

**GOVERNMENT OF MAHARASHTRA
PUBLIC WORKS DEPARTMENT
PUBLIC WORKS REGION, NAGPUR
PUBLIC WORKS CIRCLE, CHANDRAPUR
Public Works Division Wardha**

E-Tender Papers (C Form Lumsum basis)

FOR

**CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI,
DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A,
IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA.**

NAME OF AGENCY-

AGREEMENT No. C/

/ DL/2025-26

CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER
ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

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GOVERNMENT OF MAHARASHTRA

PUBLIC WORKS DEPARTMENT

Original Agreement No. : **C (Lum-sum)**

Name of Work : **CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..UR.**

Name of Contractor :

Date of Receipt of Tender : **As per on line Tender Schedule**

No. & Date of Work Order :

Amount put to Tender : **Rs. 26,74,94,463.000**

Percentage quoted :

Amount of Contract :

Date of Commencement :

Time stipulated for completion of work : **24 (Twenty Four) Calender months from the date of written order to start work, which will include the monsoon period.**

Date of completion as per Agreement :

Actual Date of Completion :

Reference to sanction of tender :

Extension of time limit : 1
2
3

Certified that this original Agreement contains : **Pages 01 to and Drawing**

DETAILS OF WORK

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A in KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA.

Estimated Cost put to tender : **Rs. 26,74,94,463.000**

Earnest Money : **Rs. 13,37,500/-**

The EMD applicable amount shall be paid via Online mode or other mode like DD/ FDR. Total Security Deposit 1% (One percent) **Rs. 26,75,000/-** (50% in cash at the time of Agreement and 50% from R.A.bills).

Tender Schedule

Cost of Tender Form	:	Rs.5900/-
Period for DownloadingTender Forms	:	Refer Online schedule on portal https://mahatenders.gov.in
Date of Pre-bid meeting	:	On dt. .5/2026. at 16.00 hours in the office of Chief Engineer Public Works Region Nagpur.
Last date and time for online bid preparation and hash submission (technical and financial)	:	Refer Online schedule on portal https://mahatenders.gov.in
Date and time for online bid data decryption and re-encryption (technical and commercial)	:	Refer Online schedule on portal https://mahatenders.gov.in
Receipt of <u>online EMD / ,Undertaking on paper in prescribed format, <u>Tender Document fees, to be paid online only via Payment Gateway mode/</u></u> TDR of Additional performance Security Deposit (If required)	:	<u>Document Tender Fee to be paid via online mode only.and EMD to be paid via online modeor other mode like DD/FDR. .</u>
Registration class of Contractor	:	Not Applicable

DETAILS OF WORK

1. **NAME OF WORK: -** CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A in KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..
- 2 **Estimated Cost** **Rs. 26,74,94,463.000**
- 3 **Earnest Money (The EMD applicable amount shall be paid via Online mode or other mode like DD/FDR.).** **Rs 13,37,500/-**
- 4 Total Security Deposit (Rs.26,75,000/-) 0.50 % of tendered value in the form of cash or Bank Guarantee in approved form as initial Security Deposit at the time of acceptance of tender & 0.50 percent will be recovered from R.A. Bills of Contractor at 1% of the gross bill value.
- 5 Time Limit For Completion Of Work 24 (Twenty Four) Calendar Months from date of written work order to start work including monsoon.
- 6 **Cost of Tender Form** **Rs.5900/-**
- 7 Period for Downloading Tender Forms Refer **Online schedule on portal <https://mahatenders.gov.in>**
- 8 Date of Pre-bid meeting and Venue **on .5.2026 at 16.00 hours in the office of Chief Engineer Public Works Region Nagpur.**
- 9 Last date and time for online bid preparation and hash submission (technical and financial) Refer **Online schedule on portal <https://mahatenders.gov.in>**
- 10 Date and time for online bid data decryption and re-encryption (technical and commercial) Refer **Online schedule on portal <https://mahatenders.gov.in>**
- 11 Receipt of online EMD , stamp paper of Rs. 100/- bond Affidavit (Original) in prescribed format given in Annexure I and Tender Document fees, to be paid online only via Payment Gateway mode / TDR of Additional performance Security Deposit (If required) / Location Map of Hot Mix Plant Document Tender Fee and EMD to be paid via online mode only. It is ensure that the EMD paid online through bidders account only
- 12 Registration class of Contractor Not Applicable

TO BE FILLED BY THE CONTRACTOR

I/We have quoted my/our offer in lump sum rate in words as well as in figures. I/We further undertake to enter into contract in regular "C" form(Lumsum) in Public Works Department.

Name and signature of Contractor/

Power of Attorney holder

CHECK LIST FOR DOCUMENTS TO ACCOMPANY THE TENDER

(VIDE CHAPTER - III PARA - 11)

Sr. No.	BRIEF DETAILS OF DOCUMENTS REQUIRED.TO BE UPLOADED IN ENEVELOPE NO I	WHETHER UPLOAD OR NOT
1.	<p>Earnest money of minimum 13,37,500/- shall be paid via online using NEFT/RTGS or payment gateway mode. Or other mode like DD /FDR <u>It is ensure that the EMD paid online through bidders account only</u></p> <p>After Tender opening, the EMD of the unsuccessful bidder will be returned to account provided by the bidder during the bid preparation as given in challan under Beneficiary Account Number.</p>	
2.	<p>Selected Lowest bidder (L1) has to submit the hard copy of Performance Security in the form of Demand Draft of required amount as per condition given in Performance Security to the office of Executive Engineer Public Works Division Wardha within 8 (Eight) days from the date of opening of financial bid.</p> <p>The Performance Security shall be made as per Clause specified in document</p>	
3.	<p>Tender form, conditions of contract, specifications and contract drawings can be downloaded from the e-Tendering portal of Public Works Department, Government of Maharashtra i.e., https://mahatenders.gov.in after entering the details, payment of Rs.5900/- (Rupees Five Thousand Nine Hundred only) should be paid online using payment gateway. The fees of tender document will be non refundable. Further information regarding the work can be obtained from the above office.</p>	
4.	<p>Scanned from original copy of list of works in hand and works tendered along with supporting certificates.</p>	
5.	<p>Scanned from original copy of Details of the other works tendered for and in hand as on the date of submission of this tender in prescribed form</p>	
6.	<p>Scanned from original copy of the Details of work of similar type with supporting certificates.</p>	
7.	<p>Scanned From original copy of List of Technical Personnel of the tenderer and further likely to be appointed on this work</p>	
8.(i)	<p>Scanned from original copy of Self Declaration regarding completeness,</p>	

	correctness and truthfulness of documents submitted on Plain paper as per prescribed proforma given in Annexure I	
8(ii)	Affidavit regarding completeness, correctness and truthfulness of documents submitted on Stamp paper of Rs.100/- as per prescribed proforma given in Annexure II	
9.	Scanned from original copy of Power of Attorney on behalf of firm, proprietorship firm /Partnership firm / Pvt. limited Company or any other registered company Registered with Registrar of Company to sign agreement/ other correspondence with department authority.	
10	Joint Venture is allowed. (As per Conditions Given)	
11	Scanned from original copy of Statements showing the similar type of bridge works executed during the last five years in prescribed form	
12	Scanned from original copy of Contractor own design with broad details.	
13	The tenderer should further demonstrate availability of the Machinery/equipment's according to list of machinery mentioned in Schedule No.1	
14	<p>Availability for this work following technical personnel...</p> <p>(i) Project Manager ---- One Number having minimum qualification as B.E. (Civil) with not less than 10 years' experience in construction and supervision of bridge work (information to be submitted in Form VII. The scanned copy of curriculum vitae shall be upload in Envelope No.1</p> <p>(ii) Site Engineers ----- 2 Numbers having minimum qualification as Diploma (civil) having experience of 10 years</p> <p>(iii) Supervisor ----- One Number having experience of 10 years and other one having experience of minimum 5 years of Bridge works</p> <p>(iv) Lab Assistant ----- One Number having experience of 5 years of lab work (BE Civil)</p> <p>The scanned copy of curriculum vitae shall be upload in Envelope No.1 Form VII</p>	
15	Use of Specialized machinery as per DTP Conditions	

16	<p>(i) Scanned Copy of original Certificate for having Minimum annual turnover of not less than Rs. 1003.10 lakhs (Rupees Ten crore Three lakh ten thousand Only) in any one year during last Five financial years updated to current cost (Such certificate for civil engineering works are required to be obtained from the Chartered Accountant of Maharashtra state / any State of India). For updating to current cost please refer table at the end of this clause.</p>	
	<p>a) Scanned Copy of original Certificate for having Successfully commenced and completed three works of bridge / Viaduct / Aqua duct / ROB / RUB / flyover on his own design / PWD Design with any Government or Semi Government organization each bridge work value not less than Rs. 509.33 lakhs updated to current cost and each bridge of minimum length 90.00 meters, and three Cement Concrete (pavement Concrete) Road work, each work value not less than 421.62 lakhs in last five financial years and current year. For updating please refer table (Such certificate are required to be obtained from the officer not below the Rank of Executive Engineer (Completed Work Carried out In Govt/ Semi Govt Bodies such as MHADA, MSEB, MIDC, CIDCO Etc or Local Bodies. will only be considered.) OR</p> <p>Scanned Copy of original Certificate for having Successfully commenced and completed two works of bridge / Viaduct / Aqua-duct / ROB / RUB / flyover on his own design / PWD Design with any Government or Semi Government organization each bridge work value not less than Rs. 636.67 lakhs updated to current cost and each bridge of minimum length 110.00 meters and two Cement Concrete (pavement Concrete) Road work, each work value not less than 527.01 in last Five financial years and current year. For updating please refer table (Such certificate are required to be obtained from the officer not below the Rank of Executive Engineer (Completed Work Carried out In Govt/ Semi Govt Bodies such as MHADA, MSEB, MIDC, CIDCO Etc or Local Bodies. will only be considered.) OR</p> <p>Scanned Copy of original Certificate for having Successfully commenced and completed one work of bridge / Viaduct / Aqua-duct / ROB / RUB / flyover on his own design / PWD Design with any Government or Semi Government organization each bridge work value not less than Rs. 1018.67 lakhs updated to current cost and each bridge of minimum length 170.00 meters and one Cement Concrete (pavement Concrete) Road work work value not less than rs.843.23 lakhs, in last five financial years and current year. For updating please refer table (Such certificate are required to be obtained from the officer not below the Rank of Executive Engineer (Completed Work Carried out In Govt/ Semi Govt Bodies such as MHADA, MSEB, MIDC, CIDCO Etc or Local Bodies. will only be considered.)</p>	

(iii) Scanned Copy of certificate of satisfactorily executed minimum quantities of following items in any continuous twelve calendar months in five years prior to current year and current year. (Such certificates are required to be obtained from the officer not below the rank of Executive Engineer or Equivalent) and the certificate shall specifically mention the period of execution as continuous twelve calendar months.

a.) Concrete of grade M-20 & above	- 2448.00	Cum.
b.) HYSD/ TMT steel	- 164.70	MT.
c.) Cement Concrete (pavement Concrete) M40	1580.00	Cum.
d.) GSB, GR. I, GR.II	- 1336.00	Cum.

The list is not exhaustive and tenderer are advised to go through tender documents carefully and enclose all documents mentioned in the blank tender form.

CHAPTER – I

GOVERNMENT OF MAHARASHTRA

PUBLIC WORKS DEPARTMENT

INVITATION FOR TENDERS

BRIEF TENDER NOTICE

NAME OF WORK: - CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

Online lumpsum offer on contractors own Design & Drawing in "C" form are invited by the Executive Engineer, Public Works Division Wardha . Following work from Bidders who fulfill the required criteria. The name of work, estimated cost, earnest money, security deposit, time limit for completion etc. are as under.

Sr. No.	Name of work	Estimated Cost (Rupees)	Earnest Money (Rupees)	Security Deposit (Rupees)	Class of Contractor	Time limit in Tender (Calendar Months)
1	CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..	26,74,94,463.00 (Work Portion Rs- 26,05,97,561.00 Royalty- Rs 57,45,942.00 Testing- 11,50,960.00 Tender Cost- 26,74,94,463.00	13,37,500/-	26,75,000/-	Not Applicable	24 (Twenty Four) Months (Including monsoon)

1. Bidding documents may be downloaded from the e-Tendering portal of Public Works Department, Government of Maharashtra i.e. <https://mahatenders.gov.in> after entering the details, payment of **Rs.5900/- (Rupees Five Thousand Nine Hundred only)** should be paid online using payment gateway mode only. The cost of Bid document will be non refundable. Interested bidders may obtain further information regarding the work from the above office.
2. The Bids will be opened as per the e-Tender Schedule, in the presence of such intending Bidders or his/ their authorized representatives who shall be present at that time.
3. Bid Security of the amount specified for the work in the table shall be paid via online using NEFT / RTGS or payment gateway mode or In the Form of DD / FDR / DD / FDR shall be Drawn in the Name of Executive Engineer, Public Works Division Wardha . **Bid security shall be drawn directly from the**

account of Bidder / Bidding Firm or lead partners in case of J.V. The guidelines for the same are included in bid document.

4. The Bids must be submitted online on <http://mahatenders.gov.in> or on as per NIT & Technical bid will be opened on date as per NIT, in the presence of bidders who have to attend in the office of the **Superintending Engineer, P.W. Circle Chandrapur (Bid opening Authority) (As per NIT)**
5. The pre-bid meeting will be held on Date 05.2026 @ 16.00Hrs. (As per e-tender schedule uploaded on e-portal <http://mahatenders.gov.in>) in the presence of bidders who wish to attend in the office of the **Chief Engineer, P.W. Region Nagpur.**
6. **Physical Submission**
 1. "Sealed Envelope No. I -"Contained -Technical & Financial Bids as specified in NIT after Submission of Bid within 72 hours (excluding holidays). Name of work and e-tender no. shall be written on the envelope.
 2. Submission of hard copy is a essential. However, hard copies will be opened only if there are problems in opening/ downloading of tender offers. If the contractor inadvertently or otherwise does not submit hard copy, then it shall not constitute a bar to open his e-offer. His online tender shall be opened by the tender opening authority and will be processed. If the contractor's offer is lowest then it will be accepted and his downloaded tender shall be treated as hard copy.
7. Before submitting the proposal, the bidders shall mandatorily register and enlist themselves (the firm and all key personnel), on <http://mahatenders.gov.in> further, the bidders shall follow the operating procedure as may be prescribed on the said website.
8. Contractor shall submit bar chart /CPM / PERT this work by visiting site and taking review of the work within fifteen days after receiving letter regarding performance security.
If contractor fails to do so then 1% amount shall be deducted from each running bill. Progress of work shall be monitored as per approved bar chart by the competent authority (i.e. E.E./S.E. or C.E.) after scrutiny of the bar chart/CPM/PERT submitted by contractor. If progress is satisfactory, then 75% amount deducted shall be returned to contractor and remaining 25% amounts shall be forfeited to Government.
9. All the Clarifications, Circulars, Notifications and Resolutions related to tenders issued by Government from time to time till the date of Submission of Bid shall be applicable and binding to the bidders and shall be treated as part of agreement unless specifically mentioned on the contrary or modified in the bid Documents.
10. If offers of two or more bidders are found identical, then all such bidders shall be asked to submit their revised offers in closed envelope in presence of tender opening authority. The offers shall be less than the offer already submitted. The bidders with lowest offer shall be considered for award of work.
11. **ROYALTY, and Testing Charges**
All Testing charge for required quantity of Testing, and Royalty on account of extraction of construction material payable under minor mineral act prevailing in the State is included in schedule of rates. Any such due payable to Govt. or any other Agency / Organization, if not paid by contractor

and claimed by such authority, same shall be deducted from the Contractor's bill and reimbursed to the claimant.

12. Contractor should upload Affidavit on Rs.100/- stamp paper as per Appendix-1 (Attached at the end of this article)
13. At any point of time during tender process, work execution period, Defect Liability Period, submitted papers/documents/applications including material purchase vouchers, test reports, bitumen challans, quantity related papers or any papers of contractor should be true, correct & of the papers submitted by Contractor is found incorrect, faulty, not true, dubious, bogus, forged etc. then relevant actions of blacklisting & criminal proceedings as per Indian Penal Code (IPC) shall be initiated against Contractor/ JV / Partnership Firms/Private Ltd./Companies(Bidder). PWD Officers / Engineers / Divisional Account Officers shall not be held responsible for the papers submitted by the Contractor.
14. During Technical Opening/Scrutiny of envelop No.1 of tender, if contractor submits false papers / reports for fulfillment of qualifying criteria, then envelop No.2 of such contractor shall not be opened. Also such PWD registered contractor / non registered contractor shall be blacklisted & information of contractor being blacklisted shall be circulated to all P. W. Divisions & allied P. W. Departments.
15. After issuance of work order, if it is founds that papers submitted / uploaded are forged, bogus, incorrect, then such contractor shall be blacklisted & Criminal Proceeding as per IPC shall be initiated. If work is at initial stage, the tender of work shall be cancelled.
16. As per the Government Resolution dated 11 October 2024, any bid exceeding 10% of the tendered cost shall not be accepted for the said work. If a contractor submits a bid that exceeds this limit, even if it is the lowest bid, it shall be rejected prima facie without further consideration, and the tender for the said work shall be reinvited.

Instruction to Bidders

TENDERING PROCEDURE :

1.1 A. Blank Tender Forms

Bidding documents can be purchased/down loaded from the e-Tendering Portal of Public Works Department, Government of Maharashtra i.e. <https://mahatenders.gov.in> after paying Tender Fees via online **mode** as per the Tender Schedule.

- 1.1.1 If it is not possible on line to download the drawings, the set of drawing may be supplied to the bidders in "**Hard Copy**" by the Department, on Proof of receipt of payment towards cost of bidding documents as per the tender schedule.
 - 1.1.2 The bid submitted by the bidder shall be unconditional. Conditional bids shall be summarily REJECTED.
 - 1.1.3 All bidders are cautioned that bids containing any deviation from the contractual terms and conditions, specifications or other requirements and conditional bids will be treated as non-responsive. The bidder should clearly mention in forwarding letter that his offer (in envelope No. 1& 2) does not contain any conditions, deviations from terms and conditions stipulated in the tender.
 - 1.1.4 Bidders should have valid Class-II/III Digital Signature Certificate (DSC) obtained from any Certifying Authorities.
 - 1.1.5 For any assistance on the use of Electronic Tendering System, the Users may call the below numbers: **Contact Us (NIC) The 24x7 Toll Free Telephonic Help Desk Number 1800 3070 2232**
Mobile Number +91787807985/86
Mobile Number +7878007972/731.2.8
- 1.2 Guidelines to Bidders on the operations of Electronic Tendering System of Public Works Department is available at E-Tendering portal of P.W. Department i.e. <https://mahatenders.gov.in> The bidder shall obtain clarification/help from assistance mentioned in para 1.2.7 No grievances /claims will be entertained on failure of submission of online bid.

A. Pre-requisites to participate in the Bidding processed by PWD:

1. Enrollment and Empanelment of Contractors on Electronic Tendering System:

The Contractors interested in participating in the Bids of Public Works Department processed using the Electronic Tendering System shall be required to enroll on the Electronic Tendering System to obtain User ID.

After submission of application for enrolment on the System, the application information shall be verified by the Authorized Representative of the Service Provider. If the information is found to be complete, the enrolment submitted by the Vendor shall be approved.

For participating in Limited and Restricted tenders the registered vendors have to apply for empanelment on the sub-portal of PWD in an appropriate class of registration. The empanelment will have to be approved by the respective officer from the PWD. Only empanelled vendors will be allowed to participate in such bids.

The Contractors may obtain the necessary information on the process of enrolment and empanelment either from Helpdesk Support Team or may visit the information published under the link Enroll under the section E-Tendering Toolkit for Bidders on the Home Page of the Electronic Tendering System.

2. Obtaining a Digital Certificate :

The Bid Data that is prepared online is required to be encrypted and the hash value of the Bid Data is required to be signed electronically using a Digital Certificate (Class — II or Class — III). This is required to maintain the security of the Bid Data and also to establish the identity of the Contractor transacting on the System.

The Digital Certificates are issued by an approved Certifying Authority authorized by the Controller of Certifying Authorities of Government of India through their Authorized Representatives upon receipt of documents required to obtain a Digital Certificate.

Bid data / information for a particular Tender may be submitted only using the Digital Certificate which is used to encrypt the data / information and sign the hash value during the Bid Preparation and Hash Submission stage. In case during the process of preparing and submitting a Bid for a particular Tender, the Contractor loses his/her Digital Signature Certificate (i.e. due to virus attack, hardware problem, operating system problem); he / she may not be able to submit the Bid online. Hence, the Users are advised to store his / her Digital Certificate securely and if possible, keep a backup at safe place under adequate security to be used in case of need.

In case of online tendering, if the Digital Certificate issued to an Authorized User of a Partnership Firm is used for signing and submitting a bid, it will be considered equivalent to a no objection certificate / power of attorney to that User to submit the bid on behalf of the Partnership Firm. The Partnership Firm has to authorize a specific individual via an authorization certificate signed by a partner of the firm (and in case the applicant is a partner, another partner in the same firm is required to authorize) to use the digital certificate as per Indian Information Technology Act, 2000.

Unless the Digital Certificate is revoked, it will be assumed to represent adequate authority of the Authority User to bid on behalf of the Firm for the Tenders processed on the Electronic Tender Management System of Government of Maharashtra as per Indian Information Technology Act, 2000. The Digital Signature of this Authorized User will be binding on the Firm. It shall be the responsibility of Partners of the Firm to inform the Certifying Authority or Sub Certifying Authority, if the Authorized User changes, and apply for a fresh Digital Signature Certificate. The procedure for application of a Digital Signature Certificate will remain the same for the new Authorized User.

The same procedure holds true for the Authorized Users in a Private / Public Limited Company. In this case, the Authorization Certificate will have to be signed by the Director of the Company or the Reporting Authority of the Applicant.

For information on the process of application for obtaining Digital Certificate, the may visit the section Digital Certificate on the Home Page of the Electronic Tendering System.

3. Recommended Hardware and Internet Connectivity:

To operate on the Electronic Tendering System, the Contractors are recommended to use Computer System with at least 1 GB of RAM and broadband connectivity with minimum 512 kbps bandwidth.

4. Set up of Computer System for executing the operations on the Electronic Tendering System:

To operate on the Electronic Tendering System of Government of Maharashtra, the Computer System of the Contractors is required be set up. The Contractors are required to install Utilities available under the section Mandatory Installation Components on the Home Page of the System.

The Utilities are available for download freely from the above mentioned section. The Contractors are requested to refer to the E-Tendering Toolkit for Bidders available online on the Home Page to understand the process of setting up the System, or alternatively, contact the Helpdesk Support Team on information / guidance on the process of setting up the System.

B. Steps to be followed by Contractors to participate in e-Tenders processed by PWD

i. Preparation of online Briefcase:

All Technical Document must be Scanned & Uploaded in RAR/PDF Format.

ii. Online viewing of Detailed Notice Inviting Tenders:

The Bidders can view the Detailed Tender Notice along with the Time Schedule (Key Dates) for all the Live Tenders released by PWD on the home page of PWD e-Tendering Portal on <https://mahatenders.gov.in> under the section Recent Online Tender.

iii. Download of Tender Documents:

The Pre-qualification/Main Bidding Documents are available for free downloading. However to participate in the online tender, the bidder must purchase the bidding documents via online mode by filling the cost of Tender Form Fee.

iv. Online Bid

For BID SECURITY payment, If bidder use Online Net Banking mode Only. Bidder will have to validate the BID SECURITY payment as a last stage of bid preparation. If the payment is not realized with bank, in that case system will not be able to validate the payment and will not allow the bidder to complete his Bid Preparation stage resulting in nonparticipation in the aforesaid e-Tender.

v. Digitally signing the documents to be uploaded

The contractor can scan the documents in PDF/RAR format. Avoid scanning the document in OTHER format. It is mandatory to upload all the documents with digital signature using PDF/RAR Format.

5. Short listing of Bidders for Financial Bidding Process:

The Tendering Authority will first open the Technical Bid documents of all Bidders and after scrutinizing these documents will shortlist the Bidders who are eligible for Financial Bidding Process. The shortlisted Bidders will be intimated by email.

6. Opening of the Financial Bids :

The Bidders may remain present in the Office of the Tender Opening Authority at the time of opening of Financial Bids. However, the results of the Financial Bids of all Bidders shall be available on the PWD e-Tendering Portal immediately after the completion of opening process.

7. Tender Schedule (Key Dates) :

The Bidders are strictly advised to follow the Dates and Times allocated to each stage under the column "Contractor Stage" as indicated in the Time Schedule in the Detailed Tender Notice for the Tender. All the online activities are time tracked and the Electronic Tendering System enforces time- locks that ensure that no activity or transaction can take place outside the Start and End Dates and Time of the stage as defined in the Bid Schedule.

At the sole discretion of the Tender Authority, the time schedule of the Tender stages may be extended.

C. Terms and Conditions For Online-Payments

Cost of bidding documents & BID SECURITY Must be Paid Online Net banking mode Only.

General Terms and Conditions For E-Payment

1. Once a User has accepted these Terms and Conditions, he/ she may register on Merchant's website and avail the Services.
2. Merchant's rights, obligations, undertakings shall be subject to the laws in force in India, as well as any directives/ procedures of Government of India, and nothing contained in these Terms and Conditions shall be in derogation of Merchant's right to comply with any law enforcement agencies request or requirements relating to any User's use of the website or information provided to or gathered by Merchant with respect to such use. Each User accepts and agrees that the provision of details of his/ her use of the Website to regulators or police or to any other third party in order to resolve disputes or complaints which relate to the Website shall be at the absolute discretion of Merchant.
3. If any part of these Terms and Conditions are determined to be invalid or unenforceable pursuant to applicable law including, but not limited to, the warranty disclaimers and liability limitations set forth herein, then the invalid or unenforceable provision will be deemed superseded by a valid, enforceable provision that most closely matches the intent of the original provision and the remainder of these Terms and Conditions shall continue in effect.
4. These Terms and Conditions constitute the entire agreement between the User and Merchant. These Terms and Conditions supersede all prior or contemporaneous communications and proposals, whether electronic, oral, or written, between the User and Merchant. A printed version of these Terms and Conditions and of any notice given in electronic form shall be admissible in judicial or administrative proceedings based upon or relating to these Terms and Conditions to the same extent and subject to the same conditions as other business documents and records originally generated and maintained in printed form.
5. The entries in the books of Merchant and/or the Payment Gateway Service Providers kept in the ordinary course of business of Merchant and/or the Payment Gateway Service Providers with regard to transactions covered under these Terms and Conditions and matters therein appearing shall be binding on the User and shall be conclusive proof of the genuineness and accuracy of the transaction.
6. **Refund For Charge Back Transaction:** In the event there is any claim for/ of charge back by the User for any reason whatsoever, such User shall immediately approach Merchant with his/ her claim details and claim refund from Merchant alone. Such refund (if any) shall be effected only by Merchant via payment gateway or by means of a demand draft or such other means as Merchant deems appropriate. No claims for refund/ charge back shall be made by any User to the Payment Gateway Service Provider(s) and in the event such claim is made it shall not be entertained.
7. In these Terms and Conditions, the term "**Charge Back**" shall mean, approved and settled credit card or net banking purchase transaction(s) which are at any time refused, debited or charged back to merchant account (and shall also include similar debits to Payment Gateway Service Provider's accounts, if any) by the acquiring bank or credit card company for any reason whatsoever, together with the bank fees, penalties and other charges incidental thereto.
8. Refund for fraudulent/duplicate transaction(s): The User shall directly contact Merchant for any fraudulent transaction(s) on account of misuse of Card/ Bank details by a fraudulent individual/party and such issues shall be suitably addressed by Merchant alone in line with their policies and rules.

9. Server Slow Down/Session Timeout: In case the Website or Payment Gateway Service Provider's webpage, that is linked to the Website, is experiencing any server related issues like 'slow down' or 'failure' or 'session timeout', the User shall, before initiating the second payment,, check whether his/her Bank Account has been debited or not and accordingly resort to one of the following options:
- i. In case the Bank Account appears to be debited, ensure that he/ she does not make the payment twice and immediately thereafter contact Merchant via e-mail or any other mode of contact as provided by Merchant to confirm payment.
 - ii. In case the Bank Account is not debited, the User may initiate a fresh transaction to make payment.

However, the User agrees that under no circumstances the Payment Gateway Service Provider shall be held responsible for such fraudulent/duplicate transactions and hence no claims should be raised to Payment Gateway Service Provider No communication received by the Payment Gateway Service Provider(s) in this regard shall be entertained by the Payment Gateway Service Provider.

Limitation of Liability :

Merchant has made this Service available to the User as a matter of convenience. Merchant expressly disclaims any claim or liability arising out of the provision of this Service. The User agrees and acknowledges that he/ she shall be solely responsible for his/ her conduct and that Merchant reserves the right to terminate the rights to use of the Service immediately without giving any prior notice thereof.

Merchant and/or the Payment Gateway Service Providers shall not be liable for any inaccuracy, error or delay in, or omission of (a) any data, information or message, or (b) the transmission or delivery of any such data, information or message; or (c) any

loss or damage arising from or occasioned by any such inaccuracy, error, delay or omission, non-performance or interruption in any such data, information or message. Under no circumstances shall the Merchant and/or the Payment Gateway Service Providers, its employees, directors, and its third party agents involved in processing, delivering or managing the Services, be liable for any direct, indirect, incidental, special or consequential damages, or any damages whatsoever, including punitive or exemplary arising out of or in any way connected with the provision of or any inadequacy or deficiency in the provision of the Services or resulting from unauthorized access or alteration of transmissions of data or arising from suspension or termination of the Services.

3. The Merchant and the Payment Gateway Service Provider(s) assume no liability whatsoever for any monetary or other damage suffered by the User on account of:
- (I) The delay, failure, interruption, or corruption of any data or other information transmitted in connection with use of the Payment Gateway or Services in connection thereto; and/or
 - (II) Any interruption or errors in the operation of the Payment Gateway.
4. The User shall indemnify and hold harmless the Payment Gateway Service Provider(s) and Merchant and their respective officers, directors, agents, and employees, from any claim or demand, or actions arising out of or in connection with the utilization of the Services.

The User agrees that Merchant or any of its employees will not be held liable by the User for any

loss or damages arising from your use of, or reliance upon the information contained on the Website, or any failure to comply with these Terms and Conditions where such failure is due to circumstance beyond Merchant's reasonable control.

Miscellaneous Conditions :

1. Any waiver of any rights available to Merchant under these Terms and Conditions shall not mean that those rights are automatically waived.
2. The User agrees, understands and confirms that his/ her personal data including without limitation details relating to debit card/ credit card transmitted over the Internet may be susceptible to misuse, hacking, theft and/ or fraud and that Merchant or the Payment Gateway Service Provider(s) have no control over such matters.
3. Although all reasonable care has been taken towards guarding against unauthorized use of any information transmitted by the User, Merchant does not represent or guarantee that the use of the Services provided by/ through it will not result in theft and/or unauthorized use of data over the Internet.
4. The Merchant, the Payment Gateway Service Provider(s) and its affiliates and associates shall not be liable, at any time, for any failure of performance, error, omission, interruption, deletion, defect, delay in operation or transmission, computer virus, communications line failure, theft or destruction or unauthorized access to, alteration of, or use of information contained on the Website.
5. The User may be required to create his/ her own User ID and Password in order to register and/ or use the Services provided by Merchant on the Website. By accepting these Terms and Conditions the User agrees that his/ her User ID and Password are very important pieces of information and it shall be the User's own responsibility to keep them secure and confidential. In furtherance hereof, the User agrees to;
 - i. Choose a new password, whenever required for security reasons.
 - ii. Keep his/ her User ID & Password strictly confidential.
 - iii. Be responsible for any transactions made by User under such User ID and Password. The User is hereby informed that Merchant will never ask the User for the User's password in an unsolicited phone call or in an unsolicited email. The User is hereby required to sign out of his/her Merchant account on the Website and close the web browser window when the transaction(s) have been completed. This is to ensure that others cannot access the User's personal information and correspondence when the User happens to share a computer with someone else or is using a computer in a public place like a library or Internet cafe.

Debit/Credit Card, Bank Account Details

1. The User agrees that the debit/credit card details provided by him/ her for use of the aforesaid Service(s) must be correct and accurate and that the User shall not use a debit/ credit card, that is not lawfully owned by him/ her or the use of which is not authorized by the lawful owner thereof. The User further agrees and undertakes to provide correct and valid debit/credit card details.
2. The User may make his/ her payment (Cost of bidding documents & BID SECURITY) to Merchant by using a debit/credit card or through online banking account. The User warrants, agrees and confirms that when he/ she initiates a payment transaction and/or issues an online payment instruction and provides his/ her card / bank details:
 - i. The User is fully and lawfully entitled to use such credit / debit card, bank account for such transactions;
 - ii. The User is responsible to ensure that the card/ bank account details provided by him/

- her are accurate;
- iii. The User is authorizing debit of the nominated card/ bank account for the payment of Tender Fee and Earnest Money Deposit.
 - iv. The User is responsible to ensure sufficient credit is available on the nominated card/ bank account at the time of making the payment to permit the payment of the dues payable or the bill(s) selected by the User inclusive of the applicable Fee.

Personal Information :

3. The User agrees that, to the extent required or permitted by law, Merchant and/ or the Payment Gateway Service Provider(s) may also collect, use and disclose personal information in connection with security related or law enforcement investigations or in the course of cooperating with authorities or complying with legal requirements.
4. The User agrees that any communication sent by the User vide e-mail, shall imply release of information therein/ therewith to Merchant. The User agrees to be contacted via e-mail on such mails initiated by him/ her.
5. In addition to the information already in the possession of Merchant and/ or the Payment Gateway Service Provider(s), Merchant may have collected similar information from the User in the past. By entering the Website the User consents to the terms of Merchant's information privacy policy and to our continued use of previously collected information. By submitting the User's personal information to us, the User will be treated as having given his/her permission for the processing of the User's personal data as set out herein.
6. The User acknowledges and agrees that his/ her information will be managed in accordance with the laws for the time in force.

