer-in-Charge who shall there upon confirm, reverse or vary such decision.
17. **Work Preliminaries**

17.1 **Display of Work Information**

The two information sign boards, as shown in Section VII Clause 8.22 of this Volume, in rectangular shape made out of 3 mm thick M.S. sheet painted with one coat of zinc chromate stoving primer and two coats of yellow stove enamel paint on front side and gray stove enamel paint on back side and border/messages/symbols etc. with cutout of white retro reflective sheeting of Engineering Grade including M.S. angle iron frame of 35x35x3mm and two M.S. angle iron post of size 65x65x6mm properly cross braced with angle iron of 50x50x5mm etc. duly painted with alternate black and white bands of 25 cm in width including G.I. fixtures etc. and fixing the board in 1:4:8 concrete block of size 60x60x75 cm shall be fixed on the Site (each on one side). It is incidental to the Work and no extra payment will be made to the Contractor.

17.2 **Omissions and Discrepancies**

In case of errors omissions and/or disagreement between written and scaled dimensions in drawing or between the drawings and specifications etc. the following order of preference shall apply.

i) Between the actual scaled and written dimensions or descriptions on a drawing the latter shall be adopted.

ii) Between the written or shown description or dimensions in the drawing and the corresponding one in the specifications, the latter shall apply.

iii) Between the quantities shown in the schedule of quantities and those arrived at from the drawing the latter shall apply.

iv) In case of omissions and/or doubts or discrepancies in dimension or description of any item or specifications a reference shall be made to the Engineer-in-Charge whose elucidation, elaboration or decision shall be considered as authentic. The Contractor shall be held responsible for any error that may occur in the Work through lack of such reference and precaution.

17.3 **Temporary Diversions, Maintenance of Same and Traffic Management**

In addition to provisions made herein, it is stipulated that the Contractor shall construct, maintain and carry out the traffic management including the safety features, for all temporary diversions.

17.4 **Site Office**

The Contractor shall, for the purpose of supervision of Works & management of Work schedule establish fully furnished Site office having floor area & amenities as mentioned in Volume II at the place as approved by the Engineer-in-Charge. The Contractor shall provide the furniture as per the list attached in volume II.

For road & bridge works the Site office will have to be established on Work Site only.

17.5 **Laboratory for Testing**

The Contractor shall, for the purpose of testing the materials establish a field laboratory of adequate floor area as approved by Engineer-in-Charge. The Contractor
shall provide all equipments and amenities as per the details mentioned in Section V Volume I.

Note: The field laboratory shall preferably be located adjacent to the Site office for bridge Works. Incase of road Works the field laboratory shall either be established at plant Site or as directed by Engineer-in-Charge.

17.6 The Contractor will make arrangements to carry out various tests in the field laboratory established for this purpose. The 70% samples could be tested at the field laboratory. However minimum 30% samples shall be got tested in the Government laboratory or laboratory approved by the Engineer –in-Charge. The charges of testing the material in Government or Government approved laboratory or recognized laboratory approved by Engineer-in-Charge shall be borne by the Contractor only.

17.7 The material for which tests can not be carried out at the field laboratory shall be tested at the Government laboratory approved by the Engineer-in-Charge. The material which can not be tested at Government laboratory shall be tested at the recognised laboratory approved by the Engineer-in-Charge in presence of the Engineer-in-Charge or his authorised representative.

18. Materials for use on Work

18.1 General

18.1.1 The Contractor shall make his own independent investigations into the availability as well as suitability of the various materials required for construction.

18.1.2 The Contractor will have to make his own arrangement for procuring quarries or quarry permits. Necessary assistance for this will be extended by the Department if desired.

18.1.3 All the material required for construction of Work shall be brought by the Contractor at his own cost. The samples of material to be procured shall be got approved from the Engineer-in-Charge. The material as per approved samples shall only be procured.

18.1.4 The Contractor shall submit periodically as well as on completion of Work, an account of all materials brought by him in a manner as directed by the Engineer-in-Charge. The Contractor shall also furnish monthly account of materials. A separate register shall be maintained on Site for recording daily item wise receipt and consumption of cement, steel and asphalt used by him and also item wise consumption of other materials used. This register shall be signed daily by the Contractor or his representative and representative of Engineer-in-Charge.

18.1.5 The Contractor shall not transfer any material once brought at Work Site without prior written permission from Engineer-in-Charge and for bonafied reasons only.

18.1.6 Testing of all construction material shall be carried out as per required frequency and specifications as stipulated in Section V-C of this Volume.

18.1.7 In case the materials brought by the Contractor become surplus owing to the change in the design for the Work the materials should be taken back by the Contractor at his own cost after prior permission of the Engineer-in-Charge.
18.1.8 The charges for conveyance of materials from the place of delivery to the Site of Work and the actual spot on Work Site shall be entirely borne by the Contractor. No claim on this account shall be entertained.

18.1.9 All empty cement bags or empty asphalt drums shall be the property of Contractor and the same shall be removed immediately after completion of Work.

18.1.10 The Contractor shall procure the hume pipes if required for this Work from MSSIDC.

18.2 Cement

18.2.1 The Contractor shall make his own arrangement for procurement of Cement required for the Work. The cement shall be OPC Grade-43 conforming to IS 8112. The supply of cement shall be of brand approved by Engineer-in-Charge. The testing of cement so procured shall be carried out as per the frequency as mentioned in Section V-C of this Volume. The testing charges will have to be borne by the Contractor.

18.2.2 Cement to be used on Works shall be as fresh as possible and shall be used within two months from the date of manufacture.

18.3 Steel

18.3.1 Contractor shall make his own arrangement for procurement of reinforcing steel, prestressing steel and structural steel conforming to the grade as mentioned below.

18.3.2 Reinforcement Steel

a) For plain and reinforced concrete (P.C.C. & R.C.C.) steel conforming to IS 1786 having grade S415 shall be used. All steel shall be procured from the original producers. Rolled steel shall not be used for the Work.

b) Fusion bonded epoxy coated reinforcing steel shall meet the requirements of IS 13620. The other requirement for use of fusion bonded epoxy coated steel shall conform to the provisions stipulated in MORT&H Specification (Fourth Revision) Clause No. 1009.3.

18.3.3 Prestressing Steel

Prestressing steel shall be as per the provisions of MORT&H specification (Fourth Revision) Clause No. 1009.2.

18.3.4 Structural Steel

All structural steel shall before fabrication comply with the requirements as mentioned in Clause No. 1009.6 of MORT&H specification (forth revisions)

18.4 Bitumen

18.4.1 Contractor shall procure Bitumen of required grade as mentioned in the Material Schedule in Volume II.
18.4.2 Contractor shall use Bulk/Packed bitumen obtained from any Government refinery only. If he desires to procure the bitumen from any other source, he will obtain the express permission of the Engineer-in-Charge before doing so.

18.4.3 Bitumen to be procured by Contractor shall conform to the IS 73 of grade as stipulated in Contract Data Volume II.

18.4.4 Contractor should be aware that delay may occur in getting the bulk bitumen to be supplied at the refinery. The contractor therefore is advised to place indent for their requirement sufficiently in advance to allow for the period usually taken by the refinery for supplying bulk bitumen.

18.4.5 The Contractor is expected to know all the rules & regulations framed by the refineries for supply of bitumen.

18.4.6 The Contractor shall have to submit attested copy or original purchase voucher duly supported by delivery challan & exit gate pass. The bitumen brought by the Contractor for the Work will be open to check by the Engineer-in-Charge or his representative at all times.

18.4.7 The Engineer-in-Charge reserves the right of weighment of individual random bouzer as and when considered necessary at the cost of the Contractor.

18.4.8 The bitumen so procured will have to be tested as per the frequency as mentioned in Section V-C of this Volume. The testing charges will have to be borne by the Contractor.

18.5 Cement Concrete

18.5.1 The Contractor shall carry out all preliminary tests to work out grading and proportioning of aggregates in order to obtain and maintain uniform quality of Work. The Contractor shall supply all materials, labour for preparing and testing samples as required by the Engineer-in-Charge. Unless otherwise specified in the detailed item wise specifications, 3 cubes of 150 x 150 x 150 mm, will be tested for every 30 cubic metre of concrete or per day’s work which ever is higher. The Contractor shall also make field arrangements for slump test and bulkage of sand. The cubes shall be got tested at approved laboratory and the test results shall conform to the M.O.R.T. & H specifications (4th Revision) Clause No. 1716.2.5 or as laid down in the specifications.

18.5.2 a) All concrete shall be machine mixed, either in a concrete mixer or in a batching and mixing plant as per specifications. No hand mixing will be permitted. The mixer or the plant shall be at an approved location considering the proportions of the mixes and transportation means available with the Contractor.

b) For controlled or High grade concrete, the grading of aggregate shall be got approved from the Engineer-in-Charge. The correct proportions and the total quantity of water for the mix will be determined by means of preliminary tests and shall be got approved from the Engineer-in-Charge. However, such approval does not relieve the Contractor from his responsibility regarding the minimum strength requirements for Work. Test shall be taken in accordance with relevant codes and specifications.
18.5.3 Concrete shall meet with any other requirements as specified on the drawings or as directed by Engineer-in-Charge. Additional requirements as regards overall limits of deleterious substances in concrete shall be as per M.O.R.T.& H. specifications (Fourth Revision) Clause No.1704.4

18.5.4 The concrete shall be mechanically vibrated for proper compaction by the method approved by the Engineer-in-Charge.

18.5.5. The concrete shall be cured only by potable water for full 28 days after the time of its placement or as may be directed by Engineer-in-Charge. Alternate method of curing viz. steam curing, use of curing compound shall be got approved from Engineer-In-Charge in writing before its application.

18.6 Reinforced Concrete

The Work included in this Contract shall be carried out in addition to the specifications detailed herein, in accordance with specifications and regulations as laid down in the following standard specifications.

<table>
<thead>
<tr>
<th>No.</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>3</td>
<td>I.S. 383: 1976 Specifications for Coarse and fine aggregate from natural courses for concrete</td>
</tr>
<tr>
<td>4</td>
<td>I.S. 1786: 1985 Specifications for cold twisted bars.</td>
</tr>
<tr>
<td>5</td>
<td>I.S. 432: 1982 Specifications for mild steel and medium steel bars.</td>
</tr>
</tbody>
</table>

If the standard specifications quoted above fall short for the items quoted in these schedules of this Contract, reference shall be made to the latest British Standard of Specifications. If any of the items of Contract do not fall in reference quoted above, the decision and specifications of the Engineer-in-Charge shall be final.

18.7 Ordinary and High Grade Concrete

If the concrete strength falls below that specified for the items and if the use can be permitted under Clause 303.3.7 of the I.R.C. Bridge code Section III (Bridge component) may be accepted at the discretion of the Superintending Engineer, concerned as a substandard Work at a suitable reduced rate. Reduced rate will be determined by the Engineer-in-Charge concerned according to circumstances of the case and the concerned Superintending Engineer's approval to the reduced rate as mentioned above is necessary.

18.8 Formwork and Staging

18.8.1 The Contractor shall design the shuttering and supporting system for different components of the structure as per provisions contained in IRC 87 and shall furnish
the same to the Engineer-in-Charge sufficiently in advance for approval taking into consideration the time required for approval before erection. An approval to the design of shuttering & supporting system shall be preferably accorded within 45 days from the date of submission. The formwork shall be inspected and approved by the Engineer-in-Charge before concreting is done. However such approval does not relieve the Contractor from his responsibility in case of mistakes, loss of profile if any.

18.8.2 For bridge structure, forms for concrete shall be constructed of mild steel plates or marine plywood and be of substantial and rigid construction true to shape and dimensions shown on the drawings. Where metal forms are used all bolts and rivets shall be counter sunk and well ground to provide a smooth plane surface.

18.8.3 Forms shall be mortar tight and shall be made sufficiently rigid by the use of ties and bracings to prevent any displacement or sagging between supports. They shall be strong enough to withstand all pressure, ramming and vibrations, without deflection from the prescribed lines during and after placing the concrete. The form work shall be robust and strong and the joint shall be leak proof. Screw jacks or hard wood wedges where required shall be provided to make up any settlement in the formwork before or during the placing of concrete.

18.8.4 Desired camber shall be provided in horizontal members of structure. Specially in long spans to counter act the effects of any deflection. The form Work shall be so fixed as to provide for such camber, if required.

18.8.5 The form work shall be coated with an approved release agent that will effectively prevent sticking and will not stain the concrete surface. Lubricating machine oils shall not be used for such coating.

18.8.6 Forms shall be so constructed as to make removal in sections in the desired sequence, without damaging the surface of concrete or disturbing other sections. The forms shall be removed in period as directed by Engineer-in-Charge.

18.8.7 In order to ensure completion of bridge within the stipulated period, the Contractor shall have to arrange a minimum number of sets of staging and shutterings as well as equipments of the required size for different components as stipulated in **Tender Data Volume II**.

18.8.8 Use of slip form shuttering wherever feasible will be preferred.

19. **Patented devices**

Whenever the Contractor desires to use any designed device, material or process covered by letter of patent or copy right, the right for such use shall be secured by suitable legal arrangement and agreement with patent owner and the copy of their agreement shall be filed with the Engineer-in-Charge if so desired by the latter.

20. **Rejection of Material**

20.1 Any stock or batch of material (s) of which sample(s) does not conform to the prescribed test and quality shall be rejected by the Engineer-in Charge or his representative and such material(s) shall be removed from the Site by the Contractor.
Contractor         Executive Engineer

at his own cost. Such rejected material shall not be made acceptable by any modifications.

20.2 Material not corresponding in character and quality with approved samples will be rejected by the Engineer-in-Charge or his representative and shall be removed from Site by the Contractor at his own cost.

21. **Stacking, Storage & Guarding of Materials**

21.1.1 The stacking and storage of materials at Site shall be in such a manner as to prevent deterioration or intrusion of foreign matter and to ensure the preservation of their quality, properties and fitness for the Work. Suitable precautions shall be taken by the Contractor to protect against atmospheric actions, fire and other hazard.

21.1.2 The materials likely to be carried away by wind shall be stored in suitable stores or with suitable barricades and where there is likelihood of subsidence of soil, heavy materials shall be stored on paved platforms. Suitable separating barricades and enclosures as directed by Engineer-in-Charge shall be provided to separate various materials brought by Contractor.

21.2 The Contractor shall at his own expenses, engage watchmen for guarding the materials, plant, machinery and the Work during day and night against any pilferage or damage and also for prohibiting trespassers.

21.3 No materials brought to the Site shall be removed from the Site without the prior approval of the Engineer-in-Charge.

21.4 All constructional plant, provided by the Contractor shall, when brought on the Site, be deemed to be exclusively intended for the construction and the Contractor shall not remove the same or any part thereof (Save for purpose of moving it from one part of the Site to another) without the consent in writing of the Engineer-in-Charge who shall record the reasons for withholding the consent.

21.5 The materials shall not be stacked in place where it is liable to be damaged or lost due to traffic passing over or to be washed away by rain or floods, to be buried under the land slide etc. or slip down on embankment or hill side etc. No claims for any loss due to these and similar causes will be entertained.

21.6 Before stacking, the materials shall be free from all earth, rubbish, vegetable matter and other extraneous substance and in the case of metal, screened to gauge, if so directed when ready. It shall be collected/stacked entirely clear of the roadway, on ground, which has been cleaned of vegetation and levelled. On high banks, ghat roads etc. where it may not be practicable to stack it entirely clear of the road way, it may be stacked with permission of the Engineer-in-Charge, on berms in such a way as to cause minimum danger and obstruction to the traffic or as may be directed by him.

21.7 The material brought by the Contractor and dismantled material if any shall be so stacked as to allow the traffic on National Highway in smooth and undisturbed manner without any hindrances and as directed by Engineer-in-Charge. If at any point of time it is felt by the Engineer-in-Charge that the material stacked along the
road side is causing hindrances to the through traffic or blocking the required working area then the such material will be ordered to be removed or shifted at the place directed by the Engineer-in-Charge at the cost of the Contractor.

22. **Supervision and Inspection of Work**

22.1 **Supervision**

22.1.1 The Contractor shall either himself supervise the execution of the Works or shall appoint the competent agent approved by the Engineer-in-Charge to act on his behalf. The intimation of appointment of such agent shall be communicated in writing to the Engineer-in-Charge within 10 days of the date of work order.

22.1.2 Orders given to the Contractor's agent shall be considered to have the same force as if these had been given to the Contractor himself. If the Contractor fails to appoint suitable agent as directed by the Engineer-in-Charge, the Engineer-in-Charge shall have full power to suspend the execution of the Work until such date a suitable agent is appointed and the Contractor shall be responsible for the delay so caused to the Works and the Contractor shall not be entitled for any compensation on this behalf.

22.2 **Inspection**

22.2.1 The Engineer-in-Charge and or any person authorised by him shall at all times have access to the works or part thereof and to all workshops and places (including required documents) where Work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the Contractor shall offer every facility for and every assistance in or in obtaining the right to such access.

22.2.2 The Contractor shall inform the Engineer-in-Charge in writing when any portion of the Work is ready for inspection giving him sufficient notice to enable him to inspect the same without affecting the further progress of the Work.

22.2.3 The Contractor shall provide at his own cost necessary ladders and such arrangements as are considered safe by the Engineer-in-Charge for proper inspection of all parts of the Work.

22.2.4 The Contractor shall extend his full co-operation and make all necessary arrangements when needed for carrying out inspection of the Work or any part of the Work by the local representatives, M.L.A., M.P. and officers etc. No compensation shall be paid to the Contractor on this account.

23. **Measurement of Works**

23.1 **Initial Measurement for Record**

23.1.1 Where for proper measurement of the Work, it is necessary to have an initial set of levels or other measurement taken, the same as recorded in the authorised field book or Measurement book of Government by the Engineer-in-Charge or his authorised representative will be signed by the Contractor who will be entitled to have a true copy of same made at his cost.
23.1.2 Any failure on the part of the Contractor to get such level etc. recorded before starting the Work will render him liable to accept the decision of the Engineer-in-Charge as to the basis of taking measurements.

23.1.3 The Contractor will not cover any Work which will render its subsequent measurement difficult or impossible without first getting the same jointly measured by himself and the authorised representatives of the Engineer-in-Charge. The record on the Government side of such measurements will be signed by the Contractor and he will be entitled to have a true copy of the same made at his cost.

23.2 Intermediate and Final Measurements
The General rules for intermediate & final measurement for payment shall conform to the provisions mentioned in Clause 113 of MORT&H specifications 4th Revision.

24. Completion of Work
24.1 The Contractor after completion of Work shall clean the Site of all debris and remove all unused materials other than those supplied by the Department and all plant and machinery, equipment, tools etc., belonging to him within one month from the date of completion of the Work, or otherwise the same will be removed by the Department at his cost or disposed off as per departmental procedure. Incase the material is disposed off by Department, the sale proceeds will be credited to the Contractor's account after deducting the cost of sale incurred. However no claim of Contractor regarding the price of amount credited will be entertained afterwards.

24.2 The Work shall not be considered to have been completed in accordance with the terms of the Contract until the Engineer-in-Charge shall have certified in writing to that effect. No approval of material or workmanship or approval of part of Work during the progress of execution shall bind the Engineer-in-Charge or in any way prevent him from even rejecting the Work which is claimed to be completed and to suspend the issue of his certificate of completion until such alteration and modification or reconstruction have been effected at the cost of the Contractor as shall enable him to certify that the Work has been completed to his satisfaction.

24.3 After the Work is completed the Contractor shall give notice of such completion to the Engineer-in-Charge and within 30 days of receipt of such a notice the Engineer-in-Charge shall inspect the Work and if there is no defect in the Work, shall furnish the Contractor with certificate indicating the date of completion. However, if there are any defects which in the opinion of the Engineer-in-Charge are rectifiable he shall inform the Contractor the defects noticed. The Contractor after rectification of such defects shall then inform the Engineer-in-Charge and Engineer-in-Charge on his part shall inspect the Work and issue the necessary completion certificate within 30 days if the defects are rectified to his satisfaction, and if not, he shall inform the Contractor indicating defects yet to be rectified. The time cycle as above, shall continue.
24.4 In case defects noticed by the Engineer-in-Charge which in his opinion are not rectifiable but otherwise Work is acceptable at reduced payment, Work shall be treated as completed. In such cases completion certificate shall be issued by the Engineer-in-Charge within 30 days indicating the unrectifiable defects for which specified reduction in payment is being made by him.

24.5 The completion certificate shall not be issued until the Site is thoroughly cleaned and cleared off all unwanted material.

24.6 On completion of Work in all respects necessary certificate will be issued by the Engineer-in-Charge and defect liability period will be counted from the date of issue of such certificate.

24.7 Completion drawing

The Contractor shall submit to the Engineer-in-Charge within 2 (two) months of actual completion "Completion Drawing" as specified below and operation and maintenance instructions for the whole of the Work.

These drawings shall be accurate and correct in all respect and shall be shown to and approved by the Engineer-in-Charge. For "Completion" drawing 2 (Two) prints and one polyester film of quality approved by the Engineer-in-Charge or his representative shall be supplied.

24.8 Supply of Coloured Record Photographs and Album

24.8.1 The Contractor shall arrange to take colour photograph at various stages/ facets of the Work including interesting and novel features of the Work as desired by the Engineer-in-Charge needed for authentic documentation as desired. The Photographs shall be of acceptable quality and they shall be taken by professionally competent photographer with camera having the facility to record the date of photographs taken in the prints and negative /C.D. The Contractor shall supply two colour prints of each of the photographs taken to the standard 4"x6" size mounted in albums of acceptable quality along with C.D. Also the negative in 35 mm. size for each photograph or in C.D. shall be supplied. Each photograph in the album shall be suitably captioned.

It shall be considered as incidental to the Work and no additional payment whatsoever will be made for the same.

24.8.2 Videography

Contractor shall supply video films/video C.D. of important activities of the Work as directed by Engineer-in-Charge during currency of the project and editing them to a video film/ CD of playing time not less than 90 minutes and up to 180 minutes as directed by Engineer-in-Charge. Such a film shall be suitably narrative and titled indicating chainages, activities. The video cassette/CD shall be of acceptable quality and shall be capable of producing colored pictures. This is incidental to work and no payments shall be made for the same.
25. **Handing over of Work**

25.1.1 All the Work and materials before finally taken over by Government, will be the entire liability of the Contractor for guarding, maintaining and making good any damages of any magnitude. Interim payments made for such Work will not alter this position.

25.2 The handing over by the Contractor and taking over by the Engineer-in-Charge or his authorised representative will always be in writing of which copies will go to the Engineer-in-Charge and the Contractor. It is however, understood that before taking over such Work Government will not put it into regular use as distinct from casual or incidental one, except as specifically mentioned elsewhere in this Contract, or as mutually agreed to.

26. **Maintenance**

26.1 **During Contract Period**

26.1.1 The section of road in which the work lies shall be deemed to be handed over on Date of Work Order (in respect of repairs to pot holes formed during agreement period). Not withstanding whether the agency has tackled some length or otherwise the responsibility of maintaining the complete length covered under the scope of work will be with the agency only. The agency shall get the potholes filled as per the directions of the Engineer-in-Charge and ensure that the road remaining traffic worthy. The Contractor shall maintain the finished surface of the road for a period as stipulated in Contract data Volume II during the Contract period without any extra cost to the Government irrespective of the designs standards and specifications and actual traffic etc.

26.1.2 The Contractor shall get the potholes filled up with asphalt materials and keep the road surface in good condition throughout this period as directed by Engineer-in-Charge. 5% amount of the total Work done shall be withheld from the R.A. bills towards performance guarantee of the Work and shall be re-appropriated toward the charges required for repairs and rehabilitation of the road if necessary, during Contract period if the Contractor fails to maintain the road in desirable condition as per the instruction of the Engineer-in-Charge.

26.1.3 The 5% amount withheld towards maintenance charges shall be allowed to be replaced with Bank Guarantee or other recognized forms at intermediate stage, if so desired in writing.

26.1.4 All damages during execution shall be made good by the Contractor at his own cost. He will be responsible for any damages to the road surface including B.T. surface in rainy seasons and during construction and guaranteed maintenance period and no separate payment will be made for restoring such damages.

26.1.5 Defective Work is liable to be rejected at any stage. The Contractor on no account shall refuse to rectify the defects merely on reasons that further Work has been carried out. No extra payment shall be made for such rectification.
26.2 During Defect Liability Period

26.2.1 Defect liability shall mean the obligation of Contractor to undertake the following Works as per the specifications, to the satisfaction of Engineer-in-Charge.

a. To complete any Work which is outstanding in date stated in Taking Over Certificate within a stipulated time as directed by Engineer-in-Charge and

b. To execute all Work required to remedy defects or damage as may be as notified by Engineer-in-Charge on or before the expiry date of the defects notified by the Engineer-in-Charge for the Works or sections as the case may be. If a defect appears or damage occurs the Contractor shall be notified accordingly by the Engineer-in-Charge or his authorised representative on his behalf. The Contractor shall remedy the defects/damages notified to him within a time period as stipulated by Engineer-in-Charge. If the Contractor fails to remedy / rectify the defects or damages by this notified date, it shall be executed at the risk and cost of Contractor.

26.2.2 The Contractor has to commence the remedying Work as soon as possible and in any case not later than 3 days of its communication by the Engineer-in-Charge and complete the same within 15 days maximum or in a time period as directed by Engineer-in-Charge. In case the Contractor fails to start the remedying Work within above specified period, the Department will take necessary action to carry out such Works at the risk and cost of the Contractor and the amount so incurred will be recovered from the Contractor from any such amount payable to the Contractor by the Government or through the deposit available with the Department and even as recovery of land revenues if necessary.

26.3 The agency will have to make all necessary arrangements for smooth flow of traffic till the time the remedying rectification Work is completed or also this will be done by the Department at the risk and cost of Contractor. The Contractor's liability of maintaining the road to the required specifications will commence right from the date of Work order till the expiry of defect liability period. The liability extends to the untackled portion of Work also.

26.4 Visit of Contractor During Defect Liability Period

Contractor shall carry out one inspection in every 3 months during the first year after completion of the Work and carry minimum 2 inspections per year for the remaining years of Defect Liability Period. However during rainy season the Contractor shall undertake such an inspection every month till the monsoon is over. The inspection shall be in the company of the representative of Engineer-in-Charge. The defects noticed during the inspections shall be recorded and signed by the Contractor and representative of Engineer-in-Charge. The Contractor shall rectify the defects, if any, within 15 days or such period as may be notified by the Engineer-in-Charge.
D. PAYMENTS & ADVANCES

27. Payments

27.1 The Contractor must understand clearly that the rates quoted are for completed Work and include all costs due to labour, scaffolding, plant, machinery, supervision, power, royalties, octroi, taxes etc. and should also include all expenses to cover the cost of night Work if and when required and no claim for additional payment beyond the prices or rates quoted will be entertained.

Each Bill including Running Account Bill will be paid in the office of Regional Officer and Superintending Engineer, Ministry of Road Transport and Highways, Mumbai.

27.2 Running Bills

The Contractor should submit the bills to the Engineer-in-Charge in appropriate forms.

27.3 Final Bill

The Contractor should submit final bill within one month after completion of the Work. The photographs of work (before and after) shall also be submitted along with the bill. Disputed items and claims if any shall be excluded from the final bill and settled separately later on.

27.4 Withheld payments

27.4.1 In respect of bituminous items 20 % (Twenty percent) payment of bituminous items in a particular kilometer will be withheld till completion of drain, C.D. Works, side shoulders, side drains, Site clearance, road side furniture and other items in that kilometer. After completion of these items in that particular kilometer, the withheld amount will be finally released.

27.4.2 An amount equal to 5% (five percent) of amount of Work done shall be deducted from each R.A. bill towards performance Security Deposit. This deposit shall be refunded to the Contractor on the expiry of defect liability period, based upon satisfactory performance by Contractor subject to final certificate of Engineer-in-Charge.

27.4.3 On completion of Work as certified by Engineer-in-Charge the 5% amount withheld towards Performance Security shall be allowed to be replaced by Bank Guarantee of Scheduled Bank from a branch located in Maharashtra if so desired in writing.

27.4.4 The Contractor will have to carry out testing of all the materials used in the work as per the frequency specified in section V of this volume and furnish the test results alongwith bills. If he fails to do so an amount equal to minimum 5% or such percentage as decided by Engineer-in-Charge shall be withheld from amount due for payment for particular item of work for which testing frequency falls short of.
28. **Claims**

Claims for extra Work shall be registered within 30 days of occurrence of the event. However bills for these claims including supporting data/details may be submitted subsequently.

29. **Disputes & Arbitrations**

*No Arbitration is allowed*

30. **Advances**

30.1 **Advance Payment**

Advance payment for the Works done but not measured by Engineer-in-Charge shall be admissible after Engineer-in-Charge is satisfied that the Work applied for advance, is as per directives and specifications; and to the quantum. No advance shall exceed 75% amount against Work done. Advance shall be adjusted in subsequent payments.

30.2 **Secured Advance on Materials**

30.2.1 The Engineer-in-Charge shall pay Secured Advance on request of the Contractor for non perishable materials actually brought to work Site or hot mix plant site which are in accordance with the specification for Works. Ownership of such materials shall be deemed to vest with the Department for which the Contractor has to submit an **Indemnity Bond** in an acceptable format and the quantities of materials are not excessive and shall be used within a period of 3 months by the Engineer-in-Charge.

30.2.2 No amount of Secured Advance shall exceed 75% of the invoice value of the materials or provision of rates of materials made in the estimates, whichever is less.

30.2.3 Recoveries of advances so paid shall be made from the intermediate bills for work done as the materials are used the necessary deduction being made whenever the items of work are billed for.

30.3 **Mobilisation Advance**

The Department will pay mobilisation advance to the Contractor if it is explicitly agreed so in Volume – II of the Contract Document and if the same is requested by the Contractor in writing within three months of the date of notice to proceed with the Work, towards mobilisations in respect of Works in a lump sum amount equivalent to 5% of the Contract amount.

Before payment of the advance, the Contractor will have to execute the documents as mentioned below.

i) Agreement between the Engineer-in-Charge and the Contractor about payment of mobilisation advance.

ii) Security Bond to be given by the Contractor about completing the Work as per specifications and within specified time limit.
 iii) The Contractor shall furnish Bank Guarantee of amount equal to the amount of mobilisation advance. This Bank Guarantee shall be of a Scheduled Bank from a Branch located in Maharashtra acceptable to the Engineer-in-Charge and in the approved form. The guarantee shall be valid for the period up to full repayment of the advance. The advance is payable to the Contractor only after submission of such Bank Guarantee.

 iv) The advance shall be used by the Contractor exclusively for mobilisation in connection with the Works. Should the Contractor misappropriate any portions of the advance, it shall become due and payable immediately and no further advances will be made available to the Contractor thereafter.

 v) This advance will be recovered from the bills payable to the Contractor for this Work in installments. Recovery shall start from the bill next to one when cost of Work done is equal to or more than 25% and then it shall be recovered at the rate of 15% of the bill amount from every R.A. bill.

 vi) The entire advance shall be recovered before completion of original time limit for the Work. In case of difficulty, if any, in recovering the advance, it shall be recovered from the Bank Guarantees given by the Contractor.

 vii) The advance shall carry simple interest as given in Contract Data Volume II. The rate of interest once stipulated in Volume II shall be applicable for the full period of the contract.

 viii) The Contractor will be free to make, repayment of the advance even earlier than the stipulated period of recovery as fixed above.

30.4 Machinery Advance

The Department will pay machinery advance to the Contractor if it is explicitly agreed so in Volume – II of the Contract Document and if the same is requested by the Contractor in writing in respect of the Work in a lump sum amount equivalent to not more than 5% of the Contract amount.

The advance will be paid subject to the condition mentioned below.

 i) Execution of the agreements by the parties thereto.

 ii) Provision by the Contractor of valid Bank Guarantee issued by a Scheduled Bank from a branch located in Maharashtra of an amount equal to the advance. Such Bank Guarantee shall remain effective until the advance has been repaid by the Contractor out of the current earnings and certified by the Engineer-in-Charge in form of B.G. acceptable to the Department as indicated in this document.

 iii) The advance shall be given on the basis of 90% of purchase value of new machinery and 75% of depreciated value of old machinery subject to a ceiling limit of 5% of the Contract amount. The depreciated value of old machinery should be taken as "Replacement Value" minus depreciation for number of
years/plant hours, at the rates prescribed in the guide book on transfer of used equipment issued by the Central Water Commission.

iv) The advance will be granted on only such equipment and machinery which is considered necessary for execution of Work and is in good order and certified as such after taking trial, by the Engineer-in-Charge or his representative of the Work.

v) The 90% & 75% advance will be based on the valuation of the cost of each piece of equipment made by the Engineer-in-Charge of the Work on the lines indicated in (iii) above.

vi) The machinery advance shall carry simple interest as given in Contract Data Volume II. The rate of interest once stipulated in Volume II shall be applicable for the full period of the Contract.

vii) No advance or part advance shall be paid after expiry of 2 months or 1/3 rd time of the period Contracted for completion of Work from the date of the order for commencement whichever is later. Notwithstanding this limit, Superintending Engineer may at his discretion, for reasons to be recorded in writing, authorise payment of advance any time till completion of 50% of the tendered cost of Work. The Superintending Engineer is empowered to authorise counting of the period for aforesaid limit from a suitable date in case there is a delay in the starting of Work due to reasons wholly beyond the control of the Contractor.

viii) No advance shall be payable if the admissible advance on any one piece of machinery is less than Rs. 20000/-

ix) In the event of dispute regarding the type of necessary equipment, the decision of the Engineer-in-Charge will be final and binding on the Contractor.

x) The recovery of advance shall commence from first bill to be paid after payment of advance. The recovery of advance along with full amount of interest accrued thereon shall be made proportionately to the Work done so that full advance with interest thereon is recovered by the time 75% of the Work is completed. The advance once given and recovered will not be recouped. Similarly, against same machinery no new advance will be given in the same Contract.

xi) The advance shall not be admissible in respect of consumable stores, spare parts and inspection vehicles.

xii) The machinery on which advance will be normally payable is listed as under:

1) Trucks : (Tipping and conventional)
2) Tractors : (Crawler and rubber tyred)
3) Rollers : (Vibratory and static roller)
4) Compressors
5) Water tankers Motorized
6) Dumpers
7) Hot Mix plants
8) Paver finishers
9) Mixers.
10) Such other specialized machinery as may be decided by the Superintending Engineer.

xiii) The Contractor should produce the registration certificate/book of the vehicles/machinery and the Engineer-in-Charge should satisfy himself by scrutiny of original registration book/certificate that the vehicle etc. for which registration is essential and has not been hypothecated earlier. The Engineer-in-Charge should endorse on the registration book/certificate that the said vehicle/machinery is hypothecated to the Government before paying the advance. The Engineer-in-Charge should simultaneously inform the R.T.O., with whom registration has been made, of the fact of hypothecation of vehicle/machinery to the Government.

xiv) In case of plant/machinery (other than vehicles) for which no registration is required and hence no registration certificate/book can be produced, the Engineer-in-Charge, should ascertain from appropriate authenticated documents that the machinery/plant/equipment is purchased and owned by the Contractor and from the office of the Registrar of Companies that no charge on account of hypothecation etc. has been recorded earlier on the said machinery/plant before payment of advance. An affidavit on stamp paper as per sample form attached should be obtained from the Contractor affirming that the machinery on which advance has been sought and is to be brought on Site has not been hypothecated to any other bank/institution/individual etc. and no advance has been obtained against the same and is outstanding. It should also contain affirmation prohibiting the Contractor to hypothecate or to obtain any other advance on the said machinery till the hypothecation with the Department is in force.

xv) The following conditions should also apply while paying advance.

a) Machinery/its components shall not be moved out of the project area even for heavy repairs without prior written approval of the Engineer-in-Charge. In no case machinery should be taken outside the state for repairs.

b) In case the Contractor abandons the Work, the advance will be recovered by encashment of Bank Guarantee.

c) The Contractor may, at his option, repay the advance earlier by increasing the percentage rate of deduction indicated above.
E. SAFETY MEASURES

31. SAFETY MEASURES

31.1 The Contractor shall take all necessary precautions for the safety of the Workers and preserving their health while Working. He shall also give special protection and take precaution where ever required. The Contractor shall also comply with the directions issued by the Engineer-in-Charge in this behalf from time to time at all times. The following are some of the requirements listed, though not exhaustive.

i) Providing protective footwear to Workers in situations like mixing and placing of concrete, in quarries and place where the Work is to be done under too much wet conditions, movements over surface infested with oyster growth as also for laying of hot mix bituminous material.

ii) Providing protective head ware to workers working in quarries etc. to protect them against accidents.

iii) Taking such normal precautions like providing handrails to the edges of the floating platforms or barrages etc.

31.2 Adequate precautions shall be taken to prevent danger from electrical equipments. No materials on any of the Site shall be stacked or placed as to cause danger or inconvenience to any person or the public. The Contractor shall provide all necessary fencing and lights to protect public from accidents and shall be bound to bear expense of defence of every suit, action or the other proceedings of law that may be brought by any person for injury sustained owing to neglect of the above precaution and to pay any damages and costs which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of the Contractor will have to be paid to compromise any claim by any such person.

31.3 Contractor shall provide full length gum boots, leather hand gloves, leather jackets with fireproof aprons to cover the chest and back reaching up to knees, plain goggles for the eyes to the labour working with hot asphalt, vibrators in cement concrete and also where use of any or all these items is, essential in the interest of health and well being of the labourers in the opinion of the Engineer-in-Charge.

31.4 Jackets & Helmets To The Labour/Supervisors/Engineer-in-Charges

Contractor shall provide safety jackets of orange colour in fluorescent hue, helmets (Reflective type), so as to make them starkly visible, to all his persons including drivers, operators & departmental officers, staff working on the Site to avoid any accident.

31.5 Working platform, gangways and stairways shall be so constructed that they do not sag unduly or are more than 3.25 m above ground level or floor level. It shall be closely boarded and should have adequate width and should be suitably fenced as described above.

31.6 Providing life belts to all men working at such situations from where they may accidentally fall into water. Equipping the boats with adequate number of life buoys etc.
31.7 Avoiding bare live wires etc. as would electrocute Workers.
31.8 Take all necessary precautions with regard to use of divers.
31.9 The Contractor shall at his own expenses construct and maintain proper magazines, if such are required for the storage of explosive for use in connection with the Works, such magazine being situated, Contracted and maintained in accordance with the Government rules applicable in this behalf. The Contractor shall at his own expense obtain such license or licenses as may be necessary for storage and using explosives. Notwithstanding that the locations etc. of storage of explosives are approved by the Engineer-in-Charge, the Government shall not incur any responsibility whatsoever in connection with the storage and use of explosive on the Site of any accident or occurrence whatsoever in connection therewith, all operations of the Contractor in or for which explosive is deployed being at the risk of the Contractor and his sole responsibility and the Contractor has hereby given to the Government an absolute indemnity in respect thereof.

31.10 Police Protection

For the Special protection of the camp of the Contractors Work, the Department will help the Contractors as far as possible to arrange for such protection with the concerned authorities the cost shall be borne by the Contractor.

31.11 The Contractor shall take all precautions against damages by floods or submergence being area is low lying or from accidents etc. not covered by excepted risks. No compensation will be allowed to the Contractor on this account or for carrying out the repairing of any such damages to the Work during construction. The Contractor shall be liable to make good at his cost any plant or material belonging to the Government lost or damaged by floods or from any other causes while in his charge.

31.12 Precautions to be taken by the Contractor to Prevent Accident

i) No live electric lines should be allowed to run along the ground in the blasting zone and they should be at least 3 m. above ground if not more.

ii) The wiring cable should not be taken near the live electric line and it should be preferably short firing cable as supplied by the supplier of explosives. If such a cable is not available a substitute cable made up of several pieces jointed and taped be used.

iii) The blasting shed from where the exploder is to be finally operated should be at least 500 Ft. away from the area to be blasted. It should have a strong roof which can withstand the impact of flying stones at this range.

iv) Only trained hands should be allowed to handle explosives cable, detonators etc.

v) Contractor has to lay electric/ telephone cables coming under construction at a position ordered by the Engineer-in-Charge at his own cost.
F. AMENITIES

32. Amenities to Labourers

32.1 Taking necessary steps towards training the Workers concerned of the use of machinery before they are allowed to handle it independently and taking all necessary precaution in and around the areas where machines, hoists and similar units are Working.

32.2 Providing sufficient first-aid trained staff and equipment to be available quickly at the Work Site to render immediate first-aid treatment in case of accident due to suffocation, drowning and other injuries.

32.3 Medical And Sanitary Arrangements To Be Provided For Labourers Employed in the Construction by the Contractor:
   a) The Contractor shall provide an adequate supply of pure and wholesome water for the use of labourers on Works and in camps.
   b) The Contractor shall construct trenches, semi permanent latrines for the use of labourers. Separate latrine shall be provided for men and women.
   c) The Contractor shall build sufficient number of huts on suitable plot of land for use of the labourers according to the following Specifications.
      i) Huts of bamboos and grass may be constructed.
      ii) A good Site not liable to submergence shall be selected, on high ground remote from jungle but well provided with trees, shall be chosen wherever it is available. Neighborhood of tank, jungles, grass or weeds should be particularly avoided. Camps should not be established close to large cutting of earth Work.
      iv) The lines of huts shall have open space of at least 10 meters between rows. When a good natural Site can not be procured particular attention should be given to the drainage.
   v) There would be no over crowding. Floor space at the rate of 3 Sqm. (30 Sq. Ft.) per head shall be provided. Care should be taken to see that the huts are kept clean and in good order.
   vi) The Contractor must find his own land. If he wants Government land, he should apply for it. Assessment for it, if demanded will be payable by Contractor. However the Department does not bind itself for making available the required land.
   d) The Contractor shall construct sufficient number of bathing places, sufficient number of washing places should also be provided for the purpose of washing cloths.
e) The Contractor shall make sufficient arrangement for draining away the surface and sullage water as well as water from the bathing and washing places and shall dispose off this waste water in such a way as not to cause any nuisance.

f) The Contractor shall engage a medical officer with a traveling dispensary for a camp containing 500 or more persons if there is no Government or other private dispensary situated within 8 kilometers from the camp. In case of an emergency, the Contractor shall arrange at his cost free transport for quick medical help to his sick Workers.

g) The Contractor shall provide the necessary staff for effecting the satisfactory conservancy and cleanliness of the camp to the satisfaction of the Engineer-in-Charge. At least one sweeper per 200 persons should be engaged.

33. Amenities to Department

33.1 The Contractor shall provide within 1 month from the date of Work order the amenities as per the details mentioned in Contract Data Volume II. These amenities will have to be maintained in working /running condition with consumable etc. by the Contractor till the completion of Work or till the extended time of completion.

33.2 If the Contractor any time fails to provide the amenities within a specified time an amount as specified in Contract Data Volume II shall be debited to Contractor's account.

33.3 If in the opinion of Engineer-in-Charge the vehicle provided is not suitable for the intended purpose, the Contractor will have to withdraw particular vehicle/vehicles if so directed by the Engineer-in-Charge and shall replace the same immediately.

33.4 The amenities to be provided are incidental to Work and no extra payment shall be made. The ownership of above facilities will vest with the Contractor and the same will be reverted back to him on completion of Work as certified by Engineer-in-Charge.

34. Legal Obligations

Following are some of the labour laws applicable to the Work.

i) Workmen Compensation Act 1923.


iii) Employees P.F. and Miscellaneous Provision Act 1952.

iv) Maternity Benefit Act 1951.


vi) Minimum Wages Act 1948

vii) Payment of Wages Act 1936.
ix) Payment of Bonus Act 1965.
x) Industrial Disputes Act 1947.
i) Industrial Employment (Standing Orders) Act 1946.
i) Trade Union Act 1926
iii) Child Labour (Prohibition & Regulation) Act 1986
xiv) Inter State Migrant workmen’s (Regulation of Employment & Condition of Service) Act 1979.

35. **Indemnity**

The Contractor shall indemnify the Government against all action, suits, claims and demands brought or made against it in respect of anything done or committed to be done by the Contractor in execution of or in connection with the Work of this Contract and against any loss or damage to the Government in consequence to any action or suit being brought against the Contractor for anything done or committed to be done in the execution of the Work of this Contract. The Government may, at its discretion and entirely at the cost of Contractor, defend such suit either jointly with the Contractor or single, in case the latter chooses not to defend the case.
G. MISCELLANEOUS

36.1 The Contractor should ensure that all safety precautions are observed by his labour Working close to the National Highway, While closing the National Highway all precautions are to be taken. The Contractor shall insure his labour at his cost.

36.2 The Contractor shall be responsible for making good the damages done to the existing property or Work during construction by his men.

36.3 During the execution of Work, it is likely that the Contractor may meet with telephone cables, electric cables, water supply lines etc. It will therefore be the responsibility of the Contractor to protect them carefully. All such cases should be brought to the notice of Engineer-in-Charge and also of the concerned department by the Contractor. Any damage whatsoever done to these cables and pipelines by the Contractor shall be made good by him at his cost.

36.4 The details shown on drawings and all other information pertaining to Work shall be treated as indicative and provisional only and are liable to variation as found necessary, while preparing Working drawings which will be supplied by Engineer-in-Charge during execution. The Contractor shall not on account of such variation be entitled to any increase over the rates quoted in the tender which are on quantity basis.

36.5 The recoveries if any due from Contractor will be effected as arrears of land revenue through the Collector of the District.

36.6 The Work shall be carried out by the Contractor without causing damage to the existing Government property and/or private property. If any such damages are caused, the Contractor shall pay for restoration of the property to the original conditions and any other consequent damages.

36.7 In the event of an occurrence of an accident involving serious injury or death of any person, at Site of Work or quarry or at any place in connection with the Work the same shall be reported in writing within twenty four hours of the occurrence to the Engineer-in-Charge and the Commissioner of Workmen's compensation.
CONDITIONS OF CONTRACT

Clause 1 :- The tenderer whose Tender may be accepted (herein after called the Contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executors, administrators, Contractor and assigns) shall (A) within 10 days (which may be extended by the Superintending Engineer concerned, upto 15 days if he thinks fit to do so) of the receipt by him of the notification of the acceptance of his tender, deposit with the Executive Engineer in cash or Government securities endorsed to the Executive Engineer (if deposited for more than 12 months) of sum sufficient which will make up the full Security Deposit specified in the Tender or (B) Permit Government at the time of making any payment to him for work done under the Contract to deduct such sum as will amount as per Contract Data Volume II, of all money so payable such deduction to be held by Government by way of Security Deposit provided always that in the event of the Contractor depositing a lump sum by way of Security Deposit as contemplated at (A) above, then and in such case, if the sum so deposited shall not amount as stated in Volume II, of the total estimated cost of the work, it shall be lawful for Government at the time of making any payment to the Contractor for work done under the Contract to make up the full amount as stated in Volume II, by deducting a sufficient sum from every such payment as last aforesaid until the full amount of the Security Deposit is made up.

All compensation or other sum of money payable by the Contractor to Government under the terms of his Contract may be deducted from or paid by the sale of sufficient part of his Security Deposit or from the interest arising there from or from any sums which may be due or may become due by Government to the Contractor under any other Contract or transaction of any nature on any account whatsoever, and in the event of his Security Deposit being reduced by reason of any such deduction or sale as aforesaid, the Contractor shall, within ten days thereafter, make good in cash or Government securities endorsed as aforesaid any sum or sums which may have been deducted from or raised by sale of his Security Deposit or any part thereof. The Security Deposit referred to when paid in cash may, at the cost of the depositor, be converted into Interest Bearing Securities provided that the depositor has expressly desired this in writing.

If the amount of the Security Deposit to be paid in lump sum within the period specified at (A) above is not paid, the Tender/Contract already accepted shall be considered as cancelled and legal step will be taken against the Contractor for recovery of the amount. The amount of the Security Deposit lodged by a Contractor shall be refunded along with the payment of the final bill, If the date up to which the Contractor has agreed to maintain the work in good order is over. If such date is not over, only 50% amount of
Security Deposit shall be refunded along with the payment of the final bill. The amount of Security Deposit retained by the Government shall be released after expiry of period up to which the Contractor has agreed to maintain the work in good order is over. In the event of the Contractor failing or neglecting to complete rectification works within the period up to which the Contractor has agreed to maintain the work in good order, then, subject to provisions of Clauses 17 and 20 hereof, the amount of Security Deposit retained by Government shall be adjusted towards the excess cost incurred by the Department on rectification work. (This will be the same percentage as that in the Tender at the rate mentioned in memorandum in Volume II).

**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 of the Contract, be proceeded with all due diligence (time being deemed to be the essence of the Contract), to achieve prescribed milestones, failing which the Contractor shall pay as compensation an amount as stipulated below.

<table>
<thead>
<tr>
<th>Milestone (part duration with respect to period of completion)</th>
<th>CUMULATIVE PHYSICAL TARGET TO BE ACHIEVED</th>
<th>IF NOT ACHIEVED THE COMPENSATION PAYABLE PER DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILESTONE NO.</td>
<td>NO. OF DAYS FROM THE DATE OF WORK ORDER</td>
<td></td>
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</tbody>
</table>

(As per Contract Data Volume II)

If the agency after levy of compensation accelerates the progress of work, the levy of compensation will cease on the day the progress of the work commensurates on pro-rata basis for the time period between two milestones.

The right to revise the above rates of compensation not with standing anything contained in the Contract Data of Volume II, is reserved by the Superintending Engineer. The decision of the Superintending Engineer will be final and binding on the agency.

In no case the total amount of compensation to be paid under provision of this Clause shall exceed 10 percent of the estimated cost of the work shown in the Tender.
**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 installments) or in the case of abandonment of the work owing to serious illness or death of the Contractor or any other cause, the Executive Engineer on behalf of the Governor of Maharashtra, shall have power to adopt one of the following courses as he may deem best suited to the interest of Government.

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 that case the Security Deposit of the Contractor shall stand forfeited and be absolutely at the disposal of Government.

b) To carry out the work or any part of the work by departmentally debiting the Contractor with the cost of the work, expenditure incurred on tools and plant, and charges on additional supervisory staff including the cost of Work Charged Establishment employed for getting unexecuted part of work completed and crediting him with the value of the work done departmentally in all respects in the same manner and at the same rates as if it had been carried out by the Contractor under the terms of the Contract. The certificate of the Executive Engineer as to all the cost of the work and other allied expenses so incurred and as to the value of the work so done departmentally shall be final and conclusive against the Contractor.

c) To order that the work of the Contractor be measured up 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 all expenses incurred on advertisement for fixing a new Contracting agency, additional supervisory staff including the cost of work Charged Establishment and cost of the work executed by the new contracting agency will be debited to Contractor and, the value of the work done or executed through the new Contractor shall be credited to the new Contractor in all respects and in the same manner and at the same rates as if it had been carried out by the Contractor under the terms of his Contract. The certificate of the Executive Engineer as to all the cost of the work and other expenses incurred as aforesaid for or in getting the unexecuted work done by the new Contractor and as the value of the work so done shall be final and conclusive against the Contractor.

In case the Contract shall be rescinded under Clause (a) above, the Contractor shall not be entitled to or be paid any sum for any work thereto for actually performed by him under this Contract unless and until the Executive Engineer shall have certified in writing the performance of the such work and the amount payable to him in respect thereof and he shall only be entitled to be paid the amount so certified. In the event of either of the courses referred to...
in Clause (b) or (c) being adopted and the cost of the work executed departmentally or through a new Contractor and other allied expenses exceeding the value of such work credited to the new Contractor, the amount of excess value shall be deducted from any money due to the new Contractor by the Government Under the Contract or otherwise, howsoever or from his Security Deposit or the sale proceeds thereof provided however, that the Contractor shall have no claim against Government even if certified value of the work done departmentally or through a new Contractor except the certified cost of such work and allied expenses provided always that whichever of the three courses mentioned in Clause (a), (b) or (c) is adopted by the Executive Engineer the Contractor shall have no claim to compensation for any loss sustained by him by reason of him having purchased or procured any material or entered into any engagements or made any advances on account of or with a view of the execution of the work or the performance of Contract.

Clause 4 :- If the progress of any particular portion of the work is unsatisfactory the Executive Engineer shall notwithstanding that the general progress of the work is satisfactory in accordance with Clause 2, be entitled to take action under Clause 3(b) after giving the Contractor 10 days notice in writing and the Contractor will have no claim for compensation for any loss sustained by him owing to such action.

Clause 5 :- In any case in which any of the powers conferred upon the Executive Engineer by Clause 3 and 4 hereof shall have become exercisable and the same shall not been exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall not notwithstanding be exercisable in any future case of default by the Contractor for which by under 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 taking action under sub Clause (a) or (c) of Clause (3) he may, if he so desires, take possession of all or any tools, plant, 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 Contract rates not being applicable at current market rates to be certified by the Executive Engineer whose certificate thereof shall be final. In the alternative the Executive Engineer may after giving notice in writing to the Contractor or to his clerk of the works, foreman or other authorized agent require 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 Contractor failing to comply with any such

Contractor

Executive Engineer
requisition the Executive Engineer may remove them at the Contractor's expenses or sale 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 expenses of any such removal and the amount of the proceeds and expense of any such removal and the amount of the proceeds and expenses of any such sale be final and conclusive against the Contractor.

**Clause 6 :-** If the Contractor desires an extension of the time for completion of the work on the ground of his having unavoidably hindered in its execution, on any other ground, he shall apply in writing to the Executive Engineer before the expiry of the period stipulated in the Tender or before the expiry of 30 days from the date to which he was hindered as aforesaid or on which the cause for asking for extension occurred, whichever is earlier and the Executive Engineer may, if in his opinion, there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of the Executive Engineer in this matter shall be final.

**Clause 6 A :-** In the case of delay in handing over the land required for the work due to unforeseen cause, the Contractor shall not be entitled for any compensation whatsoever from the Government on the ground that the machinery or the labour was idle for certain period. Contractor may, however apply for extension of time limit which may be granted on the merits of the case.

**Clause 7 :-** On completion of the work the Contractor shall be furnished with a certificate by the Executive Engineer (Hereinafter called the Engineer-in-Charge) of such completion but no such certificate shall be given nor shall the work be considered to be complete until the Contractor shall have removed from the premises, on which the work shall have been executed all scaffolding, surplus materials and rubbish and shall have cleaned off the dirt from all wood work, doors, windows, floors or other parts of any building, in or upon which the work has been executed, or on which he may have had possession for the purpose of executing the work or until the work shall have been measured by the Engineer-in-Charge, or where the measurement have been taken by his subordinates until they have received the approval of the Engineer-in-Charge, the said measurements being binding and conclusive against the Contractor. If the Contractor fails to comply with the requirements of this Clause as to the removal of scaffolding, surplus material and rubbish, and cleaning off 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 materials and rubbish, and dispose off the same as he thinks fit and clean off such dirt as aforesaid, and the Contractor shall forthwith pay the amount of all expenses so incurred but 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.
Clause 8 :- No payment shall be made for any work estimated to cost less than Rs. One thousand, till after the whole of the said work shall have been completed and a certificate of completion given. But in the case of the works estimated to cost more than Rs. One Thousand, the Contractor shall on submitting a monthly bill therefor, be entitled to receive payment proportionate to the part of the work then approved and passed by the Engineer-in-Charge, whose certificate of such approval and passing of the sum payable shall be final and conclusive against the Contractor. All such intermediate payments shall be regarded as payments by way of advance against the final payment only and not as payment for work actually done and completed and shall not preclude the Engineer-in-Charge from requiring any bad, unsound, imperfect or unskillful work to be removed and taken away and reconstructed, or re-erected, nor shall any such payment be considered as an admission of the due performance of the Contract or any part thereof, in any respect or the occurring of any claim, nor shall it conclude, determine or affect in any way the powers of the Engineer-in-Charge as to final settlement and adjustment of the accounts or otherwise, or in any other way vary or affect the Contract. The final bill shall be submitted by the Contractor within one month of the date fixed for the completion of the work otherwise the Engineer-in-Charge's certificate of the measurement and of the total amount payable for the work shall be final and binding on all parties.

Payments on intermediate Certificate to be regarded as advances.

Clause 9 :- The rates for several items of work estimated to cost more than Rs. One Thousand agreed to within, shall be valid only when the item concerned is accepted as having been completed fully in accordance with the sanctioned Specifications. In cases where the items of work are not accepted as so completed the Engineer-in-Charge may make payment on account of such items at such reduced rates as he may consider reasonable in preparation of final or on account bills.

Payments at reduced rates on account of items of work not accepted as completed to be at the discretion of the Engineer-in-Charge.

Clause 10 :- 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 the claim so far as it is admissible shall be adjusted, if possible, within 10 days from the presentation of the bill. If the Contractor does not submit the bill within time fixed as aforesaid, the Engineer-in-Charge may depute a subordinate to measure up the said work in the presence of the Contractor or his duly authorized agent whose counter signature to the measurement list shall be sufficient warrant, and the Engineer-in-Charge may prepare a bill from such list which shall be binding on the Contractor in all respects.

The bill so submitted, after due scrutiny, will be sent to the office of the Regional Officer, MORT&H, Mumbai, for payment.

Bill to be submitted monthly.
Clause 11 :- The Contractor shall submit all bills on the printed forms to be had on application at the office of the Engineer -in-Charge. The charges to be made in the bills shall always be entered at the rates specified in the Contract or in the case of any extra work ordered in pursuance of these conditions and not mentioned or provided for in the Contract, at the rates hereinafter provided for such work.

Clause 12 :- If the Specification or estimate of the work provides for the use of any special description of materials to be supplied from the P.W.D. 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 may be required time to time to be used by him for the purposes of the Contract only, and the value of the full quantity of materials and stores so supplied shall be set off or reduced from any sums then due, or thereafter to become due to the Contractor under the Contract or otherwise, from the Security Deposit, or the proceeds of sale thereof, if the deposit is held in Government securities the same or a sufficient portion thereof shall in that case be sold for the purpose. All materials supplied to the Contractor shall remain the absolute property of Government, and shall on no 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 materials unused and is perfectly in good condition at the time of completion or determination of the Contract shall be returned to the Public Works Departments store, if the Engineer-in-Charge so requires by a notice in writing given under his hand, but the Contractor shall not be entitled to retain any such material except with consent and he shall have no claim for compensation on account of any such materials supplied to him as aforesaid but remaining unused by him or for any wastage in or damage thereto.

Clause 12 A :- All stores of Contracted material such as cement, steel etc. supplied to the Contractor by Government should be kept by the Contractor under lock and key and will be accessible for inspection by the Engineer -in-Charge or his agent at all times.

Clause 13 :- The Contractor shall execute the whole and every part of the work in the most substantial and workman like manner and both as regards materials and every other respect in strict accordance with Specifications. The Contractor shall also confirm exactly fully and faithfully to the designs, and 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 for the purpose of inspection at such office or at the Site of work during office hours. The Contractor will be entitled to receive three sets of Contract drawings and working drawings as well as one certified copy of the accepted Tender along with the work order free of cost. Further copies of the Contract drawings and working drawings if required by him, shall be supplied at the rate of Rs. 1000/- per working drawing except where otherwise specified.

Clause 14 :- The Engineer-in-Charge shall have power to make any alterations in additions to the original Specifications, drawings, designs and instructions that may appear to him 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 instructions in this connection which may be given to him in writing signed by the Engineer-in-Charge and such alterations shall not invalidate the Contract, and any additional work which the Contractor may be directed to do in the manner above specified as a 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 and at the same rates as are specified in the Tender for the main work. And if the additional or altered work includes any class of work for which no rate is specified in this Contract, then such class of work shall be carried out at the rates entered in schedule of rates of the division or at the rate mutually agreed upon between the Engineer-in-Charge and the Contractor which ever are lower. If the additional or altered work for which no rate is entered in the Schedule of rates of the Division, is ordered to be carried out before the rates are agreed upon, then the Contractor shall within 7 days of the date of receipt by him of order to carry out work inform the Engineer-in-Charge of the rates which it is his intention to charge for such class of work and if the Engineer-in-Charge does not agree to this rate, he shall by notice in writing be at liberty to cancel his order to carry out such class of work, and arrange to carry it out in such manner as he may consider advisable, provided always that if the Contractor shall commence work or incur any expenditure in regard thereto before the rate shall have been determined as lastly here before mentioned then 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 or rates as shall be fixed by the Engineer-in-Charge. In the event of a dispute the decision of the Superintending Engineer of the Circle will be final.

Where however, the work is to be executed according to the designs, drawings and Specifications recommended by the Contractor and accepted by the competent authority the alterations above referred to shall be within the scope of such designs, drawings and Specifications appended to the Tender.
The time limit for the completion of work shall be extended in the proportion that the increase in its cost occasioned by alterations or additions bears to the cost of the original Contract work, and the certificate of the Engineer-in-Charge as to such proportion shall be conclusive.

If the time of execution of extra item is more than 12 months then the rate as per the then prevailing current schedule of rates shall be adopted for the quantity of extra item executed after 12 months of its cropping up. The rate so adopted for extra items shall be valid for a period of 12 months and shall be revised after every 12 months.