Payment Gateway Disclaimer :

The Service is provided in order to facilitate payment of Cost of bidding documents & BID SECURITY online. The Merchant or the Payment Gateway Service Provider(s) do not make any representation of any kind, express or implied, as to the operation of the Payment Gateway other than what is specified in the Website for this purpose. By accepting/ agreeing to these Terms and Conditions, the User expressly agrees that his/ her use of the aforesaid online payment service is entirely at own risk and responsibility of the User.

1.2 TENDERING PROCEDURE: -

1.2.1 Issue of Blank Tender Forms.

Tender Forms can be purchased from the e-Tendering Portal of Public Works Department, Government of Maharashtra i.e., <https://mahatenders.gov.in> after paying Tender Fees via online mode as per the Tender Schedule.

1.2.2 Bid Security: -

- i) Bid Security shall be paid online using online mode or **In the form of DD / FDR. The DD / FDR in the name of Executive Engineer Public Works Division Wardha only. Bid security shall be drawn directly from the account of Bidder / Bidding Firm or lead partners in case of J.V** Bid Security in the form of cheques or any other form except above will not be accepted.
- ii) Tenderer of those who do not deposit Bid Security in one of the above acceptable form shall be summarily rejected.
- iii) The amount of earnest money will be refunded to the unsuccessful tenderers on deciding about the acceptance or otherwise of the tender or on lapsing of the validity period, whichever is earlier. In case of successful tenderer, it will be refunded on his payment of initial Security Deposit will be adjusted towards a part of security deposit to be paid after awarding of the work. If successful tenderer does not pay the Security Deposit in the prescribed time limit, and

complete the agreement bond, his earnest money deposit will be forfeited to the Government. In the case of Joint Venture, Bid Security shall be paid via online using NEFT/RTGS or payment gateway mode. The Security Deposit, additional security deposit etc. in the form of T.D.R./F.D.R. issued in the name of bidder drawn by scheduled bank having branches in Maharashtra and pledged, in the name of **Executive Engineer, Public Works Division, Wardha** for the period of one year will be considered.

1.2.3 PRE-TENDER CONFERENCE: -

1.2.3.1 Pre-tender conference is open to all prospective tenderer who have downloaded tender form before the date of Pre-tender Conference. The Pre-tender conference will be held wherein prospective Tenderers will have an opportunity to obtain clarifications regarding the work and the Tender Conditions.

1.2.3.2 The prospective contractor shall post their queries either in writing or orally concerning the work, and the reply to the same shall be uploaded on the portal <https://mahatenders.gov.in> and this clarification referred to as Common Set of Conditions/Deviations (C.S.D.), shall form part of tender documents and which will also be common and applicable to all tenderer. The point/points if any raised in writing and/orverbally/onlinebythecontractorinpretenderconferenceandnotfinding place in C.S.D. issued after the pre-bid conference, is/are deemed to be rejected. In such case the provision in NIT shall prevail. No further correspondence will be made thereafter with the contractor in this regard. The tender submitted by the tenderer shall be based on the C.S.D. issued by dept if any.

1.2.3.3 All tenderers are cautioned that tenders containing any deviation from the contractual terms and conditions, specifications or other requirements and conditional tenders will be treated as non-responsive.

1.2.3.4 Tenderers should have valid Class II/III Digital Signature Certificate (DSC) obtained from any Certifying Authorities. In case of requirement of DSC, interested Bidders Should go to <http://maha.etenders.in/mah/DigitalCertLasp> and follow the procedure mentioned in the document 'Procedure for application of Digital Certificate'.

1.2.4 SUBMISSION OF TENDER: -

Refer to Section 'Guidelines to Bidders on the operations of Electronic Tendering System of Public Works Department.'

1.2.4.1 OPENING OF TENDER: -

On the date specified in the Tender Schedule the following procedure adopted.

1.2.4.2. ENVELOPE No.1: - (Documents)

First of all, Envelope No.1 of the tender will be opened online to verify its contents as per requirements. If the various documents contained in this envelope do not meet the requirements of the Department, a note will be recorded accordingly by the tender opening authority and the said tenderers EnvelopeNo.2willnotbeconsideredforfurtheractionandthesamewillbe recorded. The decision of the tender opening authority in this regard will be final and binding on the contractors.

1.2.4.3 ENVELOPE No.2: (Financial Bid)

This envelope shall be opened online immediately after opening of Envelope No.1, only if the contents of Envelope No.1 are found to be acceptable to the Department. The tendered rates in Schedule 'B' or percentage above / below the estimated rates shall then be read out in the presence of bidders who remain present at the time of opening of Envelope No.2.

Offer to be submitted online. The Tenderer shall enter his quote in figures.

The contractor shall quote their offer as per details given in the main tender and also based on the detailed set of conditions issued/Additional stipulations made by the Department as informed to him by a letter from Chief Engineer/Superintending Engineer after Pre-Tender Conference. Tenderer quote their offer only unconditional.

1.3 Disqualification

Even through the tenderer meet the qualification criteria, they are subject to be disqualified if they have,

- 1.3.1 Made misleading or false representation in the form / statement, submitted, and / or record of poor performance such as abandoning the works rescinding of contract for which reasons are attributable to the non-performance of the contractor, constant history of litigation awarded against the applicant or financial failure due to bankruptcy.
- 1.3.2 The rescinding of contract of a joint venture and account of reasons other than non-performance, such as Most Experienced partner of joint venture pulling out, court directions leading breaking up to a joint venture before the start of work, which are not attributable to the poor performance of the contractor will, however, not affect the qualification of the individual partners
- 1.3.3 In the tender process, if the lowest offer is more than 10% below the cost put to tender, the tender calling authority shall obtain the detailed justification and planning of executing the work at such lower rate from the concerned contractor and based on that shall ensure the possibility of completing the work at the offered lowest rate.
- 1.3.4 Selected lowest bidder (L1) has to submit the hard copy of Performance Security Deposit if offer is more than 1% Below, in the office of Public Works Division Wardha within 8(Eight) days from the date of opening. of financial bid

CHAPTER –II
DEFINITION AND INTERPRETATION

In the “CONTRACT” (as here in after defined) the following words and expression shall have the meanings herein assigned except where otherwise specified.

- 1 The “CONTRACT” shall mean the notice of tender, the sealed quotation and the tender documents including the tender the letter of acceptance thereof therein, and the accepted conditions with annexure mentioned there including any special conditions, specifications, designs, drawings, price schedule / bill of quantities and schedule of rates. All these documents taken together shall be deemed to form one contract and shall be complementary to one another
- 2 “THE CONTRACTOR” shall mean the individual or firm or company whether incorporated or not, undertaking the work and shall include legal representatives of such as individual or persons composing such firm or company as the case may be.
- 3 The “CONTRACT SUM” shall mean the sum for which the tender is accepted
- 4 The accepting authority shall mean the Chief Engineer Public Works Nagpur Region, Nagpur.
- 5 The “CHIEF ENGINEER” shall mean the Officer who is designated as such for the time being, in whose jurisdiction the works lies, or the officer to whom the functions of the Chief Engineer may be subsequently transferred.
- 6 The “SUPERINTENDING ENGINEER” shall mean the officer is designated as such for the time being in whose jurisdiction the work lies, or the officer to whom the function of the Superintending Engineer may be subsequently transferred.
- 7 The “ENGINEER – IN – CHARGE” or “ENGINEER” shall mean the Executive Engineer- in- charge of the work or the officer to who the function of the Executive Engineer may be subsequently transferred.
- 8 “DEPARTMENT OR GOVERNMENT” OF THE STATE OF MAHARASHTRA” shall mean the Governor of said state ‘his successors in office as and assigned.
- 9 “ A DAY” shall mean a day of 24 hours from midnight to midnight irrespective of whether any work is carried out in that period or not.
- 10 “A WEEK” shall mean seven consecutive days.
- 11 “EXCEPTED RISKS” are risks due to riot (Otherwise than among contractor’s employees) and Civil Commotion in so far as both these are uninsurable, war (whether declared or not) invasion, act of Foreign enemies, Hostilities Civil war, Rebellion, Revolution, Insurrections, Military or usurped power, any acts of God such as Earthquake, Lightening and unprecedented Floods over which the contractor has

no control and accepted as such by the accepting authority.

12 "THE SITE" shall mean the lands and / or other places on under in or through which the work is to be executed, under contract including any other lands or places which may be allotted by department or used for the purpose of the contract.

13 "TEMPORARY WORKS" shall mean all works of every kind required in connection with the execution of the work tendered, but which will not form part of the latter.

14 "URGENT WORKS" shall mean any measures which in the opinion of the Engineer – In – Charge, become necessary during the progress of the work to obviate any risk or accident or failure or which become necessary for security of the worker the persons working, thereon.

15 "THE WORKS" shall mean the works to be executed in accordance with the contract or part (a) thereof as the case may be and shall include extra or additional, altered or substitute works as required for performance of the contract.

16 Where the context so requires, words imparting the singular only also include the plural and vice verse.

17 Headings and Marginal notes, if any, to the general conditions shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof in the contract.

CHAPTER – III

DETAILED TENDER NOTICE

<p>(1)</p>	<p>Online lumpsum tenders on contractors own Design & Drawing in “C” form (Lump Sum Contract) are invited from Bidders who fulfill the required criteria for the work “ CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..</p>
<p>(2)</p>	<p>SITUATION OF THE WORK The bridge site is near Pulgaon Village, Pulgaon to Amravati Border in District Wardha</p>
<p>(3)</p>	<p>The estimated cost of the work Rs. 26,74,94,463.000</p>
<p>(4)</p>	<p>Time Limit for completion of the work is 24 (Twenty Four) calendar months from the date of work order, including monsoon period.</p>
<p>(5)</p>	<p>Pre-Bid conference -Pre-Bid conference will be held on Dt. 05.2026 at 16.00 hours In the office of Chief Engineer, P.W. Region, Nagpur</p>
<p>(6)</p>	<p>VALIDITY Validity of the tender will be 120 days from the date of opening tenders & thereafter 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 Superintending Engineer, Public Works Circle, Chandrapur</p>
<p>(7)</p>	<p>EARNEST MONEY</p>
<p>(i)</p>	<p>Earnest money of minimum 13,37,500/- shall be paid via online using NEFT/RTGS or payment gateway mode or like DD/FDR After Tender opening, the EMD of the unsuccessful bidder will be returned to account provided by the bidder during the bid preparation as given in challan under Beneficiary Account Number. Earnest Money in the form of cheques or any other form except above will not be accepted</p>
<p>(ii)</p>	<p>The amount will be refunded to the unsuccessful tenderers on deciding about the acceptance or otherwise of the tender. In case of successful tenderer, it will be refunded on his paying initial Security Deposit and completing the tender documents in form</p>
<p>(iii)</p>	<p>In case of Joint Venture, Earnest money shall be paid via online using NEFT/RTGS or payment gateway mode. The Security Deposit, additional security deposit etc. in the form of T.D.R. / F.D.R. issued in the name of Joint Venture Company drawn by scheduled bank having branches in Maharashtra and endorsed, in the name of Executive Engineer, Public Works Division, Wardha for the period of one year will be considered.</p>
<p>8</p>	<p>SECURITY DEPOSIT:</p>
<p>(i)</p>	<p>The successful tenderer whose tender is accepted will have to pay Rs. 26,75,000/- towards the Security Deposit</p>
<p>(ii)</p>	<p>Rs.13,37,500/- is to be deposited in cash or bank guarantee of scheduled bank, F.D.R. of the scheduled bank / National Saving Certificate duly pledged in the name of the Executive Engineer Public Works Division, Wardha towards the initial Security Deposit, valid within the time limit prescribed in clause 21 of “C” form, agreement till completion of defect liabilities period failing which his earnest money will be forfeited to Government.</p>

	(iii) In addition to the above, an amount of Rs. 13,37,500/- will be deducted from the running bills at 1 % of value of the gross bill towards balance security deposit. This is a compulsory deduction.
9.	Condition regarding Performance Security
	Following action shall be taken about making available Demand Draft /Bank Guarantee /FDR of performance security /returning Demand Draft etc.:

Demand Draft for Additional Performance Security Deposit for Quoting Offer More than 1% below the tender cost.

1.9 B **Selected** Lowest bidder (L1) has to submit the hard copy of Performance Security in the form of Demand Draft of required amount as per condition given in Performance Security to the office of Executive Engineer P.W.Dn Wardha within 8(Eight) days from the date of opening of financial bid.

The Performance Security shall be made as per following calculation.

(i) If the tenderer quotes his offer **1% to 10% below** the cost put to tender, he shall submit the Demand Draft of the amount equal to 1% of cost put to tender. Demand Draft of Additional Performance security shall be drawn directly from the account of Bidder / Bidding Firm or lead partners in case of J.V.

ii) If the Bidder intends to quote his offer **more than 10 % upto 15 % below** the estimated cost put to Bid then he should submit Additional Performance security 1 % for every percent after 10 % below percentage in addition to the 1% mentioned above in clause A for quoting below offer.

(eg. If Bidder quotes his offer 14.6% below the estimated cost *put to bid*, then he should submit $14.6 - 10 = 4.6 \% + 1\% = 5.6 \%$ amount of the *cost put to bid* as a total Additional Performance Security.)

For The Purpose of calculation of amount of Additional performance Security, the below Percentage (%) of Bidder shall be considered only upto two decimal points (Rounded upto two decimal points).

iii) If the Bidder intends to quote his offer **more than 15 % below** the estimated cost put to Bid then he should submit Additional Performance security 2 times for every percent after 15 % below percentage in addition to the clause I & II mentioned above for quoting below offer, Demand Draft of Additional Performance security shall be drawn directly from the account of Bidder / Bidding Firm or lead partners in case of J.V.

(eg. If Bidder quotes his offer 16.6% below the estimated cost *put to bid*, then he should submit $16.6 - 15 = 1.6 \% * 2 = 3.2 \% + 1\% + 5\% = 9.2 \%$ amount of the *cost put to bid* as a total Additional Performance Security.)

Note:-

1). If the Performance Security of Demand Draft amount below Rs.1000/- then Demand Draft should be at least for Rs. 1000/-

2) Submit the Demand Draft of the commutative amount which should be rounded upto two decimal points.

3) The date of submission of hard copy shall not be extended at any cost and the tender will be rejected if Performance Security is not be submitted within 8 days. from the date of financial opening

4) If the first lowest bidder fails to submit Performance Security Deposit in stipulated time i.e. 8 days from the opening of financial bid then L-2 bidder will be communicated in writing and negotiated if he agrees to do the work at the same rate lower than the offer of L-1 bidder his tender will be accepted..

5) Such Demand Draft shall be strictly issued only by the Nationalized Bank or Scheduled Bank in favour of in the Executive Engineer Public Works Division Wardha . valid For three Months

6) The Demand Draft should bear the MICR and IFSC Code Number of the issuing bank.

7) If it is found that the Demand Draft as above submitted by the bidder is False / Forged then the Earnest Money submitted by such bidder shall be forfeited and his registration as a contractor of Public Works Department will be suspended & he will be entered in the Black List. This is also applicable for Unregistered Bidder in such case he will be entered in the Black List.

8) The work order to the successful contractor shall be issued only after the encashment of his Demand draft by the concerned Executive Engineer.

10.	<u>TENDERING PROCEDURE</u>
	<u>(A) BLANK TENDER FORMS</u>
	Tender Forms can be downloaded from the eTendering Portal of Public Works Department, Government of Maharashtra i.e., https://pwd.mahatenders.gov.in . after entering the details of payment towards Tender Fees as per the Tender Schedule
	<u>B) PRE- TENDER CONFERENCE</u> 1 Pre-tender conference open to all prospective tenderers who have downloaded tender form before the date of Pre-tender Conference, will be held at Civil Lines Nagpur on dated 05.2026. at 16.00 Hrs.in the office of the Chief Engineer, Public Works Region, Civil line Bandhkam Bhawan Bunglow No 39/1 opposite ladies Club Civil Lines Nagpur 400001, Phone No. (0712 2562986 Fax No. (0712)2565983wherein prospective Tenderers will have an opportunity to obtain clarifications regarding the work and the Tender Conditions.
	2.The prospective tenderers are free to ask for any additional information or clarification either in writing or orally concerning the work, and the reply to the same will be given by the Chief Engineer, Public Works Region, Nagpur in writing and this clarification referred to as Common Set of Conditions/Deviations (C.S.D.), shall form part of tender documents and which will also be common and applicable to all tenderers. The point/points if any raised in writing and/or verbally by the contractor in pre-tender conference and not finding place in C.S.D. issued after the pre- bid conference, is/are deemed rejected. In such case the provision in NIT shall prevail. No individual correspondence will be made thereafter with the contractor in this regard..
	3 Tender submitted by tenderer shall be based on the clarification additional facility issued (If any) by the Department & this tender shall ultimately be unconditional (Conditional tenders will be summarily rejected).
	4 All tenderers are cautioned that the tenders containing any deviation from the contractual terms and conditions, Specifications or other requirements and conditional tenders will be considered as non-responsive.
	<u>C) MANNER OF SUBMISSION OF TENDER AND ITS ACCOMPANIMENTS</u> Tender to be submitted online in two separate envelopes

11 ENVELOPE No. 1: (Documents Required)

The bidder must purchase the bidding documents via online mode by filling the cost of Tender.

The first envelope “Envelope No. 1” shall contain the following documents:

Scanned copy of Forwarding (Covering) Letter along with list of all documents / forms/ statements / Specifications/ Conditions

i.	The EMD applicable will be paid via online mode or Off line Mode in the Form of DD/FDR.
ii.	Scanned from original copy of list of works in hand and works tendered along with supporting certificates.
iii.	Scanned from original copy of Details of the other works tendered for and in hand as on the date of submission of this tender in prescribed form No.II.
iv.	Scanned from original copy of the Details of work of similar type with supporting certificates.
v.	Scanned From original copy of List of Technical Personnel of the tenderer and further likely to be appointed on this work form No.IV and in form No.VII.
vi.	Reports on the financial standing of the Bidder, such as profit and loss statements and auditor’s reports for the past five years having UDIN number mandatory
vii.	Self-declaration on plain paper regarding completeness, correctness and truthfulness of documents submitted as per prescribed proforma given in Appendix I
viii.	Affidavit / Notary regarding completeness, correctness and truthfulness of documents submitted on Stamp Paper of Rs 100/- as per prescribed proforma given in Appendix II
ix.	Scanned from original copy of Power of Attorney on behalf of firm, proprietorship firm /Partnership firm / Pvt. limited Company or any other registered company Registered with Registrar of Company to sign agreement/ other correspondence with department authority.
x.	Scanned from original of Registration documents of firm (Firm, Proprietorship firm/ Partnership firm /Registration of Private limited company / Registration of Public limited company or any other company or any other Company as the case may be.)
xi.	Scanned from original copy of Statements showing the similar type of bridge works executed during the last five years in prescribed form No.1
xii.	Scanned from original copy of Contractor own design with broad details.

xiii.	Chapter X as given in the Tender Documents needs to be uploaded dully filled by the Contractors.
xiv.	Scanned from original of list of works completed and in hand and works tendered along with supporting certificates.
xv.	Scanned from original list of plants and Machinery duly signed by the contractor.
xvi.	Scanned from original copy of Statements showing the similar type of bridge works executed during the last five years in prescribed form No.1
xvii.	Joint venture is allowed. (As Per Conditions Given)

Tender by joint venture of two registered /unregistered contractors.

1. Two contractors registered with Government of Maharashtra or unregistered contractor /individual /firm can form a Joint Venture (JV) to bid for the work
2.The JV shall be for the whole period of the contract work including defect liability period.
3.The JV shall neither be dissolved nor can any partner retire till all liabilities of the contract work is liquidated and till the expiry of defect liability period.
4.The JV shall nominate one lead partner who is registered in highest class / highest annual turnover in last 5 years certified by C.A. with UDIN and date as contractor amongst the partners of JV, and whose share in the partnership shall not be less than 51% in the JV.
5.No partner in the JV shall have a share less than 30% in the JV.
6.The share of each partner in the JV shall be in proportion to their capacity to tender for works according to their class of registration / highest annual turnover in last 5 years certified by C.A. with UDIN and date to bid for work.
7.The lead partners shall meet not less than 50 percent of all qualifying criteria like annual turnover, single work, quantities of items and Bid Capacity. The joint venture Partners must as per their share in the J.V. satisfy the criteria of annual turnover ,single work, quantities of items, and Bid capacity However either of the Partner in the J.V. shall individually or Collectively satisfy the criteria for Machinery
8.The capacity of the JV to bid for the tender will be decided on the basis of bid capacity as per formula given in qualification criteria.
9.The annual turnover, work in hand, and bid capacity shall be computed as per the share of both partners in J.V.
10.All the documents required to be uploaded by bidder in envelope number 1 shall be applicable to each partner of JV.
11.The contractor shall take care to see that all required documents like certificate of turnover, registration etc. and other of every partner of JV is uploaded in envelope number 1. If any document of any partner is not uploaded, the tender of JV is likely to be summarily rejected.
12.All online activities of e- tendering shall be performed by the lead partner of JV.

	13.No partner in JV shall be permitted to bid for the same work on the basis of his individual registration.
	14.For participating in bid they shall register online in the name of joint Venture on the " https://mahatenders.gov.in ".
	15.The Empanelment on " https://mahatenders.gov.in " shall be only for this work.
	16.In case of Joint Venture, the scanned & digitally signed copy of notarized Joint Venture (partnership) deed , as acceptable to Register of firms ,shall be submitted in Envelop No. 1 .If joint venture firm is found lowest at the time of opening of bids, the tenderer shall register the joint venture with the Registrar of Firm and submit the same to the Engineer-in-charge within 45 days from the date of opening of tender, failing which his bid shall be considered as non responsive and the Bid Security shall be forfeited. {whichever is applicable} The registration of Joint venture deed with the registrar of firms shall be mandatory
	17.Power of attorney in support of authorized signature of JV shall be uploaded.
	18.Details of bank accounts in the name of JV will required to be submitted for making of payment in the name of JV from the date of within 45 days from the date of issuing LOA/Work order.
	19.Copy of PAN, GST, PT, EPF, PF, labour registration certificate in the name of JV will have to be submitted with the registration certificate issued by registrar of firm. within 45 days from the date of issuing LOA/Work order.
xviii.	Availability for this work following technical personnel
	<p>(i) Project Manager ---- One Number having minimum qualification as B.E. (Civil) with not less than 10 years' experience in construction and supervision of bridge work (information to be submitted in Form VII. The scanned copy of curriculum vitae shall be upload in Envelope No.1</p> <p>(ii) Site Engineers ----- 2 Numbers having minimum qualification as Diploma (civil) having experience of 10 years</p> <p>(iii) Supervisor ----- One Number having experience of 10 years and other one having experience of minimum 5years of Bridge works</p> <p>(iv) Lab Assistant ----- One Number having experience of 5 years of lab work (BE Civil)</p> <p>The scanned copy of curriculum vitae shall be upload in Envelope No.1 Form VII</p> <ul style="list-style-type: none"> • Bidder shall submit the name and C.V.s of above Personnel in envelope no 1. If CV doesn't fulfill the requirement of qualification mentioned above, Envelope 2 shall not be opened. • If Bidder failed to upload C.V's of Key Personnel, then Bidder shall be given 48 hrs. time to submit the same, failing which envelope No 2 will not be opened. • सार्वजनिक बांधकाम विभाग शासन निर्णय क्रमांक संकीर्ण-२०२१/प्र.क्र.५४/इमारती -२ दि ०७.१२.२०२३ नुसार कार्यवाही करणे बंधनकारक राहिल.
12	Use of Specialized machinery (Minimum and Mandatory Machinery)

Sr. No.	Type of Equipment	Maximum Age as on 1.4.2026	Capacity	Number Required
1	Concrete batching Plant having minimum capacity of 30 cum./hours With SCADA (Owned) within 30 km from the work site	15 Years	30 Cum / hour	1 No.
2	Excavator	15 Years		1 Nos.
3	Vibratory roller With SCADA	15 Years	8-10 M.T	2 Nos.
4	Static Roller	15 Years	-	2 Nos.
5	Transits Mixer/Truck mounted Transit Mixer	15 Years	-	4 Nos.
6	Concrete Pump	15 Years		1 No
7	Slip / Fix form Paver	15 Years		1 No

Note 1. Route map of Batch Mix plant (Concrete) having minimum capacity 30 cum /Hrs showing the distance of plant from farthest point of worksite Self Signature (Documents shall be uploaded)

2. Batch Mix plant(Concrete) having minimum capacity 30 cum /Hrs Verification certificates valid for one year certified by Assistant Mechanical Chief Engineer P.W Region Nagpur for Batch Mix plant(Concrete) having minimum capacity 30 cum /Hrs (Documents shall be uploaded))

Note 3 The machineries specified under Sr.No.1 to 5 and 7 shall be owned by the contractor And Sr.No.6 shall be hired / owned by the contractor And Scanned from original copy of Registered Sale Deed in case of second hand purchase of machinery / plant should be uploaded. Scanned from original copy of Manufacturer / Supplier / Tax Invoice in case of First hand purchase of machinery / plant should be uploaded, Proforma Invoice / Retail Invoice shall not be accepted.

Note: 4 The Documents in support of ownership of machinery shall be genuine and shall be convincing to the tender opening authority.

Note: 5 – Allowable life of machinery to be used on works –

1. Allowable life of machinery to be used on works –

As per GR No.202309211603599618 Dated 21.09.2023 All New Plant and Machinery installed first time and Old machinery shifted to new place, essentially required the certificate from Assistant Chief Engineer (Mechanical).

(1) The life of new machinery will be considered as 15 years.

(2) For Hot Mix Plant/Batch Mix Plant verification certificate valid for one year issued by SE(Mechanical)/ Assistant Chief Engineer ((Mechanical) is essential

(3) After the 15th year, the contractor will get machinery certified every year from SE/ACE (Mechanical) and produce the certificate of fitness. The certificate will be required for machinery where it is necessary and not issued by RTO.

Note: 6 If SCADA arrangement is not readily available on above machinery (Particularly Mentioned) then contractor shall upload scanned copy of "Term Deposit Receipt" /F.D.R. duly pledged in the name of Executive Engineer P.W. Division, Wardha for a period of one year of Rs. 2,00,000/- (Rs. Two lakh only) of any Nationalised / Scheduled Bank duly enclosed in envelope No. 1 as a Additional Security Deposit with undertaking to procurement and installing and commissioning SCADA arrangement mobilization and commissioning with the undertaking within 30 days from the date of issue of the work order, failing which work order will be cancelled and Security Deposit along with Additional Security Deposit shall be forfeited to Government.

STATEMENT NO. 2-A

Give the following information of above machineries.

Type of Machinery	No. of machinery	Name of works on which deployed at present	Location	Output	Balance quantity for execution on works in hand
1	2	3	4	5	6

13. Post Qualification criteria: To qualify for the opening of envelope No 2 i.e. Price Bid, each bidder should have

(i)	(i) Scanned Copy of original Certificate for having Minimum annual turnover of not less than Rs. 1003.10 lakhs (Rupees Ten crore Three lakh ten thousand Only) in any one year during last Five financial years updated to current cost (Such certificate for civil engineering works are required to be obtained from the Chartered Accountant of Maharashtra state / any State of India). For updating to current cost please refer table at the end of this clause.
(ii)	<p>a) Scanned Copy of original Certificate for having Successfully commenced and completed three works of bridge / Viaduct / Aqua duct / ROB / RUB / flyover on his own design / PWD Design with any Government or Semi Government organization each bridge work value not less than Rs. 509.33 lakhs updated to current cost and each bridge of minimum length 90.00 meters ,and three Cement Concrete (pavement Concrete) Road work , each work value not less than 421.62 lakhs in last five financial years and current year. For updating please refer table (Such certificate are required to be obtained from the officer not below the Rank of Executive Engineer (Completed Work Carried out In Govt/ Semi Govt Bodies such as MHADA, MSEB, MIDC, CIDCO Etc or Local Bodies. will only be considered.) OR</p> <p>Scanned Copy of original Certificate for having Successfully commenced and completed two works of bridge / Viaduct / Aqua-duct / ROB / RUB / flyover on his own design / PWD Design with any Government or Semi Government organization each bridge work value not less than Rs. 636.67 lakhs updated to current cost and each bridge of minimum</p>

	<p>length 110.00 meters and two Cement Concrete (pavement Concrete)Road work , each work value not less than 527.01 in last Five financial years and current year. For updating please refer table (Such certificate are required to be obtained from the officer not below the Rank of Executive Engineer (Completed Work Carried out In Govt/ Semi Govt Bodies such as MHADA, MSEB, MIDC, CIDCO Etc or Local Bodies. will only be considered.) OR</p> <p>Scanned Copy of original Certificate for having Successfully commenced and completed one work of bridge / Viaduct / Aqua-duct / ROB / RUB / flyover on his own design / PWD Design with any Government or Semi Government organization each bridge work value not less than Rs. 1018.67 lakhs updated to current cost and each bridge of minimum length 170.00 meters and one Cement Concrete (pavement Concrete)Road work work value not less than rs.843.23 lakhs , in last five financial years and current year. For updating please refer table (Such certificate are required to be obtained from the officer not below the Rank of Executive Engineer (Completed Work Carried out In Govt/ Semi Govt Bodies such as MHADA, MSEB, MIDC, CIDCO Etc or Local Bodies. will only be considered.)</p>		
(iii)	<p>Scanned Copy of certificate of satisfactorily executed minimum quantities of following items in any continuous twelve calendar months in five years prior to current year and current year. (Such certificates are required to be obtained from the officer not below the rank of Executive Engineer or Equivalent) and the certificate shall specifically mention the period of execution as continuous twelve calendar months.</p>		
Sr. No.	Item of work	Quantity	Unit
(i)	Concrete of grade M-20 & above	2448.00	Cum.
(ii)	HYSD/ TMT steel	164.70	MT.
(iii)	Cement Concrete (pavement Quality Concrete) M40	1580.00	Cum.
(iv)	GSB, GR. I, GR.II	1336.00	Cum.
	<p>For 13 - (i) above the tenderer shall provide authenticated proof of information given therein. This shall include a certificate from his Chartered Accountant.</p> <p>For 13 - (ii) and (iii) above, the criteria mentioned is for works carried out in Govt. / Semi Govt. Bodies such as MHADA, MSEDCL, MIDC, CIDCO. Certificates are required to be obtained from the officer not below the rank of Executive Engineer (Work Carried out in Govt. / Semi Govt. Bodies such as MHADA, MSECDL, MIDC, CIDCO) or equivalent competent authority.</p>		
(iv) A	Bid Capacity:		
	<p>The Bid capacity shall not be less than the amount put to tender for which the bid is submitted. Bid capacity will be evaluated as part of post qualification in the following manner. Calculation of Bid Capacity should be required on contactors letter head</p>		

	Bid Capacity = (A X N X 2) - B
	A - MAXIMUM ANNUAL TURNOVER OF CIVIL ENGINEERING WORKS EXCLUDING PRIVATE WORK DURING LAST FIVE YEARS (UPDATED TO THE CURRENT D.S.R. LEVEL) WHICH WILL TAKE INTO ACCOUNT THE COMPLETED AND PART OF ONGOING WORKS COMPLETED DURING LAST FIVE YEARS. (SUCH CERTIFICATE ARE REQUIRED TO BE OBTAINED FROM THE CHARTERED ACCOUNTANT MAHARASHTRA STATE ONLY)
	N - Number of Years Prescribed For Completion of The Work, For Which The Bid Is Invited.
	B - Value of existing commitments and works (ongoing) to be completed in the period stipulated for completion of the work in the present tender. Existing commitments shall include details of tenders of works which are either accepted as lowest or have been opened and found to be lowest.
	For Evaluation of Bid Capacity for work, Chartered Accountant's Certificate for 5 years along with Profit & Loss Statement. Value of A should be supported by year wise work done certificates issued by the Engineer in Charge not below the rank of Executive Engineer / Head of Department of the Concerned Engineering Department with outward No. & Date.
	Certificates shall be obtained from the officer not below the rank of Executive Engineer.
	The value of B shall be self-attested with detailed list of works with its value. Any misleading or false representation shall be treated under Indian Penal code and the bid will be treated as non- responsive.
	(Completed work carried out In Govt/ Semi Govt Bodies such as such as MHADA, MSEB, MIDC, CIDCO Etc. or Local Bodies only will be considered.)
(iv) A	Bid Capacity: on line
	1.4.15 B; Bid Capacity :- As per Govt Circular Bid Capacity Shall be calculated as on online programme. Contractor shall Upload a On Line Document. A) Bid Capacity :- Bidders shall upload QR based Bid Capacity Certificate downloaded on or before two days of submission from Portal "bidcap.emahapwd.com". If this bid capacity Certificate is not uploaded then tender shall be treated as non-responsive B) Technical Personnel Development Bidders shall fill the relevant information of key persons and Technical Staff available with him in the formats and field specified on "bidcap.emahapwd.com" Portal Out of the total key persons and Technical staff available with bidder. shall upload the staff he desires to deploy for this work. This statement shall be downloaded from portal "bidcap.emahapwd.com". Bidder shall upload this QR based statement downloaded on or before two days of submission. If this certificate is not uploaded then tender shall be treated as non responsive

Table for Updating to Current Cost

Sr. No.	Year	Cost of work	Updated cost %

1.	2026-27	100	100
2.	2025-26	100	110
3.	2024-25	100	121
4.	2023-24	100	133
5	2022-23	100	146
6	2021-22	100	161

Note

- 1) The statements showing the value of existing commitments and on-going works as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer in charge, not below the rank of an Executive Engineer or equivalent
- 2) The envelope will be opened only if the bid capacity calculated is not less than the cost of work put to tender.
- 3) The updating of current cost of works executed earlier to above mentioned period shall be worked out in the same manner shown in above table.
- 4) Even though the bidders meet the above qualifying criteria, they are subjected to be disqualified if they have made misleading or false representation in the forms statement and attachments submitted as proof of the qualification requirements and / or record of past performance such as abandoning the works, not properly completing the contract, inordinate delays in completion litigation history or financial failures etc.
- 5) For particular tender notice ,the bid capacity has to be taken in to consideration. If the bidder is L-1 in the first bid ,the bid capacity shall be reduced for subsequent bid to be opened under the same tender Notice. If Sufficient Bid Capacity is available then only the bid shall be considered. if balance bid capacity is not available as per required bid capacity ,then bidder shall be treated as not qualified.