Clause 15 :- (1) If at any time after the execution of the Contract documents, the Engineer shall for any reason whatsoever (Other than default on the part of the Contractor and for which Government is entitled to rescind the Contract) desire that the whole or any part of the work specified in the Tender should be suspended or that the whole or part of the work should not be carried out at all he shall give to the Contractor a notice in writing of such desire and upon the receipt of such notice the Contractor shall forthwith suspend or stop the work wholly or in part as required, after having due regard to the appropriate state at which the work should be suspended so as not to cause any damage or injury to the work already done or endanger the safety thereof provided the decision of the Engineer as to the stage at which the work or any part of it could be or could have been safely stopped or suspended shall be final and conclusive against the Contractor. The Contractor shall have no claim to any payment or compensation whatsoever by reason of or in pursuance of any notice as aforesaid on account of any suspension, stoppage or curtailment except to the extent specified here-in-after.

(2) Where the total suspension of the work ordered as aforesaid continued for a continuous period exceeding 90 days, the Contractor shall be at liberty to withdraw from the Contractual obligations under the Contract so far as it pertains to the unexecuted part of the work by giving a 10 days prior notice in writing to the Engineer, within 30 days of the expiry of the said period of 90 days, of such intention and requiring the Engineer to record the final measurements of the work already done and to pay the final bill. Upon given such notice, the Contractor shall be deemed to have been discharged from his obligation to complete the remaining unexecuted work under this Contract. On receipt of such notice the Engineer shall proceed to complete the measurements and make such payment as may be finally due to the Contractor within a period of 90 days from the receipt of such notice in respect of the work already done by the Contractor. Such payment shall not in any manner prejudice the right of the Contractor to any further compensation under the remaining provision of this Clause.
(3) Where the Engineer requires the Contractor to suspend the work for a period in excess of 30 days at any time or 60 days in the aggregate, the Contractor shall be entitled to apply to the Engineer within 30 days of the resumption of the work after such suspension for payment of compensation to the extent of pecuniary loss suffered by him in respect of working machinery rendered idle on the Site or on account of his having, have to pay the salary or wages of labour engaged by him during the said period of suspension. Provided always that the Contractor shall not be entitled to any claim in respect of any such working machinery, salary or wages for the first 30 days whether consecutive or in the aggregate of such suspension or in respect of any suspension whatsoever occasioned by unsatisfactory work or any other default on his part. The decision of the Engineer in this regard shall be final and conclusive against the Contractor.

(4) In the event of

i) Any total stoppage of work on notice from the Engineer under sub-Clause (1) in that behalf

ii) Withdrawal by the Contractor from the Contractual obligation to complete the remaining unexecuted work under sub-Clause (2) on account of continued suspension of work for a period exceeding 90 days.

iii) Curtailment in the quantity of an item or items originally tendered on account of any alteration, omission or substitutions in the Specifications, drawings, designs or instructions under Clause 14 (1) where such curtailment exceeds in quantity and the value of the quantity curtailed beyond 25% at the rates for the items specified in the Tender is more than Rs. five thousand (Rs. 5000/-).

It shall be open to the Contractor within 90 days from the service of (i) the notice of stoppage of work or (ii) the notice of withdrawal from the Contractual obligation under the Contract on account of the continued suspension of the work or (iii) notice under Clause 14 (1) resulting in such curtailment or produce to the Engineer satisfactory documentary evidence that he had purchased or agreed to purchase material for use in the Contracted work, before receipt by him of the notice of stoppage, suspension or curtailment and require the Government to take over on payment such materials at the rates determined by the Engineer. Provided however such rates shall in no case exceed the rates at which same were acquired by the Contractor. The Government shall thereafter take over the material so offered, provided the quantities offered are not in excess of the requirement of the unexecuted work as specified in the accepted Tender and are of quality and Specification approved by the Engineer.
Clause 15 A :- The Contractor shall not be entitled to claim any compensation from Government for the loss suffered by him on account of delay by Government in the supply of materials entered in the Schedule ‘A’ as per Volume II, where such delay is caused by

i) Difficulties relating to the supply of railway wagons
ii) Force Majeure
iii) Act of God
iv) Act of enemies of the State or any other reasonable cause beyond the control of Government.

In the case such delay in the supply of materials, Government shall grant such extension of time for the completion of the works as shall appear to the Executive Engineer to be reasonable in accordance with circumstances of the case. The decision of the Executive Engineer as to the extension of time shall be accepted as final by the Contractor.

Clause 16 :- Under no circumstances whatsoever shall the Contractor be entitled to compensation from Government on any account unless the Contractor shall have submitted claim in writing to the Engineer-in-Charge within one month of the cause of such claim occurring.

Clause 17 :- If any time before the Security Deposit or any part thereof is refunded to the Contractor it shall appear to the Engineer-in-Charge or his subordinate incharge of the work, that any work has been executed with unsound, imperfect, unskillful workmanship or with materials of inferior quality, or 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 are otherwise not in accordance with the Contract, it shall be lawful for the Engineer-in-Charge to intimate this fact in writing to the Contractor and then notwithstanding the fact that work, materials or articles complained of, may have been inadvertently passed, certified and paid for, the Contractor shall be bound forthwith to rectify or remove and reconstruct the work so specified in whole or in part, as the case may require or if so required, shall remove the materials or articles so specified and provide other proper and suitable materials or articles at his own 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 the written intimation aforesaid, the Contractor shall be liable to pay compensation at the rate of 1% on the amount of the estimate for every day not exceeding 10 days, during which the failure so continues 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 the materials or articles complained of as the case may be at the risk and expense in all respects of the Contractor. Should the Engineer-in-Charge consider that any such inferior work or materials as described above may be accepted or made use of it shall
be within his discretion to accept the same at such reduced rates as he may fix therefor.

Clause 18 :- All works under or in course of execution 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 intention of the Engineer-in-Charge or his subordinates to visit the works shall have been given to the Contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for the purpose. Orders given to the Contractor's duly authorised agent shall be considered to have the same force and effect as if they had been given to the Contractor himself.

Clause 19 :- The Contractor shall give not less than 5 days notice in writing to the Engineer-in-Charge or his subordinates 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 taken before the same is so covered up or placed beyond the reach of measurement and shall not cover up or place beyond the reach of measurement any work without the consent in writing of the Engineer-in-Charge or his subordinate in charge of the work and if any work shall be 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 and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.

Clause 20 :- If during the period of defect liability as stipulated in Contract Data Volume II from the date of completion as certified by the Engineer-in-Charge pursuant to the Clause 7 of the Contract or the period as stipulated in Contract Data Volume II after commissioning of the work which ever is earlier in the opinion of the Executive Engineer, the said work is defective in any manner whatsoever, the Contractor shall forthwith on receipt of notice in that behalf from the Executive Engineer, duly commence execution and completely carry out at his cost in every respect all the work that may be necessary for rectifying and setting right the defects specified therein including dismantling and reconstruction of unsafe portions strictly in accordance with and in the manner prescribed and under the supervision of the Executive Engineer. In the event of the Contractor failing or neglecting to commence execution of the said rectification work within the period prescribed therefor in the said notice, and/or to complete the same as aforesaid as required by the said notice the Executive Engineer may get the same executed and carried out departmentally or by any other agency at the risk on account and at the cost of the Contractor. The Contractor shall
forthwith on demand pay to the Government the amount of such costs, charges and expenses sustained or incurred by the Government of which the certificate of the Executive Engineer shall be final & binding on the Contractor. Such costs, charges and expenses shall be deemed to be arrears of land revenue and in the event of Contractor failing or neglecting to pay the same on demand as aforesaid without prejudice to any other rights and remedies of the Government, the same may be recovered from the Contractor as arrears of land revenue.

The Government shall also be entitled to deduct the same from any amount which may then be or thereafter be payable by Government to the Contractor either in respect of the said work or any other work whatsoever or from any amount of the Security Deposit retained by Government.

Clause 21:- The Contractor shall supply at his own cost all materials (except such special materials as may be supplied from the Public works Department stores, in accordance with the Contract), plant, tools, appliances, implements, ladders, cordage, tackle, scaffolding and any temporary works which may be required for the proper execution of the work, in the original, altered or substituted form, whether included in the Specification or other documents forming part of the Contract or referred to in these conditions or not and which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter on which under these conditions he is entitled to be satisfied or which he is entitled to require together with carriage therefor to and from the work. The Contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out work, counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or materials. Failing this the same may be provided by the Engineer-in-Charge at the expense of the Contractor and the expenses may be deducted from any money due to the Contractor under the Contract or from his Security Deposit or the proceeds of sale thereof or of a sufficient portion thereof. The Contractor shall provide all necessary fencing and lights required to protect the Public from accident and shall also be bound to bear the expenses of defense of every suit, action or other legal proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay damages and costs which may be awarded in any such suit, action or proceeding to any such persons or which may with the consent of the Contractor be paid in compromising any claim by any such person.

Clause 21 A :- The Contractor shall provide suitable scaffolds and working platforms, gangways and stairways and shall comply with the following regulations.

a) Suitable scaffolds shall be provided for workman for all work that
cannot be safely done from a ladder or by any other means.

b) A scaffolds shall not be constructed, taken down or substantially altered except-
   i) Under the supervision of a competent and responsible person and
   ii) As far as possible by competent workers possessing adequate experience in this kind of work.

c) All scaffolds and appliances connected therewith and all ladders shall
   i) be of sound materials
   ii) be of adequate strength having regard to the loads and strains to which they will be subjected, and
   iii) be maintained in proper condition

d) Scaffolds shall be so constructed that no part thereof can be displaced in consequence of normal use.

e) Scaffolds shall not be overloaded and as far as practicable the load shall be evenly distributed.

f) Before installing lifting gear on scaffolds special precaution shall be taken to ensure the strength and stability of the scaffolds.

g) Scaffolds shall be periodically inspected by a competent person.

h) Before allowing a scaffold to be used by his workmen the Contractor shall check whether the scaffold has been erected by his workmen or not, take steps to ensure that it complies fully with the regulations herein specified.

i) Working platforms, gangways and stairways shall
   i) be so constructed that no part thereof can sag unduly or unequally.
   ii) be so constructed and maintained having regard to the prevailing conditions as to reduce as far as practicable risks of persons tripping or slipping, and
   iii) be kept free from any unnecessary obstructions.

j) In the case of working platforms, gangways, working places and stairways at a height exceeding 3 meters.
   i) every working platform and every gangway shall have to be closely boarded unless other adequate measures are taken to ensure safety
   ii) every working platform, gangway shall have adequate width and
   iii) every gangway, working platform, working place and stairway shall be suitably fenced.

k) Every opening in the floor of the building or in working platform shall, except for the time and to the extent required to allow the access or persons or the transport or shifting of materials, be provided
with suitable means to prevent the fall of persons or materials.

l) When persons are employed on a roof where there is danger of falling from a height exceeding 3 meters suitable precaution shall be taken to prevent the fall of persons or materials.

m) Suitable precautions shall be taken to prevent persons being struck by articles which might fall from scaffolds or other working places.

n) Safe means of access shall be provided to all working platforms and other working places.

Clause 21 B :- The Contractor shall comply with the following regulations as regard the hoisting appliances to be used by him.

a) Hoisting machines and tackle, including their attachment anchorages and supports shall
   (i) Be of good mechanical construction, sound material and adequate strength and free from patent defect and
   (ii) Be kept in good repair and in good working order.

b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of suitable quality and adequate strength and free from patent defect.

c) Hoisting machines and tackle shall be examined and adequately tested after erection on the Site and before use and be reexamined in position at intervals to be prescribed by the Government.

d) Every chain, ring, hook, shackle, swivel and pulley block used in hoisting or lowering of materials or as a means of suspension shall be periodically examined.

e) Every crane driver or hoisting appliances operator shall be properly qualified.

f) No person who is below the age of 21 years shall be in control of any hoisting machine, including any scaffolds which give signals to the operator.

g) In the case of every hoisting machine and of every chain, ring, hook, shackle, swivel and pulley block used on hoisting or lowering or as a means of suspension, the safe working load shall be ascertained by adequate means.

h) Every hoisting machine and all gears referred to in the preceding regulation shall be plainly marked with the safe working load.

i) In the case of hoisting machine having variable safe working load, each safe working load and the condition under which it is applicable shall be clearly indicated.

j) No part of any hoisting machine or of any gear referred to in regulation above shall be loaded beyond the safe working load except for the purpose of testing.

k) Motors, gearing transmissions, electric wiring and other dangerous
parts of hoisting appliances shall be provided with efficient safeguards.

l) Hoisting appliances shall be provided with such means as will reduce to a minimum risk of the accidental descent of the load.

m) Adequate precautions shall be taken to reduce to a minimum the risk of any part of a suspended load becoming accidentally displaced.

**Clause 22 :-** The Contractor shall not set fire to any standing jungle, tree, brush wood or grass without a written permit from the Executive Engineer. When such permit is given and also in all cases when destroying cut or dug up trees, brush wood, grass etc. by fire, the Contractor shall take necessary measures to prevent such fire spreading to or otherwise damaging surrounding property.

The Contractor shall make his own arrangements for drinking water for the labour employed by him

**Clause 23 :-** Compensation for all damages done intentionally or unintentionally by Contractor's labour whether in or beyond the limits of Government property including any damage caused by the spreading of fire mentioned in Clause 22 shall be estimated by the Engineer-in-Charge or such other officer as he may appoint and the estimates of the Engineer-in-Charge subject to the decision of the Superintending Engineer on appeal shall be final and the Contractor shall be bound to pay the amount of the assessed compensation on demand failing which the same will be recovered from the Contractor as damages in the manner prescribed in Clause 1 or deducted by the Engineer-in-Charge from any sums that may be due to or become due from Government to the Contractor under this Contract or otherwise.

The Contractor shall bear the expenses of defending any action or other legal proceedings that may be brought by any person for injury sustained by him owing to neglect of precautions to prevent the spread of fire and he shall also pay any damages and cost that may be awarded by Court in consequence.

**Clause 24 :-** The employment of female labourers on works in the neighborhood of soldiers' barracks should be avoided as far as possible.

**Clause 25 :-** No work shall be done on a Sunday or during night time without the sanction in writing of the Engineer-in-Charge.
Clause 26 :- The Contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the Contractor assigns or sublets his Contract, or attempt so to do, or become insolvent or commence any proceedings to be adjudicated and insolvent or make any composition with his creditors or attempt so to do the Engineer-in-Charge may by notice in writing rescind the Contract. Also if any bribe, gratuity, gift, loan, perquisite, reward or advantage, pecuniary or otherwise shall either directly or indirectly be given, promised, or offered by the Contractor or any of his servants or agents to any public officer or person in the employment of the Government in any way relating to his office or employment or if any such officer or person shall become in any way directly or indirectly interested in the Contract, Engineer-in-Charge may by notice in writing, rescind the Contract. In the event of a Contract being rescinded, the Security Deposit of the Contractor shall there upon stand forfeited absolutely at the disposal of the Government and same consequences shall ensure as if the Contract had been rescinded under Clause 3 hereof and in addition the Contractor shall not be entitled to recover or be paid for any work therefor actually performed under the Contract.

Clause 27 :- All sums payable by a Contractor by way of compensation under any of these conditions shall be considered as a reasonable compensation to be applied to the use of Government without reference to the actual loss or damage sustained and whether any damage has or has not been sustained.

Clause 28 :- In the case of a Tender by partners any change in the constitution of a firm shall be forthwith notified by the Contractor to the Engineer-in-Charge for his information.

Clause 29 :- All works to be executed under the Contract shall be executed under the direction and subject to the approval in all respect of the Superintending Engineer of the Circle 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 form time to time carried out.

Clause 30 :- (1) Except where otherwise specified in the Contract and subject to the powers delegated to him by Government under the code rules then in force, the decision of the Superintending Engineer of the Circle for the time being shall be final, conclusive and binding on all parties to the Contract upon all questions relating to the meaning of the Specification designs, drawing and instruction herein before mentioned and as to the quality of the workmanship or material used on the work or as to any other question, claim right matter or things whatsoever, in any way arising out of or relating to the Contract designs, drawing, Specifications, estimates, instruction, orders or
these conditions, or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof.

2) The Contractor may within thirty days of receipt by him of any order passed by the Superintending Engineer of the Circle as aforesaid appeal against it to the Chief Engineer concerned with the Contract work or project provided that

a) The accepted value of the Contract exceeds Rs. 10/- lakhs (Rupees Ten lakh).

b) Amount of claim is not less than Rs.1.00 Lakh (Rupees one lakh)

3) If the Contractor is not satisfied with the order passed by the Chief Engineer as aforesaid the Contractor may within thirty days of receipt by him of any such order, appeal against it to the concerned Secretary, Public Works Department who, if convinced that prima-facie the Contractor’s claim rejected by the Superintending Engineer/ Chief Engineer is not frivolous and that there is some substance in the claim of the Contractor as would merit a detailed examination and decision by the standing committee, shall put up to the standing committee at Government level for suitable decision.

**Clause 31 :-** The Contractor shall obtain from the P.W.D. stores all stores and articles of European or American manufacture which may be required for the work, or any part of the work or in making up any articles required therefor or 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 Engineer-in-Charge will be debited to the Contractor in his account at the rates shown in the Schedule in form 'A' attached to Contract, and if they are not entered in the said Schedule, they shall be debited to him at cost price which for the purpose of this Contract shall include the cost of carriage and all other expenses whatsoever, which may have to be incurred in obtaining delivery of the same as the stores aforesaid.

**Stores of European or American manufacture to be obtained from the Government**

**Clause 32 :-** When the estimate on which a Tender is made includes lump sums in respect of parts of the work the Contractor shall be entitled to payment in respect of items of work involved or the part of the work in question at the same rates as are payable under this Contract for such items, or if the part of the work in question is not in the opinion of the Engineer-in-Charge capable of measurement the Engineer-in-Charge may at his discretion pay the lump sum amount entered in the estimate and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the Contractor with regard to any sum or sums payable to him under the provision of this Clause.

**Lump sums in estimates**
Clause 33 :- In the case of any class of work for which there is no such Specification as mentioned in the general conditions of Contract such work shall be carried out in accordance with the Specifications and in the event of there being no Specification, then in such case the work shall be carried out in all respects in accordance with the instructions and requirement of the Engineer-in-Charge.

Clause 34 :- The expression 'work' or 'works' where used in these condition shall, unless there be something in the subject or context repugnant to such construction be construed to mean the work or the works contracted to be executed under or in virtue of the Contract, whether temporary or permanent and whether original, altered, substituted or additional.

Clause 35 :- The percentage referred to in the Tender shall be deducted from/added to the gross amount of the bill before deducting the value of any stock issued.

Clause 36 :- All quarry fees, royalties, and ground rent for stacking materials if any, should be paid by the Contractor.

Clause 37 :- The Contractor shall be responsible for and shall pay compensation to his workmen payable under the Workmen's Compensation Act, 1923 (VIII of 1923), (herein after called the said Act) for injuries caused to the workmen. If such Compensation is payable and or paid by Government as principal employer under the subsection (1) of section 12 of the said Act on behalf of the Contractor, this shall be recoverable by Government from the Contractor under sub section (2) of the said section. Such compensation shall be recovered in the manner laid down in Clause 1 above.

Clause 37 A :- The Contractor shall be responsible for and shall pay expenses of providing medical aid to any workmen who may suffer a bodily injury as a result of an accident. If such expenses are incurred by Government the same shall be recoverable from the Contractor forthwith and be deducted without prejudice to any other remedy of Government from any amount due or that may become due to the Contractor.

Clause 37 B :- The Contractor shall provide all necessary personal safety equipment and first aid apparatus available for the use of the persons employed on the Site and shall maintain the same in condition suitable for immediate use at any time and shall comply with the following regulations in connection therewith.

a) The worker shall be required to use the equipment so provided by the Contractor and the Contractor shall take adequate steps to ensure
proper use of the equipment by those concerned.

b) When work is carried on in proximity to any place where there is risk of drowning, all necessary equipments shall be provided and kept ready for use and all necessary steps shall be taken for the prompt rescue of any person in danger.

c) Adequate provision shall be made for prompt first aid treatment for all injuries likely to be sustained during the course of the work.

Clause 38 :- (1) Quantities in respect of the several items shown in the Tender are approximate and no revision in the tendered rates shall be permitted in respect of any of the items so long as, subject to any special provision contained in the Specification prescribing a different percentage of permissible variation, the quantity of the items does not exceed the Tender quantity by more than 25% and so long as the value of the excess quantity beyond this limit, at the rate of the items specified in the Tender is not more than Rs. 5000/-.  

(2) The Contractor shall if ordered in writing by the Engineer so to do, also carry out any quantities in excess of the limit mentioned in Sub-Clause (1) hereof on the same conditions as and in accordance with the Specifications in the Tender and at the rates (i) derived from the rates entered in the current schedule of rates and in the absence of such rates (ii) at the rate prevailing in market, the said rates being increased or decreased as the case may be, by the percentage which the total tendered amount bears to the estimate cost of the work as put to tender, based upon the Schedule of rates applicable to the year in which the tenders were invited (for the purpose of operation of this Clause, this cost shall be taken as mentioned in Contract Data Volume II.)

(3) Claim arising out of reduction in the tendered quantity of any item beyond 25 percent will be governed by the provisions of Clause 15 only, when the amount of such reduction beyond 25% at the rate of the item specified in the Tender is more than Rs. 5,000/-.  

Clause 39 :- The Contractor shall employ any famine, convict or other labour of a particular kind or class if ordered in writing to do so by the Engineer-in-Charge.

Clause 40 :- No compensation shall be allowed for any delay caused in the starting of the work on account of acquisition of land and in the case of the clearance work, for any delay in according sanction to estimates.
**Clause 41 :-** No compensation shall be allowed for delay in execution of the work on account of water standing in borrow pits or compartments. The rates are inclusive for hard or cracked soil excavation in mud, subsoil water or water standing in borrow pits and no claim for an extra rate shall be entertained, unless, otherwise expressly specified.

**Claim for compensation for delay in the execution of work.**

**Clause 42 :-** The Contractor shall not enter upon or commence any portion or work except with the written authority and instructions of the Engineer-in-Charge or of his subordinate incharge of the work. Failing such authority the Contractor shall have no claim to ask for measurements of or payment for work.

**Entering upon or commencing any portion of work.**

**Clause 43 :-**

(i) No Contractor shall employ any person who is under the age of 18 years.

(ii) No Contractor shall employ donkeys or other animals with breeching of string or thin rope. The breeching must be at least 3 inches wide and should be of tape (Newar).

(iii) No animal suffering from sores; lameness or emaciation or which is immature shall be employed on the work.

(iv) The Contractor shall pay fair and reasonable wages to the workmen employed by him in the Contract undertaken by him. In the event of any dispute arising between the Contractor and his workmen on the grounds that the wages paid are not fair and reasonable, the dispute shall be referred without delay to the Executive Engineer who shall decide the same. The decision of the Executive Engineer, shall be conclusive and binding on the Contractor, but such decision shall not in any way affect the condition in the Contract regarding the payment to be made by the Government at the sanctioned Tender rates.

(v) The Contractor shall provide drinking water facilities to the workers. Similar amenities shall be provided to the workers engaged on large work in urban areas.

**Minimum age of persons employed, the employment of donkeys and / or other animals and the payment of fair wages.**

**Clause 44 :-** Payment to Contractor shall be made by Demand Drafts or Cheques drawn on any Nationalised or Scheduled Bank by the Regional Pay & Accounts Officer (National Highway) Mumbai. Provided the amount exceed Rs. 100/- Amount not exceeding Rs, 100/- will be paid in cash.

**Method of payment**

**Clause 45 :-** Any Contractor who does not accept these conditions shall not be allowed to Tender for works.

**Acceptance of condition compulsory before tendering**

**Clause 46 :-** If Government declares a state of scarcity or famine to exist in any village situated within 10 miles of work, the Contractor shall employ upon such parts of the work as suitable for unskilled labour, any person

**Employment of scarcity labour.**

_Contractor_          _Executive Engineer_
certified to him by the Engineer or by any persons to whom Executive Engineer may have delegated this duty in writing to be in need of relief and shall be bound to pay to such persons wages not below minimum Government may have fixed in this behalf. Any dispute which may arise in connection with the implementation of this Clause shall be decided by the Executive Engineer whose decision shall be final and binding on the Contractor.

**Clause 47:** The price quoted by the Contractor shall not in any case exceed the control price, if any fixed by Government or reasonable price which is permissible for him to charge as private purchaser for the same class and description of goods under the provisions of Hoarding and Profiteering Prevention Ordinance, 1984 as amended from time to time. If the price quoted exceeds the controlled price of the price permissible under Hoarding and Profiteering Prevention Ordinance, the Contractor will specifically mention this fact in his Tender along with reasons for quoting such higher price. The purchaser at his discretion will in such case exercise the right of revising the price at any stage so as to conform with the controlled price permissible under the Hoarding and Profiteering Prevention Ordinance. This discretion will be exercised without prejudice to any other action that may be taken against the Contractor.

**Clause 48:** The rates to be quoted by the Contractor must be inclusive of sales tax. No extra payment on this account will be made to the Contractor.

**Clause 48 A:** The Contractors are bound to pay to the labourers wages according to the Minimum Wages Act, 1948 applicable to the Zone in Accordance with the order issued in Government PWD/Circular No. MWA/1063, DATED 7-12-1968. (Minimum wages act as per Government Circular CAT/1284(120)/Building Dt. 14/8/1985).

**Clause 49:** In case of materials that remain surplus with the Contractor for those issued for the work contracted from the date of ascertainment of the materials being surplus will be taken as the date of sale for the purpose of sales tax and the sale tax will recovered on such sale.

**Clause 50:** The Contractor shall employ at least 80% of the total no of the unskilled labour to be employed by him on the said work only from locally available labourers and shall give preference to those persons enrolled under Maharashtra Government Employment and Self Employment Departments Scheme. Provided, however that if the required unskilled labourers are not available locally, the Contractor shall in the first instance employ such number of persons as a available and thereafter may, with previous permission in writing of the Engineer-in-Charge of the said work, obtain the rest of requirement of unskilled the labour from outside the above scheme.
Clause 51 :- Deleted

Clause 52 :- All amounts whatsoever which the Contractor is liable to pay to the Government in connection with the execution of the work including the amount payable in respect of

1) Materials and or stores supplied/ issued hereunder by the Government to the Contractor.

2) Hire charges in respect of heavy plant, machinery and equipment given on hire by the Government to the Contractor, for execution by him of the work and/or on which the advance have been given by the Government to the Contractor, shall be deemed to be arrears of the land revenue and the Government may without prejudice to any other rights and remedies of the Government recover the same from the Contractor as arrears of land revenue.

Clause 53 :- The Contractor shall duly comply with all the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 (37 of 1970) and the Maharashtra Contract Labour (Regulation and Abolition) Rules, 1971 as amended from time to time and all other relevant statutes and statutory provisions concerning payment of wages particularly to workmen employed by the Contractor and working on the Site of work. In particular the Contractor shall pay wages to each worker employed by him on the Site of the work at the rates prescribed under the Maharashtra Contract labour (Regulation and Abolition) Rules 1971. If the Contractor fails or neglects to pay wages at the said rates or make short payment and the Government makes such payment of wages in full or part thereof less paid by the Contractor, as the case may be the amount so paid by the Government to such workers shall be deemed to be arrears of land revenue and the Government shall be entitled to recover the same as such from the Contractor or deduct the same from the amount payable by the Government to the contractor hereunder or from any other amount payable to him by Government. (Minimum Wages Act as per Government circular CAT/ 1284/ (120)/ Building-2 dated 14.08.1985)

Clause 54 :- If during the operative period of the Contract as defined in condition (i) below, there shall be any variation, in the Consumer Price Index (New Series) for Industrial Workers for centers as mentioned in Contract Data Volume II, as per the Labour Gazette published by the Commissioner of Labour, Government of Maharashtra and/ or in the Whole-sale Price Index for all commodities, prepared by the office of Economic Adviser, Ministry of Industry, Government of India, or in the price of petrol/oil and lubricants and major Construction materials like bitumen, Cement, Steel, various types of metal pipes etc., then subject to the other conditions mentioned below, price adjustment on account of (i) Labour Component (ii) Material Component (iii)
Petrol Oil and Lubricants Component (iv) Bitumen Component (v) HYSD and Mild Steel Component (vi) Cement Component (vii) C.I. and D.I. Pipes Component calculated as per formula herein after appearing, shall be made. Apart from these, no other adjustments shall be made to the Contract price for any reasons whatsoever. Component percentages as given below are as of the total cost of work put to tender. Total of Labour, Material & POL Component shall be 100 and other components shall be as per actual.

i) Labour Component - K₁ %
ii) Material Component - K₂ %
iii) P.O.L. Component - K₃ %

Total 100 %

iv) Bitumen Component - Actual
v) HYSD and Mild Steel Component - Actual
vi) Cement Component - Actual
vii) C.I. and D.I. Pipe Component - Actual

(The percentages & values of the above Components shall be as per Contract Data of Volume II)

Note :- If Cement, Steel, Bitumen, C.I. and D.I. Pipes are supplied on Schedule 'A', then respective component shall not be considered. Also if particular Component is not relevant same shall be deleted.

1. **Formula for Labour Component** :

\[ V₁ = 0.85 \times P \times \frac{K₁}{100} \times \frac{(L₁ - L₀)}{L₀} \]

Where,

V₁ = Amount of price variation in Rupees to be allowed for Labour Component

P = Cost of Work done during the quarter under consideration minus the cost of Cement, HYSD and Mild Steel, Bitumen, C.I. and D.I. Pipes calculated at the basic Star rates as applicable for the tender, consumed during the quarter under consideration.

(For star rates refer Contract Data Volume II.)
$K_1 = \text{Percentage of Labour Component as indicated in Contract Data Volume II.}$

$L_0 = \text{Basic consumer price index for Center as mentioned in Contract Data Volume II}$

$\text{shall be average consumer price Index for the quarter preceding the month in}$

$\text{which the last date prescribed for receipt of tender, falls.}$

$L_1 = \text{Average Consumer Price Index for Center as mentioned in Contract Data Volume II for the quarter under consideration.}$

2. **Formula for Material Component:**

$$V_2 = 0.85 \times P \times \frac{K_2 (M_1 - M_0)}{100 \times M_0}$$

Where

$V_2 = \text{Amount of price variation in Rupees to be allowed for Material Component}$

$P = \text{Same as worked out for Labour Component.}$

$K_2 = \text{Percentage of Material Component as indicated in Contract Data Volume II.}$

$M_0 = \text{Basic wholesale price index shall be average whole sale price Index for the}$

$\text{quarter preceding the month in which the last date prescribed for receipt of}$

$tender, falls.}$

$M_1 = \text{Average wholesale price index during the quarter under consideration.}$

3. **Formula For Petrol, Oil And Lubricant Component :**

$$V_3 = 0.85 \times P \times \frac{K_3 (P_1 - P_0)}{100 \times P_0}$$

Where

$V_3 = \text{Amount of price variation in Rupees to be allowed for P.O.L. Component}$

$P = \text{Same as worked out for Labour Component.}$

$K_3 = \text{Percentage of Petrol, Oil And Lubricant Component as indicated in Contract Data}$

$\text{Volume II.}$

$P_0 = \text{Average price of H.S.D. at the center mentioned in Contract Data Volume II}$

$\text{during the quarter preceding the month in which the last date prescribed for}$

$\text{receipt of tender, falls.}$

$P_1 = \text{Average price of H.S.D. at the center mentioned in Contract Data Volume II}$

$\text{during the quarter under consideration.}$
4. **Formula For Bitumen Component**:

\[ V_4 = QB (B_1 - B_0) \]

Where

- \( V_4 \) = Amount of price variation in Rupees to be allowed for Bitumen Component
- \( QB \) = Quantity of Bitumen (Grade as mentioned in Contract Data Volume II) in metric tonnes used in the permanent works and approved enabling works during the quarter under consideration.
- \( B_1 \) = Current, average ex-refinery price per metric tonne of bitumen (Grade as mentioned in Contract Data Volume II) under consideration including taxes (octroi, excise, sales tax) during the quarter under consideration.
- \( B_0 \) = Basic rate of Bitumen in rupees per metric tonne as considered for working out value of \( P \) or average ex-refinery price in rupees per metric tonne including taxes (octroi, excise, sales tax) of Bitumen for the grade of bitumen under consideration prevailing quarter preceding the month in which the last date prescribed for receipt of tender, falls, whichever is higher.

5. **Formula For HYSD and Mild Steel Component**:

\[ V_5 = S_0 \times \frac{(S_{I_1} - S_{I_0})}{S_{I_0}} \times T \]

Where

- \( V_5 \) = Amount of price variation in Rupees to be allowed for HYSD/Mild Steel Component.
- \( S_0 \) = Basic rate of HYSD/Mild steel in rupees per metric tonne as considered for working out value of \( P \).
- \( S_{I_1} \) = Average Steel Index as per RBI Bulletin during the quarter under consideration.
- \( S_{I_0} \) = Average of Steel Index as per RBI Bulletin for the quarter preceding the month in which the last date prescribed for receipt of tender, falls.
- \( T \) = Tonnage of steel used in the permanent works for the quarter under consideration.
6. **Formula For Cement Component:**

\[ V_6 = C_0 \times \frac{(C_{I1} - C_{I0})}{C_{I0}} \times T \]

Where

- \( V_6 \) = Amount of price escalation in Rupees to be allowed for Cement Component.
- \( C_0 \) = Basic rate of cement in Rupees per metric tonne as considered for working out value of \( P \).
- \( C_{I1} \) = Average Cement Index published in the RBI bulletin for the quarter under consideration.
- \( C_{I0} \) = Average of Cement Index published in the RBI bulletin for the quarter preceding the month in which the last date prescribed for receipt of tender, falls.
- \( T \) = Tonnage of cement used in the permanent works for the quarter under consideration.

7. **Formula for C.I./D.I. Pipe Component:**

\[ V_7 = Q_d \times (D_1 - D_0) \]

Where

- \( V_7 \) = Amount of price escalation in Rupees to be allowed for C.I./D.I. pipe Components.
- \( Q_d \) = Tonnage of C.I./D.I. pipes used in the works during the quarter under consideration.
- \( D_1 \) = Average Pig Iron price in rupees per tonne during the quarter under consideration (published by IISCO)
- \( D_0 \) = Pig Iron basic price in rupees per tonne considered for working out value of \( P \).

The following conditions shall prevail:

(i) The operative period of the Contract shall mean the period commencing from the date of the work order issued to the Contractor and ending on the date on which the time allowed, for the completion of the work specified in the Contract for work expires, taking into consideration the
extension of time, if any for completion of the work granted by Engineer-in-Charge under the relevant Clause of the conditions of Contract in cases other than those where such extension is necessitated on account of default of the Contractor. The decision of the Engineer-in-Charge as regards the operative period of the Contract shall be final and binding on the Contractor. Where any compensation for liquidated damages is levied on the Contractor on account of delay in completion or inadequate progress under the relevant Contract provisions, the price adjustment amount for the balance of work from the date of levy of such compensation shall be worked out by pegging the indices $L_1, M_1, C_1, P_1, B_1, S_1$ and $C_1$ to the levels corresponding to the date from which such compensation is levied.

(ii) This price variation Clause shall be applicable to all Contracts in B-1 form but shall not apply to piece works. The price variation shall be determined during each quarter as per formula given above in this Clause.

(iii) Price Variation under this Clause shall not be payable for the extra items required to be executed during the completion of work and also on the excess quantities of items payable under the provisions of Clause 38of the Contract form B1. Since the rates payable for extra items or the extra quantities under Clause 38 are to be fixed as per current DSR or as mutually agreed to yearly revision till completion of such work. In other words, when the completion/ execution of extra items as well as extra quantities under Clause 38of the Contract form B1 extends beyond the operative date of the DSR then rates payable for the same beyond the date shall be revised with reference to the current DSR prevalent at that time on year to year basis or revised in accordance with mutual agreement thereon, as provided for in the Contract, whichever is less.

(iv) This Clause is operative both ways, i.e. if the Price Variation as calculated above is on the plus side, payment on account of the price variation shall be allowed to the Contractor and if it is on the negative side, the Government shall be entitled to recover the same from the Contractor and the amount shall be deductible from any amounts due and payable under the Contract.

(v) To the extent that full compensation for any rise or fall in costs to the Contractor is not entirely covered by the provision of this or other Clauses in the Contract, the unit rate and prices included in the Contract shall be deemed to include amounts to cover the contingency of such other actual rise or fall in costs.
Clause 55 :-

A) The anti malaria and other health measures shall be as directed by the Joint Director (Malaria and Filaria) of health Services Pune.

B) Contractor shall see that Mosquitogenic conditions are not created so as to keep vector population to minimum level.

C) Contractor shall carry out anti malaria measures in the area as per guidelines prescribed under National Malaria Eradication programme as directed by the joint Director (M & F) of health Services, Pune.

D) In case of a default in carrying out prescribed anti malaria measures resulting in increase in malaria incidence Contractor shall be liable to pay to Government the amounts spent by Government on anti malaria measures to control the situation in addition to fine.

E) Relations with Public Authorities :

The Contractor shall make sufficient arrangements for draining away the sludge water as well as water coming from the bathing and washing places and shall dispose off this water in such a way as not to cause any nuisance. He shall also keep the premises clean by employing sufficient number of sweepers. The Contractor shall comply with all rules regulations, byelaws and directions given from time to time by any local or public authority in connection with this work and shall pay fees or charges which are leviable on him without any extra cost to Government.

Clause 56 :- The Contractor shall comply with all the provisions of the Apprentices Act, 1961 and the rules and Orders issued there under from time to time. If he fails to do so, his failure will be a breach of the Contract and the Superintending Engineer may, in his discretion, cancel the Contract. The Contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provision of the Act (vide Government Circular No. CST - 1086/CR-243 Ka-Building-2/Mantralaya, Bombay- 400 032, dated 11 Sept. 1987)

Clause 57 :- The tendered rates shall be inclusive of all taxes and cesses and shall also be inclusive of taxes leviable in respect of works Contract under the provision of the Maharashtra Sales Tax on transfer of property in goods involved in the execution of works Contract Act, 1985 (Maharashtra Act No. XIX of 1985) (Vide P.W.D. Circular No. CAT-1086/R-330/Bldg.2 dated 10/6/87.

Clause 58 :- In case of materials which become surplus with the Contractors from those issued for the work contracted for the date of ascertainment of the materials as being surplus will be taken as the date of sale for the purpose of sales tax and sales tax will be recovered on such sale.
Clause 59 :- 1) To ensure the specified quality of work which will also include necessary survey temporary works etc. the Contractor shall prepare a quality assurance plan and get the same approved from the Engineer-in-Charge within one month from the date of work order. For this Contractor shall submit an organization chart of his technical personnel to be deployed on the work along with their qualification, job descriptions defining the functions of reporting, supervising, inspecting and approving. The Contractor shall also submit a list of tools equipment and the machinery and instrumentation which he proposes to use for the construction and for testing in the field and/or in the Laboratory and monitoring. The Contractor shall modify/supplement the organisation chart and the list of machinery/equipment etc, as per the direction of the Superintending Engineer and shall deploy the persons and equipment on the fields as per he approved chart and the list respectively. The Contractor shall submit written method, statements detailing his exact proposal of execution of the work in accordance with the Specification. He will have to get these approved from the Engineer-in-Charge. The quality of the work shall be properly documented through certificate, records, check lists and Log Book of results etc. Such records shall be complied from the beginning of the work and be continuously updated and supplemented and this will be the responsibility of the Contractor. The forms should be got approved from the Engineer-in-Charge.

2) Where the work is to be on lump sum basis on Contractor’s design, the Contractor shall also prepare and submit a maintenance manual giving periodicity of maintenance works including inspections, tools and equipments to be used, means of accessibility for all parts of the structure. He shall also include in the manual, the Specification for maintenance works that would be appropriate for his design and the technique of construction. This manual shall be submitted within the Contract period.
A. CEMENT CONTENT

1. Change of Cement Content

The determination of the proportions of cement, aggregates and water to attain the required strength shall either be made (a) by designing the concrete mix which is called design Mix Concrete or (b) by adopting nominal concrete mix which are called Nominal Mix Concrete.

Nominal Mix Concrete shall be used for concrete of grade M-20 and lower. The cement content for nominal mixes shall be as under.

- **M-10** -- 4.42 Bags/ cum.
- **M-15** -- 6.27 Bags/ cum.
- **M-20** -- 7.60 Bags/ cum.

The rate of consumption of cement for various grades of concrete referred above is a theoretical rate of consumption assumed for the estimate purpose. The nominal mixes may be used with the permission of Engineer-in-Charge, however design mix concrete is always preferred to nominal mix.

Notwithstanding anything contained in para herein above the Contractor will have to obtain an economic mix design for grades of concrete M20 and above. The concrete mix to be used shall be got designed by the Contractor in an approved Laboratory with an optimum quantity of cement to give the specified strength as stipulated in Table-02 of IS-456-2000.

The mix design done earlier not prior to one year may be considered adequate for later Work provided there is no change in source and the quality of the material.

Immediately upon the receipt of work order the Contractor shall inform the Engineer-in-Charge the exact location of the sources of acceptable materials. On approval of the ingredient materials by the Engineer-in-Charge the same shall be sent to the approved Laboratory for carrying out the mix design.

The necessary charges towards the mix design including sampling, transporting and charges for mix design in the laboratory based on their prevailing schedule of rates will have to be borne by the Contractor. The mix design from laboratory will have to be obtained before taking up the execution of concrete work.

The proportions of materials as stipulated in mix design shall be adhered to by the Contractor so long as the materials continue to be of the same quality and from the same sources subject only to slight changes in relative quantities of coarse and fine aggregate for the purpose of promoting workability, provided the work tests also show the required strength.

If during the progress of work the Contractor wishes to change the material, the proportions shall be fixed on the basis of fresh preliminary mix design to give the required strength after the Engineer-in-Charge is satisfied that the materials satisfy the specifications. No adjustment in the cost will be made for a change of proportion of cement fixed in the original mix design.
B. MIX DESIGN

2. Concrete Mixes

2.1 The following instructions shall be followed as regards preliminary design of mix and methods of batching of plain cement concrete and reinforced cement concrete. These instructions should be treated as supplementary to the relevant provisions in the specifications for the respective items contained in the book of standard specifications and will override the provisions contained therein wherever they are contrary to the following instructions.

The preliminary mix design and batching for various grades of concrete shall be governed by the following guidelines.

<table>
<thead>
<tr>
<th>Concrete Grade</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Upto M-15</td>
<td>This should only be ordinary concrete. No change may be prescribed in the present practice as regards permitting volume batching.</td>
</tr>
<tr>
<td>(ii) M-20</td>
<td>Preliminary mix design must be carried out for these mixes. However, weigh batching is compulsory for cement only.</td>
</tr>
<tr>
<td>(iii) M-25 and above</td>
<td>Preliminary mix design must be prepared for such mixes. Weigh batching is compulsory for cement, fine aggregate and course aggregate.</td>
</tr>
</tbody>
</table>

2.2 For the grades of concrete M-20 and above the preliminary mix design shall be carried out from the approved Govt. laboratory. The rate quoted by the Contractor in the agreement for these items shall be final and binding on him irrespective of content of cement required as per preliminary mix design and there shall be no adjustment in the agreement rate for these items on this account

(i) The charges for preliminary design of concrete mix shall be entirely borne by the Contractor.

(ii) For grades of concrete M-20 and above where cement is to be used by weight, the cost of extra cement required to make up the under weight bags shall be borne by the Contractor.

(iii) For the items of concrete of grades lower than M-20 and other items in the agreement where cement is not to be used by weightment, the cement bags as received from the manufacturer shall be assumed to contain cement of 50 Kg. net weight.

(iv) The Admixtures such as plasticizers/ super plasticizers for concrete grade M20 and above shall be used as directed by the Engineer-in-Charge depending upon specific requirements. No extra payment on this account will be admissible.
3. **Bituminous Mixes**

(i) The bituminous wearing surfaces and other bituminous overlays as directed by the Engineer-in-Charge will have to be executed as per the job mix formula based on mix design. The Contractor will have to inform the Engineer-in-Charge in writing at least 20 days before the start of work of the job mix formula proposed for use in the Works. While establishing the job mix formula the Contractor should ensure that it is based on a correct and truly representative samples 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.

(ii) The job mix formula will have to be got approved from the Engineer-in-Charge.

(iii) The approved job mix formula shall remain effective unless and until revised job mix formula is approved. Should a change in the source of material be proposed or when specified by the Engineer-in-Charge, a new job mix formula be prepared and submitted for approval. On approval of the job mix formula the Contractor should carry out plant trials to establish that the plant is set up to produce a uniform mix conforming to the approved job mix formula.

The permissible variations as regards a) Individual percentages of various ingredients and b) Binder content, shall be as specified in MORT & H Specification Revision IV Table 500-13, 500-16, 500-19. The job mix design shall be carried out in the Regional Laboratory or any other approved laboratory as approved by Engineer-in-Charge.

Any variation of binder content beyond permissible variations will be assessed and payment will be reduced accordingly for less binder content. No extra payment will be made for any higher binder content.
C. SPECIFICATIONS FOR HOT MIX WORKS

4. Plants and Equipments

4.1 Technical requirement of Drum Mix Plant to be used on N. H. Way works:

General

The drum mix plants should be of reputed make and proven design, sturdy in structure and capable of producing desired quality of mix as per specification for laying bituminous road surface and should have following essential arrangements.

i) Cold Aggregate Feeder :- The cold aggregate feeder arrangement should have minimum 4 bins of sufficient capacity capable of storing different sizes of aggregate and fines to ensure continuous uninterrupted supply driven by a variable speed motor and a control gate to ensure accurate aggregate feed to meet design mix formula. It is pre-requisite that only properly screened and graded materials are fed to the bins.

There should be a gathering conveyor to receive and transport materials discharged from bins with separate drive arrangement.

There should be a screen or a suitable arrangement like baffle plate at the discharge end of gathering conveyor for rejection of any oversize metal above the permissible limit. The conveyor should be fitted with suitable electronic load sensor device for weighing quantity of all aggregate being fed to dryer drum.

The plant should have a mineral filler arrangement with suitable control device to accurately proportion the flow of filler material into dryer drum at appropriate stage.

ii) Dryer Drum :- It should be thermo drum type with smooth rotation arrangement to give rated output and capable of reducing the moisture content of the aggregate to desirable limit of 2% to 6% and achieving hot mix temperature (upto 160°C as per requirement) with such design that no blue smoke is emitted from the exhaust. The drum may have optional arrangement for feeding reclaimed material. There should be arrangement to restrict burner flame upto certain length in the drum before bitumen is injected.

It should be fitted with positive displacement bitumen pump driven by variable speed motor automatically controlled from control cabin capable of feeding desired quantity of bitumen synchronised with aggregate feed system. Thermo fluid system or hot oil circulation system should be an in-built feature to keep bitumen pump and pipes sufficiently hot to avoid clogging of pipes.

iii) Burner :- The burner used should be capable of burning the fuel efficiently and develop the required temperature. It should be fitted with remote control system to detect flame failure, and also electric spark ignition system or some other suitable arrangement. Burner operation should have thermostatic control of flame within the specified temperature range.
iv) Bitumen Heater :- It should consist of an insulated tank of adequate capacity fitted with effective and positive control of temperature, for allowing continuous circulation of bitumen between bitumen heater and proportioning units. Suitable arrangement should be provided for recording the temperature at the tank and in circulating system.

v) Fuel System :- Fuel tanks should be of sufficient capacity and fitted with suitable type of fuel pump to receive the fuel from storage tank and supply to line heater and burner.

vi) Cyclone System :- Cyclone unit is required to control dust discharge within the admissible standard of pollution level.

vii) Operating Control unit :- The drum mix plant must have centralised control system with operation from a control cabin located adjacent to the drum mix plant. The control system should be capable of following.

   a) Automatic control of speed of each bin feeder conveyor and gate, so as to control and regulate the flow of various grades of material to ensure constant and accurate proportion of aggregates.

   b) Pre-set and control percentage of flow of aggregate and asphalt required as per design mix.

   c) Automatic detection of plant operation failure, display of aggregate temperature, asphalt and mix temperature, aggregate flowing, fully automatic aggregate blending, bitumen / aggregate ratio control and burner control and system.

   d) Control for pre-setting the moisture content of aggregate displayed distinctly.

   e) Entire control system should be such that if desired it would be operated manually also.

viii) Surge Silo :- The plant may have optional arrangement to store hot mix material for at least equivalent to 30% of rated capacity to cater for any delay in loading the tippers. Temporary storage silo should have adequate automatic hydraulic unloading arrangement operated either from the control cabin or manually with necessary safety control.

4.2 Hot mix plant shall be calibrated by the recognized agency approved by Engineer-in-Charge and certificate to that effect shall be produced to Engineer-in-Charge.

4.3 The Contractor will have to make his plant and equipment open for the inspection by the Engineer-in-Charge or his representative or and representatives of MORT & H. The Contractor shall carry out necessary modifications if any as directed by Inspecting Authorities.

4.4 The plant should have the facility of producing a computerized output of daily Consumption of Materials as regards the bitumen, materials and mix produced. The Contractor shall make available computer output to the Engineer-in-Charge or to his representative as and when asked for.

4.5 The dry run and trial run of the hot mix plant should be carried out in presence of Engineer-in-Charge or his representative as and when directed.
4.6 It is obligatory on the part of Contractor to obtain N.O.C. regarding Prevention and Control of Pollution Act, 1974.

4.7 The plant should have a fully equipped laboratory with trained personnel to carry out all testings related to bituminous works, as mentioned in Section V for Quality Control, of this Volume.

4.8 The lead of plant from the work site shall be as specified in Contract Data Volume II.

4.9 The Contractor should employ qualified and experienced plant operator to run the hot mix plant and he should be capable of understanding and following the instructions of Engineer-in-Charge or his representative.

5. Works

5.1 The hot mix work should be carried out from the approved plant and approved machinery only. No other agency would be allowed to carry out the work. In case it is noticed that the Contractor in whose name the Work has been allotted has permitted other Contractor to carry out the Work with some other plant, the Work would be rejected and the payment for such Work would not be made at all.

5.2 Source of metal to be used for Work should be the same throughout. Should there be any change, the Contractor will have to obtain approval to the revised job mix formula at least 15 days prior to the date of its intended use.

5.3 The hot mix work should be carried out up to 20th May only.

5.4 No hot mix works shall be carried out during Night time unless otherwise permitted by the Engineer-in-Charge.

5.5 The newly laid surface shall not be opened to traffic for at least 24 hours after laying and completion of compaction without the expressed approval of Engineer-in-Charge in writing.

5.6 The necessary grade and camber for the road length under improvement should be strictly observed during execution.

5.7 The traffic management during execution of hot mix works shall be as per Section VII of this Volume.

5.8 Bituminous materials shall be transported in clean insulated vehicles and unless otherwise agreed by Engineer-in-Charge shall be covered while in transit or awaiting tipping.

5.9 Contractor should note that once the hot mix work is started, he will not be allowed to operate his plant for any work other than the works of Public Works Department without the specific permission in writing from Engineer-in-Charge.

5.10 In case for any reasons, the Work gets damaged the Contractor has to carry out the rectification at his risk and cost for full width of carriageway.

5.11 The work activity programme considering the start date and completion period shall be prepared and submitted for approval of Engineer-in-Charge, 15 days prior to start of Work. No hot mix work shall be undertaken unless such programme is approved by Engineer-in-Charge.
5.12 The Contractor shall be required to give a trial run of the equipments such as paver, vibratory roller, sprayer etc. for establishing their capability to achieve the laid down specification and tolerances to the satisfaction of Engineer-in-Charge before commencement of Work. All equipments provided should be of proven efficiency and shall be operated and maintained at all times in a manner acceptable to Engineer-in-Charge. No equipment and personnel shall be removed from worksite without permission of Engineer-in-Charge.

5.13 Plant mixed bituminous materials for pavement courses shall be weighed on accurate scales approved by the Engineer-in-charge in the presence of representative of Engineer-in-charge as and when asked for. The weighment slips shall be produced for official record. This activity is obligatory to Work.

5.14 It is obligatory on the part of Contractor to carry out the field tests as required by the Engineer-in-Charge. He should have required equipments and trained personnel to carry out such testing and will be the responsibility of Contractor to maintain record of such testing and to furnish such record to the Engineer-in-Charge within 3 days from the date of testing.

5.15 The non-working machinery if any shall not be kept at the site of work. After a days Work is over, the working machinery shall be parked in such manner as not to cause any hindrance or pose danger to the traffic plying on the section of road. The working machinery parked on site should have traffic safety devices as mentioned in Sub Section 4 of section VII.

6. Roughness Index

The Contractor shall be responsible to measure the roughness of road surface for which he may use the Roughness Index Testing machine at his own cost. Use of "Towed fifth wheel Bump integrator" shall be made to measure the roughness of the road surface. The calibration of the machine shall be done from time to time as and when warranted, from reputed institutions like C.R.R.I, New Delhi and their certificate shall be produced to that effect. The values of roughness so measured shall not exceed the values given below for various types of road surfaces under standard conditions of carrying out the test and as specified below.

1) Premix Carpet 2500 mm/Km.
2) MSS 2400 mm/Km.
3) SDBC 2200 mm/Km.
4) Bituminous Concrete 1800 mm/Km.
5) B.M. 2500 mm/Km.

The Roughness Index test shall be carried out before start of the work and after completion of Surface Course as directed by Engineer-in-Charge for the Works of Strengthening and wherever specified in Contract Data Volume II.

The results of roughness index test shall be made available to the Engineer-in-Charge within 15 days from the test so taken.
As an outcome of roughness test, where the surface irregularity of wearing surfaces falls outside the tolerances mentioned above, the Contractor shall be liable to rectify the deficiencies in a manner as directed and to the satisfaction of the Engineer-in-Charge.

If the Contractor fails to carry out roughness index test the same will be done departmentally and double the cost so incurred will be recovered from him.
D. SPECIFICATIONS FOR RIGID PAVEMENT

7. Scope

7.1 The work shall consist of construction of unreinforced dowel jointed plain cement concrete pavement in accordance with the requirement of these specifications and in conformity with the lines, grades and cross section shown on the drawing or as directed by the Engineer-in-Charge. The work shall include furnishing of all plants and equipments, materials and labour and performing all operations in connection with the work as approved by the Engineer-in-Charge.

7.2 The design parameters viz. thickness of pavement slab, grade of concrete, joint details etc. shall be as stipulated in the drawings.

8. Materials

8.1 Source of Materials:

The Contractor shall indicate to the Engineer-in-Charge the source of all materials to be used in the concrete work sufficiently in advance, and the approval of the Engineer-in-Charge for the same shall be obtained before the scheduled commencement of the work. If the Contractor later proposes to obtain materials from a different source, he shall notify the same to Engineer-in-Charge for his approval before such materials are to be used.

8.2 Cement:

Ordinary Portland Cement for use on the works shall comply in every respect with the requirements of the IS-8112 amended from time to time. The cement used in the works shall be manufactured in India and shall be of a make and quality approved by the Engineer-in-Charge. Only 43 grade Ordinary Portland Cement shall be used. The Contractor shall provide and maintain proper and sufficient storage sheds for the cement on the worksite. The floor of the stores shall be raised at least 23 cm. from the ground in order to protect the bags from moisture. Cement damaged by exposure or otherwise will not be allowed to be used in the Work and same shall be removed from the site at once.

8.3 Admixtures:

Admixtures conforming to IS : 9103 and IS : 6925 shall be permitted to improve workability of the concrete or extension of setting time on satisfactory evidence that it will not have any adverse effect on the properties of concrete with respect to strength, volume change, durability and has no deleterious effect on steel bars. The particulars of the admixture and the quantity to be used, must be furnished to the Engineer-in-Charge in advance to obtain his approval before use.

8.4 Coarse Aggregate:

(i) Aggregates for pavement concrete shall be natural material complying with IS : 383 with a Los Angeles Abrasion Test limits not more than 35 percent. The limits of deleterious materials shall not exceed the requirements set out in IS : 515. No aggregate having water absorption more than 2% shall be used.

(ii) Coarse aggregate shall consist of clean, hard, strong, dense, non porous and durable pieces of crushed stone or crushed gravel and shall be devoid of pieces of disintegrated stone, soft, flaky elongated, very angular or splintery pieces. The maximum size of
coarse aggregate shall be 20 mm. for M-40 grade pavement concrete and for dense lean concrete (DLC) it shall be 25 mm. Continuously graded or gap graded aggregates may be used as stipulated in IRC 44 and IRC 59 respectively, depending on the grading of the fine aggregate.

The aggregate shall not be alkali reactive. Dumping and stacking of aggregates shall be done in an approved manner. In case the Engineer-in-Charge considers that the aggregate are not free from dirt, the same may be washed and drained for at least 72 hours before batching as directed by the Engineer-in-Charge. In such situation the absorbed moisture content shall be carefully monitored for controlling water cement ratio.

(iii) Fine Aggregate :

The fine aggregate shall consist of clean, natural sand conforming to IS:383. Fine aggregate shall be free from soft particles, clay, shale, loam, cemented particles, mica and organic and other foreign matter.

(iv) Sand shall be of approved quality with fineness modulus between 2.4 to 3.0 as per approved mix design. The same will have to be screened to remove the oversize particles and washed to reduce the silt contents below 4% by volume after 24 hour and to bring it within the permissible range of fineness modulus. Blending of sand of fine and coarse quality may be permitted to achieve the required FM if it is found necessary to give desired results. The fine aggregates will be tested and retested as directed by the Engineer-in-Charge till they satisfy the required norms as per IS and as specified above.

8.5 Water :

Water used for mixing and curing of concrete shall be clean and free from injurious amount of oil, salt, acid, vegetable matter, or other substances harmful to the finished concrete. It shall meet the requirements stipulated in IS : 456-2000.

(i) The rate proposed in this tender for all concrete and allied works are inclusive of water cost. The Contractor shall have to make their own arrangements at their cost for bringing adequate water of potable quality for mixing concrete, curing purposes and for this no extra payment will be made.

(ii) The water brought for concreting and curing etc. shall be got tested from the laboratory as approved by Engineer-in-Charge to verify whether it is suitable for above purposes whenever directed. This testing will be done at Contractor’s cost.

8.6 Premoulded Joint Filler :

Premoulded joint filler for expansion joint shall be of thickness shown in the drawing with tolerance of ± 1.5 mm. It shall be 25 mm. less in depth than the thickness of the slab with tolerance of ± 3 mm. and provided to the full width between side forms. Holes to accommodate dowel bars shall be accurately bored or punched out to give a sliding fit on the dowel bars.

The joint filler shall comply with the requirements of IS:1838 Part I and II “Specifications for premoulded fillers for Expansion joint in concrete”.

8.7 Joint sealing compound :

Cold applied sealent Polysulphide base (Pouring Grade) conforming to BS-5212 Part II and
IS 11433 shall be used. If primers are recommended by the manufacturer, they shall be applied neatly with an appropriate brush.

8.8 Steel:

The steel shall conform to the requirement of IS : 432, IS : 1139 and IS : 1786 as relevant. The dowel bars shall conform to Grade S 240 and tie bars to grade S 425 of IS. If steel mesh is used, it shall conform to IS : 1566. The steel shall be coated with epoxy paint for protection against corrosion.

9. Proportion of concrete mix

9.1 Immediately upon the receipt of work order, the Contractor shall inform the Engineer-in-Charge the exact location of source of the accepted materials. After approval of all the materials to be used in Pavement Quality Concrete, the Contractor shall submit the mix design based on proportion by weight of all ingredients for the approval of Engineer-in-Charge. The mix design shall be submitted to the Engineer-in-Charge at least one month in advance of commencing the paving operation.

For design of cement concrete mixes guidance may be had from IRC-44 “Tentative guidelines for cement concrete mix design for road pavement and IS-10262 and IS-SP-23 Hand book on concrete mixes”.

9.2 The minimum cement content for Dry Lean Concrete and Pavement Quality Concrete shall be as follows:

<table>
<thead>
<tr>
<th>Type of Concrete</th>
<th>Grade</th>
<th>Minimum Cement Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Lean Concrete (DLC)</td>
<td>M-10</td>
<td>220 Kg. per Cum.</td>
</tr>
<tr>
<td>Pavement Quality Concrete (PQC)</td>
<td>M-40</td>
<td>350 Kg. per Cum.</td>
</tr>
</tbody>
</table>

If this minimum cement content is not sufficient to produce in the field, concrete of the strength specified in the design, it shall be increased as necessary without additional compensation under the Contract. The maximum cement content shall, however, not exceed the limits as specified in relevant IRC Codes.