Note: Even though the bidders meet the above qualifying criteria, they are subjected to be disqualified if they have made misleading or false representation in the forms statement and attachments submitted as proof of the qualification requirements and / or record of post-performance such as abandoning the works, not properly completing the contract, inordinate delays in completion litigation history or financial failures etc.

14. ENVELOPE No. 2 TENDER (FINANCIAL BID)

- i) Upload Financial document in Excel Format.

15. SUBMISSION OF TENDER: -

Refer to Section 'Guidelines to Bidders on the operations of Electronic Tendering System of Public Works Department' for details.

16. OPENING OF TENDERS:

On the date, specified in the Tender Schedule, following procedure will be adopted for opening of the Tender.

(A) ENVELOPE No. 1:- (Documents)

i) First of all Envelope No. 1 of the tender will be opened online to verify its contents as per requirements. If the various documents contained in this envelope do not meet the requirements of the Department, a note will be recorded accordingly by the tender opening authority and the said tenderers Envelope No. 2 will not be considered for further action and the same will be recorded.

The decision of the tender opening authority in this regard will be final and binding on the contractors.

ii) Where the Contractor's own design is allowed by the Department, or where the offers on contractor's own design are invited by the Department, broad details in the form of technical note shall be upload by the Tenderer in Envelope No. 1. This shall be subjected to scrutiny by the Department to ascertain the technical feasibility and acceptability of the Design of the tenderer. In case the Department finds such designs or assumption unacceptable, offers for the such designs in Envelope No. 2 shall not be considered by the Department.

(iii) The technical proposal consisting of broad details based on contractors own Design/scheme will be scrutinized by the Superintending Engineer, Designs Circle (Bridges), Nagpur in light of the documents for its acceptability or otherwise. In case of doubt the same will be got clarified from the contractor and the contractor shall modify the proposal if necessary, to suit the Design Criteria. If the contractor is not prepared to modify the proposal to suit the stipulations, the technical proposal will be judged as not suitable and Envelope No.2 of the bidder will not be opened.

(B) ENVELOPE No. 2: (Financial Bid)

This envelope shall be opened online if possible immediately after opening of Envelope No. 1, only if contents of Envelope No. 1 are found to be acceptable to the Department. The tendered rates lumpsum offer in form "C" then be read out. In the presence of bidders who remain present at the time of opening of Envelope No. 2.

17. IMPORTANT POINTS TO BE THE TENDERER NOTED BY

i) ISSUE OF FORMS: Information regarding contract as well as blank tender forms can be downloaded from the eTendering website upon providing the details of the payment of cost as detailed in the N.I.T.

ii) TIME LIMIT: The work is to be completed within time limit as specified in the N.I.T. which shall be

reckoned from the date of written order for commencing the work and shall be inclusive of monsoon period.

iii) The price- bid (amount) should be written both in words and in figures in the agreement form on the relevant page.

iv) No alterations and additions in the form of tender and in the Schedules and no additions in form of special stipulations are permitted. If any of these is found, the tender may be summarily rejected. However, the tenderer may make a point, be wished to make clear in the forwarding letter in **ENVELOPE NO. I.**

v) The price – bid (amount) should be inclusive of all prevailing taxes(Excluding GST), Octroi,Royalty charges etc. to be paid by the Tenderer for the work and the clause for extra payment on any such account shall not be entertained

vi) The tenderer (In case of firm, each partner) shall sign and the signature shall be attested as witness by a reputed person in the space provided for the purpose.

vii) All documents required to be submitted envelope No. 1 online shall be digitally signed by individual contractor's digitally signature

viii)The Tenderers shall be presumed to have carefully examined the drawings, conditions and specifications of the work and have fully acquainted themselves with all details of the site, the conditions of rock and its joints, pattern, river, weather characteristics, labour conditions and in general with all the necessary information and data pertaining to the work, prior to tendering for the work

ix)The data whatsoever supplied by the Department along with the tender documents are meant to serve only as guide for the tenderers while tendering and the Department accepts no responsibility whatsoever either for the accuracy of data or for their comprehensiveness.

x)The quarries for extraction of metal, murum etc. provided in the sanctioned estimate are as per survey conducted by the Department. The Contractor should however examine these quarries and see whether full quantity of materials required for execution of the work strictly as per specification are available in these source before quoting the rates. In case the materials are not available due to reasons whatsoever, the contractor will have to bring the materials from any other source with no extra cost to Government. The rates quoted, should therefore be for all leads and lifts from wherever the materials are brought at site of work and inclusive of royalty to be paid to the Revenue

Department by the Contractor.

xi) The contractor's offer shall include all Insurance Policies as stated in clause of tender document. No claims on this account will be entertained

In case any clarification is required, the tenderer may obtain it personally or in writing well in advance from the **Executive Engineer, Public Works Division Wardha** In any case the tenderer will be responsible to bind himself /themselves to the terms and condition and specifications of the tender once submitted by him / them.

(I) Any one or more of the documents required are missing.

(II) Any corrections, additions or alterations are made by the tenderer on any page of the tender.

(III) Any pages or pasted slips is or are missing.

(IV) The tenderer has not digitally signed at required places and Documents uploaded along with the tender.

18. Any change that will be made in the tender papers by the competent authority after issue of the same, will be intimated to the tenderer in the form of corrigendum / Addendum for incorporating the same in the tender before submitting the same.

19. Acceptance of the tender rests with the Chief Engineer, Public Works Department, Nagpur Region, Nagpur who reserves the right to reject any or all tenders without assigning any reasons thereof.

20. This detailed tender notice shall form part of tender documents.

21. Income Tax deduction at source shall be at a percentage got approved from the Income Tax Officer concerned. Necessary details as called by Income Tax authorities for this shall be furnished by the contractor.

22. The successful tenderer will be required to produce, to the satisfactions of the specified concerned authority valid and concurrence license issued in the favour under the provision of contract labour (Regulations and abolition Act 1970) before starting the work. On failure to do so, the acceptance of the tender is liable to be withdrawn

23. Power of attorney on behalf of firm authorized to sign agreements / bills etc. and collect cheques

from the department for the work done.

24. Any dues arising out of contract will be recovered from the contractor as arrears of land revenue, if not paid amicably. Moreover, recovery of the Govt. dues from the contractor will be affected from the payment due to contractor from any other Government work under execution with them.

25.0 Tax

25.1 The rates quoted by the Contractor shall be deemed to be inclusive of the **labour welfare cess and other taxes (other than GST)** that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source as per applicable law.

25.2 Payment of GST

i) Bidder shall quote his rate excluding GST.

ii) GST shall be payable on the accepted contract value.

iii) GST shall be paid to contractor on the amount of bill of work done as per prevailing rate of GST during the period of work done.

26. As per the Govt. Resolution No. BCA 2009/CR108/Labour 7A Mantralalya Mumbai

dated 17/06/2010, the workers welfare cess @ 1% will be deducted from the gross bill amount of every bill either for measured work for advance payment and/or secured advance.

27. All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen @ head quarter of Executive Engineer Public Works Division Wardha and only the Court @ Head Quarter of Executive Engineer Public Works Division Wardha shall have jurisdiction to try and adjudication over them.

28. The tenderer shall submit the list of apprentices engaged by the Contractor under Apprentice Act.

29. No foreign exchange will be released by the Department for the purchase of plants and machinery for the work by the Contractor.

30) EXAMINATION OF DRAWING AND SITE CONDITIONS:

The tenderer shall in his own interest carefully examine the drawings, conditions of contract and specifications etc. He shall also inspect the site and acquaint himself about the climate, physical sub soil geological conditions, standing water and all weather conditions prevailing at site, the nature magnitude, special features, practicability of the works. All existing and required means of communications and access to site, availability of housing and other facilities, the availability of labour and materials, labour camp site, stores, godown etc. He shall obtain all necessary information as to the risk, contingencies and other circumstances which may affect and influence the tender. No claims on any of the above or any other factors will be entertained by the Government. Should there be any discrepancy or doubt or obscurity to be observed by him, he shall set forth in writing such discrepancies,

doubts, obscurity and submit the same to Executive Engineer, P.W.Division, Wardha for elucidation as soon as possible.

(i) CONTRACT DRAWINGS: -

The Contract Drawings provided for tendering purpose with the tender documents shall be used as a reference only. Contractor should visualize the nature and type of work contemplated and to ensure that the rates and prices quoted by him in the bill of quantities take due consideration of the complexities of work involved during actual execution/ construction as experienced contractors in the field. The tendered rates/ prices for the work shall be deemed to include the cost of preparation, supply and delivery of all necessary drawings, prints, tracings and negatives which the contractor is required to provide in accordance with the contract.

(ii) DOCUMENTATION: -

If so ordered by the Engineer-in-charge, the contractor will prepare drawings of the work as constructed and will supply original and three copies to the Engineer who will verify and certify these drawings. Final as constructed drawings shall then be prepared by the contractor and supplied in triplicate along with soft copy of the same to Engineer for record and reference purpose at the contractors cost.

31) As per Government instructions, it is proposed to make payment of Contractors bills through ECS/NEFT System. For this purpose, Contractor should open his Bank account in a bank having core banking facility only.

32) Recovery of Royalty: - For all quarry materials used for the work the royalty charges on quarrying materials will be recovered at prevailing Govt. rates from each bill. Contractor shall produce Royalty Clearance Certificate Royalty passes issued by Revenue Department within 3 months from the date of payment. Failing which the amount recovered from the bill will be remitted to the revenue department and there after no further claims of the Contractor will be entertained.

33) Contractor shall submit a certificate to the effect that “ all the payments to the labour staff are made in bank accounts of staff linked to unique Identification Number (ADHAR CARD) “ the certificate shall be submitted by the contractor within 60days from the commencement of contract. if the time period of contract is less than 60 days then such corticated shall be submitted within 15 days from the date of commencement of contract.

34) At any point of time during tender process, work execution period, Defect Liability Period, submitted papers/documents/applications including material purchase vouchers, test reports, bitumen challans, quantity related papers or any papers of contractor should be true, correct & if the papers submitted by Contractor is found incorrect, faulty, not true, dubious, bogus, forged etc. then relevant actions of blacklisting & criminal proceedings as per Indian Penal Code (IPC) shall be initiated against Contractor/ JV / Partnership Firms/Private Ltd./Companies(Bidder). PWD Officers / Engineers / Divisional Account Officers shall not be held responsible for the papers submitted by the Contractor.

35) During Technical Opening/Scrutiny of envelop No.1 of tender, if contractor submits false papers / reports for fulfillment of qualifying criteria, then envelop No.2 of such contractor shall not be opened. Also such PWD registered contractor / non registered contractor shall be blacklisted & information of contractor being blacklisted shall be circulated to all P. W. Divisions & allied P. W. Departments.

36) After issuance of work order, if it is founds that papers submitted / uploaded are forged, bogus, incorrect, then such contractor shall be blacklisted & Criminal Proceeding as per IPC shall be initiated. If work is at initial stage, the tender of work shall be cancelled.

37) It Is Binding On The Contactor To Execute The Agreement In Non Judicial Stamp Paper Purchased Hum Amounting To Value Applicable To Tender Cost. It Is Mandatory To Pay Appropriates of Stamp Duty To Revenue Authority By Contractor After Acceptance Of Tender As Per Government of Maharashtra, Revenue And Forest Department Circular No. 2020 01—2016 /Case No 218/ M-1(Policy) dated 18/03/2021

38)Payment of Security Deposit by Bank Guarantee and Online BG Verification:

If the contractor wishes to pay security deposit by Bank Guarantee after tender approval then it is mandatory for contractor to verify the Bank Guarantee by paying verification fess of Rs.1000/- through the link provided below

<https://ionlinebg.emahapwd.com/>

Under this the detailed procedure of online BG verification is mentioned and also use manual can be downloaded. After confirmation of truthfulness of BG, tender will be accepted and work order will be given.

39) As per the Government Resolution dated 11 October 2024, any bid exceeding 10% of the tendered cost shall not be accepted for the said work. If a contractor submits a bid that exceeds this limit, even if it is the lowest bid, it shall be rejected prima facie without further consideration, and the tender for the said work shall be reinvited.

FORM-I

DETAILS OF WORKS OF SIMILAR OR ALLIED TYPE AND MAGNITUDE CARRIED OUT BY TENDERER

DURING LAST 5 YEARS

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

Sr. No.	Name of Work	Name & Address of Organization for whom the work was done	Place & Country	Tendered Cost	Date of Commencement.	Date of Completion	Principle Features in Brief.
1	2	3	4	5	6	7	8

•

Note : i) This is only standard form. Details are to be furnished in this format in the form of type written statement which shall be enclosed in Envelope No. I.

ii) The length of bridge shall specifically be mentioned in the Column -8

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

40

FORM-II

DETAILS OF OTHER WORKS TENDERED FOR AND IN HAND ON THE DATE OF SUBMISSION OF THIS TENDER

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

Sr. No.	Name of Work	Name & Address of Organization for whom the work was done	Place & Country	Work in Hand			Works Tendered for	
				Tendered Cost	Cost of remaining work	Anticipated date of completion	Est. Cost.	Date when decision expected.
1	2	3	4	5	6	7	8	9

Note : This is only standard form. Details are to be furnished in this format in the form of type written statement which shall be uploaded in Envelope No. I.

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

41

FORM-III

LIST OF MACHINERY AVAILABLE WITH TENDERER WHICH WILL BE USED ON THIS WORK

**NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT
BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..**

Sr. No.	Name of Equipment	No. of Unit	Kind of make	Capacity	Age of Machinery	Present Condition of machinery	Present Location with name & address of organization where machinery under use at present	Whether machinery is hypothecated to division Bank or Institute etc.
1	2	3	4	5	6	7	8	9

Note : This is only standard form. Details are to be furnished in this format in the form of type written statement which shall be uploaded in Envelope No. I.

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

FORM-IV

LIST OF TECHNICAL PERSONNEL OF THE TENDERER

LIKELY TO BE APPOINTED ON THIS WORK

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

Sr. No.	Name of Work	Designation / Post held/	Academic Qualification & experience	Remarks (Any other points)
1	2	3	4	5

Note: This is only the standard form. Details are to be furnished in this format in the form of type written statement which shall be uploaded in Envelope No. I.

STATEMENT NO. - V

STATEMENT SHOWING QUANTITIES OF WORK EXECUTED DURING THE LAST FIVE YEARS

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

NAME OF THE TENDERER: -----

Year	Quantity of Item of work Performed	Remark.
	Cement concrete (Plain or reinforcement work	Steel bar reinforcement

Note: This is only the standard form. Details are to be furnished in this format in the form of type written statement which shall be uploaded in Envelope No. I.

FORM NO. - VI

STATEMENT SHOWING WORK DONE IN ALL CLASSES OF CIVIL ENGINEERING CONSTRUCTION WORKS DURING THE LAST FIVE YEARS.

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

NAME OF THE TENDERER: -----

Sr. No.	Name of work	Amount put to Tender / Tendered Cost.	Agreement No.	Date of Commencement	amount of work done during each of last FIVE years (Rs. In Lakhs)					Amount of work remaining to be executed 2025-26	Remark
					2020-21	2021-22	2022-23	2023-24	2024-25		
1	2	3	4	5	6	7	8	9	10	11	12

Note: This is only the standard form. Details are to be furnished in this format in the form of type written statement which shall be enclosed in Envelope No. I.

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

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CHAPTER - IV

FORM - C PUBLIC WORKS DEPARTMENT

TENDER FOR A LUMP SUM CONTRACT TERMS & CONDITIONS

(Exempted from stamp duty vide G.R. No. 368 - A, 1732 of 9th October 1989)

Notes:

- 01 The EMD if applicable will be paid via online mode, Additional (Performance) Security (if Required) (copy to be Submitted as per the tender Schedule).

In case the tender is accepted the earnest money will returned to the contractor on his furnishing the security deposit required form him.
- 02 If the tender is accepted, no separate agreement shall be necessary and the tender itself shall be treated as the contract.
- 03 For Signature on the tender see rule within.

GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF CONTRACTORS

a)	In the event of the tender being submitted by a firm it must be signed by each partner hereof, or in the event of the absence of any partner, it must be signed on his behalf by a person or person holding a power of attorney authorizing him or them to do so.
b)	Receipts for payments on account of any work, when executed by a firm should also be signed by all the partners except where the contractors are described in their tender as a firm in which case the receipts shall be signed in the name of firm by one of the partners or by some other person having authority to give effectual receipts for the firm.
c)	(i) The contractor shall pay along with the tender the sum of 13,37,500/- as and by way of earnest money. Earnest money shall be paid via online using NEFT/RTGS or payment gateway mode or in the Form of DD /FDR /BG. The said amount of earnest money shall not carry any interest whatsoever.
d)	In the event of his tender being accepted subject to the provision of sub - clause (iii) below the amount of earnest money shall be dealt with as per provision in Chapter- III (9).
e)	If after submitting the tender, the contractors withdraw his offer or alters the same or if after the acceptance of his tender the contractors failure or neglects to furnish the balance or security deposit without prejudice to any other rights and powers of the Government here under or in law Government shall be entitled to forfeit the full amount of earnest money deposited by him.
f)	In the event of his tender not being accepted the amount of earnest money deposited by the Contractor shall unless, it is prior there to forfeited under the provision of sub clause (iii) above to be refunded to him on his passing receipt thereof.
g)	The amount of earnest money to be deposited shall be Rs. 13,37,500/- such earnest money should, generally be paid by the contractors in the manner detailed in the tender notice.
h)	The Superintending Engineer or his duly authorized Assistant will open tenders in the presence of contractors who have submitted tenders or their representatives who may be present at the time. The manner of submission of tenders and their opening is described in Chapter- III . In the event of a tender being rejected the Divisional Officer concerned to refund the amount of the earnest money deposited to the contractor placing the tender, on his giving a receipt for the return of the money.
i)	The officer competent to dispose of the tenders shall have the right of rejecting all or any of the tenders.
j)	Every contractor shall, unless exempted in writing by the Superintending Engineer, produce along with his tender a registration certificate of appropriate class. If he fails to produce a certificate his tender shall not be considered.
k)	The tendering contractor shall furnish a declaration, along with the tender showing all works for which he has already entered into contract and the value of the work that remains to be executed in each case on the date of submitting the tender.
l)	Every tenderer shall submit along with the tender Audited balance sheets along with profit & loss account duly signed by the Chartered Accountant as provided in I.T.Act 1961 vide Clause 44A.B for the reference years

m)	In view of the difficult position regarding the availability of Foreign exchange, no foreign exchange would be released by the Department for the purchase of plant and machinery required for the execution of the work contracted for.
n)	The contractor will have to construct shed for storing controlled and valuable materials issued to him under Schedule "A" of the agreement, at work site with having double locking arrangement. The materials will be taken for use in the presence of the departmental person. No materials will be allowed to be removed from the site of work.
o)	The contractors shall also give a list of machinery in their possession and which they propose to use on the work.
p)	Contractor should produce evidence of their registration in appropriate category (valid on the date of submission of tender) otherwise the tender will not be considered.
q)	Contractor should produce original license / attested copy of license having registered with the Assistant Commissioner of Labour as required as per contract labour (Regulation and Abolition) Act, 1970 and the Maharashtra Contract Labour (Regulation & Abolition) Rules, 1970 within 30 days after award of work order.

TENDER FOR LUMP SUM CONTRACT

I (We) _____ do hereby tender to execute the whole of the work described in the tender Document and Drawing No. _____ according to the annexed specifications signed by _____ and dated _____ for the sum of Rs. _____

(In words) _____

Signature of Contractors

Note: - Rate should not be quoted on this page (i.e. Envelope No.1)

MEMORANDUM

a)	If several subsections are included, they should be detailed in a separate list.	a)	General Description	CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..
		b)	Estimated Cost	Rs. 26,74,94,463.000 Work Portion- 26,05,97,561.00 Royalty- Rs 57,45,942.00 Testing- 11,50,960.00 Tender Cost- 26,74,94,463.000
c)	The amount of earnest money to be deposited shall be in accordance with the provisions of paras 207 of the PWD Manual.	c)	Amount of earnest money	Rs 13,37,500/- The contractor shall pay along with the tender the sum of 13,37,500/- as and by way of earnest money. Earnest money shall be paid via online using NEFT/RTGS or payment gateway mode like DD/FDR
d)	This deposit shall be accordance with paras 213 and 214 of the PWD manual.	d)	Security deposit In cash or other approved from Chapter (iii-10) To be deducted from current bill Total	Rs. 13,37,500/- Rs. 13,37,500/- Rs. 26,75,000/-
e)	This percentage where no security deposit is taken will vary from 2 percent according to the requirements of the case. Where security deposit is taken. See note to clause 21 of conditions of contract.	e)	Percentage if any, to be deducted from bills (to make up the total amount as security deposit required by (d) above.	1 %.
f)	Give Schedule were necessary showing dates by which the various terms are to be complete	f)	Time allowed for the work from the date of written order to commence.	24 (Twenty Four) calendar months including monsoons.

Should this tender to be accepted, I (We) do hereby agree and bind myself / ourselves to abide by & fulfil all the conditions annexed to the said specifications or in default thereof to forfeit and pay

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NO. OF CORRECTION

EXECUTIVE ENGINEER

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to the Governor of Maharashtra (herein after referred to as " the Government" the penalties or sums of money mentioned in the said conditions from the Government Treasury or Sub Treasury at _____ in respect of the sum of Rs. 13,37,500/-is herewith forwarded representing the earnest money the full values of which is to be absolutely forfeited to the Government should I / We do not deposit the full amount of Security specified in the memorandum, otherwise the said sum, of Rs. 13,37,500/- shall be refunded dated _____ 2026.

(Signature of Party Tendering)

Signature of **Party Tendering**
before submission of tender.

(Address)

Dated the _____ day of _____ 2026

Witness

Signature of **Party Tendering**
Signature.

(Address)

Dated the _____ day of _____ 2026

Signature of the officer by whom
accepted.

The above tender is hereby accepted by me on behalf of the
Governor of Maharashtra. Dated the day of 2026

Executive Engineer
Public Works Division
Wardha

INTEGRITY PACT

Between

Public Works Department, Maharashtra Government
having its Office at Bandhkam Bhawan, Fort Mumbai - 400001

hereinafter referred to as

"PUBLIC WORKS DEPARTMENT",

(Insert the name of the Sole Bidder)

.....
having its Registered Office at (Insert full Address)

and

.....
[Insert the name of the Partner(s), as applicable]
having its Registered Office at _ (Insert full Address)

hereinafter referred to as

"The Bidder/Contractor"

Preamble

PUBLIC WORKS DEPARTMENT intends to award, under laid-down organizational procedures, contract(s) for

[Insert the name of tile package]

NAME OF WORK - CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

(Signature) _

(For & On behalf of)

PUBLIC WORKS DEPARTMENT

(Signature) _

(For & On behalf of Bidder

/ Contractor)

Package and Specification

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

Number [Insert Specification Number of the package]

PUBLIC WORKS DEPARTMENT values full compliance with all relevant laws and regulations, and the principles of economical use of resources, and of fairness and transparency in its relations with its Bidders/Contractors.

In order to achieve these goals, PUBLIC WORKS DEPARTMENT and the above-named Bidder/Contractor enter into this agreement called 'Integrity Pact' which will form a part of the bid.

It is hereby agreed by and between the parties as under:

Section I - Commitments of PUBLICWORKS DEPARTMENT

(1) PUBLIC WORKS DEPARTMENT commits itself to take all measures necessary to prevent corruption and to observe the following principles:

a) No employee of PUBLIC WORKS DEPARTMENT, personally or through family members, will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for him/herself or third person, any material or other benefit which he/she is not legally entitled to.

b) PUBLIC WORKS DEPARTMENT will during the tender process treat all Bidder(s) with equity and fairness. PUBLIC WORKS DEPARTMENT will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c) PUBLIC WORKS DEPARTMENT will exclude from evaluation of Bids if such employee(s) who has any personnel interest in the Companies/ Agencies participating in the Bidding/Tendering process

(2) If Principle Secretary PWD, Maharashtra Government obtains information on the conduct of any employee of PUBLICWORKS DEPARTMENT which is a criminal offence under the relevant Anti- Corruption Laws of India, or if there be a substantive suspicion in this regard, he will inform its Chief Vigilance Officer and in addition can initiate disciplinary actions under its Rules.

Section II-Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution:

a) The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to PUBLIC WORKS DEPARTMENT, or to any of PUBLIC WORKS DEPARTMENT's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange an advantage during the tender process or the execution of the contract.

b) The Bidder/Contractor will not enter into any illegal agreement or understanding, whether formal or informal with other Bidders/Contractors. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or actions to restrict competitiveness or to introduce cartelization in the bidding process.

c) The Bidder/Contractor will not commit any criminal offence under the relevant Anti-corruption Laws of India; further, the Bidder/Contractor will not use for illegitimate purposes or for purposes of restrictive competition or personal gain, or pass on to others, any information provided by PUBLIC WORKS DEPARTMENT as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder/Contractor of foreign origin shall disclose the name and address of the Agents/representatives in India, if any, involved directly or indirectly in the Bidding. Similarly, the Bidder/Contractor of Indian Nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly In the Bidding.

e) The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, or committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and/ or with the execution of the contract. f) The Bidder/Contractor will not misrepresent facts or furnish false/forged documents/information in order to influence the bidding process or the execution of the contract to the detriment of PUBLIC WORKS DEPARTMENT.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section III- Disqualification from tender process and exclusion from future contracts

(1) If the Bidder, before contract award, has committed a serious transgression through a violation of Section II or in any other form such as to put his reliability or credibility as Bidder into question, PUBLIC WORKS DEPARTMENT may disqualify the Bidder from the tender process or terminate the contract, if already signed, for such reason.

(2) If the Bidder/Contractor has committed a serious transgression through a violation of Section II such as to put his reliability or credibility into question, PUBLIC WORKS DEPARTMENT may after following due procedures also exclude the Bidder/Contractor from future contract award processes. The imposition and

duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder/Contractor and the amount of the damage. The exclusion will be imposed for a minimum of 12 months and maximum of 3 years.

(3) If the Bidder/Contractor can prove that he has restored/recouped the damage caused by him and has installed a suitable corruption prevention system, PUBLIC WORKS DEPARTMENT may revoke the exclusion prematurely.

Section IV - Liability for violation of Integrity Pact

(1) If PUBLIC WORKS DEPARTMENT has disqualified the Bidder from the tender process prior to the award under Section III, PUBLICWORKS DEPARTMENT may forfeit the Bid Guarantee under the Bid.

(2) If PUBLIC WORKS DEPARTMENT has terminated the contract under Section III, PUBLIC WORKS DEPARTMENT may forfeit the Contract Performance Guarantee of this contract besides resorting to other remedies under the contract.

Section V- Previous Transgression

(1) The Bidder shall declare in his Bid that no previous transgressions occurred in the last 3 years with any other Public Sector Undertaking or Government Department that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section VI - Equal treatment to all Bidders/Contractors

(1) PUBLIC WORKS DEPARTMENT will enter into agreements with identical conditions as this one with all Bidders. (2) PUBLIC WORKS DEPARTMENT will disqualify from the tender process any bidder who does not sign this Pact or violate its provisions.

Section VII - Punitive Action against violating Bidders/Contractors

If PUBLIC WORKS DEPARTMENT obtains knowledge of conduct of a Bidder or a Contractor or a subcontractor or of an employee or a representative or an associate of a Bidder or Contractor or his Subcontractor which constitutes corruption, or if PUBLIC WORKS DEPARTMENT has substantive suspicion in this regard, PUBLIC WORKS DEPARTMENT will inform the Chief Vigilance Officer (CVO).

(*) Section VIII - Independent External Monitor / Monitors

(1) PUBLIC WORKS DEPARTMENT has appointed a panel of Independent External Monitors (IEMs) for this Pact with the approval of Central Vigilance Commission (CVC), Government of India, out of which one of the IEMs has been indicated in the NIT/IFB.

(2) The IEM is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement. He has right of access to all project documentation. The IEM may examine any complaint received by him and submit a report to Principle Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT, at the earliest. He may also submit a report directly to the CVO and the CVC, in case of suspicion of serious irregularities attracting the provisions of the PC Act. However, for ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter shall be referred to the full panel of IEMs, who would examine the records, conduct the investigations and submit report to Principle Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT, giving Joint findings.

(3) The IEM is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Principle Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT.

(4) The Bidder(s)/Contractor(s) accepts that the IEM has the right to access Without restriction to all documentation of PUBLIC WORKS DEPARTMENT related to this contract including that provided by the Contractor/Bidder. The Bidder/Contractor will also grant the IEM, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his documentation. The same is applicable to Subcontractors. The IEM IS under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s)/ Subcontractor(s) with confidentiality.

(5) PUBLIC WORKS DEPARTMENT will provide to the IEM information as sought by him which could have an impact on the contractual relations between PUBLIC WORKS DEPARTMENT and the Bidder/Contractor related to this contract.

(6) As soon as the IEM notices, or believes to notice, a violation of this agreement, he will so inform the Principle Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT and request the Principle Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to PUBLIC WORKS DEPARTMENT and the Bidder/Contractor, as deemed fit, to present its case before making its recommendations to PUBLIC WORKS DEPARTMENT.

(7) The IEM will submit a written report to the Principal Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT within 8 to 10 weeks from the date of reference or intimation to him by PUBLIC

WORKS DEPARTMENT and, should the occasion arise, submit proposals for correcting problematic situations.

(8) If the IEM has reported to the Principal Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT, a substantiated suspicion of an offence under relevant Anti- Corruption Laws of India, and the Principal Secretary PWD, Maharashtra Government, PUBLIC WORKS DEPARTMENT has not, within the reasonable time taken visible action to proceed against such offence or reported it to the CVO, the Monitor may also transmit this Information directly to the CVC, Government of India.

(9) The word '**IEM**' would include both singular and plural.

(*) Thus Section shall be applicable for only those packages wherein the IEMs have been identified in Section - I: invitation for Bids and/or Clause ITB 9.3 in Section - III: Bid Data Sheets of Conditions of Contract, Volume-I of the Bidding Documents.

Section IX - Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor after the closure of the contract and for all other Bidder's six month after the contract has been awarded.

Section X - Other Provisions

(1) This agreement is subject to Indian Law Place of performance and jurisdiction is the establishment of PUBLIC WORKS DEPARTMENT. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing.

(3) If the Contractor is a partnership firm or a consortium, this agreement must be signed by all partners, consortium members partners.

(4) Nothing in this agreement shall affect the rights of the parties available under the General Conditions of Contract (GCC) and Special Conditions of Contract (SCC) (5) Views expressed or suggestions/submissions made by the parties and the recommendations of the **CVO/IEM**[#] in respect of the violation of this agreement, shall not be relied on or introduced as evidence in the arbitral or judicial proceedings (arising out of the arbitral proceedings) by the parties in connection with the disputes/ differences arising out of the subject contract.

#CVO shall be applicable for packages to wherein IEM are not Identified in Section IFBI BDS of Condition of Contract, Volume-I, IEM shall be applicable for packages wherein IEM are identified in Section IFB/BDS of Condition of Contract, volume-I.

(Signature)

(Signature)

For & On Behalf of

For & On Behalf of

Public Works Department

Bidder/Contractor

(6) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature)

(Signature)

(For & On behalf of)

(For & On behalf of

PUBLIC WORKS DEPARTMENT

Bidder/ Contractor)

(Office Seal)

(Office Seal)

Name:

Name:

Designation:

Designation:

Witness 1:

Witness 1:

(Name & Address).

(Name & Address)

Witness 2:

Witness 2:

(Name & Address).

(Name & Address).