9.3 Specification criteria for mix design.

- a) Cement content
- b) W/C ratio
- c) Cement as specified in Work Specific technical specifications.
- d) MSA
- e) Flexural strength

9.4 Concrete Strength:

9.4.1 Even though, it is the obligatory duty of the Contractor to have an up to date laboratory at site as stipulated under subsection B of section V of this volume and carryout the necessary tests as per standard forms in this laboratory, they shall submit at least, once in two weeks, additional 3 cubes of M-40 cement concrete work for testing at the approved Laboratory for 28 days strength, 3 flexural beams alongwith the corresponding 3 C.C. cubes for testing flexural as well as compressive strength. The Contractor shall arrange to send the cubes and
flexural beams to approved material testing laboratory at least seven days before the date of
testing of the cubes, failing to which penalty of Rupees 500/- per day will be imposed and
recovered from the Contractor's bill. The charges for the testing of cubes and beams shall be
borne by the Contractor.

The cubes shall also be tested for 7 days and 28 days strength at the Contractor’s laboratory in
the presence of Engineer-in-Charge or his representative. Whenever any material, cubes and
beams are required to be sent to the Regional/ District Laboratory, the same shall be
transported to the Government Laboratory by the Contractor at his own cost. However, the
Contractor shall cast cubes during concreting of each slab and test the cubes at field
laboratory in accordance with IS : 516 for 7 days and 28 day’s strength. The acceptance
criteria for test result shall be in accordance with IS–456–2000.

9.4.2 While designing the mix in the laboratory, correlation between flexural and compressive
strength of concrete shall be established on the basis of tests on samples for any adjustment in
design. However, be ensured that in such case the materials and mix proportions remain
unaltered. The water content shall be the minimum required to provide the specified
workability for full compaction of the concrete to the required density.

9.4.3 At least three cube specimens, one each for 7 days and 28 days strength testing, shall be cast
for every 50 Cum. or part thereof of concrete placed during construction. On each day's
work, not less than nine cubes shall be cast and the same shall be tested in presence of the
Engineer-in-Charge or his representative in accordance with the testing procedure.

9.4.4 The ratio between the 7 and 28 days strength shall be established for the mix to be used in the
slab in advance, by trial design mix. The average strength of the 7 days cubes shall be
divided by the average strength of the 28 days for each work and the ratio 'R' shall be
determined. The ratio 'R' shall be expressed to three decimal places.

9.4.5 If during the construction the value of 7 days test results fall below the required 7 days
strength as per the design mix then the cement content of the concrete shall , without extra
payment, be increased by 5%. The increased cement content shall be maintained at least until
the 28 days strength have been assessed for its conformity with the requirements. Whenever
the cement content is increased, the concrete mix shall be readjusted to maintain the required
workability.

9.4.6 In case the cube test for 28 days period fails, cores shall be taken from the concrete slab and
will be tested at Contractor's cost. The core will be 100 mm dia. If it fails, action as
contemplated here under clause no 9.4.12 shall be taken.

9.4.7 The density of the compacted concrete shall be such that the total air voids are not more than
3%. The air voids shall be derived from the difference between the theoretical maximum dry
density of the concrete calculated from the specific gravities of the constituents of the
concrete and mix. The average value of three direct density measurements made on cores of at
least of 150 mm diameter. If the average of any two consecutive measurements of density of
core is below the minimum required, the extent of defective concrete shall be determined by
additional cores as directed by the Engineer-in-Charge and if required the concrete shall be
removed and replaced with new materials in accordance with the specification.
9.4.8 All cores taken for density measurements shall also be checked for thickness. In case of doubt, additional cores may be ordered by the Engineer-in-Charge and taken at locations decided by him to check the depth or density of concrete slab without any compensation being paid for the same. Thickness of the slab at any point checked as mentioned above shall be within a tolerance of ±5mm of the specified thickness as per drawing. The cost of core samples to be taken and their testing shall be borne by the Contractor. The test samples shall be taken by the agencies approved by the Superintending Engineer.

9.4.9 In calculating the density, allowance shall be made for any steel in cores. Cores shall be reinstated with compacted concrete with mix proportions of 1 part of portland cement, 2 parts of fine aggregate and 2 parts of 10 mm nominal size single sized coarse aggregate by weight or as directed by the Engineer-in-Charge at the Contractor’s cost. In case the cores are taken from the road already opened to traffic, the mix/material adopted for filling shall be such as will develop the requisite strength in a minimum of time. The holes created by cores shall be so filled that these do not shrink, if necessary non-shrink grout shall be used by the Contractor at his own cost.

9.4.10 At each site of work, minimum 6 cores shall be taken for testing. Core density test shall be carried out in accordance with relevant I.S. codes. For testing of cores for strength, refer para 9.4.11 below.

9.4.11 The results of crushing strength tests on these cores shall not be less than 0.8 times the corresponding cube crushing strength requirement, where the height to diameter ratio of the core is two. Where height to diameter ratio is varied, then the necessary corrections would be made in calculating the crushing strength of cores in the following manner.

The crushing strengths of cylinders with height to diameter ratio between 1 and 2 may be corrected to correspond to the standard cylinder of height to diameter ratio of 2 by multiplying with the correction factor obtained from the following equation:

\[
f = 0.11 n + 0.78
\]

Where

\[f = \text{Correction factor and}
\]
\[n = \text{height to diameter ratio}
\]

The corrected test results shall be analysed for conformity with the specification requirements for cube samples. Where the core tests are satisfactory, they shall have precedence for assessing concrete quality over the results of moulded specimens. The diameter of cores shall not be less than 150 mm.

9.4.12 If the tests on cores of the concrete is not satisfying the strength requirements, then the payment for the slab shall be withheld for the period as decided by Engineer-in-Charge. Slab under reference shall be kept under observation during this period and if defects are noted, then further course of action as deemed fit including replacement of the slab will be taken as decided by the Superintending Engineer, whose decision will be final. In such cases, the decision of the Superintending Engineer, regarding release of payment, fully or partly, on such slabs, will be binding on the Contractor.
9.4.13 Acceptance criteria for concrete

Average 28 days flexural strength of the batch of 4 beams should not be less than the specified characteristic strength plus 0.3 mpa. Any concrete that fails to meet the strength specified shall be removed and replaced at Contractor’s expense.

9.5 Workability

9.5.1 The workability of the concrete at the point of placing shall be adequate for the concrete to be full compacted and finished without undue flow. The optimum workability for the mix to suit the paving plant being used shall be determined by the Contractor and approved by the Engineer-in-Charge.

9.5.2 The workability shall be determined by the compacting factor test or Vee-Bee test in accordance with IS 1199 at the minimum rate of one test per 50 cum of concrete or 5 times per day whichever is greater. Tests for workability shall be carried out at the point of placing in conjunction with tests for strength. The workability shall be maintained at the optimum within the range of Compacting factor as Specified in Work specific technical specifications.

9.5.3 Any alteration to the optimum workability necessitated by change in conditions shall be rejected only after the same is agreed to by the Engineer-in-Charge. If any determination of the workability gives a result outside the tolerance further test shall be made immediately on the next available load of concrete. The average of two consecutive results and the difference between them shall be calculated, if the average is not within $\pm 0.03$ C of the optimum value or the difference is greater than 0.06 for CF or other value agreed with the Engineer-in-Charge subsequent samples shall be taken from the delivery vehicle which shall not be allowed to discharge into the works until compliance with the specification has been established.

9.6 Design Mix

9.6.1 The Contractor shall carry out laboratory trials of design mixes with the materials from the approved sources to be used. Trial mixes shall be made in presence of the Engineer-in-Charge or his representative and shall be subject to the approval of the Engineer-in-Charge. They shall be repeated, if necessary until the proportions that will produce a concrete which complies in all respects with this specification, and conforms to the requirement of the design/drawings has been determined.

9.6.2 The proportions determined as a result of the laboratory trial mixes may be adjusted if necessary during start of the construction. Thereafter, neither the materials nor the mix proportions shall be varied in anyway except with the written approval of the Engineer-in-Charge.

9.6.3 Any change in the source of materials or mix proportions proposed by the Contractor during the course of work shall be assessed by making laboratory trial mixes unless approval is given by the Engineer-in-Charge for minor adjustments like compensation for moisture content in aggregates or minor fluctuations in the grading of aggregate.
10. **Separation Membrane**

A separation membrane shall be used between the concrete slab and the DLC. Separation membrane shall be impermeable plastic sheeting 125 microns thick laid flat without creases. Before placing the separation membrane, the DLC shall be swept clean of all the extraneous materials using air compressor. Where overlap of plastic sheet is necessary, the same shall be at least 300 mm and any damaged sheeting shall be replaced. The separation membrane may be stuck to the lower layer with patches of adhesives or appropriate tape or concrete nails with washer so that sheet does not move during placement of concrete.

11. **Forms**

11.1 **Steel Forms**

All side forms shall be of mild steel only. The steel forms shall be mild steel channel sections of depth equal to the thickness of the pavement or a few millimeters less than the thickness of the pavement to match with the plus level tolerances specified for sub-base. In the latter case, the forms shall be leveled by using metal wedges or shims. The thickness of flange and web shall not be less than 6 mm and shall be capable of resisting all loads applied in the paving process. The length of form shall not be less than 3m except in the case of installations along curves. The sections shall have a length of at least 3 m except on curves of less than 45 m radius, where shorter sections may be used. When set to grade and staked in place, the maximum deviation of the top surface of any section from a straight line shall not exceed 2 mm in the vertical plane and 5 mm in the horizontal plane. The method of connection between sections shall be such that the joint formed shall be free from difference in level, play of movement in any direction. The use of bent, twisted or worn-out forms will not be permitted. At least three stake pockets for bracing pins of minimum 25 mm dia or stakes shall be provided for each 3m of form and the bracing and support must be ample to prevent springing of the forms under the pressure of concrete or the weight or thrust of machinery operating on the forms.

11.2 **Setting of Forms**

The forms shall be jointed neatly and shall be set with exactness to the required grade and alignment. Both before and after the forms are placed and set, the subgrade or sub-base under the forms shall be thoroughly tamped in an approved manner. Sufficient rigidity shall be obtained to support the forms in such a position till during the entire operation of compacting and finishing of concrete they shall not at any time deviate more than 3 mm from a straight edge 3 m in length. Forms which show a Variation from the required rigidity or alignment and levels shown in the drawing, shall be reset or removed, as directed. The length and number of stakes shall be such as to maintain the forms at the Correct line and grade. All forms shall be cleaned and oiled each time before they are used. Forms shall be set ahead of the actual placing of concrete for the entire day’s work.
12. **Joints**

The location and type of joint shall be as shown in the drawing. Joint shall be constructed depending upon their functional requirement as detailed in the following paragraphs. The location of the joints should be transferred accurately at the site and mechanical saw cutting of joints done as per stipulated dimensions. It should be ensured that the full required depth of cut is made from edge to edge of the pavement. Sawing of joints shall be carried out with diamond studded blades soon after the concrete has hardened to take the load of the sawing machine and personnel without damaging the texture of the pavement. Sawing operation could start as early as 6-8 hours depending upon the season.

12.1 **Transverse joints**

Transverse joints shall be contraction and expansion joints constructed at the spacing described in the Drawings. Transverse joints shall be straight within the following tolerances along the intended line of joints which is the straight line transverse to the longitudinal axis of the carriageway at the position proposed by the Contractor and agreed to by the Engineer-in-Charge except at road junctions or roundabouts where the position shall be as described in the drawings.

12.1.1 Deviations of the filler board in the case of expansion joints from the intended line of the joint shall not be greater than ± 10 mm.

12.1.2 The best fit straight line through the joint grooves as constructed shall be not more than 25 mm from the intended line of the joint.

12.1.3 Deviations of the joint groove from the best fit straight line of the joint shall not be greater than 10 mm.

12.1.4 Transverse joints on each side of the longitudinal joint shall be in line with each other and of the same type and width. Transverse joints shall have a sealing groove which shall be sealed in compliance with Clause 602.11 of MORT and H specifications (Fourth Revision)

12.2 **Contraction joints**

Contraction joints shall consist of a mechanical sawn joint groove, 3 to 5 mm wide and 1/4 to 1/3 depth of the slab ± 5 mm or as stipulated in the drawings and dowel bars complying with Clause 602.6.5 of MORT and H specifications (Fourth Revision) and as detailed in the drawings. The contraction joints shall be cut as soon as the concrete has undergone initial hardening and is hard enough to take the load of joint sawing machine without causing damage to the slab.

12.3 **Expansion joints**

The expansion joints shall consist of a joint filler board complying with Clause 602.2.7 of MORT and H specifications (Fourth Revision) and dowel bars complying with Clause 602.6.5 MORT and H of specifications (Fourth Revision) and as detailed in the drawings. The filler board shall be positioned vertically with the prefabricated joint assemblies along the line of the joint within the tolerances given in Clause 602.6.2.1 of MORT and H specifications.
Contractor         Executive Engineer

(Fourth Revision) and at such depth below the surface as will not impede the passage of the finishing straight edges or oscillating beams of the paving machines. The adjacent slabs shall be completely separated from each other by providing joint filler board. Space around the dowel bars, between the sub-base and the filler board shall be packed with a suitable compressible material to block the flow of cement slurry.

12.4 Longitudinal joint

The longitudinal joints shall be saw cut as per details of the joints shown in the drawing. The groove may be cut after the final set of the concrete. Joints should be sawn to at least 1/3 the depth of the slab ±5 mm as indicated in the drawing.

13. Dowel bars

13.1 Dowel bars shall be mild steel rounds in accordance with MORT and H specifications (Fourth Revision) Clause 602.2.6 with details / dimensions as indicated in the drawing and free from oil, dirt, loose rust or scale. They shall be straight, free of irregularities and burring restricting slippage in the concrete. The sliding ends shall be sawn or cropped cleanly with no protrusions outside the normal diameter of the bar. The dowel bar shall be supported on cradles/dowel chairs in pre-fabricated joint assemblies positioned prior to the construction of the slabs or mechanically inserted with vibration into the plastic concrete by a method which ensures correct placement of the bars besides full recompaction of the Concrete around the dowel bars. The dowel used in contraction joint shall be provided with plastic sheath with closed end over 60 per cent of the length. The dowels also can be coated with polyethylene. The thickness of sheath or polyethylene coating shall not exceed 0.50 mm.

13.2 Unless shown otherwise on the drawing dowel bars shall be portioned at mid depth of the slab within a tolerance of ± 20 mm and centered equally about intended lines of the joint within a tolerance of ± 25mm. They shall be aligned parallel to the finished surface of the slab and to the centre line of the carriageway and to each other within tolerance as given hereunder.

13.2.1 For bars supported on cradles prior to the laying of the slab:
   a) All bars in a joint shall be within ± 3 mm per 300 mm length of bar.
   b) 2/3rd of the bars shall be within ± 2 mm per 300 mm length of bar
   c) No bar shall differ in alignment from an adjoining bar by more than 3 mm per 300 mm length of bar in either the horizontal or vertical plane.
   d) Cradles supporting dowel bar shall not extend across the line of joint i.e. no steel bar of the cradle assembly shall be continuous across the joint.

13.2.2 For all bars inserted after laying of the slab.
   a) Twice the tolerance for alignment as indicated in (a) above. Dowel bars supported on cradles in assemblies, when subject to a load of 110 N applied at either end and in either the vertical or horizontal direction (upwards and downwards and both directions horizontally) shall conform to be within the following limits.
i) Two thirds of the number of bars of any assembly tested shall not deflect more than 2 mm per 300 mm length of bar.

ii) The remainder of the bars in that assembly shall not deflect more than 3 mm per 300 mm length of bar.

Dowel bars shall be covered by a thin plastic sheath for at least 60 per cent of the length from one end, for dowel bars in contraction joints or half the length plus 50 mm for expansion joints. The sheath shall be tough, durable and of an average thickness not greater than 0.5 mm and shall have closed end. The sheathed bar shall comply with the following pull out test.

13.4 Four bars shall be taken at random from stock and without any special preparation shall be covered by sheaths as required in above Clause. The ends of the dowel bars which have been sheathed shall be cast centrally into concrete specimens 150x150x600 mm made of the same mix proportions to be used in the pavement, but with a maximum nominal aggregate size of 20 mm and cured in accordance with IS 516. At 7 days a tensile load shall be applied to achieve a movement of the bar of at least 0.25 mm. The average bond stress to achieve this movement shall not be greater than 0.14 MPa.

13.5 For expansion joints, a closely fitting cap 100 mm long with closed end consisting of GI pipe 3 mm thickness with closed ends shall be placed over the sheathed end of each dowel bar. An expansion space at least equal in length to the thickness of the joint filler boards shall be formed between the end of the cap and the end of the dowel bar by using compressible sponge to block the entry of cement slurry between dowel and cap. It may be taped all round.

14. **Tie bars**

14.1 The bars in longitudinal joints shall be plain mild steel bars conforming to IS: 432 or deformed steel bars complying with IS: 1786 and in accordance with the requirements given below. The bars shall be free from oil, dirt, loose rust and scale.

Tie bars projecting across the longitudinal joint shall be protected from corrosion for 75 mm on each side of the joint by a protective coating of bituminous paint with the approval of the Engineer-in-Charge. The coating shall be dry when the tie bars are used.

14.2 Tie bars in longitudinal joints shall be made up into rigid assemblies with adequate supports and fixings to remain firmly in position during the construction of the slab. Alternatively, tie bars at longitudinal joints may be mechanically or manually inserted into the plastic concrete from above by vibration using a method which ensures correct placement of the bars and recompaction of the concrete around the tie bars. Tie bars are also inserted mechanically or manually from sides. During side insertion in fixed form paving they may be bent so that half length remains along the form. After removal of forms, bars shall be straightened so that they extend into the concrete placed on the other side of the concrete.

14.3 Tie bars shall be positioned to remain within the middle third of the slab depth as indicated in the drawings and approximately parallel to the surface and approximately perpendicular to
the line of the joint, with the centre of each bar on the intended line of the joints within a tolerance of ± 50 mm, and with a minimum cover of 30 mm below the joint groove.

15. **Weather and seasonal limitations**

15.1 **Concreting during Monsoon Months**

When concrete is being placed during monsoon months and when it may be expected to rain, sufficient supply of tarpaulin or other waterproof cloth shall be provided along the line of work in addition to the portable tents. Any time when it rains, all freshly laid concrete which had not been covered for curing purposes shall be adequately protected by means of tarpaulins or other waterproof cloth. Any damage caused to the surface or texture shall be corrected as decided by the Engineer.

15.2 **Concreting in Hot Weather:**

As placing of concrete in air temperatures above 35°C, is associated with defects, like loss of workability through accelerated setting, formation of plastic shrinkage cracks, etc. it is recommended that unless adequate precautions are taken no concreting shall be done in conditions more severe than the above. The procedures recommended for adoption in case of hot weather concreting are given in IRC:61" Tentative Guidelines for the Construction of Cement Concrete Pavements in Hot Weather."

15.3 The execution of work shall only be allowed for ambient temperature not exceeding 35°C. The time for execution of C.C. pavement i.e. the laying of DLC and PQC shall be 6 P.M. to 2 AM next day. The Contractor will have to ensure, adequate lighting arrangement during the night working.

16. **Joint construction**

The placement of concrete at construction joint is particularly critical Therefore, care must be taken to ensure that only quality concrete is used in their construction. The concrete used to construct these joints should be the same as for the remainder of the slab. The practice of modifying the mix at the joints is not recommended. It should be kept in mind that load transfer across a doweled joint is greatly affected by the quality of concrete and compaction around the dowels. The placement of Dowels should be carefully verified soon after paving begins.

16.1 **Sawing**

16.1.1 It is recommended that all joints be sawed. The sawing of transverse contraction and longitudinal joints should be a two phase operation. The initial sawing is intended to cause the pavement to crack at the intended joint. It should be made to required depth as directed. The second sawing provides the necessary shape factor for the Sealant material.

16.1.2 When a lengthy period is anticipated between the initial sawing of the joint and the final sawing and sealing, consideration should be given to filling the joint with a temporary filler. This filler material should keep any loose material out of the joint and reduce the potential for spalling.
16.2 Cleaning joints

Air compressors used for cleaning joints shall be equipped with suitable traps capable of removing all surplus water and oil in the compressed air. Immediately after sawing the joint, the resulting slurry shall be completely removed from the joint and immediate area by flushing with a jet of water under pressure.

16.3 Installing Backup material

A resilient rod type backup material will be installed in a manner that will produce the shape factor specified. If the sealant bonds to the backup material, a bond breaking tape is essential.

17. Surface Texture

After the final regulation of the slab and before the application of the curing membrane, the surface of Concrete slab shall be brush textured in a direction at right angles to the longitudinal axis of the carriageway. For details reference shall be made to clause No. 9.9.4 of IRC-15-2002.

18. Surface Tolerances

The levels of the subgrade and different pavement courses as constructed, shall not vary from those calculated with reference to the longitudinal and cross profile of the road shown on the drawings or as directed by the Engineer-in-Charge beyond the tolerances mentioned below.

18.1 Tolerances in surface levels.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>+ 20 mm</th>
<th>-- 25 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Subgrade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Granular Sub-base/WBM Layer</td>
<td>+ 10 mm</td>
<td>-- 20 mm</td>
</tr>
<tr>
<td>3</td>
<td>Dry lean concrete or rolled concrete</td>
<td>+ 10 mm</td>
<td>-- 10 mm</td>
</tr>
<tr>
<td>4</td>
<td>Cement concrete pavement.*</td>
<td>+ 5 mm</td>
<td>-- 6 mm</td>
</tr>
</tbody>
</table>

* This may not exceed -8 mm at 0-30 cm from the edges.

Provided, however that the negative tolerance for wearing course shall not be permitted in conjunction with the positive tolerance for base/sub course.

18.2 For checking compliance with the above requirement for subgrade, sub base courses, measurements, of the surface levels shall be taken on a grid of point placed at 6.25 m longitudinally and 3.5 m transversely or any other grid approved by the Engineer-in-Charge. For any 10 consecutive measurements taken longitudinally or transversely, not more than one measurement shall be permitted to exceed the tolerance as above. This one measurement being not in excess of 5 mm greater than the permitted tolerance.
18.3 For checking compliance with the above requirement for concrete pavements measurements of the surface levels shall be taken on a grid of 6.25 m x 3.5 m or 3.75m or any other grid directed by the Engineer-in-Charge. In any length of pavement, compliance shall be deemed to be met for the final road surface, only if the tolerance given above is satisfied for any point on the surface.

18.4 Surface regularity of pavement courses.

The longitudinal profile shall be checked with a 3 metre long straight edge/moving straight-edge as desired by the Engineer-in-Charge at the middle of each traffic lane along a line parallel to the centre line of the road.

The maximum permitted number of surface irregularities shall be as per Table below.

<table>
<thead>
<tr>
<th>Irregularity</th>
<th>Surface of Carriageways and paved shoulders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 mm</td>
</tr>
<tr>
<td>Length (m)</td>
<td>300</td>
</tr>
<tr>
<td>National Highways/ Expressways</td>
<td>20</td>
</tr>
<tr>
<td>Roads of lower category</td>
<td>40</td>
</tr>
</tbody>
</table>

Note: Category of each section of road as described in the Contract.

18.5 The maximum allowable difference between the road surface and underside of a 3 m straight-edge when placed parallel with, or at angles to the centre line of the road at points decided by the Engineer-in-Charge shall be:

- For pavement surface: 4 mm
- For granular sub-base/base courses and sub-bases under concrete pavements: 10 mm

18.6 Horizontal alignment

The horizontal alignment shall be checked with respect to the centre line of the carriageway as shown in the drawings. The edges of the carriageway as constructed shall be corrected within a tolerance of ±10 mm therefrom.

18.7 Acceptance criteria for cracked concrete slabs:

Concrete slabs may develop cracks of minor to serious nature unless appropriate precautions are taken to prevent their occurrence either during the construction phase or post-construction period. Cracks can appear generally due to the following reasons.

18.7.1 Plastic shrinkage of concrete surface due to rapid loss of moisture
18.7.2 Drying shrinkage
18.7.3 High wind velocity associated with low humidity
18.7.4 High ambient temperature.
18.7.5 Delayed sawing of joints
18.7.6 Rough and uneven surface of the base on which concrete slabs are constructed.
18.7.7 Combination of the above factors.

The slabs with full depth cracks are totally unacceptable as it amounts to structural failure. Besides, other cracks which are deep and are likely to progress in depth with time are also to be considered as serious in nature. Fine crazy cracks, however, are not serious. An acceptance criteria for cracked concrete slabs are

18.8 The concrete slabs can be accepted in the following situations:

18.8.1 Plastic shrinkage cracks - The discrete crack which is less than 500 mm length and with its depth of penetration less than half the thickness of the slab and which does not intersect with a longitudinal edge or formed joint. The cumulative length of such cracks in each slab shall not be more than 1.0 m length. Cores can be cut to ascertain the depth of cracks where doubt arises.

18.8.2 Fine hairline crazy cracks

The concrete slabs are to be rejected where the cracks formed are not complying with the above stipulation. Therefore, the slabs which are to be rejected are:

i) Slabs with cracks running transversely or longitudinally penetrating to full depth and length of the slab.

ii) Slabs with cracks which are penetrating to more than half the depth.

iii) Discrete crack which is more than 500 mm length although its depth of penetration is less than half of the depth.

iv) When the total length of all discrete crack is more than 1.0 m whose depth of penetration is less than half the depth.

19. Clean Up

The pavement surface shall be swept and/or washed down to remove all dirt, debris or foreign material prior to opening to traffic.

20. Opening to traffic

The Contractor shall not permit traffic on the pavement until the concrete has attained a desired compressive strength.

21. Other Equipment

Other tools and plants required to carry out pavement concrete work are as below.

21.1 All equipment necessary for the proper preparation of the subgrade, sub base and batching, mixing, placing, finishing and curing of the concrete pavement shall be on the project in good working conditions and shall have been inspected by the Engineer-in-Charge before the
paving operations are permitted to start. Throughout the construction of the project, the construction agency shall maintain adequate equipment in first class working condition to ensure proper execution of the work.

21.2 Batching Devices

All batching of materials should be by weight. Weighing equipment shall be of such design and construction that the materials for each batch can be quickly and accurately weighed. A weighing accuracy of a 1 percent may be considered satisfactory. The equipment shall conform to the requirement laid down in IS 2722-1964 ‘Specifications for portable swing weight Batchers for concrete (Single and Double bucket type)’. It shall be so constructed that the operator can readily shovel out the excess material in over charged hoppers and the material released all at one time when the hoppers are discharged.

21.3 Mixer

Concrete mixer of adequate capacity shall be provided and it shall be of the non tilting type, conforming to the requirements of IS 1791 "Specification for Concrete Mixer (First Revision)" and shall have a rated capacity of not less than 2 cement bags of mixed concrete. The mixer shall be equipped with an approved water measuring device capable of accurate measurement of water required per batch, the mixer shall preferably be equipped with a mechanically operated pump for filling the mixer tank.

The mixer if specially specified, shall be equipped with an approved timing device which will automatically lock the discharge level during the full time to mixing and release it at the end of mixing period, the device shall also be equipped with a bell or adjusted to ring each time the lock is released. If the timing device gets broken or out of order, the mixer will be permitted to be used while the same is being repaired, provided an approved time-piece equipped with minute and second hand, is provided and that each batch is mixed for one and half minutes.

21.4 Water supply Equipment

The water supply equipment shall be of such capacity and nature as to ensure at all time ample supply and adequate pressure for all the requirement of sprinkling subgrade, make sub base, mixing and curing of concrete etc. and all other requirement of the work.

21.5 Sub Grade Template or Strike Board

The subgrade template or strike board shall be of a rigid construction approximately 100 mm wide and shall weigh at least 45 kg.

21.6 Hand Tamper

The tamper shall be shaped to the cross profile of the slab and shall weigh not less than 10 kg/m. It shall be constructed of 75 mm thick timber or of steel channel cross-section, two feet longer than the proposed width pavement slab and sufficiently strong and rigid to retain its shape under all working conditions. If it is of timber it shall be fitted with steel plate at
bottom. The tamper shall be provided with handles which are resilient and sufficiently long to enable tamping operation to be performed by men in standing position.

21.7 Screed Board Concrete Vibrator

Screed board vibrator used for compaction and finishing of concrete shall comprise of a wooden or mild steel screed with suitable handles. The screed shall be driven by vibrating device mounted thereon either electrically or by compressed air or by Petrol engine and propelled or made to travel on sideforms, shall conform to IS: 2506 ‘Specification for Screed Board Concrete Vibrators’.

21.8 Immersion Vibrator

Immersion vibrator shall comprise of a vibrating head with suitable motive power either of compressed air, electrical or of a Petrol driven engine, rigid enough to ensure proper control, and manipulation in the mass of concrete. It shall conform to IS: 2505 ‘Specification for concrete vibrators, immersed type (First Revision)’. They shall be employed to ensure compaction of concrete along the forms and to avoid any tendency in honey combing at the edges of the slab. In case of road slab exceeding 125 mm thickness, they shall be used at suitable spacing for compacting the concrete over the entire width of the slabs in addition to screed board vibrator.

21.9 Longitudinal Float

The longitudinal float shall not be less than 3.75m in length, 150 mm wide and shall be properly stiffened to prevent flexing and warping.

21.10 Bridges

The bridges shall be so designed that when placed straddling the forms, no parts shall come in contact with the pavement. They shall be sufficiently rigid.

21.11 Long Handled wooden float

The blade of the float shall be at least 1500 mm long and 150 mm wide. Minimum of two floats shall be provided.

21.12 Belts

The belts of canvas shall not be less than 150 mm wide and shall be at least 600 mm longer than width of the slab. A minimum of two belts shall be provided.

21.13 Push Brooms

The push brooms shall not be less than 450 mm width and be made from good quality base fibre. The handle shall be least 300 mm longer than half the width of the slab. Minimum of four push brooms shall be provided.

21.14 Straight edge

The straight edge shall remain true and rigid under working conditions and shall be swing from suitable handles. The size shall be 3.0 m
21.15 Edging tool
The edging tool shall have a radius of 6 mm. The vertical limb shall extend to the required depth. A minimum two edging tools shall be provided.

21.16 Master straight edge
The master straight edge shall be of known accuracy so that it may be used for checking other straight edges. It shall be made of steel or other suitable materials of sufficient length, and of sufficient rigidity to maintain its accuracy.

21.17 Other small tools
Other small tools and equipment such as spades, shovel, iron pans, water pots, rods etc. necessary to complete the work in accordance with the intent and meaning of above Specification shall also be provided.

22. Maintenance
The defect liability for period for Cement Concrete pavement shall be as per Contract Data Volume II. If during this period concrete road fails due to (a) Development of cracks (2) Spalling of edges (3) Erosion of concrete surface etc. the action as decided by the Engineer-in-Charge shall be taken against the Contractor. In case of development of structural cracks, full depth cracks, the panel between two contraction joint shall be replaced. In the case of replaced slab, a defect liability period shall be enforced from the date of completion of such works. The decision of the Engineer-in-Charge will be final and binding to the Contractor. The rectification of defects shall be carried out as directed by the Engineer-in-Charge. During this period dressing of joints complete in all respect shall have to be done free of cost at least once in a year, preferably in the month of April or May or as directed by the Engineer-in-Charge.

E. Specifications for Flexible Pavement
For sub-grade, sub-bases, bases (Non Bituminous and Bituminous) and shoulders the specifications as laid down in MORT & H. specifications IV Revision shall prevail.

F. Specifications for Road Markings
The road markings shall be of ordinary road marking paint, hot applied thermoplastic compound or reflectorised paint and the material shall meet the requirements as specified in pursuant to Clause 803 of MORT & H specification (Fourth Revision). The marking will have to be done as per latest guidelines.
A. GENERAL

1. General

1.1 Considering the stakes and technical intricacies involved in constructions, it is needless to emphasize that an unfailing control on quality of the work has to be exercised so as to ensure that the structures constructed are stable and sound. Quality of final products depends upon adopting the proper procedure of construction in addition to proper selection of materials. For ensuring the requisites of construction, the materials and work shall be subject to Quality Control tests for ascertaining the quality of material for its approval for construction.

1.2 All materials to be used, all methods adopted and all works performed shall be strictly in accordance with the requirements of these Specifications. The Contractor shall set up a field laboratory at locations approved by the Engineer-in-Charge and equip the same with adequate equipments and personnel in order to carry out all required tests and Quality Control work as per Specifications and/or as directed by the Engineer-in-Charge. The internal layout of the laboratory shall be as per Clause 4 (a) and/or as directed by the Engineer-in-Charge. The list of equipments and the facilities to be provided shall be got approved from the Engineer-in-Charge in advance and shall be as per clause 5 of this section.

1.3 The Contractor shall carry out quality control tests on the materials and work to the frequency stipulated in clause 6 of this section. In the absence of clear indications about method and or frequency of tests for any item, the instructions of the Engineer-in-Charge shall be followed.

1.4 For satisfying himself about the quality of the materials and work, quality control tests will also be conducted by the Engineer-in-Charge (by himself, by his Quality Control units or by any other agency as deemed fit by the Engineer-in-Charge) generally to the frequency set forth in clause 6 of this section. Additional tests may also be conducted where, in the opinion of the Engineer-in-Charge, needs for such tests exist.

1.5 The Contractor shall provide necessary co-operation and assistance in obtaining the samples for tests and carrying out the field tests as required by the Engineer-in-Charge from time to time. This shall include provision of labour, attendants, assistance in packing and dispatching and any other assistance considered necessary in connection with the tests by the Engineer-in-Charge.

1.6 The Contractor shall carry out modifications in the procedure of work, if found necessary, as directed by the Engineer-in-Charge during inspection. Works failing short of quality shall either be rectified or redone by the Contractor at his own cost, and the Contractor at his own cost, shall also remove defective work or material from the site of works.

1.7 The cost of laboratory building including services, essential supplies like water, electricity, sanitary services and their maintenance and cost of all equipment, tools, materials, labour and incidentals to perform tests and other operations of quality control according to the Specification requirements shall be deemed to be incidental to the work and no extra payment shall be made for the same.
1.8 For testing of samples of soils/soil mixes, granular materials, and mixes, bituminous materials and mixes, cement and concrete cubes, aggregates, cores etc., samples in the required quantity and form shall be supplied to the Government laboratory or any other laboratory as directed by the Engineer-in-Charge by the Contractor at his own cost.

1.9 For cement, bitumen, mild steel, and similar other materials where essential tests are to be carried out at the manufacturer's plants or at laboratories other than the site laboratory, the cost of samples, sampling, testing and furnishing of test certificates shall be borne by the Contractor. He shall also furnish the test certificates to the Engineer-in-Charge in a reasonable time as directed by the Engineer-in-Charge.

1.10 For testing of cement concrete at site during construction, arrangements for supply of samples, sampling, testing and supply of test results shall be made by the Contractor as per the frequency and number of tests specified in the Handbook of Quality Control for Construction of Roads and Runways (IRC:SP:11) and relevant IS Codes or relevant clauses of these Specifications, the cost of which shall be borne by the Contractor.

1.11 Defective Materials:

All materials which the Engineer-in-Charge /his representative has determined as not conforming to the requirements of the Contract shall be rejected whether in place or not, they shall be removed immediately from the site as directed. Materials, which have been subsequently corrected, shall not be used in the work unless approval is accorded in writing by the Engineer-in-Charge. Upon failure of the Contractor to comply with any order of the Engineer/his representative, given under this Clause, the Engineer-in-Charge /his representative shall have authority to cause the removal of rejected material and to deduct the removal cost thereof from any payments due to the Contractor.

1.12 For ensuring the requisite quality of construction, the materials and works shall be subjected to quality control tests, as described in MORT&H Specifications (Fourth Revision) Clause No. 903 and or as mentioned in this Contract document. The testing frequencies set forth in clause 6 of this section are the desirable minimum and the Engineer-in-Charge shall have the full authority to carry out additional tests as frequently as he may deem necessary, to satisfy himself that the materials and works comply with the appropriate Specifications.

1.13 Test procedures for the various quality control tests are indicated in the respective I.S. Sections. Where no specific testing procedure is mentioned, the tests shall be carried out as per the prevalent accepted engineering practice to the directions of the Engineer-in-Charge.

2. Samples & Method of Sampling

2.1 All materials to be used on work such as cement, aggregates, steel, bitumen, wood, tiles etc. shall be got approved in advance from the Engineer-in-Charge and shall pass the tests and analysis required by him.
2.2 The tests shall be
(a) as per specifications of the items concerned and or
(b) as specified by the Indian Road Congress standard specification and code of practice for road and bridges or
(c) I.S. specification whichever and wherever applicable
(d) as per specification of Ministry of Road Transport and Highways latest edition section 900 Quality Control for road work or
(e) such recognized specification acceptable to the Engineer-in-Charge as equivalent thereto or in the absence of such authorised specification
(f) such requirement/tests and or analysis in the order of precedence given above.

2.3 The Contractor shall at his cost make all arrangements and/or shall provide for all such facilities as the Engineer-in-Charge may require for collecting, preparing and forwarding required number of samples for testing or for analysis of the materials or product for which laboratory testing is required to the nearest approved Government laboratory or any other laboratory as directed by Engineer-in-Charge. The Contractor shall bear all charges and cost of tests or analysis of such samples, shall also be deposited with the laboratories as per their prevailing schedule of rates.

2.4 The Contractor shall, if and when required, submit at his cost the samples of materials to be tested or analysed and if so directed, shall not make use or incorporate in the works any materials to be represented by the sample until the required test or analysis have been made and after the test results of the material finally accepted by the Engineer-in-Charge.

2.5 The method of sampling and testing of materials shall be as required by the "Handbook of Quality Control for Construction of Roads and Runways" (IRC:SP:11), relevant I.S. codes and the relevant MORT&H Specifications. Where they are contradicting, the provision in these Specifications shall be followed. Where they are silent, sound engineering practices shall be adopted. The sampling and testing procedure to be used shall be as approved by the Engineer-in-Charge and his decision shall be final and binding on the Contractor.

3. Testing of Materials

3.1 The Contractor shall make field arrangements for testing of all materials as per MORT &H Specifications or as directed by Engineer-in-Charge in the field laboratory.

3.2 The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of material.

3.3 The quality control tests shall be carried out at various stages of work viz. selection of material to be procured for work, acceptance of procured material before its use on the work, control over procedures and methods to be followed for execution of the work, after completion of work in view of its strength, durability, serviceability etc, and as directed by Engineer-in-Charge for any other reasons of public interest.

3.4 The Contractor shall carry out at least 30% testing from the Regional/ District Laboratory of the department. The necessary testing charges for these 30% tests shall be borne by the Contractor and shall carry out remaining 70% tests at his own cost in the laboratory established by him for the work as mentioned in clause 4 of this section. This is subject to
the condition that the field laboratory established by the Contractor at site or plant is certified to have set up as mentioned in the clauses hereunder by the Engineer-in-Charge. The testing charges shall be as per the prevailing schedule of rates of Vigilance & Quality Control Circle.

B. Laboratory setup

4. Field Laboratory

a) The Contractor for the purpose of testing of material shall arrange to provide and maintain fully furnished and adequately equipped field laboratory of adequate floor area, as shown in drawing. The field laboratory shall preferably be located adjacent to the site office of bridge works. In case of road works the field laboratory shall either be established at plant site or as directed by the Engineer-in-Charge. The field laboratory shall be provided with amenities like water, electric supply etc. to be arranged by Contractor.

b) The floor space requirement shall include office space for Engineer & Contractor’s representative, storage of samples, installation of equipment, laboratory table, cup boards, working platform of size 1 m x 10 m, working space for carrying out various tests, curing tank, wash basin, toilet etc. and the minimum furniture such as office tables & chairs for material engineers, stools, working tables, store accessories.

c) The cost of Construction of laboratory & site office at work site or plant site as the case may be, and cost of supply of furniture, electrical equipments fittings during the currency of Contract is incidental to work and no separate payment will be made for the same to the Contractor.

d) If the Contractor fails to establish the laboratory and site office within the stipulated period an amount as mentioned in Contract Data Volume II will be recovered from forthcoming bill payable to the Contractor.

e) The Contractor shall make available the land for Construction of Laboratory and Site office.

f) The Laboratory and Site office constructed on Contractor's land including all laboratory equipments and furniture will be the absolute property of Contractor on completion of work.

g) In case the Laboratory and site office constructed on Government land as a special case if desired by the department, it will be the absolute property of Government alongwith all laboratory equipments. For such options details as mentioned in Contract Data Volume II shall be referred.

h) The laboratory established by the Contractor shall be manned by a qualified materials Engineer/Civil Engineer assisted by experienced technicians, and the set-up shall be got approved from the Engineer-in-Charge.

i) The Contractor should prepare printed proforma for recording readings and results of each type of tests. Such formats shall be got approved from the Engineer-in-Charge. The Contractor should keep a daily record of all the tests carried out by him. Two copies of the test results should be submitted to Engineer-in-Charge within 7 days from the date of testing for examination and approval. One copy of test results will be returned to the
Contractor by the Engineer-in-Charge for keeping the record of test results in acceptable manner at site of work.

j) All Quality Control registers/records shall be maintained by the Contractor and checked by the Engineer-in-Charge or his representatives regularly. The list of register required to be maintained shall be as per the list below.

1) Gradation of B.M.
2) Gradation of carpet
3) Tack coat register
4) Laying Charts.
5) Thickness register
6) Tray test register
7) Density register at site
8) Temperature register at site
9) Crust register
10) Load register at site
11) Load register at plant
12) Register containing Impact Test flakiness & Elongation Index, abrasion value & Water absorption.
13) Trial gradation register
14) Asphalt register at plant (60/70, CRMB)
15) Marshall stability test register
16) Penetration test & elastic recovery test for CRMB register.
17) Specific gravity of Asphalt register
18) Filler/ cement register
19) Temp. at plant register
20) Visitor register
21) Event Register
22) File of printout of each load.
23) File of weigh bridge printout of each load
24) Monthly report of work as per milestone
25) Calibration certificate of control panel, plants & equipments
26) Video shooting/photographs of different operation
27) Register of registers

5. Set up of equipments

5.1 The Contractor shall have at least following equipments calibrated to the latest date in the laboratory so established. The Contractor will have to carry out the calibration of the equipments from the approved agency as and when directed by the Engineer-in-Charge at his own cost in cases where the calibration validity stands expired.

a) GENERAL

i) Oven - Electrically operated, thermostatically controlled, range upto 200°C, sensitivity 10°C.
   - 1 No.
ii) Balance - 20 Kg. Capacity (self indicating)
   - 1 No.
iii) Electronic balance - 5 Kg. Capacity, accuracy 0.5 gm.
   - 2 No.
iv) Water bath - Electrically operated & thermostatically controlled, with adjustable shelves, sensitivity 1°C
   - 1 No.
v) Thermometers : 1) Mercury in glass 0° to 250°  - 2 Nos.
2) Mercury in steel with 30 cm. stem up to 300°C  - 4 Nos.
vi) Kerosene or Gas stove / electric hot plate.  - 1 No.
vii) Set of IS sieves 45 cm. dia G.I. frame, 125 mm, 100 mm, 90 mm, 80 mm, 63 mm, 53 mm, 50 mm, 45 mm, 40 mm, 37.5 mm, 26.5 mm, 25 mm, 22.4 mm, 20 mm, 19 mm, 13.2 mm, 11.2 mm, 9.50 mm, 7.6 mm, 6.3 mm, 5.6 mm, 4.75 mm, 4.25 mm, 6.3 mm, 6 mm with lid and pan (coarse sieve)
   viii) Set of IS Fine sieves with 20 cm. dia brass frame, 2.8 mm, 2.36 mm, 1.18 mm, 0.60 mm, 0.30 mm, 0.15 mm, 0.075 mm, 425 micron, 300 micron, 180 micron, 150 micron, 90 micron, 75 micron with lid and pan. (fine sieve)
ix) Glass wares, spatulas, wire gauges, steel scales, measuring tape, enameled tray, porcelain dish, plastic bags, gunny bags, digging tongs etc.
   x) First aid kit  - 1 No.

b) AGGREGATE & SOIL TESTING
   i) Atterberg limits (liquid & plastic limit) determination apparatus  - 1 Set
   ii) Compaction test equipment (Proctor) both 2.5 kg. & 4.5 kg. rammer (light and heavy compactive efforts) with collar, a base plate and hammer (as per I.S. 2720, part 8).  - 1 Set
   iii) Dry bulk density test apparatus (sand pouring cylinder, tray, can etc.) complete.
   iv) Speedy moisture meter complete with chemicals  - 1 Set.
   v) Core cutter apparatus 10 cm. dia. 10/15 cm. height complete with dolly rammer etc.  - 1 Set.
   vi) Aggregate impact value test apparatus  - 1 Set.
   vii) Flakiness and elongation test gauge.  - 1 Set.
   viii) Standard measures of 5, 3 and 1 litre.  - 1 Set.
c) BITUMEN TESTING
   i) Penetrometer with standard needles - 1 No.
   ii) Centrifuge type bitumen extractor hand operated complete with commercial benzene.
   iii) Marshall stability test apparatus complete with all accessories.
   iv) Field density apparatus with cutting tray, chisel, hammer and standard sand.
   v) 3 meter straight edge and camber plate adjustable type.
   vi) Softening point test apparatus - 2 Set.
   vii) Measuring cylinders 500 ml, 250ml and 100 ml. - 1 No. each

d) CEMENT AND CONCRETE TESTING
   i) Vicat apparatus for testing setting time. - 1 Set.
   ii) Slump testing apparatus. - 2 Set.
   iii) Compression and flexural strength testing machine of 200 tone capacity with additional dia.
        For flexural testing.
   iv) Moulds a) 150 x 150 x 150 mm cubical for compressive strength
       b) 150 x150 x 700 mm Beam for flexural strength
   v) Compaction factor test equipment - 1 Set
   vi) Needle vibrator - 1 Set

e) CONTROL OF PROFILE AND SURFACE EVENNESS
   i) Digital level complete with all accessories - 1 No.
   ii) Auto level - 1 No.
   iii) Aluminum staff - 1 No.
   iv) Thickness measuring gauge - 6 No.
C. Frequency of Test

6. Frequency of test

6.1 Overall quality of the work depends on the quality of ingredient materials being used in the work and exercising adequate control over it. It is therefore prime responsibility of the Contractor to get the ingredient material and product tested strictly as per the frequencies stipulated hereunder.

6.2 The testing frequency specified hereunder are minimum and Engineer-in-Charge shall have full rights to carry out additional tests as may be necessary to satisfy himself that the material and works comply with the requirement of the specifications.

6.3 The frequency of the testing shall be conforming to the MORT &H specification under Chapter 900.

6.4 The Contractor shall carry out the quality control tests on material and works to the frequency stipulated in the test plan also.

6.5 The right of acceptance/rejection of the material/work done is reserved by Engineer-in-Charge, in view of non-conformation to frequency of testing.

6.6 The cost involved on account of testing of materials as per the frequency specified in table below, is included in the respective tender items. The cost of testing Charges as per prevailing schedule of rates of VQCC laboratory shall be borne by the Contractor.

6.7 If the Contractor fails to carry out testing as per the specified frequency, the cost of testing Charges at penal rate equal to ten times the prevailing schedule of rates of VQCC laboratory will be recovered from him to the extent of shortfall. The recovery on account of shortfall in testing with reference to specified frequency will be done from his immediate bills due for payment and will be credited to Government account.

6.8 Various tests (and their frequencies) to be conducted to assure quality control on the work are as follows.
i) Granular Sub Base (G.S.B.) & Water Bound Macadam (W.B.M.)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of construction</th>
<th>Test</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Granular</td>
<td>1) Gradation</td>
<td>1 test / 200 Cum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Atterberg limit</td>
<td>1 test / 200 Cum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) Moisture content prior to compaction</td>
<td>1 test / 250 Cum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) Density of compacted layer</td>
<td>As required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5) Deleterious constituents</td>
<td>As required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6) C.B.R.</td>
<td>As required.</td>
</tr>
<tr>
<td>2.</td>
<td>WBM / WMM</td>
<td>1) Aggregate impact value</td>
<td>1 test / 200 Cum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Grading</td>
<td>1 test / 100 Cum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) Flakiness index &amp; elongation index</td>
<td>1 test / 200 Cum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) Atterberg limit of binding material</td>
<td>1 test / 25 Cum of binding material.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5) Atterbergs limit of portion of aggregate passing 425 micron sieve.</td>
<td>1 test / 100 Cum of aggregate.</td>
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<td></td>
<td>6) Density (in case of WMM)</td>
<td>1 test / 500 Cum of aggregate.</td>
</tr>
</tbody>
</table>

ii) Bituminous Construction

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of construction</th>
<th>Test</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bitumen.</td>
<td>1) Quality of binder</td>
<td>2 tests per lot</td>
</tr>
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<td></td>
<td></td>
<td>2) Bitumen temp.</td>
<td>(As per IS 73)</td>
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<td></td>
<td>3) Rate of spread of binder for prime coat, tack coat etc.</td>
<td>At regular interval.</td>
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<td></td>
<td>4) Rate of spread of mix material.</td>
<td>One test per 500 m²,</td>
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<td></td>
<td>5) Binder content (Extraction)</td>
<td>Not less than 2 tests per day.</td>
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<tr>
<td></td>
<td></td>
<td>a) OGPC / MSS</td>
<td>BM, DBM, SDBC, BC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) B.M.</td>
<td>Regular control through checks on layer thickness &amp; wt. of mix material.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) DBM/SDBC/BC/Mastic Asphalt</td>
<td>One test/500 Cum &amp; not less than 2 tests per day.</td>
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<td></td>
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<td></td>
<td>Periodic, subjected to min. 2 tests per plant per day.</td>
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<td></td>
<td></td>
<td></td>
<td>One test for each 400 MT of mix subjected to min. 2 tests per plant per day.</td>
</tr>
<tr>
<td>2. Aggregate</td>
<td>i) Aggregate impact value/ Los Angeles Abrasion value.</td>
<td>1 test / 50 Cum of aggregate for BUSG - 1 test Per 200 Cum of aggregate.</td>
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<td>--------------</td>
<td>------------------------------------------------------</td>
<td>---------------------------------</td>
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</tr>
<tr>
<td></td>
<td>ii) Flakiness index &amp; elongation index.</td>
<td>a) For seal coat surface dressing OGPC/MSS - 1 test per 25 Cum of aggregate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) Gradation.</td>
<td>b) For BUSG 1 test/100 Cum of aggregate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iv) Stripping value &amp; water absorption of aggregate</td>
<td>c) For DBM/SDBC/BC one set of test on individual constituents &amp; mixed aggregate from the drier for each 400 MT of mix subjected to 2 test / plant / day.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>v) Water sensitivity.</td>
<td>d) BM/Mastic asphalt two test per day both on individual constituents and mixed aggregate from the drier.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vi) Soundness (Magnesium &amp; Sodium Sulphate)</td>
<td>Initially one set of 3 representative specimens for each source of supply. Subsequently when warranted by change in the quality of aggregate.</td>
<td></td>
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<tr>
<td></td>
<td>vii) Polish stone value</td>
<td>- do - (if required).</td>
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<td></td>
<td></td>
<td>As required.</td>
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</tbody>
</table>

|                 |                                                       | For each 400 T of mix produced, a set of 3 Marshall specimens be prepared & tested for stability, subjected to min. 2 set/ plant/ day. |
|                 | ii) Stability of mix (Marshal stability)              | As required. |
|                 |                                                       | As required. |
iii) Structural concrete for bridge work and pavement Quality Concrete.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of construction</th>
<th>Test</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Structural Concrete.</td>
<td>Compressive strength @ 28 days</td>
<td>1 Sample 1-5 Cum. 2 Samples 6-15 Cum. 3 Samples 16-30 Cum. 4 Samples 13-50 Cum. 4 plus one additional sample for each additional 50 Cum. or part thereof.</td>
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<td></td>
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<td>(Ref -Table 1700 -8)</td>
</tr>
<tr>
<td>5.</td>
<td>Pavement Concrete</td>
<td>i) Strength of concrete</td>
<td>2 Cubes and 2 beams per 150 cum. or part thereof (one for 7 day and other for 28 day strength) or minimum 6 cubes and 6 beams per days work which ever is more.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) core strength on hardened concrete</td>
<td>As per the requirement of the Engineer only in case of doubt.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii) Workability of fresh concrete slump test</td>
<td>One test per each dumper load at both Batching plant site and paving site initially when work starts. Subsequently sampling may be done from alternate dumper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iv) Thickness determination</td>
<td>From the level data of concrete pavement surface and sub base at grid point of 5/6.25 m x 3.5 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>v) Thickness measurement for trial length</td>
<td>3 cores per trial length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vi) Verification of level of string line in the case of slip form paving and steel forms in the case of fixed form paving.</td>
<td>String line or steel forms shall be checked for level at an interval of 5.0m or 6.25 m. The level tolerance allowed shall be ± 2 mm. These shall be got approved 1-2 hours before the commencement of the concreting activity.</td>
</tr>
<tr>
<td>6. Coarse Aggregate</td>
<td>i) Los Angeles Abrasion value or aggregate Impact test.</td>
<td>Once for each source of supply and subsequently on monthly basis. Before approving the aggregates and every month subsequently</td>
<td></td>
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<tr>
<td>---------------------</td>
<td>------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
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</tr>
<tr>
<td></td>
<td>ii) Soundness</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii) Alkali - Aggregate reactivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Water</td>
<td>Chemical Test</td>
<td>Once for approval of source of supply , subsequently only in case of doubt.</td>
<td></td>
</tr>
</tbody>
</table>

7. Training of Personnel

7.1 The Contractor shall arrange training camps, workshops, seminar etc. for his personnel deployed/ being deployed on Site and Plant and the departmental staff as identified by the Engineer-in-Charge, well in advance of likely start of the work, for monitoring quality of work to the optimum level. The Contractor in consultation with Engineer-in-Charge shall decide for training programme schedule and the faculty for the training course as soon as the work order is issued to him.
D. QUALITY ASSURANCE

8 Quality Assurance

8.1 It is a process which exercises various checks at different stages for a work right from its inception till its acceptance, to put it in service to ensure that the work has been properly designed and constructed as per approved designs, drawings and specifications.

8.2 In order that the properties of the completed structure be consistent with the requirements and the assumptions made during planning and the design, adequate Quality Assurance measures should be taken at the site of work.

8.3 The construction should result in satisfactory strength, serviceability and long term durability so as to lower the overall life cycle cost.

8.4 Quality Assurance Manual :- It provides a base document outlining policies, procedure, responsibility, compliance, acceptance criteria and documentation. It shall generally cover the following aspects.

a) Identification of all persons of Contractor and as well as Department side involved in Quality Assurance and their interrelationship.

b) Internal Quality Assurance system of the Contractor and the Engineer-in-Charge.

c) Levels of cross checking, verification including system of inspection and audit.

d) Organization of personnel, responsibilities and lines of reporting.

e) Criteria for acceptance/rejection including identification of authorities for making such decisions.

f) Inspection at the end of Defect Liability Period.

g) Items to be included in maintenance manual

h) All formats for documentations.

8.5 Quality Assurance Manual shall be prepared and accepted by the Contractor and the Engineer-in-Charge before start of the work.

8.6 Quality Assurance manual consisting of quality plans, test plans, checklist for inspection, quality Audit and third party inspection shall be prepared and furnished by the Contractor in pursuant to clause No. 59 of Condition of Contract and shall conform to the provisions stipulated in "Guidelines on Quality systems for Roads" -IRC:SP: 57-2000 and "Guidelines on Quality systems for Road Bridges" - IRC :SP: 47-1998.
E. LOAD TEST OF STRUCTURAL CONCRETE.

9.0 In case of doubts regarding grade of concrete used either due to poor workmanship or based on results of cube strength tests, the load testing of any part of the structure will have to be carried out by the Contractor at his own cost.

9.1 Before carrying out load test, the Contractor shall carry out the suitable non-destructive testing of the structure which are in doubt, at his own cost. Non-destructive testing is fully optional and at the discretion of the Contractor.

9.2 In such cases the Engineer-in-Charge shall inform the Contractor sufficiently in advance in writing along with the reasons for carrying out the load test, during execution of work or during maintenance period of the Contract.

9.3 The load test will have to be carried out as per the provisions contained in IS 456:2000.

9.4 If the load test results do not meet the requirements as stipulated in relevant I.S. code the structure shall be deemed to be unacceptable.
DECLARATION OF THE CONTRACTOR

I/ We hereby declare that I/We have made myself/ourselves thoroughly conversant with the local conditions regarding all materials and labour on which I/ We have based my / our rates for this tender. The specifications, local existing condition and lead of materials on this work have been carefully studied and understood by me / us before submitting this tender. I /We undertake to use only the best materials approved by the Engineer –in-Charge or his duly authorized representative, before starting the work and to abide by his decision. I/We shall maintain / rectify the entire works as per M. O. R. T. & H. specification as soon as the damage occurs up to the expiry of defect liability period without putting forth any reasons for the failure.

Signature of contractor
SAMPLE FORM

FORM F-1

DETAILS OF WORKS OF SIMILAR NATURE and MAGNITUDE AMOUNTING TO RS. (AS SPECIFIED IN TENDER DATA VOLUME II) CARRIED OUT BY TENDERER

NAME OF TENDERER :-

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of Work</th>
<th>Name and Address of Organisation for whom the work is done</th>
<th>Place</th>
<th>Tendered Cost</th>
<th>Time in which completed</th>
<th>Date of completion</th>
<th>Principal features in brief</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

Contractor  
Executive Engineer
**SAMPLE FORM**

**FORM - F-2**

DETAILS OF OTHER WORKS TENDERED FOR AND IN HAND AS ON THE DATE OF SUBMISSION

NAME OF TENDERER :-

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of Work</th>
<th>Name and Address of Organisation for whom the work done</th>
<th>Place</th>
<th>Tendered Cost</th>
<th>Work in hand (cost of remaining Work)</th>
<th>Anticipated date of completion</th>
<th>Estimated cost</th>
<th>Works tendered where decision is expected</th>
<th>Stipulated date of period of completion</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

Contractor

Executive Engineer
**FORM - F-3**

LIST OF MACHINERY AVAILABLE WITH THE TENDERER WHICH WILL BE USED FOR EXECUTION OF THE CONTRACT

NAME OF TENDERER :-

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Equipment</th>
<th>No. of Units</th>
<th>Kind and Make</th>
<th>Capacity</th>
<th>Age of Machinery</th>
<th>Present condition of Machinery</th>
<th>Present Location with name and address of organization where machinery is in use</th>
<th>Whether the machinery is hypothecated to any Bank or Institution</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>9</td>
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</tr>
</tbody>
</table>
# SAMPLE FORM

## FORM F-4

STATEMENT SHOWING TECHNICAL PERSONNEL AVAILABLE WITH CONTRACTOR WHICH CAN BE SPARED EXCLUSIVELY FOR THIS WORK

NAME OF TENDERER :-

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Designation</th>
<th>Name</th>
<th>Qualification</th>
<th>Professional experience of work carried out</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Item of Activity (Work)</td>
<td>Monthwise Programme (in the form of a Bar Chart)</td>
<td></td>
<td></td>
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<td>--------</td>
<td>------------------------</td>
<td>---------------------------------------------</td>
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<tr>
<td></td>
<td></td>
<td>1st, 2nd, etc. are Months from the date of work order</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
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<th>8th</th>
<th>9th</th>
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<th>11th</th>
<th>12th</th>
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</tbody>
</table>

Contractor | Executive Engineer
LETTER OF ACCEPTANCE

NO.-------------------------------------
Office of the Executive Engineer,
National Highway Division No 3, Thane

To,

M/s ----------------------------------
-------------------------------------
-------------------------------------

Subject: - Acceptance of tender for the [Name of Work]

Reference: - Your tender dated ------------

Dear Sir,

Your Tender for the work cited under subject above as quoted by ----------% above/below /at par
with schedule of rates is hereby accepted by -------------------------

It is requested to deposit the security deposit amount of Rs. ---------------- in the form
of Term Deposit receipt/ cash or in the form of Bank Guarantee within 10 day from the receipt of this
acceptance letter.

Failure to deposit the Security Deposit within the time stipulated will be treated as non response and
subsequently will lead to forfeiture of earnest money.


D. A. Nil
Executive Engineer
National Highway Division No 3, Thane
WORK ORDER

NO.-------------------------------------

Office of the Executive Engineer,
National Highway Division No 3, Thane

To,
M/s --------------------------------------
----------------------------------------

Subject: Work Order Tender for the Work of -----------------------------------------------
---------------------------------------------------------------------------------
i) Estimated Cost Rs.-----------------
ii) Tendered cost Rs.-----------------

Reference: i) Your tender dated -------------------
           ii) Your letter No.-----------------------

Dear Sir,

With reference to this office letter cited above, you have deposited ------------
-% initial security deposit of Rs. ------------------------------- Rs.-----------------
---------------------------------------------------------------------
-----valid upto ---------------------------

Your tender for the above work Rs.---------------------------------------------------

--- (Rs. ---------------------------------- ) has been accepted by ---------------
--- vide letter No. ------------------------ dated -----------------------------

Hence the tender is hereby accepted on behalf of Governor of Maharashtra, subject to
confirmation of Bank Guarantee.
Your are requested to submit your work programme within ----------days and start the work forthwith i. e. effect from ---------- under the guidance / supervision of Assistant Engineer Gr. I, N. H. Sub Division, Murbad & complete the work within the stipulated period ie time -----------Months / year.