CONDITIONS OF CONTRACT

<p>Supply of materials by the contractor.</p>	<p><u>Clause -1</u></p> <p>The contractor (s) is / is to provide every article or thing (with the exceptions noted in Schedule "A" attached) which may be necessary and requisite for the due and proper execution of the several works included. In the contract according to the true intent and meaning of the drawings and specifications taken together which are to be signed by the Executive Engineer, Public Works Division Wardha .(herein after called the Executive Engineer) and by the contractor (s), whether the same may or may not have been particularly described in the specification or shown on the drawings provided however, that the same are reasonably and obviously to be inferred there from. In case of any discrepancy between the drawings and the specifications the Executive Engineer shall decide which of the two is to be followed. The contractor should clearly note that the Government drawings are only out line drawings and the slight or major variations from these dimensions is no responsibility of the Government. The detailed Designs calculations with working drawing and specifications are to be prepared by the Contractor at his own cost and submitted to Government sufficiently early to Superintending Engineer, Design Circle (P.W.D.) to scrutinize. The contractor will not be allowed to execute any part of thereof the structure prior to the "APPROVAL" to the designs and drawings of that part by Superintending Engineer, Designs Circle (P.W.D.) Mumbai</p>
<p>Execution of Works</p>	<p><u>Clause – 2-</u></p> <p>The contractor (s) shall set out the whole of the works as per his drawings and details as approved or supplied to him and during the progress of the works shall set right as ordered by the Executive Engineer or his agent any criers which may be found therein and shall provide all plants, labour and materials for the purpose, The contractor (s) shall also provide all plants, labour and materials (With the exceptions noted in Schedule "A" attached) which may be necessary and requisite for the works and which if accepted shall be paid for at the rates given in Schedule "B" here to annexed. All materials and workmanship are to be best of their respective kinds. The contractor (s) shall leave the works in respect of clean and perfect at the completion thereof.</p>
	<p><u>Clause-2(A)</u></p> <p>I / We agree that this offer shall remain open for acceptance for minimum period of 120 days from the date fixed for opening the same and thereafter until it is withdrawn by me/ by notice in writing duly addressed to the authority opening the tender and sent by registered post A. D. or otherwise delivered at the office of such authority.</p> <p>Treasury Bank</p> <p>Challan No. Dated</p> <p>In respect of the sum of Rs. 13,37,500/- representing the earnest money is herewith forwards. The amount of earnest money shall not bear interest and shall be liable to be forfeited to the Government should I /We fail to (i) abide by mentioned above or (ii) sign and complete the contract documents as required by the Engineer and furnish the security deposit as specified in Item (d) of the memorandum contained in paragraph above within</p>

	time limit laid down in clause 21 of the form. The amount of earnest money may be adjusted towards the security deposit or refunded to me / us if so desired by me / us in writing, unless the same or any part thereof has been forfeited as aforesaid.
Drawings & specifications	<u>Clause- 3</u> Complete copies of the drawings and specifications signed by the contractor and approved by Superintending Engineer, Designs Circle, Mumbai shall be furnished by him to the Executive Engineer for his / their own use and the same or copies thereof shall be kept with the site in charge of the contractor (s) agent who is to be constantly kept on the work site by the Contractor (s) and to whom the instructions can be given by the Executive Engineer.
Subletting of work.	The contractor (s) shall not sublet the works or not any part thereof without the consent in writing of the Executive Engineer.
Control over works.	<u>Clause - 4</u> The Executive Engineer shall have at all times access to the works, which are to be entirely under his control. He may require the contractor (s) to dismiss any person in the contractor (s) employment upon the work. If such person is in his opinion incompetent or misconduct himself and the contractor (s) shall forthwith comply with every such requirement.
Alterations in drawings or specifications, etc.	<u>Clause-5</u> The contractor (s) shall not vary or deviate from the approved drawings or specification or execute any extra work of any kind whatsoever unless upon the express authority of the Executive Engineer which shall be obtained by an order in writing of Executive Engineer or by plain or drawings expressly given or signed by him as an extra work or initiation by any subsequent written approval signed by him. In case of daily labour all vouchers for the same shall be delivered to the Executive Engineer or the officer in charge at the latest during the work following that in which the work may have been done and only such day work is to be allowed for as may have been authorized by the Executive Engineer to be so done unless the work cannot form its character to be properly measured and valued.
Depth of foundations.	The foundation shall be carried to the depths in suitable strata shown in the drawings.
The power to make additions & alterations in drawings or specifications, etc. Such alterations do not invalidate the contract.	<u>Clause – 6-</u> The Executive Engineer shall have power to make any alterations in or additions to the original specifications, drawings designs and instructions that may appear to him to be necessary or advise during the progress of work and the contractor (s) shall be bound to carry out the work in accordance with the instructions which may be given to him / them in writing signed by the Executive Engineer and such alteration shall not invalidate the contracts and may additional work which the contractor (s) may be directed to do in the manner above specified as part of the work or any curtailment of the work as designed which may be found necessary during the period of constructions, shall be carried out or omitted by the contractor(s) on the same conditions in all respects on which he / they agree to do the main work and if the additional or altered work for which no rate is specified in this contract, then

<p>Rates for works not entered in the estimate or schedule of rates of the District.</p>	<p>such class of work shall be carried out at the rates entered in the schedule of rates of the Division or at the rates mutually agreed upon between the Engineer - In - Charge and the contractor whichever are lower, if the additional work 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 seven days of the date of receipt by him / them of the order to carry out the work inform the Executive Engineer, of the rate which he / they proposed to charge for such class of work and if the Executive Engineer does not agree to this rate. He shall by notice in writing be at liberty to cancel his order to carry out it but in such manner as he may considered advisable provided always that if the contractor shall commence work or incur any expenditure in regard here to before the rates shall have been determined as lastly herein before mentioned, then in such case he / they shall only be entitled to be paid in respect of the work carried out of expenditure incurred by him / them period of the date of such determination of the rate as aforesaid according to such rate or rates as may be fixed by the Executive Engineer. In the event of dispute, the decision of the Superintending Engineer of the circle shall be final.</p> <p>The time limit for the completion of the work shall be extended or curtailed in the proportion that the increase or decrease in its costs, occasioned by alterations or additions or curtailment, bears to the cost of the original contract work and the certificate of the Engineer - In - Charge as to such proportion shall be conclusive and binding.</p>
<p>Materials left on site</p>	<p><u>Clause -7</u></p> <p>All work and materials brought and left upon the site of the work either by the contractor (s) or by his / their orders for the purpose of forming part of work are to be considered to be property of the Government of Maharashtra and the same shall not be removed or taken away by the contractor (s) or any other person without the special leave or consent in writing of the Executive Engineer, but Government shall not in any way be answerable for any loss or damage which may happen to or in respect of any such work to materials on account of the same being lost or stolen or injured by weather or otherwise.</p>
<p>Removal & substitution of materials</p>	<p><u>Clause –8</u></p> <p>The Executive Engineer shall have full power to require the removal from the premises of all materials which, in his opinion are not in accordance with the specification and in case of default the Executive Engineer shall be at liberty to employ other persons to remove the same without being answerable or accountable for any loss or damage that may be caused to such materials. The Executive Engineer shall also have full power to require other proper materials to be substituted and in case of default the Executive Engineer may cause the same to be supplied and all costs which be incurred in such removal and substitution shall be borne by the contractor (s).</p>
<p>Action in case of improper materials & workmanship</p>	<p><u>Clause – 9</u></p> <p>If in the opinion of the Executive Engineer any work or part thereof is executed with improper materials or defective, workmanship the contractor (s) shall, when required by the Executive Engineer forthwith re-execute the same and substituted proper materials and workmanship and in case of default by the contractor (s) in so doing within a week from the date of the requisitions the Executive Engineer shall have full power to employ other persons to re-</p>

	execute the work and the cost thereof shall be borne by the contractor.
Action and compensation Payable in case of bad work	<p><u>Clause -10</u></p> <p>If any time before the security deposit or bad may part thereof is refunded to the contractor, it shall appear to the Engineer - In Charge or his subordinate in charge of the work, that any work has been executed with unsound, imperfect or 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 the work, materials or articles complained of may have been inadvertently passed, certified and paid for, the contractor shall be found 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, or articles so specified and provided 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 one percent 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 thereof. (Accompaniment to P.W.D. Govt. Resolution No. CAT - 1087 / CR - 94 / Bldg.2 / Dated 14.06.1989).</p>
Contractor liable for damage done and for imperfections.	<p><u>Clause - 10A</u></p> <p>If during the period of Twenty years for Bridge proper and Ten years for CC Road from the date of completion as certified by the Engineer - In - Charge pursuant to Clause -14 of the Contract or Twenty years for Bridge proper and Ten years for CC Roads after commissioning the work whichever is later in the opinion of the Executive Engineer the said work is defective in any manner whatever 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 there in including dismantling and reconstruction on 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 with the period prescribed, therefore, in the said notice and or to complete the same as aforesaid as required by the said notice, the Executive Engineer shall get the same executed and carried out departmentally or by any other agency at the risk on account and of the cost of the contractor. The contractor forthwith on demand pay to the Govt. the amount of such costs, charges and expenses sustained or incurred by the Govt. of which the certificate of the Executive Engineer shall be final and binding on the contractor. Such costs, charges and expenses shall be deemed to be arrears of land revenue and in the event of the 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 payable or which</p>

	may thereafter become payable by the Govt. to the contractor either in respect of the said work or any other work what so ever or from the amount by Government, (accompaniment to P.W.D. Govt. Resolution No. CAT - 2018 / CR - 151 / Bldg.2/Dated 14.01.2019).
Responsibility of contractor for damage by fire etc.	<p>Clause-11</p> <p>From the commencement of the work to the completion of the same the work shall be under the contractor's charge. The contractor (s) shall be held responsible for any damage done to the same by fire or any other cause and he / they shall be liable</p> <p>to make good all such damage and to carry out any repairs which may be rendered necessary to the same by fire or other caused and they are to hold the Government harmless from any claim for injuries to persons or structural damage, damage to property happening from any neglect or default, want of proper case or misconduct on the part of the contractor (s) or of any one in his / their employ during the execution of the work.</p>
Execution of works not included in the contract.	<p>Clause-12</p> <p>The Executive Engineer shall have full power to send workmen upon the premises to execute fittings and other works not included in the contract and for which the contractor (s) shall afford every reasonable facility during ordinary working hours provided the such operations shall be carried in such a manner as not to impede the progress of the work included in the contract. The contractor (s) shall not, however, be responsible for any damage which may happen to be occasioned in the execution of any such fittings or other works.</p>
Action when work is not duly completed.	<p>Clause-13-The work comprised in this tender shall be commenced immediately upon its acceptance and as soon as possession of the site can be had. The whole work including all additions and variations as aforesaid (but excluding such, if any, as may have been postponed by an order from the Executive Engineer) shall be completed in every respect by the contractor (s) within stipulated time and if from any cause whatever (Other than willful obstruction, default on the part of the Executive Engineer or his staff) and except as hereinafter. Provided the whole of such work shall not be finished to the satisfaction of the Executive Engineer within the stipulated or appointed period. The contractor (s) shall forfeit and pay to Govt. by way of ascertained and liquidated damages for each default the sum equal to 0.1 percent or such smaller amount as the Chief Engineer (whose decision in writing shall be final) may decide of the said estimated cost of the whole work as shown in the tender for every week that such default continues provided always that the total amount of compensation to be paid under the provision of this clause and clause 22 shall not exceed 5 percent of the estimated cost of the work as shown in the tender. The amount of such damages, if any, may be deducted by way of set off from, any unpaid portion of the contract price or may be otherwise recovered from the contractor (s) and shall be brought into account by the Executive Engineer when setting the contractor's accounts for his final certificate as herein after provided.</p>
Extension of time on account of alterations	<p>Provided nevertheless that if the contractor(s) shall be of the opinion that he/they are entitled to any extension of time on account of the works being altered, varied or added to or on account of any delay by reason of any inclement weather or other caused beyond the control of the contractor(s) or in consequence of orders to that effect from the Executive Engineer, himself (which order the accepting authority is hereby empowered to make). Then</p>

	<p>in any such cause or cases it shall be competent for the Executive Engineer by an order in writing to extend the aforesaid period for final completion by such period or period as he may deem reasonable, however, he has to obtain prior sanction from Superintending Engineer/Chief Engineer who is competent to accept the tender and the contractor (s) shall there upon complete the work or works within such extended period or period as aforesaid, further the contractor (s) shall not be entitled to any extension of time unless he / they shall, within Ninety days (90 Days) after the happening of the event in respect of which he / they shall consider himself / themselves entitled to any such extension of Executive Engineer written notice of such claim for the extension of time and of the ground or grounds, therefore, and of the period thereof unless in any case the Executive Engineer shall in his discretion dispense with such notice and certify the extension of time. Provided further that in cases in which any extension of time has been granted, the aforesaid provision relating to payment of damage for default in completion of the work within the time so extended shall apply.</p>
Final Certificate	<p><u>Clause -14</u></p> <p>On completion of the work contractor (s) shall be furnished with a certificate by the Executive Engineer of such competent but no such certificate shall be given not shall the work be considered to be complete until the contractor(s) shall have removed from the premises on which the work shall have been executed all centering surplus - materials and rubbish, and shall have cleaned off the dirt from all work in or upon which the work has been executed or of which / he / they may have had possession for the purpose of executing the work, nor until the work shall have been measured by the Executive Engineer or where the measurements have been taken by his subordinate until they received the approval of the Executive Engineer, the said measurements being binding and conclusive against the contractor (s). If the contractor (s) fail to comply with the requirements of this clause as to the removal of scaffolding, surplus materials and rubbish, and cleaning of dirt on or before the work of Executive Engineer may, at the expenses of the contractor (s) remove such scaffolding, surplus materials and rubbish, and dispose off the same as he thinks fit and clean off such dirt as aforesaid; forthwith pay the amount of all expenses so incurred, but shall have no claim in respect of any such centering, scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.</p>
Action when contractor becomes bankrupt etc.	<p><u>Clause-15</u></p> <p>If the contractor (s) shall become bankrupt or shall compound with or a make any assignment for the benefit of his / their creditor or shall suspend or delay the performance of his / their part of the contract except on account of the causes mentioned in clause 13 or in consequence of his/their not having proper instructions for which the contractor (s) shall have duly applied the Executive Engineer may give to the contractor (s) his / their assignee or trustee, as the case may be, written notice requiring the works to be proceeded with; and in case of he does not receive any satisfactory reply from the contractor (s) or his / their assignee or trustee within the period of seven days from such notice if shall lawful for the Executive Engineer to enter upon & take possession of the works and to employ any other person or persons to carry on and complete the same and to authorize him or them to see the plant, materials and any other property of the contractor (s) upon the work & in any such event the costs and charges which may be incurred in carrying on and completing the said works shall be payable to the Executive Engineer by the contractor (s) and may be set off by</p>

	the Executive Engineer against any money due or to become due to the contractor (s).
Payment to contractor for work done.	<p><u>Clause -16</u></p> <p>At the end of every calendar month or at earlier interval joints measurements of the work done and materials laying at site shall be taken. Payment will be made to the contractor for work done at the rate shown in the schedule of payments or (Schedule of Payment) on priority basis when particular of payment is not completed in all respect. Advance on materials brought to site shall be given in accordance to the rules of the department for payment of secured advance.</p>
Certificate	<p><u>Clause -17</u></p> <p>The certificate of the Executive Engineer hereinafter referred to showing the final balance due to payable to the contractor (s) shall be conclusive evidence of the work having been duly completed and that the contractor (s) shall be entitled to receive payment of the final balance in accordance with such certificate, but without prejudice to the liability of the contractor (s) under the provision of clause-10.</p>
No compensation for alteration in or rectification of work to be carried out.	<p><u>Clause -18</u></p> <p>If at any time after the execution of the contract documents the Executive Engineer shall for any reason whatsoever; not require the whole or any part of the work as specified in the tender to be carried out the Executive Engineer shall give notice in writing of the fact to the contractor (s) who shall thereupon have no claim to any payment or compensation whatsoever on account of any profit or advantage which he / they might have derived in from the execution of the work in full but which he / they didn't derive in consequence of the full amount of the work not having been carried out neither shall he / they have any claim for compensation by reason of any alteration having been made in the original specification, drawings, designs and instructions which may involve any curtailment or increase of the work as originally contemplated.</p>
Compensation under the workmen's compensation Act.	<p><u>Clause – 19</u></p> <p>The contractor (s) shall be responsible for and shall pay any compensation to his workman which maybe payable under the work-men's compensation Act. 1923 {VIII of 1923} {hereinafter called the said Act) for injuries suffered by them. If such compensation is paid by the Government as principal under subsection {1} of Section 12 of the Act on behalf of the contractor {s} it shall be recoverable by the Government from the contractor (s) under subsection (2) of the said section, and such compensation shall be recovered in accordance with the conditions notified at the time of inviting tenders.</p>
	<p><u>Clause - 19A</u></p> <p>The contractor shall be liable to pay the expenses of providing medical aid to any workman who may suffer any injury as a result of an accident at or near the work site whether on duty or off-duty & whether such accident taken place on a holiday or on a working day. It shall be open to Government to incur the requisite expenses for providing such medical aid and to recover the same from the contractor. Certificate of the Executive Engineer as to amount of expenses actually incurred on providing such medical aid shall be final and conclusive against the contractor.</p>

Payment of Quarry Fees and Royalties	<p><u>Clause – 20</u></p> <p>All quarry fees, royalties’ octroi dues and fees, royalties’ etc. ground rent for stacking materials, if any, shall be paid by the Contractor.</p>
Security Deposit	<p><u>Clause 21</u></p> <p>The person / persons whose tender may be accepted (Hereinafter called the contractor, which expression shall unless excluded by or repugnant to the context including his, he her, executors, administrators, and assigns) shall (A) within 10 days (which may be extended by the Superintending Engineer thinks fit to do so) of the receipt him of the notification of the acceptance of his tender deposit with the Executive Engineer in cash or Govt. securities endorsed to the Executive Engineer (if deposited for more than 12 months) sum sufficient which will made up the full security deposit specified in the tender or (B) (Permit Government to the time of making any payment to him for work done. Under the contract to deduct such as will amount to two percent of all moneys so payable such deductions to be held by Government by way of security deposit provided always that in the event of the contractor depositing a lumpsum by way of security deposit as contemplated at (A) above, them and in such case, if the sum so deposited shall not amount to two percent of the total estimated cost of the work, it shall be lawful for Government at the time making any payment to the contractor for work done under the contract to make up the full amount to two percent 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 sums of money payable by the contractor to Government under the terms of his contract may be deducted from his contract may be deducted from or paid by the sale of sufficient part of 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 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.</p> <p>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 a lump sum within the period specified at (A) above is not paid the tender/contract already accepted shall be considered as cancelled and legal steps taken against the contractor for recovery of the amount. The amount of the security deposit dodged 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 work within the period upto which the contractor has agreed to maintain the work in good order, then, subject to provisions of clauses 10 & 10-A hereof the amount of Security deposit retained by Government shall be adjusted towards the excess cost incurred by the department on rectification work.</p>
Compensation for delay.	<p><u>Clause – 22</u></p> <p>The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor (s) and shall be reckoned from the date on which the order to commence</p>

	work is given to the contract be proceeded with, all the diligence, (time being deemed to be of the essence of the contract of the part of the contractor (s) and if the contractor (s) makes / make default there in, he / they shall pay as compensation the sum which may be determined under clause 13.
Note: The qty. of work to be done within a particular time to be specified above shall be fixed by the Officer competent to accept the contractors after taking into consideration the circumstances of each case & shall be inserted in the blanks space kept for the purpose & abide by the programme of detailed progress laid down by the Executive Engineer.	<p>And further to ensure good progress during the execution of the work contractors shall be bound, in all cases in which the time allowed for any work exceeds one months to complete.</p> <p>1/5 of the work in 1/4 of the time.</p> <p>2/5 of the work in 1/2 of the time.</p> <p>3/4 of the work in 3/4 of the time.</p> <p>Full work in full original time.</p> <p>In the event of the contractor (s) failing to comply with any of these conditions he/ they shall be liable to pay compensation an amount equal to one percent, or such smaller amount as the Chief Engineer (whose decision in writing shall be final) may decide, of said estimated cost of the whole wok every day that the due quantity of work remain incomplete, provided always that the total amount of compensation to be paid under the provisions of this clause shall not exceed 5 % of the estimated cost of the whole work as shown in the tender.</p>
Action when the progress of any particular portion of the work is unsatisfactory.	<p><u>Clause – 23</u></p> <p>If the progress of any particular portion of the work is unsatisfactory, the Executive Engineer shall not withstanding that: general progress of, the work is accordance with the conditions mentioned in clause 22 be entitled to take action under clause 10 after giving the contractors 10 days notice in writing. The contractors (s) will have no claim for compensation for any loss sustained by him / them owing to such action.</p>
Liability for damages sing from non - provision of light fencing etc.	<p><u>Clause-24</u></p> <p>The contractors (s) shall provide all necessary fencing and lights required to protect the Public from accident and shall be bound to bear the expenses of defense of every suit, action or other legal proceeding that may be brought by any person for injury sustained by him owing to neglect of the above precautions and to pay may any such suit, action or proceedings or which may with the consent of the contractors (s), be paid for compromising any claim by any such person.</p>

<p>Liability of contractor if any damage done in or out side work area.</p>	<p><u>Clause – 25</u></p> <p>Compensation for all damage 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 11 shall be estimated by the Executive Engineer or such other officer as he may appoint and the estimates of the Executive Engineer subject to the decision of the Superintending Engineer or appeal, shall be final, and the contractors (s) shall be bound to pay the amount of the assessed compensation on demand on his / their failures to do so the same will be recovered from the contractors (s) damage in the manner prescribed ' -clause 13 of or deducted by the Executive Engineer from any sums that may be due or may become due from the Government to the contractors (s) under this contract i or otherwise.</p>
<p>Work on Sunday</p>	<p><u>Clause-26</u></p> <p>No work shall be done on Sundays without the sanction in writing of the Executive Engineer.</p>
<p>Minimum age of persons employed the employment of donkeys and other animals and the payment of fair wages.</p>	<p><u>Clause-27</u></p> <p>i) No contractor shall employ any person who is under the age of 18 years.</p> <p>ii) No contractor shall employ donkeys or other animals with free thing, of striking or thin rope. The breaching must be at least three inches wide and should be of type (Newar).</p> <p>iii) No animal suffering from sores, lumens or emaciation or which is immature shall be employed on the work.</p> <p>iv) The Executive Engineer or his agent is authorized to remove from the work any person or animal found working which does not satisfy these conditions and no responsibility shall be accepted, by the Government for any delay caused, in the completion of the work by such removal.</p> <p>v) The contractor shall pay fair and reasonable wages to the workman employed by him in the works 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, his decision shall be conclusive and binding on the contractor, but the existence of the dispute or the decision, if any, of the Executive Engineer shall not in any way effect the conditions in the contract regarding the period during which the work is to be completed or the payment to be made by the Government of the sanctioned tender rates.</p> <p>vi) The contractor/s will have to make payment to labours abiding by the minimum wages act.</p>
<p>Method of Payment</p>	<p><u>Clause – 28</u></p> <p>Payment to contractors will be made through BEAMS and credited online to the payee account.</p>

<p>Acceptance of conditions compulsory before tendering for work</p>	<p><u>Clause – 29</u> Any contractor who does not accept these conditions shall not be allowed to tender for works and his name shall be removed from the list of contractors.</p>
<p>Employment of scarcity labours</p>	<p><u>Clause – 30</u> If Government declares a State of scarcity of famine to exist in any village situated within 10 miles of the work the piece worker / contract or shall employ upon such parts of the work, as are suitable for unskilled labour, any person certified to him by the Executive Engineer, or by any person to whom the Executive Engineer may have delegated this duty in writing, to be in need or relief and shall be bound to pay to such persons wages not below. the minimum which Government may have fixed in the 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 piece worker/ contractor.</p>
<p>Preference to local labourers.</p>	<p><u>Clause – 31</u> The contractor shall employ at least the unskilled labour to be employed by him on the said work only from locally available labours and shall give preference to those persons enrolled under Maharashtra Government Employment and Self Employment Department scheme. Provided however, that if the required unskilled labours are not available locally, the contractor in the first instance employ such number of persons as is available and thereafter may with persons permission in writing of Engineering-In-Charge of the said work, obtain the rest of requirement of unskilled labour from outside the above scheme.</p>
<p>Recovery as arrears of land revenue.</p>	<p><u>Clause – 32</u> All amounts whatsoever which the contractor is liable to pay to the Government in connection with execution of the work including the amount payable in respect of (i) materials and/ or stores supplied / issued hereunder by the Government to the contractor (ii) hire charges in respect of heavy plant, machinery & equipment given in hire by the Government to the contractor 'c' execution by him of the work and/ or or which advance have been given by the Government to the contractor shall be deemed to be arrears of 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.</p>
<p>Apprentices Act ,1961</p>	<p><u>Clause – 33</u> A contractor shall comply with the provision 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 the breach of the contract and the Superintending Engineer may, in his discretion cancel the contract. The contractor shall also reliable for any pecuniary liability arising on account of any violation by him of the provision of the Act.</p>

GST or surplus materials	<p>Clause-34</p> <p>34.1 The rates quoted by the Contractor shall be deemed to be inclusive of the labour welfare cess and other taxes (other than GST) that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source as per applicable law.</p> <p>34.2 Payment of GST</p> <p>i) Bidder shall quote his rate excluding GST.</p> <p>ii) GST shall be payable on the accepted contract value.</p> <p>iii) GST shall be paid to contractor on the amount of bill of work done as per prevailing rate of GST during the period of work done.</p>
Tendered Rate	<p>Clause-35 The tenderer rate shall be inclusive of all taxes and cesses and are also be inclusive of the leviable tax in respect sale by transfer of property in goods involved in the execution of works contract under the provision of Rule 58 of Maharashtra Value Added Tax Act, 2005 for the purpose of levy of tax.</p>
Price variation	<p>Clause - 36</p> <p>Price Variation restricted to 5% of the accepted contact value excluding the compensation payable for the material (Bitumen, steel and cement) which have been directly given difference in purchase price and star rate and formula as applicable</p> <p>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 Nagpur Center as per the Labour Gazette published by the Commissioner of Labour, Government of Maharashtra and or in the Wholesale Price index for all commodities, prepared by the office of Economic Advisor, Ministry of Industry, Government of India or in the price of petrol / Oil and Lubricants, and major construction material like bitumen cement, steel, various type of metal, pipes, etc. then subject to the other conditions mentioned below, price adjustment on account of</p>
	<p>(i) Labour component, (ii)Material component, (iii)Petrol Oil and Lubricants components (iv) Bitumen component (v)HYSD & Mild / T.M.T. / Structural Steel component</p> <p>Calculated as per formula hereinafter appearing shall be made restricted to 5% of the accepted contact value excluding the compensation payable for the material (Bitumen, steel and cement) which have been directly given difference in purchase price and star rate and formula as applicable. Apart from these, no other adjustment 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 components shall be 100 and other components shall be as per actual.</p>
	<p>(i)Labour Component - = 17.86% (ii)Material Component - = 80.56 % (iii)POL Component - = 1.58 % Total- 100.00 %</p>

	<p>(4)Steel Actual</p> <p>(5)Cement Actual</p> <p>(6)Bitumen Actual</p>								
	<p>(1) FORMULA FOR LABOUR COMPONENT:</p> $V_1 = 0.85 \times P \times \left[\frac{K_1}{100} \right] \times \left[\frac{L_1 - L_0}{L_0} \right]$ <p>WHERE</p> <p>V₁ = Amount of price variation in Rupees to be allowed for labour component</p> <p>P = Cost of work done during the quarter under consideration Minus the cost of Cement, Steel and Bitumen calculated at the basic star rates as applicable for the tender consumed during the quarter under consideration. These star rates are specified here</p>								
	<p>Star Rates</p> <table border="1"> <tr> <td>(i)</td> <td>Cement</td> <td>Rs. 6000/-</td> <td>Per MT</td> </tr> <tr> <td>(ii)</td> <td>TMT-FE-500 reinforcement</td> <td>Rs. 61000/-</td> <td>Per Mt</td> </tr> </table> <p>K₁ = Percentage of Labor Component as indicated above.</p> <p>L₀ = Basic Consumer Price Index for Nagpur center shall be average consumer price index for the quarter preceding the month in which the last date prescribed for receipt of tender falls.</p> <p>L₁ = Average Consumer Price Index for Nagpur Centre for the quarter under Consideration.</p>	(i)	Cement	Rs. 6000/-	Per MT	(ii)	TMT-FE-500 reinforcement	Rs. 61000/-	Per Mt
(i)	Cement	Rs. 6000/-	Per MT						
(ii)	TMT-FE-500 reinforcement	Rs. 61000/-	Per Mt						
	<p>(2) FORMULA FOR MATERIAL COMPONENT:</p> $V_2 = 0.85 \times P \times \left[\frac{K_2}{100} \right] \times \left[\frac{M_1 - M_0}{M_0} \right]$ <p>WHERE</p> <p>V₂ = Amount of price variation in Rupees to be allowed for material Component</p> <p>P = Same as worked out for labour component.</p> <p>K₂ = Percentage of Material Component as indicated above</p> <p>M₀ = Basic Wholesale Price Index shall be average wholesale price index for the Quarter preceding the month in which the last date Prescribed for receipt of tender falls.</p> <p>M₁ = Average Wholesale Price Index during the quarter under Consideration</p>								

	<p>(3)FORMULA FOR PETROL, OIL & LUBRICANT COMPONENT</p> $V_3 = 0.85 \times P \times \left[\frac{K_3}{100} \right] \times \left[\frac{P_1 - P_0}{P_0} \right]$ <p>WHERE</p> <p>V₃ = Amount of price variation in Rupees to be allowed for POL component</p> <p>P = Same as worked out for labour component.</p> <p>K₃ = Percentage of Petrol, Oil and Lubricant component</p> <p>P₀ = Average price of H S.D.at Mumbai during the quarter preceding the month in which the last date prescribed for receipt of tender falls</p> <p>P₁ = Average Price of HSD at Mumbai during the quarter under consideration</p>
	<p>(4) FORMULA FOR / MILD STEEL/ TMT/ STRUCTURAL STEEL COMPONENT</p> $V_5 = S_0 \frac{(Sl_1 - Sl_0)}{Sl_0} \times T$ <p>WHERE</p> <p>V₅ = Amount of price variation in Rupees to be allowed Mild Steel TMT Steel component.</p> <p>S₀ = Basic rate of T.M.T HYSD/Mild Steel in rupees per metric tonne as considered for working out value of P.</p> <p>Sl₁ = Average Steel Index published in the RBI Bulletin during the quarter under consideration.</p> <p>Sl₀ = Average of Steel Index published in the RBI Bulletin for the quarter preceding the month in which to the last date prescribed for receipt of tender falls.</p> <p>T = Tonnage of steel used in the permanent works for the quarter under consideration.</p>
	<p>(5) FORMULA FOR CEMENT COMPONENT</p> $V_6 = C_0 \frac{(Cl_1 - Cl_0)}{Cl_0} \times T$ <p>WHERE,</p> <p>V₆ = Amount of price variation in Rupees to be allowed for cement component.</p> <p>C₀ = Basic rate of cement in rupees per metric tonne as considered for working out value of P.</p> <p>Cl₁ = Average cement Index published in the RBI Bulletin for the</p>

	<p>quarter under consideration.</p> <p>Cl₀ = 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.</p> <p>T = Tonnage of cement used in the permanent works for the quarter under consideration.</p>
	<p>(6) FORMULA FOR BITUMEN COMPONENT:</p> $V_4 = Q_B (B_1 - B_0)$ <p>WHERE</p> <p>V₄ = Amount of price variation in Rupees to be allowed for Bitumen component.</p> <p>Q_B = Quantity of Bitumen (Grade) in metric tonnes used in the permanent works and approved enabling works during the quarter under consideration.</p> <p>B₁ = Current average ex-refinery price per metric tonne of Bitumen (Grade) under Consideration including taxes (octroi, excise, sales tax) during the quarter under consideration.</p> <p>B₀ = 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, VAT) 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.</p>
	<p><u>The following conditions shall prevail:</u></p> <p>i) The operative period of the contract shall mean the period commencing from the date of work order issued to the contractor and ending on the date on which the time allowed for the completion of 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 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 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 work from the date of levy of such compensation shall be worked out by pegging the indices L₁, M₁, B i P₁, Cl₁ and Sl₁ to the levels corresponding to the date from which such compensation is levied.</p>

	<p>ii) The price variation under this clause shall not be payable for the extra items required to be executed during the completion of the work and also on the excess quantities payable under the provisions of Clause 38 of the contract form B-1 since the rates payable for the extra items or the extra quantities under the clause 38 are to be fixed as per the current DSR or as mutually agreed subject 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 38 of the contract form B-1 extends beyond the operative date of the DSR, from the rates payable for the same beyond the date shall be revised with reference to the next current DSR prevalent at that time on year to year basis or revised rates, in accordance with mutual agreement thereon, as provided for in the contract, whichever is less.</p>
	<p>iii) This clause is operative both ways, i.e., if the price variation as calculated above is in 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 amount shall be deductible from any amounts due and payable under the contract.</p>
	<p>iv) 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.</p>
<p>Additional conditions for Quality Assurance & Maintenance Manual)</p>	<p>Clause 37- To ensure the specified quality of work which will also include necessary surveys, Temporary works etc., and 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, the contractor shall submit an organization chart of his technical personnel to be deployed on the work along with their qualifications, job descriptions defining the functions of reporting, supervising, inspection and approving, the contractor shall also submit a list of tools, equipment and the machinery and instrumentation which be proposed to use for is design the construction and for casting in the field and/or in the laboratory and monitoring. The contractor shall modify, supplement the organization chart and the list of machinery / equipment etc. as per the directions of the Superintending Engineer and shall deploy the personnel and equipment on the fields as per the approved chart and list respectively. The contractor shall submit written method, statements dealing his exact proposals 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 certificates, records, check-lists and log books of results etc., such records shall be compiled 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 Executive Engineer - In - Charge.</p> <p>Where the work is to be done on lump-sum basis on contractor's design the contractor shall also prepare and submit a maintenance manual giving procedure for maintenance, with the periodicity of maintenance works including inspections, tools and equipment 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 h and technique of construction. This manual shall be submitted within the contract period.</p>

<p>INSURANCE OF CONTRACT WORK</p>	<p><u>Clause 38 INSURANCE OF CONTRACT WORK</u></p> <p>Contractor shall take out necessary Insurance Policy/Policies (Viz contractors all risk Insurance policy, Erection all risk, Insurance policy etc. as decided by the Directorate of Insurance) so as to provide adequate insurance cover for execution of the awarded work for total contract value and complete contract period compulsorily from the, "Directorate of Insurance, Maharashtra State, Mumbai" only. Its postal address for correspondence is "264, MHADA, First Floor, Opp. Kalanagar, Bandra (East) Mumbai-400051". (Telephone Nos.26590403/26590690 and Fax Nos. 26592461/26590403. Similarly all workmen appointed to complete the contract work are required to insure under 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 contract work and paid to the Directorate of Insurance Fund Maharashtra State, Mumbai. The Director of Insurance reserves the right to distribute the risk of insurance among the other resources.</p>
<p>INSURANCE</p>	<p><u>Clause 38 (A) INSURANCE</u></p> <p>The contractor shall take out necessary Insurance Policy / Policies (viz. Contractors All Risks Insurance Policy, Erection All Risks Insurance Policy etc. as decided by the Directorate of Insurance) so as to provide adequate insurance cover for execution of the awarded contract work for total contract value and complete contract period Compulsory from the "Directorate of Insurance, Maharashtra State, Mumbai" only. Its postal address for Correspondence is "264, MHADA, First Floor, Opp. Kalanagar, Sandra (East), Mumbai-400 051" (Telephone Nos. 022-26590403 1 26590690 and Fax No. is 022-26592461 / 26590403). Similarly, all workmen's appointed to complete the contract work are required to insure under workmen's compensation Act.</p> <p>The contractor shall renew the insurance policy for the extended period of the contract. The contractor shall also take out additional insurance policy for the increase contract cost. The insurance policy shall be valid upto extended period. Insurance policy/ policies taken out from any other company will not be accepted, if any Contractor has not taken out the insurance policy from the "Directorate of Insurance, Maharashtra State, Mumbai" or has effected insurance with any insurance company, the same will not be accepted and 1 % of the tender amount or such amount of premium calculated by the Government Insurance Fund will be recovered directly from the amount payable to the contractor for the executed contract work and paid to the Directorate of Insurance Fund, Maharashtra State, Mumbai. The Director of Insurance reserves the right to distribute the risks of insurance among the other insurers</p> <p>Insurance</p> <p>4.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Contract Period, in the amounts and deductibles stated in the Contract Data for the following events which are due to the Contractor's risks:</p> <p>(a)loss of or damage to the Works, Plant and Materials;</p> <p>(b)loss of or damage to Equipment:</p>

	<p>(c) loss of or damage of property (except the Works, Plant, Materials and Equipment) in connection with the Contract; and</p> <p>(d) Personal injury or death of any personnel employed by the contract is during execution and maintenance defect liability period. Employee of PWD, any person using the faculty created by the contract during the construction and defect liability period.</p> <p>4.2 Policies and certificates for insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred. 4.3. If the contractor does not provide any of the policies and certificated required, the employee may affect the insurance which the Contractor should have provided and recover premiums the Employer has paid from payments otherwise due to the Contractor of it's payment is due, the payment of the premiums shall be a debt due shall be recoverable from the bills and deposits of the contractor of any work In Maharashtra and If no dues in work than as arrears of land revenue.</p> <p>4.4 Alterations to the terms of insurance shall not be made without the approval of the Engineer.</p> <p>4.5 Both parties shall comply with any conditions of the insurance policies.</p> <p>4.6 If completion period of work is Extended, then period of Insurance must be renewed/ extended as per requirement.</p> <p>4.6.1 The contractor shall produce the labour insurance policy, of Directorate of Insurance Maharashtra State within the 30 Days from the issue of work order; same will be reimbursed to the contractor.</p> <p>4.6.2 If contractor fails to produce the labour insurance policy Concerned Executive Engineer shall draw the policy, the amount of expenditure incurred for drawing the policy shall be recovered as penalty from the 1st R.A. bill of the contractor as penalty to the Contractor.</p> <p>4.6.3 If completion period of work is Extended, then period of labour Insurance must be renewed/ extended as per requirement.</p>
<p>Labour Welfare cess (Upkar)</p>	<p><u>Clause 39 Labour Welfare cess (Upkar)</u></p> <p>As per the Govt Resolution No. BCA 2009/CR108/Labour 7A Mantralalya Mumbai dated 17/06/2010, the workers welfare cess @ 1% will be deducted from the gross bill amount of every bill either for measured work or advance payment and/or secured advance</p>
<p>Clause 40 :</p>	<p>Clause 40 : (1) If at any time after the execution of the contract documents, the Engineer in charge 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 for any period 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 stopped or suspended so as not to cause any damage or injury to the work already</p>

	done or endanger the safety thereof provided the decision of the Engineer in charge as to the stage at which the work or any part or 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 what-so-ever 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 in charge , within 30 days of the expiry of the said period of 90 days of such Intention and requiring the Engineer in charge 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 measurement 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 in charge requires the contractor to suspend the work for a period in excess of 30 days at anytime or 60 days in the aggregate, the contractor shall be entitled to apply to the Engineer in charge 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, had 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 what-so-ever occasioned by unsatisfactory work or any other default on his part. The decision of the Engineer in charge in this regard shall be final and conclusive against the contractor.
	(4) <u>In the event of</u>
	Any total stoppage of work on notice from the Engineer in charge under sub-clause (1).
	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.
	Curtailment in the quantity of any item or items originally tendered on account of any alteration, omission or substitution in the specifications, drawings, designs or instructions under clause 14(1) where such curtailment exceeds 25% in quantity and the value of the quantity curtailed beyond 25% at the rate for the items specified in the tender is more than Rs.Ten Thousand(Rs.10,000/-)

	<p>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 (iii) notice under clause 14(1) resulting such curtailment or produce to the Engineer in charge 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 material at the rates determined by the Engineer, provided however, such rates shall in no case exceed the rates at which the 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 in charge.</p>
	<p>NOTE:-In Case the provisions of this form "C" conflict with those in detailed provisions s attached to this tender, the detailed provisions & conditions would prevail over this form "C".</p>

APPENDIX -"A"

Schedule showing (Approximately) the materials to be brought by the contractor on his own cost.