A copy of Agreement registered under No. ----------- Please acknowledge the receipt,

D. A. : Certified copy of Executive Engineer,

                      Agreement National Highway Division No 3
                      Thane

1) Copy submitted to Accountant General Mah –II (A &E), Nagpur for information.
2) Copy submitted to Superintending Engineer, --------- Circle --------for information
3) Copy forwarded to AE Gr. I / SDE / SDO N. H. Sub Division, Murbad for information and necessary action along with true copy of Agreement
4) Copy to Auditor at Division Office along with true copy of Agreement.
SAMPLE FORM

Form of unconditional Bank Guarantee from Contractors for
[to be specified by State ]

(On Stamp Paper worth Rs. 100/-)

MODEL FORM OF BANK GUARANTEE BOND

In consideration of the Government of Maharashtra (herein after referred to as “The Government”) having agreed to exempt _________________(herein after referred to as “The Contractor”) from depositing with the Government in cash the sum of Rs. _________________(Rupees _________________ only) being the amount of security deposit payable by the contractor to the Government under the terms and conditions of the agreement dated the ______ day of __________ and made between the Government of the one part and the Contractor of the other part [herein after referred to as "the said Agreement"] for _________________ as security for due observance and performance by the Contractor of the terms and conditions of the said Agreement, on the Contractor furnishing to the Government a guarantee in the prescribed form of a Scheduled Bank having branches in Maharashtra in fact these presents in the like sum of Rs. _________________ (Rupees _________________ only) We ______________________________________________________________________

BANK/LIMITED registered in India under _________________ Act and having one of our local Head office at ___________________________________________________________________________________do here by :

1. GUARANTEE TO THE GOVERNMENT :

(A) Due performance and observance by the Contractor of the terms covenants and conditions on the part of the Contractor contained in the said Agreement.

AND

(B) Due and punctual payment by the Contractor to the Government of all sums of money, losses, damages, cost, charges, penalties and expenses payable to the Government by the Contractor under or in respect to the said Agreement.

2. Undertake to pay to the Government on demand and without demur and not withstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding filed in any Court of tribunal relating thereto the said sum of Rs. ____________________ (Rupees __________________ only) or such less
sum may be demanded by the Government from us, our liability hereunder being absolute and unequivocal and agree that

3.(a) The guarantee herein contained shall remain in full force and effect during the subsistence of the said Agreement and that the same will continue to be enforceable till all the dues of the Government under or by virtue of the said Agreement have been duly paid and it's claims satisfied or discharged and till the Government certifies that the terms and conditions of the said Agreement have been fully, properly carried out by the Contractor.

3.(b) We shall not be discharged or released from the liability under this guarantee by reasons of:

(i) Any change in the constitution of the Bank or the Contractor, or
(ii) Any arrangement entered into between the Government and the Contractor with or without our consent;
(iii) Any forbearance or indulgence shown to the Contractor.
(iv) Any variation in the terms covenants and conditions contained in the said Agreement
(v) Any time given to the Contractor, or;
(vi) Any other conditions or circumstances under which, in law, a surety would be discharged.

3.(c) Our liability here in under shall be joint and several with that of the Contractor as if we were principal debtors in respect of the said sum of Rs.___________________ [Rupees __________________ only ]

3.(d) We shall not revoke this guarantee during its currency except with the previous consent in writing of the Government.

IN WITNESS WHEREOF THE Common Seal of __________________________________
has been herein affixed this _________________ day of _____ ____________________200.

The common seal of_______________ was pursuant to the resolution of the Board of Directors of the Company dated the _________________ day of _______________ herein affixed in the presence of____________________ who, in token thereof, have

Here to set their respective hands in the presence of.

1) ____________________________
2) ____________________________
SAMPLE FORM

Simple Form of Bank Guarantee for Performance Security.

In consideration of the Government of Maharashtra (hereinafter called "the Government") having to exempt __________________(hereinafter called "the Contractor") from depositing with the Government in cash the sum of Rs. ___________________(Rupees _______________________ only) being the amount of Performance Security payable by the Contractor to the Government under the terms and conditions of the Agreement dated the ______________ Day of ____________ 20 ____ and made between the Government of the one part and the Contractor of the other part (hereinafter referred to as "the said Agreement") for ______________ as security for due observance and performance by the Contractor of the terms and conditions of the said Agreement, on the Contract furnishing to the Engineer-in-Charge a Guarantee in the prescribed form of a Scheduled Bank having branches in Maharashtra being in face these presents in the like sum of Rs. ______________ (Rupees _______________________________ only).

We ___________________________ Bank/Limited registered in india under __________________________ Act and having one of our Local Head Office at __________________________ Do hereby:

1. Guarantee to the Government:
   a) Due performance and observance by the Contractor of terms, covenants and conditions on the part of the Contractor in said Agreement,

   AND

   b) Due and punctual payment by the Contractor to the Government of all sums of money, losses, damages, costs, charges, penalties and expenses payable to the Government by the Contractor under in respect of the said Agreement.

2. Undertake to pay to the Government on demand and without dispute raised by the Contractor(s) in any suit or proceeding filed in any Court of tribunal relating thereto the said sum Rs. ______________ (Rupees _______________________________ only) or such lesser sum as may be demanded by the Engineer-in-Charge from us. Our liability hereunder absolute and unequivocal and agree that.

3  a) The guarantee herein contained shall remain in full force and effect during the subsistence of the said Agreement and that the same will continue to be enforceable till all the dues of the Government under or by virtue of the said Agreement have been duly paid and its
claims satisfied or discharged and till the Engineer-in-Charge certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the Contractor.

b) We shall not be discharged or released from the liability under this guarantee by reasons of:
   
   (i) Any change in the constitution of the Bank or the Contractor;
   (ii) Any agreement entered into between the Engineer-in-Charge and the Contractor with or without our consent;
   (iii) Any forbearance or indulgence shown to the Contractor;
   (iv) Any variation in the terms, covenants or conditions contained in the said Agreement;
   (v) Any time given to the Contractor; or
   (vi) Any other conditions or circumstances under which, in law; a surety would be discharged.

c) Our liability hereunder shall be joint and several with that of the Contractor as if we the principal debtors in respect of the said sum of Rs___________ (Rupees __________________________ only).

We shall not revoke this guarantee during its currency except with the previous consent in writing of the Engineer-in-Charge.

4 Notwithstanding anything contained herein before our liability under this guarantee is restricted to Rs. ______________ (Rupees __________________________ only). Our guarantee shall remain in force up to ____________________________ .

IN WITNESS WHEREOF the Common Seal of __________________ has been hereunto affixed this __________________________ Day of __________________

The common seal of ______________ was pursuant to the resolution of the Board of Directors of the Company dated the __________________________ Day of ______________ 20

_________________ herein affixed in the presence of __________________________ who, in token thereof have here to set their respective hands in the presence of

1. __________________________

2. __________________________
SAMPLE FORM

FORM OF INDENTURE FOR SECURED ADVANCES

(For use in cases in which the Contract is for finished work and the Contractor has entered into an Agreement for the execution of a certain specified quantity of work in a given time)

THIS INDENTURE made the day of

BETWEEN

(hereinafter called the Contractor which expression shall where the context so admits or implies be deemed to include his executors administers and assigns) of the one part and THE GOVERNOR OF MAHARASHTRA (hereinafter called the Governor of Maharashtra which expression shall where the context so admits or implies be deemed to include his successors in office and assigns) of the other part.

WHEREAS by an agreement dated the (hereinafter called the said agreement) the Contractor has agreed.

AND WHEREAS the Contractor has applied to the Governor of Maharashtra that he be allowed advances on the security of materials absolutely belonging to him and brought by him to the site of the works the subject of the said agreement for use in the construction of such of the works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of material and labour and other charges ) AND WHEREAS the Governor of Maharashtra has agreed to advance to the Contractor the sum of Rupees on or before the execution of these presents paid to the Contractor by the Governor of Maharashtra (the receipt whereof the Contractor doth hereby acknowledge ) and of such further advances (if any)as may be made to him as aforesaid the Contractor doth hereby covenants and agree with the Governor of Maharashtra and declared as follows :-

NOW THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees on or before the execution of these presents paid to the Contractor by the Governor of Maharashtra (the receipt whereof the Contractor doth hereby acknowledge ) and of such further advances (if any)as may be made to him as aforesaid the Contractor doth hereby covenants and agree with the Governor of Maharashtra and declared as follows :-
1. That the said sum of Rupees so advanced by the Governor of Maharashtra to the Contractor as aforesaid and all or any further sum or sums advanced as aforesaid shall be employed by the Contractor in or towards expediting the execution of the said works and for no other purpose whatsoever.

2. That the materials detailed in the said running account bill which have been offered to and accepted by the Governor of Maharashtra as security are absolutely the Contractor's own property and free from encumbrances of any kind and the Contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the Contractor indemnifies the Governor of Maharashtra against all claims to any materials in respect of which an advance has been made to him as aforesaid.

3. That the materials detailed in the said running account bill and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractor solely in the execution of the said works in accordance with the directions of the Divisional Officer, ___________________________ Division (hereinafter called the Divisional Officer) and in the terms of the said agreement.

4. That the Contractor shall make at his own cost all necessary and adequate arrangement for the proper watch, safe custody and protection against all risks of the said materials and that until used in construction as aforesaid, the said materials shall remain at the site of the said works in the Contractor's custody and on his own responsibility and shall at all times "be open to inspection by the divisional officer or any officer authorized by him. In the event of the said materials or any part thereof being stolen, destroyed or damaged by him. In the event of the said materials or any part thereof being stolen, destroyed or damaged the Contractor will forthwith replace the same with other materials of like quality or repair and make good the same as required by the divisional officer.

5. That the said materials shall not on any account be removed from the site of the said works except with the written permission of the divisional officer or an officer authorized by him on that behalf.
6. That the advances shall be repayable in full when or before the Contractor receives payment from the Governor of Maharashtra of the price payable to him for the said works under the terms and the provisions of the said agreement provided that if any intermediate payments are made to the Contractor on account of work done then on the occasion of each such payment the Governor of Maharashtra will be at the liberty to make a recovery from the Contractor's bill for such payment by deducting there from the value of the said material then actually used in the construction and in respect of which recovery was not been made previously the value for this purpose being determined in respect of each description of materials at the rates at which the amounts of the advances made under these presents were calculated.

7. That if the Contractor shall at any times made any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing to the Governor of Maharashtra shall immediately on the happening of such default be repayable by the Contractor to the Governor of Maharashtra together with interest thereon at twelve per cent per annum from the date or respective dates of such advance to the date of repayment and with all costs, charges, damages and expenses incurred by the Governor of Maharashtra in or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractor and the Contractor hereby covenants and agrees with the Governor of Maharashtra to repay and pay the same respectively to him accordingly.

8. That the Contractor hereby charges all the said materials with the repayment to the Governor of Maharashtra of the said sum of Rs.________________ and any further sum or sums advanced as aforesaid and all costs, charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding any thing in the said agreement and without prejudice to the powers contained therein if and whenever the covenant for payment and repayment hereinbefore contained shall become enforceable and the money owing shall not be paid in accordance therewith the Governor of Maharashtra may at any time thereafter adopt all or any of the following courses as he may deem best :-

(a) Seize and utilize the said materials or any part thereof in the completion of the said works on behalf of the Contractor in accordance with the provisions in that behalf contained in the said agreement debiting the
Contractor with the actual cost of effecting such completion and the amount due in respect of advances under these presents and crediting the Contractor with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the Contractor he is to pay same to the Governor of Maharashtra on demand.

(b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from the sale retain all the sums aforesaid repayable or payable to the Governor of Maharashtra under these presents and pay over the surplus (if any) to the Contractor.

(c) Deduct all or any part of the money owing out of the security deposits or any sum due to the Contractor under the said agreement.

9. That except in the event of such default on the part of the Contractor as aforesaid interest on the said advance shall not be payable.

10. That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been hereinbefore expressly provided for the same shall be referred to the Superintending Engineer, _________________Circle, ________ whose decision shall be final.

IN WITNESS WHEREOF the said ____________________________and _____________ by the order and under the direction of the Governor of Maharashtra have hereunto set their respective hands the day and year first above written.

Signed, sealed and delivered by The said Contractor in the presence of

Signature-

Witness Name -

Address –

Signed by

the order and under the direction of the Governor of Maharashtra in the presence of

Signature-

Witness Name-

Address-
SAMPLE FORM

BANK GUARANTEE FORM OF MOBILISATION ADVANCE

In consideration of THE GOVERNOR OF MAHARASHTRA exercising the executive power of the Government of the State of Maharashtra (hereinafter referred to as "THE GOVERNMENT") having at the request of _______________________, a company registered under the Companies Act 1956 and having its registered Office at ________________________,

(a) Shri ___________________________________ and

(b) Shri ___________________________________ etc.

Carrying on business in partnership, in the firm name and style of Messers _______________________, at ______________________ (hereinafter referred to as "The Contractor") agreed to lend an advance to the Contractor as the Mobilization Advance for the work of _______________________, the sum of Rs. ______________________ (Rupees ______________________ only) on the terms and conditions inter alia, that the Contractor/s furnish to the Government a guarantee from the Scheduled Bank having branches in Maharashtra for the sum of Rs. ______________________ (Rupees ______________________ only) together with interest thereon at _____ percent per annum guarantying due repayment thereof by the Contractor/s at the time and in the manner as provided in the condition No. ___________ of the Agreement annexed to the Tender Agreement dated the __________, the day of ________________________ and made between the Government on the one part and the Contractor/s the other part (hereinafter referred to as "THE SAID AGREEMENT") a complete copy thereof is annexed hereto.

We ____________________________________________

___________________________ incorporated in India under __________________________ Act and having one of our local offices at ______________________ do hereby guarantee to the Government due and punctual repayment by the Contractor/s as per the provisions in the condition No. ___________ of the Special/General conditions of the Agreement appended to the said Agreement to the Contractor/s as aforesaid together with interest thereon at the rate specified in the condition No _____ of the Agreement appended to the said Agreement AND we do hereby undertake that

Contractor

Executive Engineer
we shall pay to the Government forthwith on demand the said sum of Rs. _______________
(Rupees ____________________________ only) or such lesser sum as may be then
due and payable by the Contractor/s to the Government together with interest thereon at the rate
of ______________________ per annum from the date of payment of the said advance by .the
Government to the Contractor/s till repayment and as may be demanded by the Government from
us as and by way of indemnity on account of any loss or damage caused to or suffered by the
Government by reason of Government being .unable to recover the same from the Contractor/s as
provided in the Special / General conditions of the tender appended to the said Agreement.

AND WE DO HERE BY FURTHER AGREE THAT

a) The guarantee herein contained shall remain in full force and effect and shall continue
to be enforceable till the whole of the said sum of Rs. ___________ (Rupees
______________________________ only) together with interest thereon
as aforesaid paid by the Government to the Contractor/s and all the dues of the
Government under Special / General conditions of the Agreement appended to the said
Agreement have been fully paid and its claims satisfied or discharged.

b) The guarantee herein contained shall be valid for the entire period during which the
said agreement is in operation or till the Mobilisation Advance together with the
interest has been recovered from the Contractor/s whichever is earlier.

c) We shall not be released or discharged from the liability under this guarantee by reason of –

i) Any change in the constitution of the Bank or of the Contractor/s.

ii) Any arrangement made between the Government and the Contractor/s with or
without our consent.

iii) Any variation in the terms, covenants or conditions of the Agreement for tender.

iv) Any time given to the Contractor/s.

v) Any forbearance or indulgence shown to the Contractor/s or

vi) Any other conditions/circumstances under which in law, a surety would be
discharged.
d) Our liability hereunder shall be joint and several with that of the Contractor/s as if we were the Principal debtors receiving the said sum of Rs._____________________________

(Rupees ________________________________ only) from the Government.

e) We shall not revoke this guarantee during its currency except with the previous consent of the Government in writing.

PROVIDED ALWAYS that notwithstanding anything herein before contained, our liability under this guarantee shall be limited to the sum of Rs. _________ (Rupees__________

______________________________only) and interest thereon as aforesaid and shall remain in force until the __________ day of ______________ 20 __________

______________ AND if claims under the guarantee are not made and communicated to us in writing before the said date viz. ________________ day of

______________ 20 __________

______________ all rights of the Government under this guarantee shall stand forfeited and thereupon we shall be released and discharged from all liabilities hereunder.

IN WITNESS WHEREOF the __________________________ Bank has executed these present this ______________ day of ______________ 20 __________
SAMPLE FORM

FORM OF BANK GUARANTEE FOR ADVANCE ON PLANT AND MACHINERY

To (Name of Employer) _______________________________________________________

___________________________________________________________________________

(Address of Employer)           _ __________________________________________________

___________________________________________________________________________

Name of Contract ____________________________________________________________

___________________________________________________________________________

Gentlemen,

In accordance with the provisions of the conditions of Contracts, Advance for Plant and
Machinery of the above mentioned Contract, (Name and Address of Contractor) shall deposit
with (Name                  of                Employer) _______________________________________________________

___________________________________________________________________________

___________________________________________________________________________

a Bank Guarantee to guarantee his proper and faithful performance under the said Clause of the
Contract in an amount of (Amount of Guarantee) Rs.___________________________ (In words
Rs.__________________________________________________________ )

We the (Bank______________________________________________________________

_________________________________________________________________________

_____________________________)  as instructed by the Contractor agree unconditionally and

___________________________________________________________________________

irrevocably to guarantee as primary obligator and not as surety merely, the payment to (name  of
Employer)

___________________________________________________________________________

___________________________________________________________________________

_____________________on his first demand without whatsoever  _____________________

___________________________________________________________________________

(Tenderers are not required to fill in this form at the time of tender submission).

(An amount is to be inserted by the bank), right of objection on our part without his first
claim to the Contractor in the amount not exceeding ( amount of Guarantee)
Rs. _____________ (in words Rs. __________________________ only) in the event that in the obligation expressed in the clauses of the above mentioned Contract have not been fulfilled by the Contractor giving the right of the claims to the Employer for recovery of the whole or part of the advance mobilization loan from the Contractor under the Contract.

We further agree that no change or addition to or other modification of the terms of the Contract or of works to be performed there under or of any of the Contract documents which may be made between (Name of E.E.)__________________________________________________________
____________________________________ and the Contractor shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of advance payments under the Contract until (Name of Executive Engineer) _____________________________ _____________________________
________________________ receives full repayment of the same amount from the Contractor.

Yours truly

SIGNATURE AND SEAL

Name of Bank _______________________

____________________________________

Address _____________________________

____________________________________

____________________________________

Date : _______________________________
SAMPLE FORM

UNDERTAKING AGAINST ADVANCE FOR PLANT AND MACHINERY

In consideration of the Advance for Plant and Machinery of Rs.________________________
_________________________________________________________________
advanced by

The Government to ___________________________________________________________
(Here in after referred to as the Contractor) as per the Provisions of the Agreement for the work of
___________________________________________________________________________

We, the Contractor do hereby undertake to abide by the following conditions.

1) The whole of the said sum of Rs. _________________ (Rupees________________安置
________________________) with interest at the prescribed rate shall forthwith become due
and payable by the Contractor to the Government immediately on the happening of any one of
the following events that is to say –

a) If in the option of the __________________________________________________________
_______ whose decision thereon will be final and binding on the Contractor, the
Contractor has failed to maintain satisfactory progress in execution of the said work
last accepted by the Executive Engineer.

b) If and when the said Agreement is determined by either party for any reasons
whatsoever.

c)_ If the whole of the said work and/ or a substantial part thereof is withdrawn by the
Government from the Contractor.

d) If there is any stoppage of the said work by the Contractor for a continuous period
exceeding one month without the prior permission in writing of the Engineer-in-
Charge.

e)_ If any attachment levied on the assets or property of the Contractor is not raised
within a period of 21 days.

f) If the Contractor stops or discontinues his business.
g) If a petition for winding up the Contractor's company is presented to any Court or if the Contractor company passes any resolution for being wound up.

2) The Contractor hereby covenants that upon the Government permitting the Contractor to use the said Articles for the purposes of executing the said works and not for any other purpose whatsoever the Contractor will so use the same and will at the Contractor's own costs and expense maintain and keep the same in substantial order and repair and working condition (usual wear and tear excepted) and will from time to time subject to the necessary import licenses being granted by the Government of India either replace such of the said Articles as may from decay, deterioration, destruction or any other cause whatsoever become useless or unadoptable for the purposes for which they were intended with new substitutes or proper or suitable articles respectively failing which in the alternative proportionately repay such advance in addition to the stipulated rate of deduction provided in the Agreement, so that the said work undertaken by the Contractor continues to be carried on with the utmost efficiency possible. The Contractor shall at all reasonable times keep the said Articles open to inspection by the Engineer or his authorized representatives.

3) The Contractor shall at his / its / their own costs make all necessary and adequate arrangements for the proper watch, safe custody and protection against all risks of the said Articles and that the said Articles shall remain at the site of the said works at his / its / their own risk and on his own responsibility.

4) The Contractor hereby declares that the said Articles which have been offered to and accepted by the Government for granting advance against them are the absolute property of the Contractor and are free from encumbrances of, any kind whatsoever and the Contractor hereby agrees to indemnify and save harmless the Government from and against any action, proceeding, claim and demand in respect of any of the said Articles and all costs, charges, expenses and damages sustained or incurred or payable by the Government in respect thereof.

5) The said Articles shall be used by the Contractor solely on the said works in accordance with the direction of the ________________________________ as defined in the said Agreement and the terms of the said Agreement and the Contractor shall not sell, pledge hypothecate, transfer or part with possession or any way deal with or dispose off the said Articles till the advance for plant and machinery with due interest thereon is outstanding against the Contractor.
6) The Contractor shall at all times pending repayment of the advance together with interest due on it at its/his/their/own costs insure and keep insured the said Articles for the full value thereof in the joint names of the Contractor and the Government with an insurance company to be approved by the ___________________________ against risk of loss or damage from whatever cause arising other than the Excepted Risks. The Contractor shall pay all premium and sums of money necessary for keeping such insurance on foot and the insurance policy and receipts for premium in original paid shall be deposited with the ___________________________. The Contractor shall assign all its/his/their right, title and interest in such policies to the Government.

7) The said Articles shall not on any account be removed from the site of the said works except the previous written permission of the Engineer as stipulated in the said Agreement.

8) The Contractor hereby further covenants with this Government that in case of default in payment or the whole sum becoming payable as provided in the said agreement or in the payment of the principal money on due date or in default of the performance of any of the covenants by the Contractor hereinbefore contained in case the said Agreement is terminated for any reasons whatsoever the Government may enforce all or any of the remedies provided by law including realization of the Bank Guarantee provided for Advance for plant and machinery.

IN WITNESS WHETHER OF ( ________________________________________________

______________________________ The common seal of the Contractor has been hereunto affixed

______________________________ the Contractor above named have here to set their
respective hands and ____________________________________________________

_________________________________________ has for and on behalf of the Governor of

Maharashtra hereto set his hand and affixed the seal of his office on the day and year hereinabove written.
A. SAFETY MEASURES FOR PLANT AND EQUIPMENT AT SITE

1. Arrangement for Traffic During Construction

The Contractor shall at all time carry out work on the highway in a manner creating least interference to the flow of traffic while consistent with the satisfactory execution of the same. For all works involving improvements to the existing highway, the Contractor shall, in accordance with the directives of the Engineer, provide and maintain, during execution of the work, a passage for traffic either along a part of the existing carriageway under improvement, or along a temporary diversion constructed close to the highway. The Contractor shall take prior approval of the Engineer regarding traffic arrangements during construction.

2. Traffic Safety and Control

The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the Engineer for the information and protection of traffic approaching or passing through the section of the highway under improvement. Before taking up any construction, an agreed phased programme for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer.

The barricades erected on either side of the carriageway/portion of the carriageway closed to traffic, shall be of strong design to resist violation, and painted with alternate black and white stripes. Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings,

Painted drums or a similar device to the directions of the Engineer. At night, the passage shall be delineated with lanterns or other suitable light source.

One-way traffic operation shall be established whenever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic. This shall be done with the help of temporary traffic signals or flagmen kept positioned on opposite sides during all hours. For regulation of traffic, the flagmen shall be equipped with red and green flags and lanterns/lights.

On both sides, suitable regulatory/warning signs as approved by the Engineer shall be installed for the guidance of road users. On each approach, at least two signs shall be put up, one close to the point where transition of carriageway begins and the other 120 m away. The signs shall be of approved design and of reflectory type, if so directed by the Engineer.

3. Maintenance of diversions and traffic control devices

Signs, lights, barriers and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time they are required as directed by the Engineer. The temporary travelled way shall be kept free of dust by frequent applications of water, if necessary.
4. **Additional Slogans for Use**

4.1 Not withstanding whether it as per the rules of the Traffic authorities or otherwise the agency should ensure that their vehicles, the term includes all construction machinery towed or self driven are equipped with the following to emphasize traffic safety.

   a) Reflector 4 Nos.
   
   b) Tail lamp 2 Nos.
   
   c) One of the following slogans

      i) Drink and drive, you won't survive
      
      ii) Live and Let Live
      
      iii) A Cat has 9 lives you have only 1.
      
      iv) जल्दी करती काम खराब, होश में आओ लाट सहाब
      
      v) समय मुल्यवान है लेकिन जीवन अमूल्य है
      
      vi) वाहन व्यवस्थित जीवन सुरक्षित
      
      vii) एक झपकी एक अपघात
      
      viii) आपकी भूल दुसरोंकी परेशानी
      
      ix) जेथे लक्ष विचित्र तेथे अपघात निष्पात
      
      x) आवरा बंगाला सावरा जीवाला
      
      xi) मनाचा ब्रेक उत्तम ब्रेक
      
      xii) दारुह एकच प्यला कारण तृमध्या नाशाला
      
      xiii) नको मरण, नको अपघात, वेगावर ताबा बाळगाद दक्षता
      
      xiv) युप्राप्त मद्यपान आवृत्तियाची युप्राप्त युप्राप्त

4.2 In absence of the above requirements and failure of the agency to fulfill them in a reasonable time the Executive Engineer-in-Charge of the Work will get it done from the Mechanical wing of the P. W. Department and would recover the cost from the amount due to the agency at the following rates.

   a) Reflector Rs. 25/- Per Nos.
   
   b) Tail Lamp Rs. 175/- Per Nos.
   
   c) Slogan Rs. 75/- Per Nos.
B. SAFETY MEASURES FOR TRAFFIC MANAGEMENT AT SITE.

5. Traffic Safety Measures during construction and maintenance of roads and bridges

5.1 The Contractor shall have to provide Traffic Safety Measures on DIVERSION During Construction/Reconstruction of BRIDGE/C.D.WORKS comprising of Road Traffic Sign Boards and devices as per detailed design, drawing, specification and as directed by Engineer-in-Charge.

5.2 The Contractor shall have to provide the traffic safety arrangements as per detailed drawing before allowing traffic on the diversion. The traffic safety arrangements will have to be got approved from Engineer-in-Charge by the Contractor before taking any construction activities for Bridge/C.D. Work.

5.3 The Contractor shall have to provide, sign and cautionary and informatory boards listed below as per the instructions and to the satisfaction of Engineer-in-Charge before commissioning of diversion. A certificate to that effect shall be obtained.

A) The Sign No.1 the board display the message “GO SLOW – WORK IN PROGRESS” shall be placed at a distance of 120 m. away from the point where the Diversion begins. The signboard shall be of size 1.0 m. x 1.0 m. having Red Background and messages in white colour.

B) The Sign No.2 “SPEED LIMIT (20)” shall be placed at a distance of 100 m. away from the point where the Diversion begins. The board shall be of size 60 cm. dia. Having white background and Red Border and the numerals shall be in black colour as per IRC-67-1977. Distance between Sign No.1 and Sign No.2 shall be minimum 20 m.

C) Speed Breakers / Humps shall be provided and marked with black and white colour in checkered pattern in accordance with IRC-99-1988. Speed breaker shall be provided at a distance of at least 20 m. away from the point where diversion begins.

D) The Sign No.3 – The cautionary signboard indicating “SPEED BREAKER” shall be placed on either side of the speed breaker at a distance of atleast 40 m. away from the Speed Breaker. The cautionary board shall be of an equilateral triangle of size 90 cm. having white colour background, retro-reflective border in red colour and non-reflective symbol in black colour. The definition plate shall be of size 60 cm. x 20 cm. having retro-reflective white colour background and message with non reflective black colour as per IRC-99-1988.

Retro-reflective “CAT-EYE” (Aluminium) shall also be provided on either side of the speed breaker as shown in the drawing.
E) The Sign No.4 – DIVERSION board shall be placed at the point of detour. The signboard shall be of size 0.90 m. x 0.60 m. having red background and white retro-reflective messages.

F) Road marking for guiding the traffic (centerline / edge line marking) approaching the traffic where diversion begins shall be provided on the pavement with pavement marking paint in white colour as per IRC-35-1970. Retro-reflective Cat – Eye made of aluminium body shall be placed along centerline marking before speed breakers as shown in the drawing. Sand filled plastic cones mounted with Retro-reflective Arrow Hazard Marker sign shall be placed as indicated in the drawing. Plastic cone shall be 73 cm. in height having 39 cm. square / hexagonal base.

G) Retro-reflective Strong Inviolable Stand Type Barrier painted black and having white Retro-reflective Strips for closer of traffic shall be placed on to cover the entire width of carriageway including shoulders as per drawing. The barricades shall be opened for the use of construction machinery only in the presence of responsible field person of the department. The Barricades shall not be removed unless the permission is given by the responsible officer of the rank not less than Sub-Divisional Engineer. The Barricade shall have two plates of size 1.30 m. x 0.20 m. painted Black and shall have White Retro-reflective strips and mounted on angle Iron Stand of 1.0 m. height.

H) Yellow light flasher shall be kept lit from sunset to sunrise, three nos. at the point of detour and two nos. at barriers on both sides as indicated in the drawing.

I) Informatory sign board indicating name of work, Amount of Contract, Completion period, Defect Liability period, Name of Contractor with Telephone No., Name of Executive Engineer with Telephone No. Shall be provided between sign board No.4 and the barricade. The sign board shall be having Blue Stove Enamel Paint background and white messages retro-reflective as per IRC-67-1977.