Sr. No.	Particulars	Quantity	Unit	Remarks
1	Cement OPC 43 Grade	6533.270	One Metric Tonne	The Contractor will have to bring the material at his own cost. The necessary test certificates and vouchers, as proof of purchase will have to be submitted to Engineer-In-Charge. The RCC Pipe should be purchased from MSSIDC unit of district only
2	TMT Steel FE 500	549.006	One Metric Tonne	

SCHEDULE-"B"

Memorandum showing items of work to be carried out

Sr. No.	Quantities estimated but may be more of less	Item of work	Tendered Rate		Unit	Total Amount according to estimate. qty.
			In Fig.	In works		
----- Not Applicable-----						

SCHEDULE-"C"

Attached Separately

- Note : i) All work shall be carried out as per Public Works Department Hand Book , MORT&H and other specifications.
- ii) The quantities mentioned in Schedule "A" are based on departmental drawing meant for reference / estimation only. The slight or major variations from these quantities is no responsibility of the Government. The contractor should ascertain the quantities based on his own drawings and specifications.

CHAPTER-V

Conditions to Schedule - "A"

(For material to be brought by Contractor)

Following are the modifications / amendments / additions to the specifications for road and bridge works.

(1) Cement- Cement to be used for works, shall be Ordinary Portland Cement confirming to IS : 8112

Independent testing of cement used shall be done by the contractor at site and in the laboratory approved by the Engineer before use. Any cement with lower quality than those shown in manufacturer's certificate shall be debarred from use.

Any consignment or part of a consignment or cement which has deteriorated in any way, or specification shall not be used in the works and shall be removed from the site by the contractor without charge to the Employer.

Cement shall be transported, handled and stored on the site in such a manner as to avoid deterioration contamination. Each consignment shall be stored separately so that it may be readily identified and inspected and cement shall be used in the sequence in which it is delivered at site.

The contractor shall prepare and maintain proper records on site in respect of the delivery, handling. Storage and use of cement and these records shall be available for inspection by the Engineer at all times.

(2) Mild Steel / H.Y.S.D., steel / TMT Steel (Fe 500):

Reinforcement shall comply with provisions of contained in IRC: 21 - 2000. High Yield Strength Cold Twisted Deformed Bars shall be round and shall comply with IS: 1786 "Cold Twisted Steel Bars for concrete reinforcement". Mild Steel and medium tensile steel bars shall comply with IS: 432 (Part - I) and hard drawn steel wire fabric shall comply with IS: 2090.

All reinforcement shall be free from rust, loose scale or coats of oil paints etc. which may destroy bonds and shall be protected by anticorrosive treatment before placing in position for concreting.

(3) Bulk / Packed Bitumen :

Pack Bitumen confirming to following tests will only be accepted.

- i) Only VG 30 Bitumen Emulsion of Medium Grade shall be used
- ii) Bitumen brought on site shall confirm to IS:73
- iii) Testing has to be arranged by Contractor from recognized Laboratory at his own cost for all tests mentioned in IS: 73.

For other activities like storage, weighments etc. std. specification No. Rd. 42 Pg. 204 will be referred.

Contractor has to arrange his own static tanks for storage of bulk bitumen.

If it is decided to procure bulk bitumen, contractor has to intimate Engineer- In - Charge in advance, so that weighment of each Bouzer can be done on any weigh - bridge in the presence of representative of Engineer- In - Charge. No consignment will be allowed to unload until it's weighment is checked on weigh bridge by departmental person.

(4) Rejection of materials not conforming to Specifications :

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 or his representative and such materials shall be removed from site by the contractor at his own cost. Such rejected materials shall not be made acceptable by any modifications.

Materials not corresponding in character and quality with approved samples will be rejected by the Engineer or his representative and shall be removed from site at the contractor's own cost. Cement balance at the end of working season will not be allowed to use for any component of work in the next season.

(5) Conditions on which secured advance will be granted to contractor for Cement. Steel and Bitumen :

- i) Secured advance if demanded by the contractor will be sanctioned only after delivering consignment of above materials on actual work site.
- ii) Payment of secured advance of above materials will be paid with monthly bills only.
- iii) For calculation of secured advance prevailing rates of above materials in D.S.R. or market rate (Bills of manufacturer to be supplied by contractor to confirm market rate) whichever is lower will be taken into account.
- iv) Contractor has to submit the bill of manufacturer (Certified Xerox copy or duplicate copy) with every consignment of above materials brought on site.
- v) Only following limited stock will be entertained for sanctioning secured advance.
 - a) Cement: Qty. required for two months period of work as per programme of work submitted in advance by contractor.
 - b) TMT Fe500: Qty. required as per steel Bar programme of work submitted in advance by contractor for one fair working season i.e. Nov. to June every year.
 - c) Bulk / Packed Bitumen: As per (v-b) above.
- vi) No secured advance on cement / steel will be sanctioned after 1st May every year. Outstanding secured advance on account of cement on 31st May every year will be recovered in to from the monthly bill of this work due on 1st June.
- vii) For sanctioning secured advances amount for quantities of Items in v above will be calculated with rate in (iii) and above 75% of that amount will only be sanctioned as a secured advance through monthly bills.

ADDITIONAL CONDITIONS FOR MATERIAL BROUGHT BY THE CONTRACTOR

1)	All the material required for construction for work shall be arranged by the contractor at his own cost & confirmation of design criteria.
2)	The samples of material to be procured shall be got approved by the Engineer-In-Charge, Material as per approved samples shall only be procured. The decision of Engineer in charge in this regards shall be final. 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 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, 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.
3)	All the materials required for the work shall be brought by the contractor at his own cost. In each case, certificate for its quality and quantity shall be produced by the contractor and samples of each material shall be got tested from Government Laboratory as mentioned in condition at serial No.39(4)(1) (General condition) by the contractor at his own cost and the test results of samples shall be supplied to the Department. The material not conforming to the required standard shall be removed at once from the site of the work by the contractor at his own cost.
4)	Testing of all construction material shall be carried out as per required frequency and specifications and the charges for testing shall be borne by the Contractor.
5)	The contractor shall construct shed/sheds as per direction of the Engineer-In-Charge of the work for storing the materials brought at site. The material shall be taken out for use in the presence of the departmental representative only.
6)	The contractor shall make his own arrangement for the safe custody of the materials which are brought for construction of work.
7)	The contractor shall not transfer any material once brought at work site without prior written permission from Engineer-In-Charge.
8)	In case the materials brought by the contractor become surplus owing to the change in the design of the work, the materials should be taken back by the contractor at his own cost after prior permission of the Engineer-In-charge.
9)	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.
10)	The contractor shall furnish the account of asphalt brought by him at each time before placing orders for further supply. Also the same should submit on completion of the work, final account of the material used by him to the Department. This account will be scrutinized by the Engineer-In-Charge.

11)	Contractor should bring the bitumen from Govt. refinery only
12)	All empty asphalt drums shall be the property of contractor and the same shall be removed immediately after completion of work.
13)	Agency shall ensure the laying temperature of hot mix materials specified & accordingly he shall make necessary arrangement for preventing loss of temperature of hot mix material during transit from location of drum mix plant to work site.
14)	The agency should use the steel manufactured by the main producer only.
15)	The contractor shall procure the RCC pipes if required for this work from M.S.S.I.D.C. only. Proof of purchasing of pipe should be submitted.
16)	The contractor should inform the schedule of arrival of Bouzers to the Engineer-in-charge time to time.
17)	The contractor shall also arrange to provide field laboratory at plant site along with all necessary equipment & materials for testing the grade of bitumen procured by him.
18)	The contractor shall produce sufficient documentary evidence. Bill for the purchase ,octroi Receipts, Gate passes etc. for the purchase of material from the manufacture/ producers, brought on the work site at once. If so requested by the department.

ADDITIONAL TENDER CONDITIONS

1	Construction Machinery/Equipment.:
	1.1) The methodology and equipment to be used on the project shall be furnished by the contractor to the Engineer well in advance of commencement of work and approval of the Engineer obtained prior to its adoption and use.
	1.2) The contractor shall give a trial run of the equipment for establishing its capability to achieve the laid down specifications and tolerance to the satisfaction of the Engineer before commencement of work, if so desired by the Engineer-in charge.
	1.3) All equipment provided shall be proven efficiency and shall be operated and maintained at all times in manner acceptable to the Engineer-in-charge.
	1.4) No equipment or personnel will be removed from site without permission of Engineer-in charge.
2	Work Programme and Methodology of Construction:
	The Contractor shall furnish his programme of construction for execution of the work within the stipulated time schedule together with methodology of construction of each type of work and obtain the approval of the Engineer-in-charge.
3	Revised Programme of work in case of slippage :
	In case of slippage from the approved work programme at any stage, the contractor shall furnish revised programme to make upto slippage within the stipulated time schedule and obtain the approval of the Engineer-in-charge.
4	Action in Case of disproportionate progress :
	In case of extremely poor progress of the work or any item at any stage of work which in the opinion of the Engineer cannot be made good by the contractor considering his available resources, the Engineer will get it accelerated to make up the lost time through any other agency and recover the additional cost incurred, if any, in getting the work done from the contractor after informing him in writing about the action envisaged by him
5	Setting Out :
	Setting out the work as spelt out in clause 109 of Ministry's Specification for Road and Bridgeworks (5 th Revision 2013) will be carried out by the Contractor.

6	Public Utilities:
	Action in respect of public utilities will be taken by the contractor as envisaged in clause 110 of MORT&H Specification of Road and Bridgework (5 th Revision 2013)
7	Arrangement for traffic during construction:
	Action for arrangement for traffic during construction will be taken by the contractor as envisaged in the contract documents and spelt out in clause 112 of M.O.R.T.&H. Specification of Road and Bridge work (5 th Revision 2013)
8	Quality Control :
	The responsibility of achieving quality of work will be on the contractor who will take actions as stipulated in P.W.D. Standard Specifications of Buildings and as per Schedule 'C' of Tender Document.
9	Govt. of Maharashtra, PWD, Standard Specifications :
	PWD Standard Specifications, Govt. of Maharashtra will form part of the contract documents and the contractors will be legally bound to the various stipulation made therein unless and other wise specifically relaxed or waived wholly or partly through a special clause in the correct documents.
	The contractor should produce the no objection certificate obtained from the Maharashtra Pollution Control Board before starting Crusher/Drum Mix Plant on the work site.
10	Action for Precaution for Safeguarding the arrangement during Construction Contractor as envisaged in the Contract documents and spelt out in clause III of M.O.R.T.&H Specification of Roads and Bridges work (5 th Revision 2013)
11	<u>Stamp Duty</u> As per Bombay Stamp Act 1958 amended via The Maharashtra Stamp Act 1958 and provision contained in article 63 of Schedule-I, the contractor shall bear whole required amount of Stamp Duty on works contract in the form of Stamp Paper of Online (franking or e-SBTR) as applicable as per prevailing rate declared by Govt. of Maharashtra before work order. The Contractor quote his rate accordingly and no claim against this shall be considered. If the contractor fails to bear this amount, acceptance of the tender shall be liable to be considered as withdrawn.
12	<u>Payment of Security Deposit by Bank Guarantee and Online BG Verification:</u> If the contractor wishes to pay security deposit by Bank Guarantee after tender approval then it is mandatory for contractor to verify the Bank Guarantee by paying verification fess of Rs.1000/- through the link provided below

<https://ionlinebg.emahapwd.com/>

Under this the detailed procedure of online BG verification is mentioned and also use manual can be downloaded. After confirmation of truthfulness of BG, tender will be accepted and work order will be given.

(I) **Special Conditions**

(A) For Plantation - 200 Nos.

1. By the end of the maintenance period of 2 years, the contractor has to achieve a growth of plant 150mm and above stem dia from ground level and height 15 ft and above and healthy canopy.
2. The Contractor shall still be liable for maintenance period of 2 years, even if the plant a ready tree of the growth of 150mm and above stem dia from ground level and height 15ft and above and healthy canopy.
3. If the contractor fails to achieve growth of 150mm and above stem dia above the ground level and height of 15ft and above along the healthy canopy, will be liable for a penalty of Rs. 4000/- per plant, And the same amount will be deducted from the bill.
4. Self-watering system tree guard, brand name "Rakshak" or any other self-watering tree guard of required parameters has to be approved by the PWD. Any system of self watering tree guard used for the project, should have a successful plantation history of minimum 2 years, and the list carried out 50% of the successful plantation quantity of the work order.
5. If the contractor is not interested to execute the work after award of contract, then, he can be released from the same, by informing the same to the department within 15 days of issue of the work order and by paying an amount of Rs. 3000/- per plant to the department.
6. If the contractor hires any sub-contractor for plantation/ landscaping work, the same shall be approved by the PWD department. And , the sub-contractor will also be responsible for achieving a growth of plant 150mm and above stem dia from the ground level and height of 15ft and above in 2 years. If the sub-contractor fails in achieving the said growth of the plants, he too shall liable for a penalty of Rs.4000/- per plant. And the same amount will be deducted from the bills.
7. Such penalty of Rs.4000/- per plant will be recovered only for the number of plants that has not achieved the growth of plant 150mm and above the stem dia from the ground level and height of 15ft and above in 2 years, from his bill .
8. Plant distance, type of plantation and number of rows will be decided as per the guidelines of '**IRC SP 021 Guidelines on Landscaping and Tree Plantation.**'
9. If the contractor denies and deposit Rs.3000/- per plant for the plantation works; Then department shall hold the right of awarding the plantation work to any other experienced contractor who is ready to fulfill the conditions of growth of plant 150 mm and above stem dia from the ground level and height of 15ft and above. If such contractor too fails in achieving the said growth of the plant,

he shall be liable for a penalty Rs.4000/- per plant. And the same amount will be deducted from the bills.

10. The growth rate of the plant after the completion of 1st year should be height 10ft and above of all the plants. And after the completion of 2nd year the growth of all plants should be 150 mm and above stem dia above the ground level and height of 15ft and above along with healthy canopy.

Maintenance During Defect Liability Period

- (B) Maintenance period shall be as specified in clause 10(A). The following defects noticed in the period specified in clause 10(A) shall be carried out by the contractor at his own cost within the specified period as directed by Engineer in Charge.

(a) For Bridge

1. Structural defects noticed during defect liability period such as loss of prostheses, deflection / displacement in structure, failure of structure due to corrosion etc.
2. Replacement of Expansion Joints, along with repair/ reconstruction of concrete wearing course if required.
3. Replacement of bearings.
4. Latest defects notices in Defect Liability Period due to improper workmanship.
5. Any other defects observed by the Department in view of structural stability of structure.

Other than above items, the routine maintenance items such as replacement of broken railings, painting, repair to protection work shall be carried by Department through other scheme / job.

(b) Approach / Road (Cement Concrete)

Structural Defects noticed during Defect Liability Period such as pot holes, cracks, raveling and maintenance of joints shall be done by the contractor, in Defect Liability Period as specified in Clause 10(A)

CHAPTER-VI

BRIEF DESCRIPTION OF THE WORK

CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTIRICT BORDER ROAD SH-322 A, in KM 9/500 IN PULGAON TALUKA, DISTRICT WARDHA.

- 1) The index map, village map and site plan may be referred for the guidance of Tender. A set of drawing showing arrangement of the Bridge contemplated by the department is attached. (Longitudinal section and cross section). The contractor shall tender on "C" form on his own design, complying with the various requirements indicated in this chapter as well as other chapters. The details shown in above drawing ("L" section, cross section) enclosed are to be taken as indicative and tentative only.
- 2) The lump-sum price to be quoted by the contractor in form "C" shall include the design and construction of the complete bridge with approaches satisfying the various requirements indicated in these documents including the following works.
 - i) Removing and disposing the excavated material including cofferdams (if any) at required location and clearing the vents of the bridge up to the natural ground level.
 - ii) Marking out the centre line of the bridge and various other components and complete lining out with masonry and / or concrete pillars for proper lines and levels with precision theodolite survey including establishing theodolite stations, bench marks etc.as directed.
 - iii) Taking at least one bore hole (Double tube) at each foundation location in advance and carrying out tests as specified in the tender documents.
 - iv) Providing foundation as per approved design upto the required foundation levels.in any case not above the level shown in department drawing.

- v) Providing substructure as per approved design such as piers, abutments, wings or returns etc. including filling in returns with boulder /sand as directed up to the end of return
- vi) Providing superstructure as per approved design.
- vii) Providing necessary bearings, expansion joints, wearing coat, road kerbs /wheel guard stones, railing, water spout as and if design so requires, median verge, ducts for services flexible stone mat & Anticrash Barriers M-40 Grade, W- Beam Steel/Metal Crash Barriers aprons as per drawing.
- viii) Providing anti-corrosive treatment to reinforcement, if necessary depending on the environment. However, some special specification and condition specified for marine environment in this tender document shall not be taken into account since bridge site is not located in marine environment.
- ix) Fixing the fittings and fixtures as may be supplied by the department for certain amenities to be provided by the Department.
- x) Five RCC pillars, one at each corner of the bridge, of suitable architectural design to define the ends of the bridge as per details approved by the Department with exterior Grade Emulsion painting
- xi) Filling behind abutment and returns as per clause 714.3 (Appendix-VI) of IRC 78,1983 with filter media with granular material.
- xii) Marble / Granite Tablets on the R.C.C. pillar of size 1.50m x 2.0 m & 4 tablets of size 1.20x1.5M
- xiii) Retro reflective sign board (as per IRC-67) of required size & shape (as directed by the Engineer in Charge)
- xiv) Hazard Marker of IRC standards. as required raised pavement Marker as required
- xv) Painting the bridge structure in exterior Grade Emulsion as directed by the Engineer in Charge
- xvi) Painting to RCC kerb with flat oil of specified make as directed by the Engineer-in-charge.

- xvii) Thermoplastic paint (Bridge proper + return length + approaches length
- xviii) Cat eye stud of size 10 cm x 10 cm – As per requirement of site
- xix) Construction of CC road for Approaches with crust given in drawing and protection by pitching Retaining wall etc.
- xx) The Contractor shall have to arrange and pay for carrying out various laboratory tests and Tests to be conducted at site. The test shall be carried out as per frequency required and as per direction of Engineer In charge at regional /District laboratory of P.W.D or at the laboratory approved by Engineer In charge for tests which are not conducted in PWD laboratory.

3) The lump sum price shall also include dismantling of existing structure at bridge site, construction of diversion. the construction of Major Bridge, CC Approaches, CC Drain, Protection and retaining wall, connecting road etc. if the contractors design envisages or provides for the use of any special type of material not covered by these work specifications the contractor shall furnish its specification along with his tender

The scope of work shall include the following works and items.

1. BRIDGE PROPER

Construction of Major Submersible Bridge in perpendicular to stream with minimum bridge length 210 meters center to center (Right angle length) width of Bridge shall be 10.50 m and clear carriageway shall be 7.50 meter. With footpath 1.050 m on either side of Bridge.

$$(7.50+0.225+0.225+1.050+1.050+0.225+0.225) = 10.500$$

Items of Work for Bridge:

- a) Excavation in soft strata, hard murum & Soft rock and in hard rock by chiseling and wedging for all lifts and disposing off excavated material as directed including required dewatering.
- b) Dewatering for foundation of pier and abutment and retaining wall and other parts including diversion of stream by providing cofferdams, earthen bunds etc. as may be necessary.

- c) R.C.C. M-30 for **Foundation of** Pier & Abutment, open foundation with PCC M-15 Grade leveling course below it.
- d) RCC M-30 for pier, abutment and returns of adequate length.
 - 2. **Dementing od Existing Bridge/ Causeway:**
 - 3. **Dementing of existing structure (causeway/Bridge) including sismentalling of R.C.C./ P.C.C. and stone masonry work.**
- e) M-30 RCC work for Ballast wall, Cantilever return **retaining Walls** and C-type RCC abutment including compaction, formwork and curing.
- f) M-30 RCC solid pier including provision of v-shaped false joint.
- g) RCC M-30 for abutment & Pier cap **and inspection Gallery** including compaction, finishing, and curing.
- h) RCC M-40 Pedestal over pier and abutment and below Bearings.
- i) RCC M-35 for main Girder (4 girder system) with cross girder and RCC M-35 Grade **for** solid/deck slab including formwork, vibrating, compaction and curing.
- j) Annular filling in C.C.M-15 around footing upto rock top.
- k) Strip Seal Expansion Joints etc.
- l) RCC M-30 for dirt wall
- m) R.C.C. M-35 for Kerb**
- n) Providing 90 cm thick flexible Stone Mat.
- o) R.C.C. M 35 Discontinuous kerbs with railing of mild steel angle post.
- p) Providing TMT FE -500 D steel bar Reinforcement
- q) Providing strip seal expansion joints
- r) R.C.C.M30 Wearing course.
- s) Neoprene bearing.
- t) 100 mm dia PVC. pipes for weep holes as per drawing
- u) Guard railing for inspection gallery and M.S. Railing for Bridge**
- v) Back filling by granular material behind abutment return etc. and 0.60m thick filter media / abutment/ return walls**

w) Providing 90 cm x 60 cm marble plate engraving 10 cm height letter, figures including painting the letters /figures with approved color and shade as directed by Engineer in charge.

x) Providing and fixing heavy duty inter locking concrete grey paving blocks of 60mm thickness on footpaths of bridge

y) Providing two coats of flat oil paint with primer

2) APPROACHES

Total length of approaches with construction of cement concrete road on both side of Bridge will be 2770.00 meters (760 m on Vitala side and 2010.00 m Pulgaon Side) as per attached drawings. The carriageway with for 540m length shall be 7.00 and for 220m length Carriage Way Width shall be 10.5m on vital side – The carriageway width shall be 9.90m for 140m Road length and Width of carriageway shall be 10.5 m for 120 m road length this 260 m length on Pulgaon Side Shall have Service Road on both Sides with 5.5m Wide Carriageway. After this 500m length of road with 7.0m wide Carriageway towards Pulgaon side. Bypass of 240 m length with 5.5 m wide carriageway and 490 m length with 7.0m width carriageway Fanning at two Junctions and fanning at various widths of road Converging with each other shall be provided.

Approaches:

The provision of construction of C.C. Road along with approaches shall be as per Type cross-sections (TCS) attached

TCS 01 Chainage 0/0 to Ch. 0/540 Length 540 m Roadway width 9m, carriageway width 7.00m

C.C. Road

TCS 02 Chainage 0/540 to 0/690 length 150m Road way width 10.5m, C.C. Road

Crust: - 250mm thick P.Q.C., 150mm thick DLC, 150mm thick GSB and subgrade 500mm thick

TC5 03 Chainage 0/700 to 0/760 length 60.00 m Roadway and carriage way width 10.5m full width cc road

Crust: 250mm thick PQC, 150mm thick DLC, 150mm Thick G.S.B. and Subgrade 500 mm Thick

TCS 04 Chainage 0/970 to 1/110 (140m length) roadway width = 10.50 m. Carriageway 9.90m width CC Road to be constructed with retaining wall on both sides and service road on either side of road 5.5 m Wide.

Crust - 250mm thick PQC., 150mm thick DLC, 150 mm thick G.S.B., Subgrade-500mm thick

For service road crust = 250mm thick PQC, 100 mm thick DLC, 150mm thick G.S.B. and Subgrade-500mm thick.

TCS 05 Chainage 1/230 to 1/730 length 500m and 0/240 to 0/730 length 490 m Carriageway width 7m with C.C. Road and 1.0m wide paving blocks on either side

Crust - 250mm thick PQC, 150mm thick DLC, 150mm thick G.S.B. and subgrade 500 mm thick below paving blocks GSB of thickness as per road and Subgrade 500mm thick

TCS 06 Chainage 0/0 to 0/240 (240m length) carriage way width 5.50m C.C. Road and 1.0 m wide Paving blocks on both sides Retaining wall on one side of road

Crust: 250 mm thick PQC, 150mm thick DLC ,150mm thick. GSB, Subgrade 500mm thick

TCS 07 : Chainage 1/110 to 1/230_(120m length)

Carriageway 10.5 m wide C.C. Road with service roads or 5.5m on each side of Road

crust. - 250mm thick PQC, 150mm thick DLC, 150 mm thick G.S.B. and subgrade 500mm thick

Items of Work for Approaches:

- i) Clearing and grubbing road land.
- ii) Excavation of roadway in earth, soil of all sorts
- iii) Transportation of unsuitable material.
- iv) Earthwork: -Providing earthwork of required thickness with material of 6 % CBR having not less than 97% of Standard Proctor Density of with material obtained from departmental land
- v) Providing Sub grade with material obtained from other sources CBR not less than 10.00 and having proctor density 97% of designed proctor density of top 500mm.
- vi) Watering and compacting of embankment formed of materials obtained from the road cutting

- vii) Conveying Materials obtained from road cutting up to 500 m lead including laying, Watering and compacting
- viii) G.S.B 150 mm thickness for full width
- ix) DLC 150 mm thickness for approach length & 100 mm thickness for service road.
- x) PQC M-40 250 mm thickness having width as per drawings, TMT FE500, 32 mm dia dowel bars, TMT FE500, 12 mm dia tie bars, cutting transverse contraction joints 3 to 4 mm, contraction joints polysulphide sealant, expansion joint, cast in situ RCC M-20 mountable type kerb without gutter, c.c.pipe of IS 458-2003 NP-2 Class of 450 mm dia.
- xi) Paved shoulders: - M-50 Grade, 100 mm thick for 1.0 m width on both sides of road Hydraulically Pressed Mechanically Vibrated Paving Block for side width as per drawings for TCS 05-990 m length and TCS 06-240 m length and in underpass 666.83 Sqm. Total Quantity 3126.83 Sqm.
- xii) Murum shoulders: - Providing, spreading and compacting hard murum for side width as per drawings.
- xiii) Dry rubble stone pitching for submersible as well as non – submersible approaches & quadrant pitching for 23m/30m/60 cm thk. & below that 15/30 cm for quarry spall. As per type dry No. V / F1/ 1972 of P.W.Deptt or as directed by engineer in-charge Dry Rubble stone masonry with toe Wall of 0.5 width x 1m depth for embankment having height up to 1.5 m and Rubble apron of 30cm thick on u/s and 60 cm thick on D/s laid on quarry Spall of required Thickness as per type drawings
- ⑦ Road side furniture traffic signs and Pavement markers, delineators etc.

The following items shall have to be executed:

- | | |
|--|--------|
| i) Providing and fixing 200m stones as per IRC standard | 10 nos |
| ii) Providing and fixing 1:2:4 ordinary km. Stones in c.c 1:4:8 | 03 nos |
| iii) supplying and fixing molded chank raised pavement markers cat exe 738 Nos | |
| minimum | |

iv) Road marking with hat applied thermoplastic compound -1295.55sqm for applying patta

v) Metal beam crash barrier Type A w metal beam crash barrier - 394.20 m

vi) Providing and fixing circular 900mm dia sign board made out of 2mm Aluminum sheet - 12 Nos

vii) Providing and fixing equilateral triangle sign board of 900 mm. Size -15 Nos

viii) Providing and fixing cautionary/warning sign board of Octagonal size of 900 mm size made of 2 mm aluminum sheet -2 Nos

ix) Providing and fixing of retro reflectorized informatory Sign board of rectangular square shape having area less than 0.9 Square meter. 75.78 sqm

x) Providing and fixing of Retro reflectorized informatory sign board of rectangular /square shape having area more - 4.32 Sqm than 0.9 square meter

xi) Road Delineators: supplying and installation of delineators -1780 Nos

xii) Pitching & required thickness shall be provided to the Approach road to be constructed for the bridge up to road top level, for length up to 0.6m above highest flood level. 23 cm thick pitching over filter material of 15 cm thickness shall be provided on either side of the road to the section having total height up to 1.5 m. Pitching of 30 cm thickness shall be provided with filter material of 15 cm thickness on U/S of section having height above 1.5m with apron at bottom of road of 1.0m width Pitching of 60 cm thickness over filter material of 30 cm thickness filter material shall be provided on D/S of section having height more than 1.5 m with apron at road bottom of 3 m Width with same provision with filter Material Pitching of 23 cm thickness shall be 0.15m Thick provided on U/S up to 1.5 cm height from Road Top and Pitching of 30 cm Thickness with Filter Shall be provided on D/S For up to 1.5m height

xiii) CC M-15 Guard stones as directed by engineer in charge.

xiv) Providing and casting in-site or precast tapering Rcc M 20 mountable type kerb

xv) Hazard marker as directed by engineer in charge.

4) construction of Diversion: construction of diversion of minimum 300 m length with Required earthwork and subgrade 0.15m thick having CBR greater than 10 with top width 6 cm and carriage way of G.S.B 0.20 m thick with RCC pipes of 1000 mm dia NP3 class Minimum 15 Nos 10m length.

5) RETAINING WALL

Construction of Retaining wall minimum total length 639.30m. as per site conditions and having 6.5 m height of 60 m length, having 5.5m height with length 139.30 m, having 4.5 m height of

80 m length, having 3.5m height with 300m length and having 2.5m height with 60m length

minimum sections as per attached drawings or as directed by engineer in charge.

- 1) Excavation for foundation
- 2) Leveling course C.C.M-15
- 3) RCC M-30 Raft slab
- 4) RCC M-30 Retaining wall
- 5) Weep holes 100 mm dia.
- 6) TME FE500 Steel for reinforcement.
- 7) Filter media with stone aggregates.
- 8) Filter media with using dismantled Stones

6) CC Drain: -

Construction of RCC Covered Drain with M-20 Grade of Concrete with 1.00 m x 1.30 m outer size for a length of 2030.00 m on each side having Total length of 4060m

- 1) Excavation for required length width and depth having 0.15m thickness of raft, walls and slab.
- 2) 80 mm soling 150 mm thk.
- 3) PCC M-10 for foundation
- 4) RCC M-20 for Raft slab
- 5) RCC M-20 for drain wall
- 6) RCC M-20 for covered slab.
- 7) Weep holes with pvc pipe of 110 mm dia.
- 8) Fe-500 TMT steel bar reinforcement.

6. Testing of Materials and other quality Control Test-

The work includes testing of all materials and tests required to ascertain quality the test shall be carried as per frequency specified in Annexure -III

7. Site Conditions:

1 The bridge site is near Pulgaon town.

2. Pulgaon is the nearest big City Market center for daily necessity, is about 2.00 Kms from the site.
3. The nearest Post Office, Police Station, Rural Hospital is at Pulgaon which is in 2.00 Kms away from bridge Site
4. The nearest Rly. junction is located at Pulgaon about 2 .00 KM away from the site.
5. Telephone facility is available
6. Supply of potable water is available at Pulgaon
7. There is a Rural hospital at Pulgaon
8. Climatic conditions:
 - a] Rainfall: 1000 mm
 - b] Hottest Month: - May (Max temp. is about 47^oC)
 - c] Coldest Month: - January (Min. Temp is 10^oC)
9. The terrain of site: -Plain
10. Harvesting period: - Generally from September to November

4 (C) IMPORTANT REQUIREMENTS

1 Preamble:

i) This tender is for designing and CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTIRICT BORDER ROAD SH-322 A, KM 9/500 IN PULGAON TALUKA, DISTRICT WARDHA.

ii) All the requirements / stipulations specified in the contract including General conditions, special conditions, drawings, scope of work, design criteria etc. shall deemed to be part of "Lump sum part of the contract".

iii) The scope of lump-sum contract shall include construction of Bridge including returns and backfill material as specified and necessary slope to retain the each slope of fill material in the returns and approaches. The alignment of bridge and the profile have been decided by the department, except small modifications which may be required due to actual site conditions. The alignment and profiles of the bridges and its approaches shall be same as shown in the departmental drawing

2 The scope of "Lump sum part of the contract" shall be as specified in the contract and is summarised below for convenience but shall not be limited to:

a) Topographical survey including location of services or obstructions if any,

b) Geo-technical investigation, etc. for the scope length of the work / bridge approaches as applicable as below:

Taking Confirmatory bores at each pier and abutment location for Subsoil Investigation including submission of geotechnical report from an expert. Trial bore shall be taken with double core tube diamond bit in rock portion. Bore depth shall be at least 5 metres below the tentative proposed foundation level or with consistence recovery of rock whichever is below. Taking undisturbed soil sample at 3.0 m interval and SPT at 1.5 metre intervals till refusal and testing for etc. Rock sample shall be tested for Compressive strength specific gravity and water absorption to ascertain Safe Bearing Capacity of rock from where embedment of foundation starts. Geologist shall analyze subsoil investigation data and recommend each foundation level,

ii) The appointment & services of Expert like Structural Engineer, Geologist, Erection Expert (For temporary structural work for erection of centering and shuttering etc) shall be made available whenever required for the work with prior approval of Engineer.

iii) Preparation & Submission of Work Plan, Methodology of each activity, Quality Assurance Plan, Construction Manual, Safety manual, Maintenance manual etc., satisfying IRC specifications and tender condition and as Built Drawings, etc. (Each in triplicate).

iv) Preparation of Design, drawings and execution for all components of the bridge like Foundation Substructure Superstructure, Returns / Retaining walls including its backfill materials. Parapet / Anti crash barrier including its backfill materials etc complete. The contractor's structural engineer shall get it approved from competent authority and submission of Number of copies and set of design and drawing as specified in the tender .document

v) Preparation of General Arrangement Drawing of entire work,

vi) Construction of Island, Cofferdam, Diversion of Channel etc. (Scheme shall be enclosed in envelope No. 1.)

vii) Contractor has to submit a proper methodology for the construction of foundation, piers and casting of superstructure with design of shuttering centering etc. and all temporary works. Launching system of girder for superstructure shall be got approved from competent authority..

viii) Contractor may have to construct bunds across the river for launching of girder with the help of crane or for erecting centering & shuttering for structure. The bund shall have necessary cross pipes for unobstructed flow of water.

IX) Kerbs and railing shall be painted with flat oil paint as approved by Engineer-In-Charge

X) If contractor proposes Pile foundation it shall be with Mild Steel liner minimum 6 mm thick from rock level to bottom of pile cap. Liner shall be coated with suitable coating. In case of piles, not founded on rock liner shall be provided at least upto scour depth. While working out capacity of pile, friction, upto scour shall be deducted.

XI) If Contractor proposes raft foundation it shall be provided to atleast minimum sours depth. Laying of raft slab shall be in dry condition after dewatering as per design and drawing .

XII) Laying of foundations pier cap / well cap etc. in dry condition after dewatering as per design and drawing.

XIII) Providing and fixing Spherical /POT / PTFE bearings as per designs and specifications,

XIV) Providing Modular / Strip seal type expansion joints as per approved design and specifications.

XV) Casting Box girder / i girders over centering or specially erected steel truss as per; methodology. The girders may be Pre-cast and launched with approved launching system / scheme.

XVI) Casting of diaphragms and deck slab as per design and drawing,

XVII) Providing of asphalt wearing coat with uniform thickness as described and providing thermoplastic patta painting on wearing coat (One discontinuous at centre and two continuous at edge)

XVIII) Fixing of waterspouts and Crash Barrier as per drawing enclosed in tender document.

- XIX) Arrangement for inspection of superstructure and bearing shall be made and provided in the lump sum cost. The arrangement shall be got approved from Engineer in charge / S.E. Design Circle.
- XX) Periodic Inspection of work with Departmental officer during defect liability period and attending to the defects pointed out.
- XXI) Construction of approaches with required road width at top with full c.c road at top and the submersible treatment with protection as per type drawing.
- XXII) Maintenance of work till defect liability period for bridge 20 years and approaches for 3 years.
- XXIII) Passing of foundation by PWD or recording/Checking of measurements by J.E./D.E./E.E. of PWD shall not absolve contractor from the responsibility of providing strong and durable structure. Any defect due to structural or constructional lapses shall be rectified by the contractor at his own cost. And no extra payments will be made for the same.

3 TRIAL BORES / SUBSOIL INVESTIGATIONS:

Few trial bores have been taken along Bridge by the department and are indicated on the NIT drawings. The information is indicative only. The contractor appointed for the work has to take confirmative bore one at each location of the proposed foundations and design the foundations accordingly. A Geo-Technical Expert with prior approval the Engineer shall be appointed by the contractor who will prepare detailed Geo-technical report indicating the proposed founding levels and SBC at that level. During construction the Geo-Technical Expert shall visit the site and certify each founding level and SBC of top of foundation strata in which foundation are to be embedded. All cores of the trial bores taken by the contractor shall be preserved by the contractor till completion of the project and shall be handed over to the department thereafter. Trial bores shall extend at least 5.0m below proposed founding level. One bore shall be taken in approaches at foundation location of returns / back fills material and also establishes SBC at interval of 1.50m & 3.00 m below the general ground level. The bore shall be taken 5 meter below proposed foundation and shall extend minimum 5.0 m below ground level. In case of

problematic soils, sufficient numbers of tests to establish characteristic of strata shall be done to arrive at solutions as directed by the engineer. Where rock is not available even upto depth of 40m, partially end bearing and partially friction piles / wells can be accepted with skin friction taken below the scour level. The SBC shall be got approved from Engineer before design. All data like SPT, Atterberg Limits, c, f, cc, etc. required to establish skin friction and end bearing capacity shall be collected during the geo-technical investigation.

4 Diversion of stream and dewatering:

Bridge is to be constructed across the Wardha river During construction bunds, cofferdams for diversion of stream, dewatering using pumps etc will be inevitable, Location of proposed piers shall be such as not to cause any additional water obstruction over the permitted. The cofferdams / bunds constructed by the contractor shall be removed after completion of work so as to clear the waterway. And no obstruction shall be left / created in the river after completion of work / foundation

5 LOCATION AND ORIENTATIONS OF PIERS:

Orientation of piers for the bridge shall be parallel to the flow of current and collinear with existing piers. As such present proposal is prepared with right angle shown in the GAD but orientation of the same may need some review since the orientation shall be decided as per site conditions so that no turbulence is created. The minimum linear water-way specified shall be observed.

6 SOME OF THE RESTRAINS AT SITE OF WORK:

The Major restraints at the location of work are listed below so that contractor shall take appropriate action:

i) Traffic:-

Contractor shall verify himself regarding transport of his machinery to location of work site and existing road. As far as possible transport of construction machinery shall be independent and necessary temporary approaches are required to be constructed. Cost of temporary approaches to site of work is incidental to cost of work and included in lump sum cost of bridge. Care has to be taken that the construction machinery and activities do not obstruct the traffic and works

carried out by other agency for roadwork. Contractor shall provide necessary caution board and information board at his cost as directed by Engineer.

ii) Working in River: -

River Bridge including the approaches have to be constructed in short time and during monsoon period working in river should be avoided garbage Construction garbage's shall not be disposed off in the river.

7 SEQUENCE OF CONSTRUCTION: -

The sequence of construction of project as a whole consistent with the Milestones set by the Employer, if any, shall be worked out by. The contractor and based on the same work program be submitted.

8 THE APPOINTMENT OF EXPERTS:-

There are several specialized activities for which specialized agencies / Experts are required to be appointed by the contractor with prior approval of the Engineer. The lists of specialized agencies are as below: -

Geo-technical Expert for deciding founding levels and SBC of strata of bridges, approaches, temporary structures, Returns etc.

Structural Bridge Engineer: Immediately after receipt of work order the contractor shall send the proposal of appointment of bridge design engineer to the client. Minimum criteria for appointment shall be: -

He shall be qualified preferably M. Tech / M.E. (Structures) with a minimum experience of 15 yrs in the field of structural designs.

He shall have designed at least two-river Bridge with length more than 100 m.

Experience in design of pre-stressed superstructure for at least one bridge / flyover is essential.

The duties of the Structural Bridge Engineer will be as under:

Within 7 days from date of receipt of work order he will send the programme for submission of detailed design and drawings to the Engineer. The programme shall be such that all the designs will be submitted for approval within 15 days from date of work order.

GAD for the proposed work will be prepared by Structural Bridge Engineer. The GAD shall be based on detailed topography survey, Geotech investigation to be carried out by the contractor. The same shall commensurate with the NIT GAD.

The Structural Bridge Engineer will prepare the design report based on design criteria given in NIT. The design report shall include general information of bridge, salient features, loadings, combinations of loading, design parameters, material specifications codes, specifications etc. The detail design calculations in three sets and drawings in 10 sets will be submitted by the Structural Bridge Engineer to the SEDC (Bridges) Navi Mumbai. As per the priority decided by the Employer, if any. The SEDC (Bridges Navi Mumbai. will scrutinize the design / drawings and communicate its approval / remarks. The Structural Bridge Engineer shall comply the remarks and send the modified design / drawings immediately and or send 10 copies of approved drawings for final approval when initial approval is given.

Prepare design and drawings and certify that the erected staging is as per his design for all temporary structures required for completion of the project.

Prepare erecting / launching scheme including design calculation and obtain approval of Engineer.

Prepare: methodology / method statements for construction of all components of the structure including temporary structures. (Except those prepared by Erecting Expert)

Prepare risk analysis statement at each stage of work and suggests preventive measures thereof.

First unit of every component of the Bridge shall be checked and certified by the Structural Bridge Engineer.

Erection Expert: -

The Erection Expert shall be a Graduate Bridge (Civil) Engineer with about 15 to 20 years of experience in the field of Erection of centering shuttering, launching of girders etc. He shall prepare detailed stage-wise methodology of erection including drawing and get the same approved at least 30 days before actual starting of the erecting at the site. The safety aspects shall be highlighted in the methodology of Erection report.

CHAPTER-VII

GENERAL CONDITIONS OF CONTRACT

1. Authority of the Engineer - in - Charge :

Save in so as it is legally or physically shall execute, complete and maintain the work in strict accordance with the contract under the directions and to the entire satisfaction of the Engineer-In - Charge's instructions and directions on any matter (Whether mentioned in the contract or not) pertaining to this work.

The Engineer - In - Charge shall decide all questions which may arise as to quality and acceptability of materials furnished & work executed, manner of execution, rate of progress of the work interpretation of the plans and specifications and acceptability of fulfillment of the contract on the part of the contractor. He shall determine the amount and quantity 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.

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 there in 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.

1.1 Authorities of the Engineer - In - Charge's Representatives :

The duties of the representative of the Engineer - In - Charge are to watch and supervise the work and to test and examine any materials to be used or workmanship employed in connection with the work.

1.2 The Engineer - In - Charge may from time to time, in writing, delegate to his representative any of power, any authorities vested in the Engineer - In -Charge and shall furnish to the contractor a copy of such delegations of powers and authorities. Any written instructions of approval given by the representative of the Engineer- In - Charge,

		provided always as follows
		a) Failure of the representative of the Engineer- In - Charge of disapproval of' any work or material shall not prejudice the power of the Engineer - In - Charge there after to disapprove such work or materials and to order the 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.
2.		<u>Other Conditions for submission of Tender:</u>
	2.1	The contractor shall be deemed to have carefully examined the work and site conditions including labour, the general and special conditions, the specification, schedules and drawings and shall be deemed to have visited the site of the work and to have fully informed himself regarding the water levels, wind and current velocity and subsoil conditions and carried out his own investigations to arrive at the rates quoted in the tender. In this regard he will be given necessary information to the best of the knowledge of Department but without any guarantee about it.
	2.2	It is presumed that the contractor has carefully gone through the works specifications (P. W. D. and MORT & H), P.W.D. hand Book and relevant I. R. C. Codes and the Schedule of Rates of the District and studied the site conditions before arriving at the rates quoted by him.
3 A		<u>Layout of Work :</u>
		3.A.1 Layout of the bridge will be done by the contractor in consultation with the Executive Engineer of the Department or his representative. Some permanent marks should, however, be established to indicate the demarcation of the abutment, location and reference made to this permanent marks in measurements books and drawings signed by the contractor and the Department Officer. The responsibility regarding layout will be joint.
3		<u>Treasure Trove:</u>

		In the event of discovery by the contractor or his employee during the progress of the work of any treasure, fossils, minerals or any other articles of value or interest, the contractor shall give immediate intimation of these to the Engineer and forth with make over to the Engineer of such tarsier of things which shall be the property of Government.
4		<u>Agent and Work Order Book :</u>
	4.1	The contractor shall engage an authorized full time agent on the work capable of managing and guiding the work and understanding the specifications and contract conditions. A qualified and experienced Engineer also shall be provided by the contractor as his site Engineer for at all technical matters. Site Engineer can also be designated as an agent of the contractor. Agent will take orders as will be given by the Engineer 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 and his representative on the work site. The contractor shall supply, to the Engineer- In - Charge the details of all supervisory and other staff employed by him and notify changes when made, and satisfy the Engineer- In - Charge regarding the quality and sufficiency of the staff thus employed. The Engineer - In - Charge will have the right to ask for changes in the contractors supervisory staff both with respect to number and quality and to order removal from work any of such staff. The contractor shall comply with such orders immediately.
	4.2	<u>Work order book</u> shall be maintained on site and it shall be the property of Government and the contractor shall promptly acknowledge the orders given therein by the Engineer or his authorized representative or his superior officers, and comply with them. The compliance shall be reported by the contractor to the Engineer - In - Charge in good time so that it can be checked. 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. Whenever any instructions are written in the work order book, the contractor will be supplied the first carbon copy.
5		Initial Measurements for Record : Where for proper measurement of the work, it is necessary to have an initial set of levels or other measurements taken, the same as recorded in the authorized field book, measurement book of Government by the Engineer - In - Charge or his authorized representative will be signed both the parties that is Departmental Officer and Contractor or his legal representative. One attested copies of this measurements will be supplied to contractor on demand. Any failure on the part of the contractor to get such levels etc. recorded before starting the work will render him liable to accept the decision of Engineer -

	<p>In - Charge as to the basis of taking measurements.</p> <p>The contractor shall not take over any work without first getting the same jointly measured and recorded by himself, and the authorized representative of the Engineer - In - Charge, the record of such measurements maintained by the Government shall be signed by the contractor and he will be entitled to have a certified true copy of the same made at his cost.</p>
6	<p><u>Custody of Work:</u></p> <p>All work and materials before being finally taken over by Government will be the entire liability of the contractor for guarding, maintaining and making good and damages of any magnitude. It is, however, to be understood that before taking over such work, Government will not put it to its regular use as distinct from casual or incidental use, except as specially mentioned elsewhere in this contract or as mutually agreed to.</p>
7	<p><u>Co-ordination:</u></p> <p>When several agencies for different sub works of the work are, to work simultaneously on the project site, the contractor shall rend full co-operation for achieving proper co-ordination different contractors to ensure timely completion of the whole work smoothly, the contractor may make his independent arrangements for water power, access housing etc. But if he so desired he will be at liberty to come to mutual agreement with other contracting agencies in this behalf and make joint arrangements with the approval of the Engineer- In-Charge the contractor shall not take or cause to be taken any steps or action that may cause disruption, delay, discontent or disturbance to work, labour or other arrangements etc; of other contractors in work location. Any action by the contractor which the Engineer- In -Charge may consider infringement of the above would be considered as a breach of the contract conditions and shall be dealt with as such.</p> <p>In case of any dispute or disagreement between the various contractors, theEngineer- In - Charge's decision regarding the co-ordination, co-operation and facilities to be provided by any of the contractors shall be final and binding on the contractor concerned and such a decision or decisions shall not vitiate the contract nor absolve the contractor of his obligations under the contract, nor form the grounds for any claim or compensations.</p>
8.	<p><u>Patented devices, materials & processes</u> :Whenever the contractor desires to use any design, device, materials 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 owners and the copy of their agreement shall be filed with the Engineer- In-Charge.</p>
9	<p><u>Relation with Public Authorities:</u></p>

	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 pay fees or charges, which are available on him without any extra cost to Government.
10.	<p><u>Indemnity:</u></p> <p>The contractor shall indemnify the Government against all actions, suits, claims, and demands brought or made against it in respect of any thought or made against it in respect of anything done or omitted 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 of any action or omitted to be done in the execution of the works of this contract. The Government say, at its discretion and entirely at the cost of contractor, defend such suit either jointly with the contractor or singly in case the tenderer chooses not be defend the case.</p>
11	<p><u>11.1 Stacking and storage and guarding of materials</u></p> <p>The stacking and storage of material 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 the materials against atmospheric actions, fire and other hazards, actions, fire and other hazards, the materials likely to be stored on paved platforms, suitable separation barricades and enclosures as directed shall be provided to separate materials brought by contractor and materials issued by Government of contractor under Schedule "A" same applies for the material obtained from different sources of supply</p> <p><u>11.2</u> The contractor shall at his own expenses, engage watchmen for guarding the materials and plant and machinery and the work during day and night against any pilferage or damage and also for prohibiting trespassers</p> <p>11.3 No materials brought to site shall be removed from the site without the prior approval of the Engineer In charge.</p>
12	<p><u>Inspection of Work</u></p> <p>12.1 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</p>

	further progress of the work.
	12.2 The contractor shall provide at his cost necessary ladders and such arrangements as are considered safe by the Engineer In charge for proper inspection of the parts of the work.
13	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.
14	In the event of an occurrence of an accident involving serious injures or death of any person, at site of work of quarry or at any place in connection with work the same shall be reported in writing within 24 hour of the occurrence to the Engineer In charge and the Commissioner of workmen's compensation.
15	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 6 months from the date of completion of the work, or otherwise the same will be recovered at his cost or disposed off as per department procedure. In case the material is disposed off by Department, the sale proceeds will be credited to contractor's account the deduction the cost of sale incurred. However, no claim of contractor regarding the price of amount credited will be entertained.
16	All constructional plant, provided by the contractor shall when brought on the to the site be deemed to be exclusively intended for the construction and the contractor shall not remove the same or any part there of (save for the 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 reason for withholding the consent.
17	<u>RESTRICTIONS BECAUSE OF LOCAL NAVIGATIONAL TRAFFIC</u> If there is navigational traffic in the creek or river, during the construction of the bridge, the contractor will have to take proper precautions such as leaving navigational channels unobstructed providing proper and sufficient lighting on the foundation wells, and keeping the concerned authorities informed about the work in progress.
18	<u>TIDE LEVELS AND WAVE HEIGHTS</u> As per general experience, the actual tide levels are likely to be same what different from these

	indicated elsewhere in the Tender documents. The contractor while deciding his construction methods etc. will have to take this into accounts.
19	<u>COMPLETION CERTIFICATE</u>
	19.1 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 materials or workmanship or approval of part of the 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 complete 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 certified that the work has been completed to his satisfaction.
	19.2 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 a 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 the notify 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.
	19.3 In case defect noticed by Engineer- In- charge which in his opinion are not rectifiable but otherwise work is acceptable at the reduced payment work shall be treated as complete. In such cases completion certificate shall be issued by the Engineer In charge within 30 days indicating the non-rectifiable defects for which specified reduction in payment is being made by him.
	19.4 The issue of completion certificate shall not be linked of with the site clearance on completion of the work
	19.5 Should regular public traffic be allowed on the bridge at any stage prior to its being taken over, then the maintenance period shall deemed to commence from the date of such traffic passing over the bridge and shall be up to 30 days after the date of issued of completion certificate, by Engineer- In- charge but not more than 12 moths after opening to traffic.

20	<p><u>ANCILLARY WORKS</u></p> <p>The contractor shall submit to Engineer-In-charge in writing the details of all ancillary works including layout and specifications to be followed for 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 modification 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 modifications to ancillary works at his own expenses as ordered by Engineer- In-charge</p>
21	<p><u>TEMPORARY QUARTERS</u></p> <p>The contractor shall at his own expenses make his own arrangement for housing his staff with all necessary amenities a protective measure etc. General layout plan for such structures shall be got approved from the Engineer In charge. It will be the responsibility of the contractor to get his layout plan of temporary structure approved also from the local competent authorities.</p>
22	<p><u>SAFETY MEASURES</u></p> <p>The contractor shall take all necessary precautions for the safety of the workers and preserving their health while working in such jobs, which require special protection and precautions. The contractor shall also comply with the direction issued by the Engineer- in- charge in this behalf from time to and at all times. The following are some the requirements (The list is not exhaustive)</p>
	<p>i) Providing protective footwear to workers in situations like mixing and placing of mortar or concrete, in quarries and places where the work is done under too much wet conditions as also for movement over surface infested with oyster growth.</p>
	<p>ii) Providing protective headwear to workers working in quarries etc. to protect them against accidental fall of materials, from above.</p>
	<p>Providing hand rails at the edge of floating platforms, barges, walkways, ladders etc.</p>
	<p>iii) Supporting workmen with safety belts, ropes etc. when working on any cranes, cribs, hoists drudgeries etc.</p>
	<p>iv) Taking necessary steps towards training the workers concerned on the use of machinery before they are allowed to handle it independently and taking all necessary precautions in hand around the areas where machines, hoists and similar units are working. Wherever required by the law and persons</p>

	handling the machinery shall have the requisite licenses certificate
	v)Preventing over loading and overcrowding of floating and land based machinery and equipment.
	vi)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.
	vii)Avoiding bare live wire etc as would cause electrocution
	viii)Making all platforms staging and temporary structures sufficiently strong and not causing the workmen and supervisory staff to work under risks.
	ix)Providing sufficient first aids, trained staff and equipment's to be available quickly at the work site to render immediate first aid treatment in case of accidents due to suffocation drawing and other injuries.
	x)Taking all necessary precautions where divers are engaged on work
	xi)Providing full length gum boots leather hand gloves, leather jacket with fire proof aprons to cover the chest and back reaching up to knees and plain goggles for eyes to labour working with hot asphalt, handling vibrators in cement concrete and also where use of any or all these items is beneficial in the interest of health and well being of the labourers in the opinion of the Engineer In charge.
23	<u>EXPLOSIVES</u> The contractor shall at his own expenses construct and maintain proper magazines, for the storage of explosives if required for use in connection with works, such magazines, being situated, constructed and maintained in accordance with the Government rules applicable in that behalf. The contractor shall at his own expenses obtain such licenses or license necessary for storing and using explosives. Not with understanding that the location etc. of storage of explosive 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 or any accident of violation of any laws, rules, order etc. whatsoever in connection therewith, all operator of the contractor in which or for which explosives are employed being at the risk of the contractor and upon his sole responsibility the contractor hereby gives to Government an absolute indemnity in respect thereof.
24	<u>MEDICAL AND SANITARY ARRANGEMENTS TO BE PROVIDED FOR LABOUR EMPLOYED IN THE CONSTRUCTION BY THE CONTRACTOR</u>
	a)The contractor shall provide an adequate supply of potable water for the use labourers on work and in camps.
	b) The contractor shall construct trench type semi permanent latrines for the use of labourers Separate latrine shall be provided for men and women

	c) The contractor shall built sufficient numbers of huts on suitable plot of land for the use of labourers according to the following specifications.
	i) Huts of bamboo's and grass may be constructed.
	ii) A good site not liable to submergence shall be selected. High ground remote from jungle but well protected with trees, shall be chosen wherever it is available. The neighborhood of thick jungle, grass and weeds should be particularly avoided. Camps should not be established closed to large cuttings of earth work.
	iii) The lines of huts shall have open spaces of the least ten Metre between rows. When a good natural site can not be procured particular attention should be given to the drainage.
	d) The contractor shall construct sufficient number of well screened bathing places sufficient number of washing places should also be provided for the purposed of washing cloth.
	e)The contractor shall make sufficient arrangements to drain away the surface and village water as well as water from bathing & washing places and shall dispose off this wastewater in such a way as not to cause any nuisance
	f)The contractor shall engage a medical officer with traveling dispensary for a camp containing 500 or more persons if there is no Government or other private dispensary situated within 8 kms from the camp. In case of emergency contractor arrange at his cost, transport for quick medical help to his sick workers
	g)Instruction of the District Health Officer on matters such as water supply sanitary conveniences at the camp site, accommodation and food supply shall be followed by the contractor
	h)The contractor shall make arrangements for all anti-malaria / Dengu measures to be provided for the labour employed on the work. The anti-malaria / Dengu measure shall be as directed by the District Health Officer. Cost of antimalaria / Dengu measures will be born by the contractor.
25	The contractor except as provided in special condition which follow, shall if necessary construct at his cost temporary roads and maintain these in proper conditions till completion of the work, at his own cost.
26	The contractor except as provided in special conditions which follow shall have to, at his own expenses make all preliminary arrangements for labour, water, electricity and materials etc. immediately after getting the work order. The Government may render necessary assistance in this regard by way of letters of recommendation, if so requested by the contractor. No claim for any extra payment or application for extension of time of the ground of any difficulty in connection with the above matters will be entertained.
27	<u>WORKING METHOD AND PROGRESS SCHEDULE :-</u>
	27.1 Contractor shall submit within the time stipulated by the Engineer in the writing the details of actual method that would be adopted by contractor for the execution of any item as required by Engineer at each of the locations ,supported by necessary detailed drawing and sketches including those of the plant

and machinery that would be used , their locations , arrangement for conveying and handling materials etc. and obtains prior approval of the Engineer In charge , well in advance of starting of such item of work. The Engineer In charge reserved the right to suggest modifications or raise objections to 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. The contractor shall take cognizance of such suggestions / objections and suitably modify his method of construction. No claim on account of such changes will be entertained by Government

27.2 The contractor shall furnished within one month of the order to start the work the 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 date of procurement and setting up of materials and plant and machinery. The programme is to be such as to be practicable of achievement towards the completion whole work in the time limit and of the particular items, if any, on the due date specified in the contract. Planning and programme of work shall be done by the mutual discussion between the **Executive Engineer, Public Works Division, Wardha** and contractor's representative In charge of work and not unilaterally by PERT method. Planning of submission and scrutiny of design will be according to the detailed schedule mutually agreed before start of work between the contractor and Departmental Officers. The progress of work shall be drawn up if necessary. No revised programme shall be operative without such acceptance by Engineer- in- charge in writing. The Engineer 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 as an when ask for acceptance of the programme or the revised the programme by the Engineer- in- charge shall not relive the contractor of his responsibility to complete the whole of the work by prescribed time or extended time if any.

27.3 The contractor shall deploy sufficient plant, equipment and labour as may be necessary to maintain progress schedule. The working and shift hours restricted to one shift a day for operation 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 the prior approval of the Engineer- in- charge. Night works which require supervision shall not be permitted except when specifically allowed by Engineer each time if requested by contractor. The contractor shall provided necessary lighting arrangement etc. for night work, as directed by Engineer without extra cost.

27.4 The contractor shall submit reports on progress of work in prescribed forms and statements etc. and periodical interval in the form of progress chart, forms, statements and/ or report as may be approved by the Engineer. Forms for sending reports about the progress will be supplied by the **Executive Engineer, Public Works Division, Wardha**

27.5 The Contractor shall maintain proforma charts, details regarding machinery, equipment labour materials, personnel etc. as may be specified by Engineer In charge and submit periodical returns thereof in perform to be got approved from the Engineer In Charge.

28

PAYMENTS

	Lump sum quoted offer is for the completed work and the progressive payment shall be made in accordance with accepted billing schedules.
29	TAXES Rates shall be inclusive of sale Tax, VAT and other taxes / charge (Excluding GST) as enforceable on the date of issued of tender form.
30	<u>CLAIMS FOR EXTRA WORKS</u>
	30.1 Claims for extra work shall be registered within 30 days of occurrence of the event. However, bills for these claims along with supporting data / details shall be submitted within 30 days after registration of the same.
	30.2 Bills for extra work or for any claims shall be paid separately apart from interim bills for the main work. The payment of bills for the main work shall not be withheld for want of decision on the extra /claim not covered in the schedule of items for extra work.
31	<u>ADVANCE ON MACHINERY / MOBILISATION ADVANCE</u> No <u>Machinery / Mobilization</u> advance will be admissible to the contractor
32	<u>BILLS AND PAYMENTS</u>
	32.1 Two running payments in a month are permitted. First of the bills shall be submitted by the contractor by the 10 the day of the month. Second bill if necessary shall be submitted by the contractor by the 25 day of the month.
	32.2 The format of running bill on which the bills are to be submitted by the contractor shall be supplied to the contractor by the Department.
	32.3The final bill shall be submitted within one month of the date of issue of completion certificate. The final bill shall be paid within three months of initial submission if it is in order.
	32.4 In case of disputed items either in running account bills or the final bills, such items shall be excluded or balance payment effected within the prescribed time limit. Disputed items and claims shall be settled separately.
	32.5 Recovery of secured advance shall be effected through bills proportionally as per consumption of materials in the work billed for.
	32.6 The contractor can have true copy of the bills paid to him after paying charges as prescribed the Engineer- In -charge for photo-coping the same
33	<u>EXTRA WORKS</u>
	33.1 When the contract is on form "C" any extra work likely to crop up are included in schedule of item for extra work in chapter X, where the contractor shall quote his rates. The contractor shall execute

	any other item if likely to be cropped up.
33.2	Rates for all rebates as a percentage of the rates for extra work shall be the following
a) Foundation	75%
b) Piers, Abutments including well caps	
Abutment caps and piers caps	80%
c) Super structure	85%
d) Approaches & other Items	75 %
33.3	Any items beyond the items referred to in the schedule "C" shall be derived from the State Schedule of rates (SSR) at the time of sanction of extra items.
33.4	The rates for items not covered either by the Schedule "C" or DSR shall be work out from actual expenses adding 20 % for overheads and for profit. The Contractor shall submit the account of actual expenses in such cases duly countersigned periodically in the form and manner as directed by Engineer- in-charge. The Engineer In charge may call for the contractor books of accounts for verifications any time
33.5	For controlled concrete mix different than the item given in schedule "C" rates shall be derived from corresponding rates for nearest designated mixes by linear interpolation.

34	<u>BILLING SCHEDULE FOR INTERIM PAYMENTS</u>
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34	<u>BILLING SCHEDULE FOR INTERIM PAYMENTS</u>
A.	<p>34.1 The contractor shall submit detailed billing schedule for interim paymepnts along with his tender. The billing schedule shall be subject to the following overall limitations.</p> <p>A. Bridge Proper - Total payment shall be 34.99 % of agreement amount shall be excluding royalty and testing charges considering this as 100% break up shall be as below</p> <p>a) Payment for all foundation including exploratory bores shall be 28.00 % (Establishment of camp, confirmatory boring structural Design submission after approval of competent authority - 2 % and for all foundation 26.00 %))</p> <p>b) Payment for substructure shall be 32.00 %</p> <p>c) Payment for superstructure shall be 30.00 %</p> <p>d) Payment for remaining items of work shall be 10.00 %</p> <p>e) Total payment shall be 100 % only i.e. 34.99% of agreement amount.</p>

B	B Retaining wall :- Total payment shall be 10.69% of agreement amount excluding royalty and testing charges considering this as 100% break up shall be as below, based on finished Length i.e. completed length
	1) 25 % Length :- 25 %
	2) 50 % Length :- 50 %
	3) 75 % Length :- 75 %
	4) 100 % Length :- 100 %
Total payment shall be 100% only i.e. 10.69 % of agreement amount.	
<p>C) Approaches - Total payment shall be 37.53 % of agreement amount. excluding royalty and testing charges Considering this as 100% break up shall be as below.</p> <p>a) Earthwork up to sub grade and cutting if existing earthen bund and all sort of dismantling including Side Shoulder and setting out road alignment and curves – 10.00 %.</p> <p>b) Development of GSB layers for approaches road – 10.00 %</p> <p>c) DLC and PQC with Paved shoulder and murum shoulders – 65.00 %</p> <p>d) Pitching and Protection wall - 3.00%</p> <p>e) Miscellaneous works including crash barriers and transportation of excavated stuff. - 12.00%</p> <p>Total payment shall be 100% only i.e. 37.53 % of agreement amount excluding royalty and testing charges.</p> <p>E) Road side C.C. drain :-Total payment shall be 100% only i.e. 13.87 % of agreement amount.</p> <p>F) Road side furniture and miscellaneous- Total payment shall be 100% only i.e. 2.12 % of agreement amount excluding royalty and testing charges.</p> <p>h) Royalty, Testing & Toll Charges – Royalty, Testing and Toll charges shall be paid as per actual expenses incurred by the contractor after producing the voucher ,invoice, royalty passes issued by the competent authority.</p>	
34.2 On acceptance of the alternative design with span arrangement and rates of variation of foundation in the contract, if the contractor desires to change the span arrangement resulting in increase or decrease in the number of foundation, quoted as per meters depth of foundation, shall be varied as under.	