J) The Sign No.5 “RESTRICTION ENDS” sign shall be placed at 200 m. beyond the edge of work area. The size of sign plate shall be 60 cm. dia. having white background retro-reflective and black band of non-reflective. The Signs, Lights, Barricades and other traffic control devices shall be well maintained, till such time the traffic is commissioned on the New Bridge / C. D. Work. The size, shape and colour of all the sign and caution boards shall be as mentioned above as per detailed drawings in accordance with the relevant I.R.C. specifications and as per Ministry of Road Transport and Highways Specifications.
ARRANGEMENTS DURING CONSTRUCTION / RECONSTRUCTION OF ROADS & BRIDGES WHERE TRAFFIC IS TO BE PASSED OVER A DIVERSION (NOT TO SCALE)
SIGN 1
GO SLOW
WORK IN PROGRESS
SIZE 1 M X 1 M

SIGN 2
20
SIZE 60 CM CIRCLE
I.R.C. 67-1977

SIGN 3
गति अवरोधक
SIZE 90 CM TRIANGLE
DEFINITION PLATE SIZE
20 X 60 CM
I.R.C. 67-1977

SIGN 4
DIVERSION
SIZE 0.90 x 0.60 M.

SIGN 5
RESTRICTION ENDS
SIZE 60 CM CIRCLE
DEFINITION PLATE
SIZE 20 X 60 CM
I.R.C. 67-1977

INVIOLABLE BARRIER
TWO PLATES EACH OF SIZE 20 X 130 CM
ANGLE IRON STAND 100 CM HEIGHT
6. **Traffic Safety Measures during reconstruction of cross drainage structures where traffic can be passed over part width**

6.1 The Contractor shall have to provide Traffic Safety Measures on road during reconstruction of cross drainage structures in part width, comprising of traffic signboards and devices as per detailed design, drawing and specification as directed by Engineer-in-Charge.

This includes providing traffic safety arrangements required for traffic control within the vicinity of work Site before actual start of the widening of the C.D. Work. The Contractor will have to provide the traffic safety arrangements as per the detailed drawing before starting dismantling the existing structure. The traffic safety arrangements will have to be got approved from the Engineer-in-Charge by the Contractor before taking any construction activity for the C.D. Work.

6.2 The Contractor shall have to provide sign and cautionary and informatory boards listed below as per the instructions and to the satisfaction of Engineer-in-Charge before commissioning of diversion. A certificate to that effect shall be obtained.

A) The Sign No.1 the board display the message “GO SLOW – WORK IN PROGRESS” shall be placed at a distance of 120 m. away from the point of detour and shall be of size 1.0 m. x 1.0 m. having red background and messages in white colour.

B) The Sign No.2 “SPEED LIMIT (20)” shall be placed at a distance of 100 m. away from the point of detour. The boards will be of size 60 cm. dia. having white background and red border and the numerals shall be in black colour as per IRC-67-1977. Distance between Sign No.1 and Sign No.2 shall be minimum 20 m.

C) Speed Breakers / Humps shall be provided and marked with black and white colour in checkered pattern and stop line 20 cm. wide with letters “STOP” painted white on the pavement in accordance with IRC-99-1988 and IRC-35. Speed breakers shall be provided at a distance of minimum 20 m. away from the point of detour and line indicating “STOP” shall be exactly on the point of detour.

D) The Sign No.3 – The cautionary signboard indicating “SPEED BREAKER” shall be placed on either side of the speed breaker at a distance of at least 40 m. away from the speed breaker. The cautionary board shall be of an equilateral triangle of size 90 cm. having white colour background, Retro-reflective border in red colour and non-reflective symbol in black colour. The definition plate shall be of size 60 m. x 20 cm. having retro-reflective white colour background and message with non reflective black colour as per IRC-99-1988. Retro-reflective “CAT-EYE” (Aluminium) shall also be provided on either side of the speed breaker as shown in the drawing.

E) The Sign No.4 – STOP sign with definition plate indicating “ONE WAY TRAFFIC” shall be placed at the point of detour. The STOP sign shall be octagonal in shape of size 90 cm. having red background and message in white colour as per IRC:67-1977.
F) Road marking for guiding the traffic (centerline / edge marking) approaching the work area shall be provided on the pavement with pavement marking point in white colour as per IRC-35-1970 as shown in the drawing.

Retro-reflective Cat – Eye made of aluminium body shall be placed along centerline marking before speed breakers as shown in the drawing. Sand filled plastic cones mounted with Retro-reflective Arrow Hazard Marker sign shall be placed as indicated in the drawing. Plastic cone shall be 73 cm. in height having 39 cm. square / hexagonal base.

G) Retro-reflective Strong Inviolable Stand Type Barrier painted black and having white Retro-reflective Strips shall be placed at either ends of the widening area in half width of the carriageway edge of the formation. The barricades shall not be removed unless the permission is given by the responsible officer of the rank not less than Sub Divisional Engineer. The Barricade shall have two plates of size 1.30 m. x 0.20 m. painted black and shall have White Retro-reflective Strips and mounted on Angle Iron Stand of 1.0 m. height.

H) Retro-reflective Hazard Marker shall be provided on opposite side of work area at both the ends of parapet wall of cross drainage structure. The size of sign plate shall be 30 cm. x 90 cm. painted with black colour and yellow retro-reflective strips as per IRC: 79-1981.

Yellow light flasher shall be kept lit from sunset to sunrise, 2 Nos. along the white painted line and 3 Nos. at barriers on both sides as indicated in the drawing.

I) Informatory sign board indicating name of work, Amount of Contract, Completion period, Defect Liability period, Name of Contractor with Telephone No., Name of Executive Engineer with Telephone No. shall be provided between sign board No.4 and the barricade. The sign board shall be having Blue Stove Enamel Paint background and white messages retro-reflective as per IRC-67-1977.

J) The sign No.5 “RESTRICTION ENDS” sign shall be placed at 200 m. beyond the edge of work area. The size of sign plate shall be 60 cm. dia. having white background retro-reflective and black band of non-reflective.

The Signs, Lights, Barricades and other traffic control devices shall be well maintained, till such time the traffic is commissioned on the new C. D. Work. The size, shape and colour of all the sign and caution boards shall be as mentioned above as per detailed drawings in accordance with the relevant I.R.C. specifications and as per Ministry of Road Transport and Highways Specifications.
ARRANGEMENTS DURING RECONSTRUCTION OF CROSS DRAINAGE STRUCTURES WHERE TRAFFIC CAN BE PASSED OVER PART WIDTH (NOT TO SCALE)
SIZE 1 M X 1 M

GO 'SLOW
WORK IN PROGRESS

SIGN 1

20

SIGN 2
SIZE 60 CM CIRCLE

SIGN 3
SIZE 90 CM TRIANGLE
DEFINITION PLATE SIZE 20 X 60 CM

STOP

SIGN 4
TOP PLATE SIZE 90 CM OCTAGONAL
BOTTOM PLATE SIZE 60 X 90 CM.

ONE WAY TRAFFIC

RESTRICKTION ENDS

SIGN 5
SIZE 60 CM CIRCLE
DEFINITION S PLATE
SIZE 20 X 60 CM

PLASTIC CONE WITH ARROW, HAZARD MARKER
CONES 73 CM HEIGHT, SQUARE BASE
OF 39 CM & TOP DIA. OF 6 CM. WITH
ARRANGEMENT OF FILLING SAND NOT
LESS THAN 20 KG
SIGN PLATE SIZE 45 X 60 CM.

CAT EYE
(ALUMINUM)
SIZE 10 X 10 CM. HAVING 3 NOS.
EYES OF 16 MM. DIA CONTAINING
7 BEDS EACH ON BOTH SIDES IN
RETRO REFLECTIVE
7. **Traffic safety measures during widening of roads where traffic can be passed over part width**

7.1 The Contractor shall provide Traffic Safety Measures on road during widening of existing road comprising of Traffic Sign Boards and devices as per detailed design, drawing and specification as directed by Engineer-in-Charge.

This includes providing traffic safety arrangements required for traffic control near the stretch of road where widening work is being taken up, before actual start of widening work of road. The Contractor will have to provide the traffic safety arrangements as per the detailed drawing. The traffic safety arrangements will have to be got approved from the Engineer-in-Charge by the Contractor before taking any construction activities for widening of road.

7.2 **The Contractor shall have to provide sign and cautionary and informative boards listed below as per the instructions and to the satisfaction of Engineer-in-Charge before commissioning of diversion. A certificate to that effect shall be obtained.**

A) The Sign No.1 “SPEED LIMIT (20)” shall be placed at a distance of 120 m. away from the point where the transition of carriageway begins. The sign board shall be of size 60 cm. dia. having white background and red border and the numerals shall be in black colour as per IRC:67-1977. Distance between Sign No.1 and Sign No.2 shall be minimum 20 m.

B) The Sign No.2 cautionary boards indicating “NARROW ROAD AHEAD” shall be placed at a distance of 80 m. away from the point of transition of carriageway. The signboard shall be of an equilateral triangle of size 90 cm. having white colour background, retro-reflective border in red colour and non reflective symbol in black colour as per IRC-67-1977.

C) The Sign No.3 signboard indicating “MAN AT WORK” shall be placed at a distance of 40 m. away from the point of transition of carriageway. The signboard shall be of an equilateral triangle of size 90 cm. having white colour background, retro-reflective border in red colour and non reflective symbol in black colour as per IRC:67-1977.

D) The Sign No.4 the board displaying the message “GO SLOW- WORK IN PROGRESS” shall be placed at the point of transition of carriageway. The size of signboard shall be 1.0 m. x 1.0 m. having red background and retro-reflective messages in white colour.
E) Sand filled plastic cones mounted with Retro-reflective Arrow Hazard Marker sign shall be placed as indicated in the drawing. Plastic cone shall be 73 cm. in height having 39 cm. square / hexagonal base. Sand filled plastic cones shall be placed along the road length where Work is in progress as shown in the drawing.

F) Retro-reflective Strong Inviolable Stand Type Barrier shall be placed at either ends of the widening area upto the edge of the formation. The barricades shall not be removed unless the permission is given by the responsible officer of the rank not less than Sub-Divisional Engineer. The Barricade shall have two plates of size 1.30 m. x 0.20 m. painted black and shall have White Retro-reflective Strips and mounted on Angle Iron Stand of 1.0 m. height.

G) Yellow light flasher shall be kept lit from sunset to sunrise, 2 Nos. along transition line of traffic and 3 Nos. at barriers on both sides as indicated in the drawing.

H) Informatory sign board indicating name of work, Amount of Contract, Completion period, Defect Liability period, Name of Contractor with Telephone No., Name of Executive Engineer with Telephone No. Shall be provided at the starting point, end point of the stretch of road proposed for widening as per the scope of the agreement. The sign board shall be having Blue Stove Enamel Paint background and white messages retro-reflective as per IRC-67-1977.

The Signs, Lights, Barricades and other traffic control devices shall be well maintained, till such time the traffic is commissioned on the widened road. The size, shape and colour of all the sign and caution boards shall be as mentioned above as per detailed drawings in accordance with the relevant I.R.C. specifications and as per Ministry of Road Transport and Highways Specifications.
DRAWING NO. 3

LEGEND
- PLASTIC CONE
- PLASTIC CONE WITH ARROW HAZARD MARKER
- YELLOW LIGHT FLASHER TO BE KEPT LIT FROM SUNSET TO SUNRISE
- POSITION OF FLAGMAN

NOTE: REFER DRAWING NO. 3-A FOR DETAILS.

ARRANGEMENTS OF SIGNS FOR WIDENING OF ROADS WHERE TRAFFIC CAN BE PASSED OVER PART WIDTH (NOT TO SCALE)
INCONVENIENCE IS REGRETTED

(90 X 90) CM

Contractor

Executive Engineer
8. **Other Regulatory Signs and Caution Boards**

The Contractor shall provide following traffic regulatory boards during the construction operations as instructed by Engineer-in-Charge.

8.1 **“ROAD WORK” SIGN**

The sign shall be used as indicated in the typical at all times when maintenance repairs or minor construction work is carried out. The sign shall be erected on a portable stand and shall be displayed only during the times when repair or minor construction work is in progress. It shall be placed face down or removed when activities are temporarily suspended such as at lunch time or at the close of the day.

The sign shall be erected when the maintenance or minor construction activity extends over longer period of time and is of a more stationary nature. It may also be used at intermediate locations on long construction areas to set apart certain road sections having a higher degree of construction activities than observed in other intersections.

The signs shall be located on the shoulder or at the curb in full view of approaching traffic.

The signs shall be erected at a distance from the work Site to be established as instructed by Engineer-in-Charge. When the “Traffic Control Person Ahead” sign is used, the “Road Work” signs shall be located at the same distance as defined above, in advance of the sign.

8.2 **“DETOUR AHEAD” SIGN**

The sign shall be used as indicated in the typical at all times when maintenance repairs or minor construction work is carried out. The sign shall be erected on a portable stand and shall be displayed only during the times when repair or minor construction work is in progress. It shall be placed face down or removed when activities are temporarily suspended such as at lunch time or at the close of the day.

The sign shall be erected when the maintenance or minor construction activity extends over longer period of time and is of a more stationary nature. It may also be used at intermediate locations on long construction areas to set apart certain road sections having a higher degree of construction activities than observed in other intersections.

The signs shall be located on the shoulder or at the curb in full view of approaching traffic.

The signs shall be erected at a distance from the work Site to be established as instructed by Engineer-in-Charge. When the “Traffic Control Person Ahead” sign is used, the “Road Work” signs shall be located at the same distance as defined above, in advance of the sign.
The signs shall be erected in advance of the “Detour – Turn Off” sign at a distance that is to be determined by referring to the appropriate Table.

The sign shall be erected in advance of the “Detour” sign on roadways having more than two lanes. The sign may be used in place of the sign on a roadway having more than two lanes where the signs are required only for short term day time operations, or in all urban work operations.

Two signs shall be erected, one on each side of the approaching lanes, if the highway is divided. Sign may be used in place of the sign on divided highways where the sign must be mounted on a narrow median.

On freeways, the oversize sign shall be used. A sign may be used where the sign must be mounted on a narrow median.

8.3 “DETOUR AHEAD – 2 km.” Sign

The sign shall be used where one direction of a divided highway detours across the median and travels in one lane of the opposite direction.

The signs shall be erected, one on each side of the approaching lanes.

The smaller sign may be used only on a narrow median, or where the signs are required only for short-term daytime work operations.

On freeways two oversize signs shall be erected. Signs may be used where the sign must be mounted on a narrow median.

The signs shall be erected 2 km. in advance of the “Detour – Turn Off” Sign.

8.4 “ROAD DIVERSION WARNING” SIGN

The signboard shall be erected at location where traffic is diverted around a work area. The sign indicates the vehicle path to be followed.
The sign shall be erected in advance of the detour at a distance determined by referring to the appropriate Table.

Two signs shall be erected, one on each side of the approaching lanes, if the highway is divided.

8.5 “TRAFFIC CONTROL” SIGN

This double-sided hand held traffic control device shall be used by TCP’s to direct traffic by signaling the desired warning towards oncoming vehicles in accordance with instructions detailed in the Manual, or the training given by the Road Authority or the Contractor. If only one TCP is being used, the side of the sign not facing the intended direction of control must be covered so as not to confuse drivers in the opposite direction.

* Colour

**Slow** : Chartreuse fluorescent background, black message and retro-reflective white border.

**Stop** : Red-orange fluorescent octagon, retro-reflective white message and border, black corners.

8.6 “TRAFFIC CONTROL PERSON (TCP) AHEAD” SIGN
8.7 "SURVEY CREW AHEAD" SIGN

This portable sign shall be used by survey crews at all times when survey work is in progress on the right of way and shall be removed or placed face down when the survey crew is not working.

The signs shall be placed by the survey crew in accordance with defined regulations or instructions issued.

It shall be mounted on a portable stand equipped at all times with two flag poles and fluorescent red orange flags.

8.8 "SOFT SHOULDERS" SIGN

The Soft Shoulders sign shall be used where soft shoulders present a hazard to vehicles that may get off the pavement.

The sign shall be erected at regular intervals approximately 300 m. apart over 1 km. stretch and 900 m. apart on longer sections and shall be removed after the shoulders have become thoroughly compacted.
8.9 “ADVISORY MAXIMUM SPEED” SIGN

The advisory maximum speed sign shall be used in place of the Maximum Speed sign where it is not practical to impose a regulatory speed limit. This would include sections where the geometrics of the roadway are not reduced due to construction but public traffic is required to mingle with heavy grading or like operations and it is considered that a combination of advisory speed signing and proper procedures by traffic control persons should be adequate provision for the safe passage of traffic. The signs should be erected not more than 4.5 m. from the edge of the road way approximately 600 m. apart for advisory speed zones upto 2 km. and approximately 1.5 km. apart for advisory speed zones of longer distances.

8.10 “CONSTRUCTION ZONE BEGINS/ENDS” SIGN

The “Begins” sign shall be erected not less than 30 m. from the commencement of the Construction Speed Zone and the “Ends” sign (not shown) shall be erected not less than 30 m. from the termination of the Construction Speed Zone. These signs are required on projects for which a Construction Speed Zone has been established by the Ministry or Municipal by law. The “Construction Zone” portion of this sign shall have a black message and border on a white reflectorized background. The “Begins” and “Ends” portion shall have a white reflectorized message and border on a black background.
8.11 "TRAFFIC CONES"

“Traffic Cones” may be used to delineate and to channelize traffic along a specified route during hours of daylight. This marker may be placed at the edge of the closed lane and spaced appropriately.

70 cm. cones with a white reflective collar (located on the upper half of the cones) can be used for emergency nighttime conditions, but they should not be considered for planned nighttime work sites.

The white reflective collar should consist of a minimum of one 10 cm. band of reflectivity level 1 "high intensity" material.

8.12 “ROAD CLOSED” SIGN

The “Road Closed” Sign shall be used where due to construction activities, a road way must be temporarily closed.
8.13 CONSTRUCTION MARKER

The construction marker may be used to delineate diversions and closed lanes, channelize traffic through a construction area, mark channelizing tapers in advance of closed lanes and generally provide separation between construction work sites and the flow of traffic.

The markers shall be placed at the edge of closed lanes and spaced in accordance with speed related distances.

Consideration should be given to other channelizing devices for high speed, high volume areas.

Appropriate bases and uprights (as approved by the road authority) are necessary to ensure the stability of sign and driver safety in both rural or urban areas.

8.14 DELINEATORS

Delineators are classified under three types.

(i) Roadway Indicators,
(ii) Hazard Markers, and
(iii) Object Markers.

Each of these serves a somewhat different purpose. “Roadway Indicators” are intended to delineate the edges of the roadway so as to guide drivers about the alignment ahead, particularly where it might be confusing for some reason. The objective of “Hazard Markers” is to define obstructions like guardrails and abutments adjacent to the carriageway, for instance at culverts and bridges which are narrower than the roadway width at approaches.
“Object Markers” are used to indicate hazards and obstructions within the vehicle flow path, for example channelising islands close to the intersections.

Delineators are basically driving aids and should not be regarded as a substitute for warning signs, road markings, or barriers for out of control vehicles.

8.15 ROADWAY INDICATIONS

8.15.1 Roadway indicators could be in the form of guide posts made of metal, concrete, timber, cut stone, plastic or other suitable material depending on availability and cost. Iron tubes, concrete or plastic pipes, wooden posts, steel channel sections etc. can be conveniently adopted for the purpose. Plastic posts have the advantage of being safer for out of control vehicles while concrete pipes would be less prone to vandalism or theft. The posts may have a circular, rectangular or triangular cross section; however, the side facing the traffic should not be less than 10 cm. wide.

As an alternative to normal posts, empty bitumen drums, suitably painted, can also be used for roadway delineation, especially when it is for temporary use in the event of diversions, road works etc.
Roadway delineator posts should be about 80-100 cm. high and painted alternately black and white in 15 cm. wide strips. Bitumen drums should also be painted similarly.

White unreflecterised delineators are permissible. It is preferable that for improved visibility at night and at locations where visibility is poor due to fog etc., the delineator posts should be of reflecterised type, fitted with white coloured rectangular (80 x 100 mm.) or circular (75 mm. dia.) reflecterised panels at the tip. For additional guidance, such panels may also be fixed on reverse side of posts fixed on the right hand side. These too should be white in colour. If feasible, reflectors should also be fixed on empty bitumen drums employed for delineation.

8.15.2 APPLICATION

The decision to use roadway indicators, whether continuously or in short sections selectively, will be guided by factors such as importance of the road, volume of fast traffic, speed of travel, accident experience, danger posted by any specific deficiency in the road alignment etc. Primary use of roadway delineators is in non-urban sections of main roads, especially in curved reaches. Unless road and traffic conditions so warrant, their use in urban sections will normally not be necessary, nor on roads which are adequately lighted.

In situations where a guardrail or parapet wall is provided for safety, roadway indicators may be mounted above immediately behind the guardrail. In addition, the guardrail might be painted black and white alternately as explained above.

8.15.3 CRITERIA FOR USE

Normally use of roadway indicators should be considered under the following situations:

(i) Curved Sections

(a) Horizontal curves of radius 100 m. or less.
(b) Vertical curves with inadequate

(ii) Straight Sections

(a) Road sections where visibility is often poor due to mist, fog or snowy conditions.
(b) Reaches where the alignment appears uncertain to the driver e.g. pavement with transitions, temporary road diversions, etc.
(c) Road Sections subject to frequent submergence and pounding due to storm water.
(d) Approaches to narrow bridges and culverts.
(e) Valley side of hill roads.
(f) Road embankments exceeding 3 m. in height.
(g) Approaches to important intersections.
(h) Special problem points such as causeways and tunnels.
8.15.4 Placement and Spacing

As a general rule, delineator posts should be erected at the edge of the usable shoulder, and in the case of kerbed sections at a distance of 0.6 to 1.5 m. from the kerb face. On hill roads, they may be placed either on the parapet or at the edge of the shoulder. The overall line of posts should be parallel to centerline of the road ordinarily, except that at guardrails or other obstructions, it may be so adjusted that the delineators are in line with or inside the innermost edge of the obstruction. As far as practicable, the tops of the posts should be in a uniform grade, taking into account the effects of shoulder cross-fall and super-elevation.

**Note**: Delineators should be placed at a constant distance from the carriageway edge except that when the construction exists near the pavement edge, the line of delineators should make a smooth transition so as to be in line with the construction.

Delineator installation on curved approach to a bridge.

On horizontal curves, the spacing should be fixed in relation to the curve radius as given in Table below.

**RECOMMENDED SPACING FOR ROADWAY INDICATORS ON HORIZONTAL CURVES**

<table>
<thead>
<tr>
<th>Radius of Curve (metres)</th>
<th>Spacing on Curve, S (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>50</td>
<td>8</td>
</tr>
<tr>
<td>100</td>
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<td>900</td>
<td>48</td>
</tr>
<tr>
<td>1000</td>
<td>50</td>
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</tbody>
</table>
Delineators should be continued beyond the curve on either side. The spacing of first, second and third delineators on the approaches, in advance and beyond the curve, should be 1.8S, 3S and 6S respectively (where S is the normal spacing on the curve) but not exceeding 50 m. The method of placement is shown below:

Notes:
1. Adjust distance ‘X’ suitable so that the last roadway delineator is at the end of the curve.
2. Install all delineators at edge of the roadway perpendicular to the on coming traffic.
3. ‘S’ is spacing of delineators on the curve as per radius of curve.

8.15.5 Roadway delineator spacing on curves.

On vertical curves where visibility is not adequate, roadway indicators should be provided at a spacing of 30 to 50 m.

On straight sections, roadway indicators should be spaced uniformly 50 – 70 m. from each other, according to local conditions, the posts being in pairs, one on each side of the roadway. On divided roads, these should also be provided on medians. Where the normal uniform spacing is affected by crossroads, driveways etc. and a delineator would fall in that area, the same may be moved in either direction a distance not exceeding one quarter of the usual spacing. If it still falls in such a zone, it should be omitted.

At problem locations like causeways, road delineators may be installed at a much smaller spacing, say 5 or 10 m. according to local conditions.

8.16 HAZARD MARKERS

Design

Any of the following two designs may be adopted for hazard markers:

i) **Type 1**: A marker consisting of three red reflectors arranged vertically.

ii) **Type 2**: Striped markers consisting of alternately black and yellow stripes sloping downward at an angle of 45° towards the side of the obstruction on which the traffic is to pass. If possible, reflectorised paint may be used for this purpose.
Application and Placement

Hazard markers should be put up wherever there are objects so close to the road as to constitute an accident hazard e.g. bridge abutments, guardrails etc. Either of the two designs, Type 1 or Type 2 could be used for the purpose.

The markers should be erected immediately ahead of the line of obstruction for instance on a narrow bridge just where the bridge rail starts. When placed in conjunction with a guardrail on a bridge approach, the hazard markers should be located immediately behind the guardrail and at sufficient height to ensure that these will be properly visible to the oncoming traffic. The inside edge of the markers should be in line with the inner edge of the obstruction as far as possible.

The markers on a narrow bridge in continuation of a curve shall be provided.

8.17 OBJECT MARKERS

Design

Several designs of object markers are possible. These consist basically of circular red reflectors arranged on triangular, rectangular panels, or alternately all red reflectors mounted similarly. The markers may be bigger if the conditions so warrant.

At problem locations, red reflectors may also be used independently for instance inset on the face of the kerb.

8.17.1 Application

Typical locations where object markers should be used are:

i) Traffic islands at approaches to intersections;
ii) Around periphery of rotary islands;
iii) Median openings;
iv) Facing approaching traffic at islands forming left infiltration lanes;
v) On medians islands on far side of the intersections;
vi) At points where traffic divides into different directions e.g. down ramps of a grade separated intersection, and
vii) On far side of T – Junctions and street dead-ends.

Object markers need not, however, be put up on islands provided with lighted bollards.

8.17.2 Placement

The markers should be erected facing the traffic close to the point where the construction within the roadway starts, for instance in the case of a channelising island at its nose point. No part of the object marker should, however, encroach upon the carriageway. To ensure this, it is desirable that markers should be set back from the face of the kerb at distance of at least 50 cm.

Height of object markers might vary depending upon the situation, but should be generally around 40 – 50 cm. so that reflectors are fully visible to the approaching traffic.
8.18 REFLECTORS

8.18.1 REQUIREMENTS FOR REFLECTORS

Reflectors can be made of films, synthetic materials like plastic or glass. Whatever material is used, it should have stable optical characteristics, desired colour (i.e. white for roadway indicators and red for hazard markers or object markers) and a visibility of at least 200 m. under clear weather conditions when illuminated by the upper beam of the car headlights.

Synthetic reflectors costs relatively less and may be preferred, but glass reflectors have the advantage that despite frequent cleaning which would scratch their surfaces, they maintain their efficiency. Presence of water can, however, affect the efficiency of synthetic reflectors if it is therefore, desirable that these should be mounted in welded waterproof units.

The reflector units should be inset into the lateral face of the delineator post or securely fastened to it by suitable means. Rivets are preferable to screws. The units should be easily replaceable so that damage to a unit does not necessitate changing the post altogether.

8.19 INSTALLATION OF DELINEATORS

Techniques of installation can vary according to nature and stiffness of the ground and local custom. In hard ground, posts may be installed by burying or pressing them into the ground. If the ground is not stiff enough, a proper foundation, whether prefabricated or cast-in-situ, will be desirable. Installation should ensure that the post does not change its orientation, particularly when it is of a circular shape.

The delineators should be so positioned that the reflectorised or painted face is perpendicular to the direction of travel.

8.20 MAINTENANCE

Iron, wooden or concrete posts should be repainted regularly. To remove dirt, the reflective unit should be scrubbed clean periodically, especially after rains. The ground around the delineators should be kept clean by cutting grass and bushes periodically so that visibility of the delineators is not affected.

8.21 PROVIDING RUMBLING STRIPS AND SPEED BREAKERS

On Highways the rumbling strips are to be provided for speed regulation.

The rumbling strips to be provided shall be of 15 to 25 mm. height, 200 to 300 mm. wide spaced about a metre centre to centre, roughly 15 to 20 rumbling strips shall be provided at one location.

The location of the rumbling strips shall be properly painted and made prominently visible and also necessary cautionary signs as prescribed by the IRC are provided to caution the drivers in advance about the presence of the speed breakers.

On other roads the hump type speed breaker shall be provided. The design comprises of a circular hump having radius of 17 metres and a maximum height of 10 cm. at the centre extending to the full width of the roadway (i.e. both on the carriageway and shoulders).
RECOMMENDED SPECIFICATION FOR ROUNDED HUMP TYPE OF SPEED BREAKER FOR GENERAL TRAFFIC PREFERRED SPEED 25 km/h

RECOMMENDED SPECIFICATION FOR ROUNDED HUMP TYPE OF SPEED BREAKER FOR HEAVY TRUCK AND BUS TRAFFIC AT PREFERRED SPEED CROSSING

RECOMMENDED PLACEMENT OF HUMP/HUMPS IN MID BLOCK SECTION
HUMP MARKING IN CHEQUERED PATTERN AND SIGN BOARD LOCATIONS
SPEED BREAKERS AT T-INTERSECTION ON RAILWAY CROSSING

PLAN OF SPEED BREAKER ON APPROACH TO A SHARP CURVE.
Painting of kerbs of central verge and kerbs of Road Bridges

To improve the traffic safety and also enhance the aesthetics of the bridge the kerbs shall be painted with a luminous paint with alternate strips of black and white.

(A)

(B)

OR

500  500

500  500
COLLAPSIBLE BARRICADING

- Red Flag
- 25mm Ø Pipe
- 12 mm. white border
- Necessary hooks to be provided to board for hanging it
- 12 Nos.
- 38
- P.W. Dept. work in progress
- Red Back ground
- 3.65
- Collapsible barricading made of flats angles or rods as available
- Pipes of 12.50\% or pedestal of mild steel
- 18 mm Ø
- 0.9
- 1.05
- 8’
8.22 INFORMATORY BOARD FOR WORK

The Contractor shall install at his own cost the informatory board of minimum size 1.20 m x 2.45 m with other details as shown in drawing below on both ends of road section under construction in case of road works and at locations approved by Engineer-in-Charge in case of buildings and bridge work. The locations and size of board may be changed if desired by Engineer-in-Charge. The board shall be made of reflective sheeting of Engineering grade on 3mm thick M.S. Sheet, with yellow background and letters in black colour.

INFORMATORY SIGN BOARD
1. ALL DIMENSIONS ARE IN METRE
2. TOTAL NO. OF COLUMNS = 14 NOS.
3. BUILT UP AREA = 68 SQM
4. DRG. IS NOT TO SCALE

SCHEDULE OF DOORS AND WINDOWS
D = 1.05 M X 2.40 M
D1 = 1.5 M X 2.10 M
D2 = 0.75 M X 2.10 M
W1 = 1.20 M X 1.50 M
V = 0.60 M X 0.90 M