	<p>N = Number of pier foundation as per accepted tender</p> <p>R = Rate of taking foundation deeper or rebate for resting foundation at higher level as per contract.</p> <p>N1 = Number of pier foundation as per revised span arrangement.</p> <p>R1 = Rate of taking foundation deeper or rebate for resting foundation at higher level.</p> $R1 = \frac{R \times N}{N1}$
	<p>34.3 For intermediate stage under each of the above item (a) to (e) the payment for first unit shall not exceed twice the average of all units. No payment shall be made for ancillary work, which do not form a part of bridge such as centering fabrication yards, casting yards, cofferdam etc.</p>
35	<p><u>ASSISTANCE IN PROCURING PRIORITIES PERMITS ETC.</u></p>
	<p>35.1 The Engineer In charge on written request by the contractor will, if, in the interest of work and its progress, assist the contractor in securing police protection and the priorities for controlled materials, permit 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 Government however shall not be responsible for non availability of such facilities or delay in this behalf and no claims on account of such failure or delay be allowed by the Government.</p>
	<p>35.2 The contractor will have 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 as per rules in force on recovery of necessary security deposit and rent if requested by the contractor in writing. For such arrangement a separate agreement in prescribed form will have to be signed by the contractor. Such an agreement shall be independent of this contract and the supply or non- supply of machinery shall not form a ground for any claim or extension of time limit for this work.</p>
36	<p><u>WATER SUPPLY</u></p>
	<p>36.1 Availability of adequate water for works and sources thereof shall be got confirmed by the Contractor before submitting of tender.</p>
	<p>36.2 The contractor shall make his own arrangements at his own cost for entering into a contract with concerned authorities for obtaining the connection and carry the water up to the work site as required by him. The location of the pipeline with respect to the road shall be decided by the Engineer In charge and</p>

	shall be binding on the contractor.
	36.3 The contractor is advised to provide water storage tanks of adequate capacity to take care of possible shut down of water supply system.
	36.4 The contractor shall have to supply water required by the Department for its establishment at work site at mutually agreed terms
	36.5 No extra claim on account of carriage of water will be entertained.
37	<u>ELECTRICITY</u>
	37.1 The contractor will have to make his own arrangement at his own cost for obtaining or providing electric supply at work site.
	37.2 Electrical supply for the Department's use at work site shall be provided by the contractor at mutually agreed terms. The contractor may not abide by these conditions when power supply at the site fails.
38	<u>TELEPHONE FACILITIES</u>
	Contractor will have to make his own arrangement at his own cost for telephone connection at work site if required.
39	<u>ACCESS TO SITE OF WORK</u> :- Providing the right of way for the access to bridge site proper from the available nearest road will be the responsibility of the Contractor. The cost of constructing and maintaining such access road shall be born by the contractor.
40	<u>MATERIALS SOURCES</u>
	40.1 The tenderer shall make their own independent investigations into the availability as well as suitability of the various materials required for construction as referred to in this Para.
	40.2 If any quarry is in the possession of the department the contractor will be allowed to use the same on usual conditions. In other cases, the contractor will have to make his own arrangement for procuring quarries or the quarry permits, necessary assistance of which will be given by the department.
	40.3 The contractor will have to pay royalty charges at his cost as per Govt. directives from time to time

	40.4 Limestone shall not be permitted for any concrete work.
41	<u>LAND</u>
	41.1 The contractor shall make all efforts to obtain land required for ancillary work for the construction of the bridge and approaches. In case the contractor is unable to obtain land and if requested, then department may requisition land at his cost.
	41.2 Land as available with the Department or requisitioned by the Department at the request of the contractor will be handed over to the contractor for such use as will be necessary for ancillary works required for the construction of bridge, on payment of rent to the Department. Plot development if any will have to be done by the Contractor at his own cost. The development shall be in conformity with the regulation of local authority.
	41.3 If for the purpose of construction of the bridge it becomes necessary for the contractor to occupy land not in possession of the Department, the contractor will have to make his own arrangements with the land owner and pay such compensation as mutually agreed between them.
	41.4 On completion of work, all land mentioned in Para 41.1 / 41.2 / 41.3 / shall be handed over back to owners, or the Department as the case may be after clearing the land as directed by the Engineer -In-charge. Dismantling of building on Government or Departmental land shall be done only after approval of Engineer In charge.
42	<u>DAMAGES BY FLOODS AND ACCIDENTS</u>
	42.1 The contractor shall take all precaution against damages by floods or tides or from accidents etc. not covered by accepted risks. No compensation will be allowed to the contractor on this account or for correcting and repairing any such damages, to the work during construction. The contractor shall be liable to make good at his cost any plants or materials belonging to the Government lost or damaged by the floods or from any other causes while in his charge. The proof of occurrence of flood report with flood level will have to be furnished by the contractor. No compensation will be allowed from losses on ancillary items and equipment which are brought to the site by the contractor for effecting execution for the work
43	In the event of an accident involving serious injuries or damages to human life or death if any of his employees and or labourers or trespasser, the same shall be reported within 24 hours of the occurrence to the Engineer In charge and commissioner of workmen compensation.

43	<p>If any “ urgent works” (in respect where of the decision of the Engineer- in-charge shall be final and binding) becomes necessary and the contractor is unable or unwilling to carry it out at once, the Engineer -In-charge may be on his own or through other people shall, have it carried out as he may considered necessary. If the "urgent work" shall be such as in the opinion of the Engineer- in- charge the contractor liable under the contract to carry out at his expenses, all expenses incurred on it by the Department shall be adjusted or set off against any sum payable to him.</p>
44	<p><u>EXCEPTED RISK</u></p>
	<p>(i)The “ EXCEPTED RISK are war , hostiles (whether war be declared or not) ,invasion, act of foreign enemies ,rebellion ,revolution, insurrection or military or usurped power, civil war, unprecedented flood or unless solely restricted to employees of the contractor or of his subcontractors and arising from the conduct of the works, riot, commission or disorder ,or sue of occupation by the Employer of any part of the permanent works , or ionizing radiation’s or contamination by radio activity from any nuclear fuel, radioactive atomic explosives, or other hazardous properties of any explosives, nuclear assembly or nuclear component thereof, pressure waves caused by aircraft or other serial devices traveling of the forces of nature as an experienced contractor could not foreseen ,or reasonably make provision for or insure against all of which are herein collectively referred to as “ the excepted risks”.</p>
	<p>(ii) DAMAGE TO WORK BY EXCEPTED RISKS :</p> <p>The expenses what so ever arising in this connection will be compensated to the contractor for any loss or damage to property of the contractor used or intended to be used for the purpose of the works (including property in transit to site) and occasioned either directly or indirectly by the said excepted risk.</p> <p>If the works to temporary works or any materials (whether for the former or later) brought to site shall sustain destruction or damage by reasons of any of the said excepted risks, the contractor shall be entitled to payment for any materials so destroyed or making good any such destruction or damages whether to the works or temporary works and for replacing or making good such materials so far may be necessary for the completion of the work on a price costs basis as the Engineer in Charge may certify to be reasonable.</p>
	<p>(iii)The contractor shall lodge his claim, on such account in writing, supported by necessary details, documents etc. as required by Engineer- In-charge immediately but not later than 30 days, of such occurrence of damage to works by excepted risks.</p>
	<p>(iv)The prime cost will be the basic for the deciding the claim.</p>

	Destruction, Damage injury or loss caused by the explosion or impact whenever and wherever occurring of any mine, bomb, shell, grenade or other projectile type missile or ammunition or explosive or war resulting from action described in 44 above be deemed to be a consequence of the said excepted risks.
45	<u>SUPENSION OF WORK</u>
	45.1 The contractor shall, on the return order of the Engineer- In- charge suspend the progress of the work or any part thereof for such time or times and in such manner as the Engineer- in- charge may consider necessary and shall during such suspension properly protect and secure the work, so for as it is necessary in the opinion of the Engineer -in- charge.
	45.2 If the suspension in sub clause 45.1 is ordered for no fault of the contractor.
	45.3 The contractor shall be entitled to a reasonable extension of time
	45.4 If the total period of all such suspension of the entire works exceeds thirty days, the contractor shall, in addition be entitled to compensation, as the Engineer- In- charge may consider reasonable, in respect of slaughters and or wages actually paid by the contractor to his site employees and labour remaining ideal during the period of suspension adding there to a percentage of 10 % to cover indirect expenses of the contractor provided the contractor produces documentary evidence in support thereof, to the satisfaction of the Engineer -In- charge including conveying justification why such employees and labour could not be discharged or directed to other works.
46	<u>ALTERATION IN LAYOUT</u>
	Large scale alteration in the layout shall not be permitted, however if so desired by the contractor, minor alternations will be permissible, provided the modified design is technically as well as aesthetically acceptable to the department with reference to Design Criteria provided in chapter X and provided further that the quantities of materials to be supplied by the department do not increase and no extra payment is involved. The decision of the Engineer in this respect shall be final and binding on the contractor
47	<u>DISPUTES AND ARBITRATION</u>
	47.1 No arbitration is allowed.
	47.2 In case of disputes or difference of opinion arising between the Engineer- In- charge and the contractor, the contractor shall refer the matter to Superintending Engineer through the Engineer -in-

	charge with an advance copy to the Superintending Engineer
	47.3 In case the Superintending Engineer's decision is not acceptable to the contractor, the contractor may refer the matter to the Chief Engineer within 30 days of receipt of order by him through the Superintending Engineer, with an advance copy to the Chief Engineer. In case the Chief Engineer's decision is not acceptable and if the matter otherwise satisfied and the condition laid down for the purpose, the contractor can refer the matter to the Secretaries committee appointed by the Government of Maharashtra vide Government resolution, Public Works Department, No CAT / 1074 / 2906 Dated 16.12.1974. To the Chief Engineer although the claim as may be shall be final and binding on Government, the concerned contractor shall still have right to go to the court of law in case he is not satisfied with decision of the standing committee or of the Cabinet.
	47.4 Notwithstanding anything contained above, is so far as the specifications and technical provisions of the contract are concerned, the decision of the Chief Engineer shall be final or binding on the Contractor.
48	<u>CONTRACTOR TO INFORM HIMSELF FULLY</u> The contractor shall be deemed to have carefully examined the work and site conditions including labour, the general special conditions, the specifications, schedules and drawing and shall be deemed to have visited the site of the work and to have fully informed himself regarding the local current velocity and subsoil conditions and carried out his own investigations 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.
49	<u>ERRORS, OMISSIONS AND DISCREPANCIES</u>
	a) In case of error, omission and / or disagreement between the written and scaled dimensions on the drawings or between the drawings and specification etc. the following order of preference shall apply.
	viii) Between actual scaled and written dimensions or descriptions on a drawing the later shall be accepted
	ix) Between the written and shown description / or dimensions in the drawing and the corresponding one in the specification, the later shall apply.
50	<u>ASSISTANCE IN PROCURING PRIORITIES PERMITS ETC</u>
	The Engineer -in- charge on written request by 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 priorities for deliveries,

transport permits for controlled materials, permit for quarries and other similar permits including labour license etc. where such are needed. The Government will not however be responsible for non availability of such facilities or delay in this behalf and no claims on account of such failures or delay shall be allowed by the Government. The contractor shall have to make his own arrangement for machinery required for the work. However, if such machinery is conveniently available with Department, it may be spared as per rules in force on recovery of necessary Security Deposit and rent with agreement in the prescribed form. Such an agreement shall be independent of this contract and the supply or non-supply of machinery shall not form a ground for any claims or extension or time limit for this work.

51 **SAMPLE AND TESTING OF MATERIALS**

i) All materials to be used on work such as cement, lime , bricks, aggregates, steel, stone, asphalt woods, tiles etc. shall be got approved in advanced from the Engineer In charge and shall pass the test and or analysis required by him.

ii) The contractor shall at his risk and cost make all arrangements and / or shall provide for all such facilities as the Engineer- in- charge may required for collecting, preparing and for forwarding required number of samples for test or for analysis to the nearest approved laboratory and bear all charges and cost of testing. Such sample shall also be deposited with Engineer- in- charge.

x) The contractor shall, if an when required, submit at his cost the samples of materials to be tested or analyzed and if so directed, shall not make use of or incorporate in the works any materials to be represented by the samples until the required test or analysis have been made and the materials finally accepted by the Engineer- in- charge.

xi) Frequency of testing shall be as per relevant works specifications, in case such frequency is not specified in works specifications then the IS code / MORT & H Specification (IV Revision) will be referred and for other cases where IS code MORT & H specification do not stipulate the frequency it will be decided at the beginning of work by mutual discussion.

52 **WEIGH BATCHING**

For M – 20 to M- 35 and above preliminary mix design shall be prepared for such mixes. Weigh batching shall be done for all materials like cement, fine aggregate, and coarse aggregate. It will be the responsibility of the contractor to obtain the mix design for cement, concrete grade at his own cost from the Govt. Laboratories/ institution. For concrete M- 20(N/mm²) and richer than M- 20(N/mm²) grade, proportioning

	shall be done by weigh batching only.
53	<u>Mix Design</u>
	53.1) The following instructions shall be followed as regards preliminary design of mix methods of batching of plain cement concrete and reinforced cement concrete. These instructions should be treated a supplementary to the relevant provision 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
	<u>Concrete Grade Guidelines</u>
	1 Up to M-15 This should only by ordinary concrete. No change may be prescribed for he present practice as regards preliminary design of mix permitting volume batching.
	2 M-20 Preliminary mix design must be carried out for these mixes. However, weight batching shall be insisted for cement only.
	3 M-20 Preliminary mix design must be carried out for these mixes. However, weight batching shall be insisted for cement only.
	53.1 For the grades of concrete M-20 and above the preliminary mix design shall be carried in P.W.D. Regional laboratory VQCC Nagpur /Chandrapur
	(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 makeup the under weight bags shall be borne by the contractor.
	(iii) For the items of concrete of grades lower than M-20 other items in the agreement where cement is not to be used by weight. The cement bags shall contain cement of 50 Kg. net weight.
	53.2 The admixtures such as plasticizers/super plasticizers for concrete grade M-20 and above shall be used as directed by Engineer-in-charge depending upon specific requirements
	. No extra payments on this account will be admissible
54	STANDARD CEMENT CONSUMPTIONS
	Cement consumptions for various grades of concrete shall be as per IRC 21-2000

55	<p><u>NOC FOR POLLUTION CONTROL</u></p> <p>It is obligatory on the part of contractor to obtain the NOC regarding under 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.</p>
56	<p><u>PHOTOGRAPHS</u></p> <p>The work covers the supply of coloured photographs with CD/DVD and albums to serve as a permanent record of various stages of the work as and when instructed by the work as and when instructed by the Engineer-in-charge for an authentic documentation as approved by the Engineer-in-charge. The contractor shall arrange to take colour photographs at various stages of the work. These photographs shall be of acceptable quality and they shall be taken by a professionally trained / competent photographers with camera having the facility to record the date of photographs taken in the prints and the contractor shall supply two colour prints of each of the photographs taken to the standard 4" x 6" size mounted in albums of acceptable quality. Also the CD / DVD shall be supplied for each photograph, Each photograph in the album shall be suitably captioned. The contractor shall arrange for taking video films of important activities of the work as directed by the Engineer-in-charge during the currency of the project and editing them to a video film of playing time not less than 60 minutes and up to 180 minutes as directed by the Engineer-in-charge. It shall contain narration of the acceptable quality and the film shall be capable of producing colour pictures. It shall be considered as incidental to the work and no additional payment, whatsoever will be made for the same. No extra payment will be made to the contractor for supply of record photograph negatives and albums including taking photograph developing and obtaining colour prints cost of album mounting of photographs and capping the same. These photographs, CD / DVD and the album shall form a part of records of the department and the prints of the same can not be supplied to anybody else or published without the written permission of the department.</p>
57	<p><u>INFORMATION BOARD</u></p> <p>After award of contract, contractor will have to provide and fix the information board showing name of work, tender cost, period of completion and other details as directed by the Engineer- in- charge. This will be treated as incidental to work; no separate payment shall be made on this account. Boards shall be as per type plan attached.</p>

महाराष्ट्र शासन

१. सार्वजनिक बांधकाम विभागाचे नांव
२. कामाचे नांव
३. कि.मी
४. कामाची किंमत
५. कंत्राटदाराचे नांव
६. काम सुरु झाल्याचा दिनांक
७. काम पूर्ण करण्याचा कालावधी
८. दोष निवारण कालावधि

वर्ष

(अ) पासुन दिनांक

(ब) पर्यंत दिनांक

58

LABORATORY CUM SITE OFFICE

The contractor shall provide, furnish, maintain and remove on completion of the work a suitable site office-cum-laboratory on the work site for use of Executive Engineer's representative. The site office cum laboratory shall be separate rooms of sufficient area. It may have brick wall & asbestos or corrugated sheet roof with false ceiling, paved floor should be 0.45 mtr. Above ground level, laboratory shall have working platform, necessary electrical provision and water supply arrangement. Arrangement of display of drawing should also be made. He should provide suitable latrines, urinals and keep them clean daily. This will be included in his offer. Necessary laboratory equipment, office furniture shall be provided by the contractor at his own cost,

After completion of work it will be property of contractor except furniture .It should be removed from site of work at his own cost.

The cost of supply of furniture and electrical fitting and laboratory equipment's at laboratory- cum-site office during the currency of contract is incidental to the work and no separate payment will be made for the same to the contractor. Contractor failing to do so, with required specifications, an amount required will be recovered from any bill payable to the contractor. The furniture and electric fitting and supply of laboratory equipment shall be completed within 15 days after making available room for the same. The items listed in the clause 58 shall be **the** absolute property of the contractor on completion of work.

59

Responsibilities for level and alignment.:

The contract 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 efforts or imperfections therein. Such

	<p>rectifications shall be carried out by the contractor, at his own cost, when instructions are issued to the effect by the Engineer in charge.</p>
60	<p><u>Levelling instruments:</u></p> <p>If measurements of items of the work are based on volumetric measurements calculated from levels taken before and after construction of the item, a large number of leveling staves, tapes, etc. will have to be kept available by the contractor at the site of work for this purpose. Lack of such leveling staves, tapes etc. in required numbers may cause delay in measurements and the work. The contractor will have therefore to keep sufficient number of these instruments readily available at site and in good working condition.</p>
61	<p><u>Supervision.</u></p> <p>The contractor shall either himself supervise the execution of the work or shall appoint the competent agent approved by the Engineer-in-charge to act on his behalf. If in the opinion of the Engineer-in-charge, the contractor has himself no sufficient knowledge and experience of receiving instructions or cannot give his full attention to the works, the contractor shall at his own expenses, employ as his accredited agent a qualified Engineer approved by the Engineer-in-charge. Orders given to the contractor's agent shall be considered to have the force as if these had been given to the contractor himself, If the contractor fails to appoint a 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 of suitable agent is appointed and the contractor shall be responsible for the delay so caused to the works and contractor shall not be entitled for any compensation on this behalf.</p>
62	<p>Inspection:</p> <p>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. The work shall not have 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. Approval of materials or workmanship or approval or part of the work during the progress of execution shall not bind the Engineer-in-charge or in any way affect him even to reject the work which is alleged to be completed and to suspend the issue of his certificate of completion until such alteration and modifications or reconstruction have been effect at the cost of the contractor as shall enable him to certify that the work has been completed this satisfaction.</p> <p>The contractor shall provide at his cost necessary ladders and such arrangements as to provide necessary facilities and assistance for proper inspection of all parts of work at his own cost.</p>
63	<p>Load Test of Superstructure:</p> <p>In the event of reasonable doubts as to the quality of workmanship or of materials used in construction, the contractor shall carry out a load test on the superstructure for testing on complete unit of the same preferably the very first of it to be cast, as directed by the Engineer in order to satisfy the Department about the adequacy of the strength of the structure and the sufficiently of methods followed and results obtained. The load test shall be carried out as per relevant specifications.</p>

	<p>The test shall be carried out for the full dead load at 125 percent live load including impact by observation of deflections a salient point and comparing them with those computed ones. The two should closely agree with residual deflection after removal of live load after 24 hours and the difference between the two shall not be more than 30% of the maximum ones, if the recovery is less than 70% the structures shall be deemed to be unacceptable.</p> <p>In case there is any deficiency, the same shall be made good by the contractor by necessary strengthening of the unit tested component and necessary improvement shall be made in the units to be constructed next as warranted by their results of the test.</p> <p>The next unit will again be tested and process reported until absolutely satisfactory results are obtained and the rest of the work will be carried out according to the procedure given such results.</p>
63.1	<p>Cost of load test and testing Charges of any part of structure:</p> <p>Load testing and testing of any part of the structure will be asked only in case of reasonable doubts. Cost of testing will have to be borne by the contractor.</p>
64.	<p>Preliminary Arrangements</p>
	<p>The contractor shall have to make at his own cost all preliminary arrangements for labour, water, electricity and materials etc. immediately after getting the work order, No claim for any extra payment or application for extension of time on the grounds of any difficulty in connection with the above matter will be entertained.</p> <p>The contractor shall at his own expenses, engage watchmen for guarding the materials and plant and machinery and the work during day and night against any pilferage or damages and also for prohibiting trespassers or damage to them. The contractor shall have to make his own arrangement for water required for any purposes on the work.</p> <p>The contractor after completion of work shall have to 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 him within one month the date of completion of the work, or otherwise the same shall be removed by the Department at his cost and the contractor shall not be entitled for payment of any compensation for the same.</p>
65.	<p><u>Plant:</u></p> <p>All constructional plant, provided by the contractor shall when brought on to the site be deemed to be exclusively intended for the construction of this work and the contractor shall not remove the same or any part thereof (say for the purpose of moving it from the part of the site to another or for repairs etc) without the consent in writing of the Engineer-in-charge which shall not be unreasonably withheld.</p>
66	<p><u>Public Utilities:</u></p> <p>In addition to clause 110 of M.O.S.T. (RW) Specifications for road and Bridge Works (Second Revision) 1988 following should be added para 110.6 Public Utility services like H.T. Line telephone lines, etc. which are visible at site should be taken notice of by the contractor while planning their works. It shall be the</p>

	<p>contractor's responsibility to inspect such services prior to the commencement of any work. While executing the works, the contractors should take care to see that these services are not disturbed or damaged during the execution. The Government will not be held liable or responsible for any delay incompletion of the job under this contract which may occur due to any damage occurred to such services in consequence of the Contractor's operations of delayed completion of the execution for the same.</p>
67	<p><u>Drawings :</u></p> <p>a] Contract Drawings: The contract drawings provided for tendering purpose with the tender documents shall be used as a reference only. Contractor should visualize the nature of type of work contemplated and to ensure that the rates and prices quoted by him in the bill of quantities take due consideration of the complexities of work involved during actual execution / construction as experienced contractors in the field. The tendered rates / prices for the work shall be deemed to include the cost of preparation, supply and delivery of all necessary drawings, prints, tracings and negatives which the contractor is required to provide in accordance with the contract.</p> <p>b] Completion Drawings. The contractor shall submit to the Engineer within 2 (Two) months of actual 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 earlier. For completion drawings 2 (Two) prints and one polyester film of quality approved by the Engineer or his representative shall be supplied.</p>
68	<p>Handing Over of Work: 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 after this position. The handing over by the contractor and taking over by the Executive Engineer or his authorized representative will be always in writing, copies of which will go the Executive Engineer or his authorized representative 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.</p>
69	<p>Relation with Public Authorities.: 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 himself pay fees or charges which are leviable on him without any extra cost to the Department,</p>
70	<p>Documentation. If so ordered by the Engineer-in-charge the contractor will prepare drawings of the work as constructed and will supply original and three copies to the Engineer who will verify and certify these drawings. Final as constructed drawings shall then be prepared by the Contractor and supplied in triplicate to the Engineer for record and reference purposes at the contractor's cost.</p>

71	<p>Water:</p> <p>If the potable water is not available in the river bed the contractor has to make his own arrangement for potable water required for concrete mixing, its curing and other parts of the construction for which no extra claim will be paid by the Department.</p>
72	<p>Repetition of Mix Design :</p> <p>Contractor shall have to submit mix design for all concrete mixes having strength M.20 and above. Every mix design have to be repeated twice every working season first in October and second in February. Also the mix design have to be repeated when the source of materials is changed or whenever directed by Engineer-in-charge</p>
73	<p>Foundation Levels:</p> <p>The foundation levels for all substructures are shown on Drawing enclosed herewith. While execution of work for the excess or saving in foundation quantities, these levels will be considered for comparison. The data with tentative rock level & their location are shown in the following table. During actual execution of work if there is any variation in the location of substructure then the strata will be interpolated from these levels</p>

74	<p>Miscellaneous items :</p> <p>In this work the execution of following items are included.</p> <p>a) Marble tablets of size 3.60 Sqm</p> <p>b) Water spouts or pressure release spouts as required.</p> <p>c) Welded joints as required The above items will have to be executed as per the specification and as directed by Executive Engineer in charge.</p>
75	<p>Wearing Coat: Asphaltic Wearing coat with 50 mm thick BM and 30 mm thick BC. for this work for total length of bridge for full carriageway width is to be executed as per the specification</p>
76	<p>INFORMATION BOARD</p> <p>The contractor shall provide the display board of size 0.90x0.60m, showing following information at the site of work with following specification at his own cost, immediately after issue of work order failure to do so a sum of Rs.1.00 lac will be recovered from the contractor from his 1st R.A.Bill and the board will be erected by the department. Providing & fixing informatory sign board in rectangular shape made out of 16guage (1.6mm) thick M.S. sheet painted with one coat of zink chromate stoning primer & two coat of traffic yellow stone enamel</p>

paint for back ground of Blackstone enamel paint from letters with white ratio reflective sheeting or engineering grade including M.S. angle iron frame of 35 x 35 x 3 mm & mm & two M.S. angle iron of size 65 x 65 x 6 mm 3.65m long properly cross braced with angle iron of 50 x 50 x 5 mm etc & fixing the board in 1:4:8 concrete block of size 60 x 60 x 75 cm including transportation etc. complete.

(77) Field Laboratory : The contractor shall arrange to provide fully furnished and adequately equipped field laboratory with adequate qualified technical staff. Preferably to locate adjacent to the site of Engineer- in – charge and provided amenities like water supply, electric supply etc. The laboratory equipment shall confirm I.S. specifications and MOST specifications.

It shall be considered as incidental to the work, and no extra payment will be made what so ever will not be made for the same.

List of machineries to be provided at site laboratory as per Annexure – VII (Set up of equipments)

After completion of work laboratory equipments will be the property of the contractor. After completion of work, the contractor shall clean all site by dismantling site office / laboratory and by removing all the debris from the site of work.

Annexure – VII (Set up of equipments)

The Contractor shall have to establish a field laboratory with following minimum equipments on the instant work at his own cost. These instruments are conforming to IS Specifications duly calibrated from competent agency. Contractor has to carry out the calibration of said instruments as directed by the Engineer – in- charge on expiry date of calibration. On completion of work in all respect, the equipments will be the sole property of the contractor.

General

1	Balance – 20 Kg. Capacity (self indicating)	1 No.	
2	Electronic balance 5 Kg. Capacity, accuracy 0.5gm.	1 No.	
3	Thermometer:	1 No.	
4	Mercury in glass 0 ⁰ to 250 ⁰		
5	Mercury in Steel with 30 cm.stem upto 300 ⁰ C 2 Nos. (Dial type)	2 Nos.	
6	Kerosene or Gas stove/electric hot plate -1 No.	1 No.	
7	Set of IS sieves 45 cm. Dia. G.I. Frame, 125 mm,100mm, 90mm, 80mm, 63mm, 53mm, 50mm,45mm, 40mm, 37.5mm, 26.5mm, 25mm,22.4mm, 20mm, 19mm, 13.2mm, 11.2mm ,9.50mm, 5.6mm, 4.75mm, 4.25mm,	1 Set of 23 Nos.	

	6.3mm,6mm, with lid and pan (coarse sieve)	sieves.	
8	Set of IS fine sieves 20 cm. dia. brass Frame, 2.8mm, 2.36mm, 1.18mm, 0.60mm, 0.30mm,0.15mm, 0.75mm, 425 micron , 300 micron, 180micron, 150 micron, 90 micron, 75 micron with lid and pan, (fine sieves)	1 Set of 13 Nos. sieves.	
9	Glass ware, spatulas, wire gauges, steel scales, measuring tape, enameled tray, porcelain dish, requirement plastic bags, gunny bags, digging tools etc.	As per requirement	
10	First aid kit	1 No.	
11	Measuring Jar for silt testing 1000 CC	2 No.	
	a) Aggregate & Soil testing		
	i) Aggregate impact value test apparatus.	1 Set	
	ii) Flakiness and elongation test gauge		
	iii) Standard measures of 5, 3 and 1 litre	1 Set	
	vi) Measuring Jars for silt testing	2 Set	
	v) Measuring Cylinders 500 ml and 100 ml.	1 No. each	
	b) Cement Concrete Testing		
	i) Compression testing machine of 200 tone capacity with two dial gauges.	1 No.	
	ii) Vicat's apparatus for testing setting time	1 No.	
	iii) Fineness of cement	1 set	
	vi) Soundness of cement	1 set	
	v) Slump cone apparats	2 Nos.	
	vi) Cube moulds 15cmx 15cmx15cm	12 Nos.	
	vii) Needle vibrator	2 sets	
	viii) Sives as per MORT & H for WBM & Bituminous works	2 sets	
	ix) Bitumen extraction testing machine	1 set	
	x) Density apparatus	1 set	

**GOVERNMENT
OF
MAHARASHTRA**

PUBLIC WORKS DEPARTMENT

**DESIGN CRITERIA FOR TENDERER'S
DESIGN ON LUMP SUM BASIS FOR
CONSTRUCTION OF MAJOR BRIDGE.**

NAME OF WORK: CONSTRUCTION OF MAJOR BRIDGE
ON WARDHA RIVER DEOLI DAHEGAON PULGAON TO
AMARAVATI DISTRICT BORDER ROAD SH-322 A, KM 9/ 500
IN PULGAON TALUKA DIST- WARDHA.

DESIGNS CIRCLE, NAVI MUMBAI.

DESIGN CRITERIA IS GENERIC IN NATURE.
APPLICABLE CLAUSES SHALL BE CONSIDERED

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1. General Requirements

In order that the tenderer's proposal qualifies for acceptance, it shall generally fulfill the following requirements:

- 1.1 It shall ensure speedy construction but with due importance to curing and durable strength of structure and lead to appreciable economy.
- 1.2 It shall be accompanied by preliminary but fairly detailed drawings and detailed description of work and specifications of materials and items. The detailed design assumptions and method statement shall also be given. If called upon, Bidder shall furnish any additional information necessary for appreciation and comparison with other alternative proposals received from other Bidders.
- 1.3 At the time of detailed design, normally the contractor shall not deviate from the basic scheme proposed by him for the purpose of tender.
- 1.4 The structure shall generally be symmetrical.
- 1.5 The elements of the bridge structure shall be cast monolithically. Cold joints shall be avoided unless approved by Engineer-in-Charge.
- 1.6 Due importance shall be given to aesthetics of piers and superstructure. The shape of structure should give pleasing appearance and architectural beauty as a whole in harmony with the surroundings.
- 1.7 Splicing of reinforcement shall be formed by laps, and mechanical devices/ couplers, wherever laps are required to be provided. The splices shall be suitably designed and conform to relevant clauses of IRC:112. It shall not be located at the point of maximum moment/ stresses and shall be symmetrical.
- 1.8 Laps shall be staggered and symmetrical and shall not be in the areas of high stresses.
- 1.9 Use 43 grade cement conforming to IS: 8112 and 53 grade cement conforming to IS: 12269, utmost care shall be taken to minimize the effects of heat of hydration.
- 1.10 The chemical admixtures conforming to IS 9103 may be used to improve the properties of fresh concrete such as workability.
- 1.11 The mineral admixtures conforming to relevant codal provisions may be used in concrete to improve its performance.
- 1.12 The procedure to be adopted for placing RMC conforming to IS 4926 shall be well defined so that the compaction of concrete is achieved. This shall be got approved from Engineer-in-Charge (Executive Engineer) in advance. The provisions mentioned in section 18 of IRC 112:2011 to be referred.
- 1.13 Type of aggregate viz. quartzite/granite/Limestone/sandstone /basalt need to be specified by contractor/bidder.
- 1.14 The minimum diameter of reinforcement for any structural member shall not be less than 10 mm. However, minimum diameter of main reinforcement in R.C.C. abutments and piers shall be 16 mm and spacing shall be limited to 200 mm. In deck slab with girders or box, maximum spacing of main steel shall not be more than 150 mm and secondary reinforcement (distribution) shall not be more than 200 mm.
- 1.15 Minimum diameter of surface reinforcement for PCC abutments and piers shall be 10 mm. The surface reinforcement of 10 mm diameter @ 200mm c/c shall be provided to PCC structural element. The minimum grade of concrete for PCC element may be lowered by 5 MPA and maximum water/cement ratio exceeded by 0.05. **The PCC abutment structure resting on pile cap shall not be provided.** The PCC elements shall not be provided until it is allowed by Superintending Engineer (BR), Design Circle, Konkan Bhavan, Navi Mumbai.
- 1.16 Sudden changes in geometry of structure shall generally be avoided as such points are susceptible to stress concentration. However, if such sudden changes in geometry

become unavoidable, rigorous analysis shall be provided such as push over, non-linear analysis as applicable shall be carried out. Decision of Superintending Engineer, Design's Circle, Konkan Bhavan, Navi Mumbai shall be final and binding in this regard.

- 1.17 The dimensional detailing as well as reinforcement of the structural components shall be given utmost importance from the point of constructability and durability and ductility.
- 1.18 Simple structure shall be adopted so that the maintenance of structure will be easy in future.
- 1.19 After completion of bridge, contractor should handover AS BUILD DRAWINGS including GAD AND BEARING LAYOUT to Executive Engineer in-charge for record purpose & safe custody. For replacement of bearings, the jack positions shall be marked on the structure with permanent marker/provision.
- 1.20 The provision of **stone steps** behind the abutment shall be provided for Inspection and easy access.
- 1.21 From the Aesthetic and Seismic point of view, it is preferable to provide all the piers having similar shape.
- 1.22 The concrete properties considered in the design are as per the IRC:112. The tabulated values of E_{cm} are given for quartzite/granite aggregates. For other aggregates, they should be multiplied by following factors

For limestone = 0.9,

For sandstone =0.7,

For basalt =1.0.

If any other type of aggregates is adopted then this reduction factor shall be obtained from Designs Circle.

The grade of concrete shall not be higher than M-50 N/mm². For higher grade of concrete above M50, Ultra-High Performance Fiber Reinforced Concrete (UHPFRC) shall be used. As per IRC:SP:114, minimum grade of concrete for RCC member shall not be less M-30 irrespective of exposure condition and length of bridge.

- 1.23 The concrete properties mentioned above are conservative and can be used without applying any further allowance for variability.
- 1.24 Reinforcement shall be TMT/ Fe 500D(IRC:112-2011).
- 1.25 The strand type considered is stress relieved strand low relaxation as per IRC:112-2011 clause 18.
- 1.26 Structural steel to be used is Grade Designation E 350, Quality C in accordance with IS:2062-2011.

2 Restrictions on Types of Structures

The following types of structural arrangements shall not be permitted:

- 2.1 Structures sensitive to unequal settlement of foundations, indeterminate structures like continuous beams, portal frames, etc. on yielding type of foundations.
- 2.2 Abutments resting on approach embankments, Spill through type of abutment & Flyback Returns.
- 2.3 Superstructures with joints at the tip of the long cantilevers with hinges, gap slab and short suspended spans

- 2.4 Superstructure with which the roadway cannot be easily widened such as bowstring girders, through truss etc. However, these may be acceptable in cases of aesthetics with prior permission of competent authority.
- 2.5 R.C.C. girder superstructures with spans more than **20 m** c/c of piers.
- 2.6 Piers in form of multiple columns not connected with continuous diaphragms.
- 2.7 Annular piles filled or empty.
- 2.8 Abutments/Piers resting on single row of piles.
- 2.9 PSC Box girders continuous over supports
- 2.10 Two girder system for superstructure.
- 2.11 Open Box Type Steel superstructure with RCC Deck Slab.
- 2.12 Raft Foundation.
- 2.13 PCC Substructure on RCC Foundation.
- 2.14 **Circular Type Pier.**
- 2.15 **Hollow type pier.**

If there is any variation in above conditions, then prior permission of Chief Engineer of that Region and Decision of Superintending Engineer, Design's Circle, Konkan Bhavan, Navi Mumbai shall be required.

3 Specifications for design and codes to be followed

The design of structural components shall conform to the criteria laid down in the latest editions of the following Codes of Practice and Standard Specifications published up to the last date of receipt of tender form.

3.1 Some Standard Specifications and Codes of Practice for Road Bridges:

IRC: 5 - 2015	Standard Specifications and Code of Practice for Road Bridges, Section I – General Features of Design (Latest Revision)
IRC: 6 - 2017	Standard Specifications and Code of Practice for Road Bridges, Section-II Loads and Load Combinations (Seventh Revision)
IRC: 112 – 2011 (Reprint 2016)	Code of Practice for Concrete Road Bridges
IRC SP: 105 - 2015	Explanatory Handbook to IRC:112-2011: Code Practice for Concrete Roads Bridges
IRC: 22 - 2015	Standard Specifications and Code of Practice for Road Bridges, Section VI – Composite Construction (Limit States Design) (Third Revision)
IRC :24 - 2010	Standard Specifications and Code of Practice for Road Bridges, Steel Road Bridges (Limit State Method) Third Revision)
IRC: 78 - 2014	Standard Specifications and Code of Practice for Road Bridges, Section VII- Foundations and Substructures (Revised Edition)
IRC:83-2015 (Part-I)	Standard Specifications and Code of Practice for Road Bridges, Section IX Bearings, Part I: Roller & Rocker Bearings (Second Revision)
IRC:83-2015 (Part II)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings (Elastomeric Bearings), Part II

	(First Revision)
IRC:83-2002 (Part III)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings, Part III: POT, POT-CUM-PTFE, PIN and Metallic Guide Bearings)
IRC:83-2014 (Part IV)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings (Spherical and Cylindrical)
IRC: 38 - 1988	Guidelines for Design of Horizontal Curves for Highways and Design Tables. (First Revision September-1989)
IRC: 87 – 2011	Guidelines for Formwork, Falsework and Temporary Structures (First Revision)
IRC SP: 13 – 2004	Guidelines for the Design of small Bridges and Culverts. (First Revision June-2004)
IRC SP: 16 – 2004	Guidelines for Surface evenness of Highway pavement (First Revision)
IRC SP: 23 – 1983	Vertical Curves for Highways (Reprint Septeber-1989)
IRC SP: 37 - 1991	Guidelines for Evaluation of Load Carrying Capacity of Bridges. (Year- 1991)
IRC SP: 51 - 2015	Guidelines for Load Testing of Bridges (First Revision)
IRC: SP: 64 - 2016	Guidelines for the Analysis and Design of cast-in-place Voided slab superstructure (First Revision)
IRC: SP: 65 - 2005	Guidelines for Design and Construction of Segmental bridges
IRC: SP: 66 - 2016	Guidelines for Design of Continuous Bridges (First Revision)
IRC: SP: 67 - 2005	Guidelines for Use of External and Unbounded Prestressing Tendons in Bridge Structures
IRC: SP: 70 - 2016	Guidelines for the Use of High-Performance Concrete (Including Self Compacting Concrete in Bridges) (First Revision)
IRC: SP: 71 - 2006	Guidelines for Design and Construction of Precast Pretensioned Girder for Bridges
IRC: SP: 84 - 2014	Manual for Specification & Standard for Four Lanning of Highways through Public Private Partnership (First Revision)
IRC:SP:114 - 2018	Guidelines for Seismic Design of Road Bridges
IS – 2911 – 2010	Code of practice for Design & Construction of Pile foundations.
IS – 13920 -2015	Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces- Code of practice.

- 3.2 Any I.R.C./SP Standard Specifications and Codes of Practice or Criteria for Road Bridges other than "A" above but published one month prior to last date of issue of tender form.
- 3.3 For any item not covered by A, and B above, Specifications for Road and Bridge Works published by I.R.C. for Ministry of Road Transport & Highways.
- 3.4 For items not covered by any of A, B and C above, Standards and Specifications Provisions of I. S. Codes of Practice.
- 3.5 For Precast Segmental Construction B.S.:5400.
- 3.6 For Pretension Construction B.S.:5400.
- 3.7 For any item not covered by any of the above Codes and Specifications, the relevant Provisions from B.S./A.A.S.H.T.O. (L.R.F.D.)/CE-FIB Model Codes 1990.

- 3.8 For items not covered by any of the above Standards and Specifications, Sound Engineering Practice and Provisions of relevant Codes of other Nations shall be referred.
- 3.9 For any items for which if any dispute arises related to the consideration of the various design parameter, applicability of codes, applicability and choice of good sound engineering practice etc., the matter shall be referred to the Superintending Engineer, Design Circle (Bridges) and in this regard, the decision of the Superintending Engineer, Design Circle (Bridges) shall be final and binding to all the parties.

4 Hydraulic Data and Roadway particulars–

(RTL (Road Top Level) of the bridge, Soffit RL and roadway particulars w.r.t hydraulics)

- 4.1 **Alignment and Location** - Alignment and location of the bridge shall be as shown in the Departmental drawing.
- 4.2 For bridges crossing water bodies like river, canal, creek etc.
- 4.2.1 **Soffit RL shall not be lower than that shown on the Departmental Drawing for all spans.**
- 4.2.2 The Road Top Level (RTL) of the Bridge at abutments shall as far as possible be the same as that shown in the Departmental Drawing. However, if the RTL at the abutment is kept higher/lower, due weightage will be given to the financial implications due to the cost of approaches due to such higher/lower RTL while deciding the acceptance of the alternative proposal.
- 4.2.3 Roadway Particulars and Carriageway Width shall be as per relevant Departmental Drawing and obligatory provision of **Annexure-1**.
- 4.2.4 **Unobstructed Linear waterway** with opening of box cells at HFL and area of waterway between bed level and HFL **should in no case be less than that provided in the Department's Proposal**. If there is any change in cross section level at proposed site location, then same shall be brought in notice to field office and Designs Circle.
- 4.2.5 Longitudinal gradient shall not be steeper than that shown in the Departmental Drawings i.e., 1 in 40.
- 4.2.6 The vertical geometry of the finished surface of deck slab and wearing course shall be in the form of a smooth curve. The design of curves (vertical / horizontal) shall be got approved from the Department. The design speed on curve shall be as stipulated in Annexure-1 of Design criteria. Super elevation, camber & widening on curves shall be suitably provided.
- 4.2.7 **Bridge shall be designed for velocity given in departmental GAD or escape velocity of water from barrage whichever produce worst effect on structure.**

5 Design Loads-

5.1 Live loads-

- 5.1.1 The Bridge shall be designed for Loading as per Table no. 6 of IRC: 6-2017. While checking for Transient Design situation condition live load of IRC Class – A one lane per one lanes without impact shall be taken into account as a temporary superimposed load. The pier height or substructure shall be constructed upto safe height if superstructure would not be constructed before monsoon season. In future, for repairs, rehabilitation and retrofitting the

project, specific load combination shall be provided at the time of execution to the competent authority. The bridge shall also be designed for one span off and no span condition in addition to seismic and wind as per IRC-6-2017. If any relaxation is expected as per site and construction period, then final decision shall obtain from SEDC(BR). The Bridge shall also be designed for Loads due to service lines as specified in **Annexure-1** of Design Criteria.

- 5.1.2 The design of components directly under moving loads shall also be checked for the effect of 40 T bogie load i.e. 20T axle load as per IRC.
- 5.1.3 **The bridge shall be designed for the IRC class special class vehicle (SV) loading as proposed under clause 201 of IRC:6-2016. The special vehicle (SV) IRC class SV loading special multi axle hydraulic trailer vehicle (Prime Mover with 20 Axle Trailer-GVW=385 Tonnes) shall be considered. The directions of competent field authority are final and binding in this regard.** Although it is not mentioned in departmental GAD, the effect of SV loading should be check on the design of the structure and its safety should be ensured.
- 5.1.4 The effect of crowding of Vehicle (i.e. placed nose to tail) shall be considered in specific areas like Urban & Industrial Traffic Zone, etc. IRC-18R load (4 wheelers & 6 wheelers) be considered for working out the effect due to this clause. See **Annexure 2** for details. This shall however be without impact.
- 5.1.5 Congestion factor shall be considered as per IRC-6-2017 with impact without any reduction as per codal provision in longitudinal moment.
- 5.1.6 The bridge shall also be designed for IRC vehicle loading as above (and not for 500 kg/sqm loadings) with assumption that the footpath provided, if any, will be removed in future and carriageway widened upto outer kerbs or railings and shall be designed for corresponding vehicular loading.
- 5.1.7 Inspection Gallery shall be designed for live load of 100 kg/sqm of plan area, if it is to be provided as specified in **Annexure-1** of Design Criteria. The decision of SEDC(BR) and Field authority in this regard is final and binding. Alternative suitable provisions for inspection of bridge shall be considered by bidder while planning of general arrangement of drawing.
- 5.1.8 The bridge with precast girder system, shall also be designed for construction load of 360 kg/m² during construction.

5.2 Wind Forces

- 5.2.1 Wind forces shall be considered as per IRC 6:2017. As per IRC:6-2017 clause 209, the basic maximum wind speed may be 44 m/s. Wind forces shall be considered as per IRC 6:2017. If design basic wind speed is greater than 36 m/sec, then bridge shall be designed for basic wind speed of 36 m/s with carrying live load.

5.3 Temperature Forces

- 5.3.1 For calculation of effect of Thermal Forces 'E' value of concrete shall be taken as 50 % of the instantaneous value to account for the effects of creep on thermal strains. Provisions of IRC -6/2017, clause no 215 and IRC: SP:115 shall be followed.

5.4 Earth Pressure

- 5.4.1 In absence of actual properties of the back fill, the abutments, returns shall be designed for a backfill with dry density of soil 1.8 t/cum, saturated density 2.00 t/cum and $\phi = 30$ degrees, $C = 0$. and $\beta=20$ degree. The actual properties of earth fill shall be investigated by the consultant of contractor.

5.5 Seismic Forces

- 5.5.1 While calculating seismic forces flood level considered shall be OFL. (As given in **Annexure-1**). The components of bridges for seismic shall be designed as per IRC:6:2017 and IRC:SP:114:2018. To improve the performance of bridges during earthquake, the bridge in seismic zone III/IV/V shall be specifically detailed for ductility. In general, prevalent ductile detailing shall be provided in plastic zone/region of structural member irrespective of codal requirement. Dynamic increment of earth pressure shall be considered in seismic zone III also irrespective of codal provision.

The response reduction factor for PCC element may be taken as 2.5 for checking of base pressure under open foundation only. PCC elements shall not be provided.

- 5.5.2 The weight of soil likely to be resting on top of the foundation shall be taken into account while computing the seismic forces.
- 5.5.3 On a single pier cap, all fixed bearings shall not be provided as concentration of lumped mass of superstructure is not recommended.
- 5.5.4 Seismic arrestors shall be designed for 2 times the seismic force in seismic zone III, IV and V
- 5.5.5 If seismic device like shock transmission unit is adopted to mitigate the effect of seismic then same shall be approved and adopted in bearings and substructure design as per the manufacturer's specification. The detailed methodology to be obtain from well-known manufacturer.

5.6 Fatigue Load

- 5.6.1 The fatigue check shall be carried out under frequent combination of Serviceability Limit State with load factors for fatigue load, taken as 1.0 for design for fatigue limit state (latest amendments).

5.6.2 All Other forces which are experienced by the structure during its construction and service condition shall be accounted in the design of bridges

5.7 Current forces

- 5.7.1 The bridge shall be designed for all the flood levels shown in the **Annexure-I** of the design criteria.
- 5.7.2 Skew current as specified in cl. 210.5 of IRC 6-2017 shall be considered not only in "span on condition", but also in "one span off condition" and "No span condition".

6 Load Combinations –

- 6.1 Load combinations given in IRC:78:2014 shall be used for checking of base pressure under foundation only and for deriving of safety factors against overturning and sliding. Table 3.4 of IRC:6 shall be used when relevant material safety factor and resistance factor introduced in IRC:78. All other combinations shall be as per IRC:6:2017 with reference to IRC 112:2011 also.

- 6.2 The partial safety factor for verification of serviceability limit state in rare combination for PSC superstructure may be taken as 0.75 for special purpose vehicle. In PSC superstructure no tension allowed even in rare combination.
- 6.3 The normal loading with earthquake and with partial safety factor of 1.0 may be considered as additional check of serviceability of stresses for substructure and foundation. The stresses shall be within limit as per clause no. 12.2.1(1).

7 Foundation

7.1 Piers/Abutments

- 7.1.1 **The contractor shall take bores by double tube boring and at least 2 no of bores in bed preferably by triple tube machine** at the final location of each pier and abutment prior to the commencement of the work to ascertain the type of strata and rock levels and quality at the location of the foundations. The contractor shall work out SBC at proposed founding level and got approved from Engineer-in-Charge i.e. Executive Engineer. The cost of these tests and interpretation of the test results shall be included in the tendered amount. No payment will be made separately for boring and testing of soil or rock. The confirmatory foundation level and SBC shall be reported to Design Circle through Executive Engineer immediately. Contractor shall submit the geotechnical report with bore details in standard format of IRC: 78 duly certified by Executive Engineer shall be submitted to design Circle.
- 7.1.2 During execution of the work, the samples from the bore holes taken at each foundation for piers and abutments shall be tested and analyzed in the laboratory approved by the department, for establishing the design parameters. Tests such as “standard penetration tests” etc. shall be carried out by the contractor and these tests shall conform to the department’s specifications. The contractor shall submit the entire data to the department along with his own /laboratory recommendations and obtain approval to the design parameters from Engineer-in-charge. Necessary interpretations of the results of tests shall be furnished to the Design Circle through Engineer-in-charge for scrutiny of design of foundation.
- 7.1.3 The cost of these tests and interpretation of the tests results shall be included in the tendered amount. No payments will be made by the department separately for testing of soil, rock etc.
- 7.1.4 While checking the stresses at the base of the foundations it shall be ensured that under the worst combinations of the forces there is no tension expect where it is founded on rock. The SBC at the foundation shall be verified during construction to ensure that the stresses imposed on the foundation strata are within permissible limit. However, if some additional bores are required by the department, such requirement shall be specified in writing and shall be deemed to be an additional work. The contractor in his offer shall quote the rate for such bores, soil sampling and testing, separately along with the tender. The taking out of the samples and carrying out the required tests shall conform to the departmental specifications. The contractor shall then submit the entire data to the department along with his own/laboratory recommendations and obtain approval to the design parameters from the Engineer-in-charge. In such cases, if required, the department may take the opinion of geotechnical expert/appointed agency at own costs.

7.1.5

(A) When type of foundation adopted by the bidder is same as shown on the departmental drawing, then:

For bidding and for the purpose of tender drawing, general foundation levels proposed for the piers & abutments shall not be higher than those proposed in the Departmental Drawings. Where pier positions differ from the Departmental Drawings, the foundation levels shall be interpolated for the purpose of this clause.

(B) When type of foundation adopted by the bidder differs than that shown on the departmental drawing, then:

For bidding and for the purpose of tender drawing, general foundation levels proposed for the piers and abutments shall be fixed with reference to the rock line(s) shown on the departmental drawing and with due considerations to the embedment of foundation into the rock as specified in the Designs Criteria and/or IRC code. The rock levels shall be interpolated for the purpose of this clause.

The Founding Levels thus worked out are to be considered as a benchmark in deciding the +/- variations and shall be as per Data and Design criteria for structures.

- 7.1.6 The temporary works such as cofferdams, sand islands, temporary bridges and centering etc. shall be completely removed immediately after completion of the relevant part of the work. The cofferdam shall be removed up to bed level and the space between pier and cofferdam shall be filled with rubble. Top 0.30m portion shall be filled with M-15 cement concrete.
- 7.1.7 In case, any independent arrangement is made to retain earth to reduce the effect of the earth pressure on the abutment, effect of surcharge if any, shall be suitably considered in the design.
- 7.1.8 While deciding the depth of foundation as per IRC-78 the minimum embedment of open foundation shall be maximum of the following
- ✓ 0.6 m. in hard rock
 - ✓ 1.5 m. in soft rock.
 - ✓ Depth of footing. (For exposed hard/soft rock)-
- 7.1.9 At the time of execution, after taking confirmatory bores, if the Contractor reports any change in foundation design parameters, then it will be the responsibility of the contractor to modify the designs accordingly as per the design requirements and to execute it at no extra cost.
- 7.1.10 Considering durability of the structure, all the measures shall be taken. In addition to this NDT like rebound hammer testing at appropriate location is to be carried out to assess the compressive strength of concrete.
- 7.1.11 Bridge foundation system shall be designed, as far as practicable, to remain elastic under design seismic action. Capacity Check as per IRC:SP:114 shall be considered.
- 7.1.12 The confinement or transverse reinforcement spacing shall not be more than 150 mm in circular pile/pier sections.
- 7.1.13 100% Buoyancy should be considered for all type of strata.

- 7.1.14 The depth of footing shall not be less than 50 times the bar diameter+cover+64 mm. The rectangular Pad footing shall be preferred and trapezoidal footings are not permitted. All around the side face of reinforcement spacing not more than 200 mm shall be provided.
- 7.1.15 The minimum depth of rectangular footing block for cantilever and counterfort retaining wall shall not be less than 500 mm.
- 7.1.16 The top face reinforcement shall be provided with half of minimum percentage of reinforcement in each direction in view there is loss of ground contact and reversal of stresses may occur upto some extent.
- 7.1.17 The open foundation shall be designed for maximum redistributed base pressure in each direction. The footing depth shall be sufficient for shear force. Shear reinforcement shall not be preferred in view of placing of reinforcement simple.
- 7.1.18 Annular filling around pier/abutment formed due to excavation shall be filled upto rock level by M-15 concrete. The rubble/soiling filling upto ground level to avoid the eddies of water in excavated trenches.
- 7.1.19 The concreting shall be done in dry condition only. If in case of certain part of the work it is practically impossible to do concreting in dry condition, tremie method shall be adopted under specific orders of Engineer-in-charge with due precaution.
- 7.1.20 Cellular footings are not permitted. Footings shall only be of solid type and fully resting on foundation strata.
- 7.1.21 The stability of any foundation in terms of factor of safety against overturning, sliding and base pressure load combination shall be considered as per IRC:78:2014.

7.2 Piers/Abutments (Ramps/ Returns/Retaining Wall)

The lengths of returns/wings of Bridge shall not be less than those worked out as follows:

- 7.2.1 If Road Level and Ground Level are same as shown in Department's Drawing, the length of return shall not be less than that shown in Department's Drawing.
- 7.2.2 If Road Level and Ground Level are different than those shown in Department's Drawing.

(A) In case of shallow foundation -The length of return shall be 1.0 m more than that needed to satisfy the requirement of 1.5:1 spilling of earth slope for returns (2:1 for wings) from the point where lowest Ground level in the end span meets the front face of abutment.

(B) In case of deep foundation

Case 1: *If Ground Level is lower than LWL/LTL.*

The length of Return shall be decided based upon the ground level. The foundation of independent return shall be rested at least 2m below ground level.

Case 2: *If Ground Level is Higher than LWL/LTL.*

The length of Return shall be decided based upon the bottom of well cap or pile cap.

- 7.2.3 The foundation of the independent returns shall be rested at least 2 m below the Ground Level subject to the provision that the SBC at that level is adequate for the proposed design. However, where rock is met at, or very close to ground surface the return must be rested at least 0.15 m into that rock.

In case of deep foundation, the foundation level of returns maybe suitably located as per site condition. It may be taken 0.15 m below the pile/well cap. The construction feasibility and safety against shear failure and settlement shall be the consideration.

The soil improvement by geo synthetic material or by any other conventional method to avoid the settlement of the structure. The cost of such improvement shall be borne by department as per site condition and decision of competent field authority is final and binding.

- 7.2.4 The thickness of main wall and tie wall shall not be less than 300 and 225 mm respectively.

7.3 Pile Foundations

- 7.3.1 Minimum embedment into rock and SBC of the strata shall be considered as per Table-1 of IS:14593-1998 for preliminary design for guidance. Same shall be verified by the detail procedure given in IRC:78-2014.

Rock Type	l_s
(1)	(2)
Sound relatively homogeneous rock including granite, gneiss	1 to 2D
Moderately weathered, closely jointed including schist, slate	2 to 3D
Soft rocks, sedimentary rocks including hard shale, sandstones, siltstone, mudstone	3 to 4D

NOTE — D is the diameter of pile.

The tension in pile is not permitted. The Socketing depth of pile in rock shall be checked as per codal provision of IRC: 78. The recommendation for depth of virtual fixity of pile and Socketing depth shall be taken from geotechnical expert based on properties of constitute material and standardized calculations and no extra payment is made from department for this.

- 7.3.2 **Only end bearing bored cast in situ piles, drilled with Conventional Method/rotary will be accepted.**
- 7.3.3 The lateral and vertical load carrying capacity of pile shall be confirmed by test pile load test as per IS-2911 (Part IV).
- 7.3.4 The piles provided as in Table (1), the minimum length of socket 2D shall be considered to avoid hinged at base at the anchorage in rock.

- 7.3.5 For achieving fixed condition, the pile shall be anchored adequately into rock for theoretically required depth but not less than that specified in Table 1 of IS:14593-1998.
- 7.3.6 For working out the capacity of pile, fixed or hinged at base, for both working and ultimate conditions shall be as per IRC:78-2014.
- 7.3.7 The bottom of pile cap for Abutment shall be taken below scour level. Suitable protection around the abutment pile cap in the form of Rubble Garlanding with toe shall be provided to protect soil below abutment pile cap.
- 7.3.8 The top of pile cap supporting abutment shall not be at higher level than the same shown in the departmental GAD, unless and until specifically permitted by the Superintending Engineer, Designs Circle (Bridge). Due considerations as regards to scour level, bed protection, fill retained etc. shall be given while deciding the top of pile cap of abutment. If the departmental GAD shows Abutment with foundation other than pile foundation, the decision of the Superintending Engineer, Designs Circle (Bridge) will be final and binding as regards to the level of top of pile cap for abutment.
- 7.3.9 The assumption of design capacity, both vertical and lateral is not allowed. Contractor shall carry out sacrificial pile load test before submission of detailed designs of piles. This load testing of test piles is to be done in non-working areas, in the vicinity of the bridge site. These tests and the routine tests shall be as per IRC:78-2014/ IS:2911-part IV.2013
- 7.3.10 The minimum dia. of piles shall be 1200 mm for river bridge and for retaining structure minimum dia shall be 750 mm with liner for returns.
- 7.3.11 The minimum diameter of the pile shall be as per the clause no. 709.1.7 of the IRC: 78-2014. Latest amendments and provision shall apply.
- 7.3.12 The minimum numbers of piles shall not be less than four below each pier.
- 7.3.13 The piles shall be design for allowable/Tolerances of tilt and shift as verticality of pile cannot be maintained.
- 7.3.14 The group of piles under each pier shall be designed for stability with tension maximum upto 20% of base area of the group for all conditions. This tension, if occurs, shall be nullified by adequate socketing.
- 7.3.15 Concreting shall be done by tremie method after ensuring proper tip Cone cleaning by tremie only.
- 7.3.16 If pile foundations are proposed, it will be obligatory to contractor to provide minimum 6mm thick permanent liner length upto 10m, 8 mm for length \geq 10m & <20m and 10 mm for length >20m to all the piles from the pile top to the top of rock/refusal level.
- 7.3.17 The maximum center to center spacing of piles shall not be more than 4 times of pile diameter and minimum shall not be less than 2.5 times the diameter of piles.
- 7.3.18 Non-Destructive integrity testing directed by the Engineer-in-charge for all piles shall be carried out by the contractor with no cost to the department.
- 7.3.19 Cost of the above tests along with the load tests shall be borne by the contractor and no extra payment will be made to the contractor.

- 7.3.20 The crack width in pile shall not be greater than 0.2 mm.
- 7.3.21 Passive pressure should be neglected while designing piles.
- 7.3.22 Min. 12 mm size bars shall be used in pile cap and footing as r/f.

7.4 Raft Foundations

- 7.4.1 The raft shall be designed with detached cutoff wall. The construction shall be as per design.
- 7.4.2 The raft foundation shall rest fully on flexible bed.
- 7.4.3 Minimum thickness of raft and ~~de-attached~~ cut off shall be 600 mm for severe environment and 500 mm for moderate environment.
- 7.4.4 Raft and cut off shall be cast in dry condition.
- 7.4.5 100mm thick layer of bed concrete and soling shall be provided below cutoffs walls.
- 7.4.6 Top of the raft shall be 70 cm below the lowest bed level or that specified in N.I.T.
- 7.4.7 Pressure relief pipes shall be provided in the raft at one number per 10 sq. meters with 100 mm diameter A.C./PVC pipes. Pressure relief pipes shall be taken through M-15 bed concrete and raft with properly designed filter below the pipe.
- 7.4.8 In case of P.C.C. piers, the anchor bars in minimum two rows shall be provided at pier location to achieve perfect bond between the raft and the pier. In case of abutment the anchor bars shall be uniformly provided over the area of contact between abutment and raft. The anchor bars shall be of minimum 25mm diameter H.Y.S.D. bars at 2 No. per sq. m. of the contact area.
- 7.4.9 Sand / Gravel shall be filled for a depth of 900 mm below raft. Any local rigid obstacles / intrusion shall be removed such that the flexibility of founding strata is ensured.
- 7.4.10 U/s and D/s aprons are important features of raft foundations. The same shall be designed as per IRC: 89. The minimum weight of stone to be used for apron shall be 40kg
- 7.4.11 Top of the apron shall be same as the top of raft. Toe wall shall be provided at the end of the aprons. The toe wall shall be embedded sufficiently.
- 7.4.12 The Value of Sub-grade reaction unless determined by actual test for design of raft foundation shall be as under:

Sr. No.	Type of Strata	Value of Sub-grade Reaction(k)
(1)	B.C. Soil	1600 T/sqm
(2)	Sand with clay/silt	2800 T/sqm
(3)	For dense sand	5600 T/sqm

7.5 Well Foundations

- 7.5.1 For well foundation IRC: 78-2014 with latest amendments and provision shall apply.
- 7.5.2 The well shall be keyed into the Rock by minimum 150mm.
- 7.5.3 The well cap should not have cantilevering from steining support. If unavoidable splayed support shall be provided.
- 7.5.4 The steining thickness of well shall not be less than 500mm and satisfy the cl.708.2.3 of IRC78/2014

- 7.5.5 M. S. cutting edge shall not be less than 40 kg/m to facilitate sinking through all types of strata. In case of well curb shall not be leaner than RCC M-30.
- 7.5.6 A suitable sump shall be provided below the level of cutting edge. Before concreting the bottom plug, it shall be ensured that its inside faces have been cleaned thoroughly. For detail about sump refer IRC 78.
- 7.5.7 6 No., 25 dia. dowel bars shall be provided with embedment in bottom plug by 1.50m, in rock and hole shall be grouted with rich cement mortar.
- 7.5.8 If foundation is expected to rest on soft rock and/or lateral forces are predominant then it is suggested to go for well foundation.

8 Substructure (Refer Annexure-II for controlling dimensions)

- 8.1 For continuous spans, pier with fixed bearings shall be designed to take all the horizontal forces. For continuous spans, in seismic case, pier with free bearings shall be designed for longitudinal bearing forces.
- 8.2 The thickness of main wall of counterfort /Box type retaining/abutment wall shall not be less than 600 mm and that of any other element shall not be less than 300mm. The counterforts shall be provided at the bearing locations. Main wall should be concentric with the loads from superstructure.
- 8.3 Dead man anchors or friction slabs shall not be provided behind abutment for relieving moments.
- 8.4 Scope for accessibility for Inspection and arrangement for lifting of the Superstructure for future replacement of Bearings shall be provided in the design of Substructure. The positions of jacks shall be distinctly shown on the drawing and also prominently marked on the structure.
- 8.5 The height of the pedestal shall not be more than 500mm.
- ~~8.6 The minimum thickness of wall for hollow sections for piers shall be 300 mm for pier height up to 10 m. For hollow sections of piers having height more than 10 m, the minimum thickness of wall shall be worked out by following formula,~~

$$T = 0.3 + 0.015 (h - 10)$$

~~Where, "t" & "h" are thickness and height of pier respectively, in m.~~
- 8.7 The substructure shall rest completely on foundation. No cantilever support to substructure shall be permitted except given in codal provisions.
- 8.8 The caps over wells and piles shall have uniform thickness.
- 8.9 R.C.C. Solid wall type piers shall be preferred. The thickness of pier in traffic direction shall not be less than **1200 mm** for R.C.C Girder type superstructure
- 8.10 The piers shall be aligned in line to the piers of the existing bridge.
- 8.11 Abutment need not be checked for scour-all-round condition.
- 8.12 One span dislodged condition shall be considered as erection/Transient Design situation condition for the purpose of design.
- 8.13 Suitably designed seismic arrestors shall be provided as specified in IRC: 6-2017.
- 8.14 Adequately designed RCC pier caps and abutment caps shall be provided over each pier and abutment respectively. The depth of rectangular pier cap shall not be less than 600

mm and tapering shall not be flat for consideration of effective depth as per the earlier provisions of IRC:21.

- 8.15 All bearings shall preferably be supported directly on pier. If the bearings resting on overhang are provided, then the differential deflection of the pier caps shall be accounted for in transverse analysis of superstructure.
- 8.16 It is a good engineering practice to transfer the load from bearing directly to the piers instead of through flexural member like beam type caps. The cantilever length of pier cap shall not be more than 2.0 m. as early distresses in expansion joint and bearings are observed by department.
- 8.17 Adequate arrangement like inspection gallery, pathway etc. as specified in the department's proposal shall be provided. The width of inspection gallery on downstream side shall be provided in such a way that the ladder with sufficient slope from deck slab shall be aligned on it. The protective railing duly approved by Design circle shall be provided. The inspection trolley shall be capable of moving from one end to other end with chain and pulley arrangement. The arrangement of trolley shown on the departmental drawing is indicative only and the contractor may propose and design accordingly alternative arrangements of movable trolley of width 0.60m to inspect the underside of the superstructure form one end to another end of the span.
- 8.18 In the design of cantilever/hammer head pier/abutment cap, the check for shear shall be given at face of support and at inner edge of outer pedestal along with other critical sections. Shear force at section 'd' from the face of support shall not be considered as shear force at face of support for pier/abutment caps, and actual shear force at face of support shall be considered.
- 8.19 At the locations of change in dimension of concrete section of pier/abutment where plastic hinge is likely to form, e.g. junction of pier and pier cap, junction of pier and footing, etc. the spacing of transverse reinforcement shall not be more than 100 mm for a height 600 mm in pier below pier cap and, in pier above footing. The transverse reinforcement provided so, shall be continued into the pier cap/footing for minimum depth of 300 mm.
- 8.20 The height of RE wall used for return and for retaining embankment shall not be more than 6.00m measured above the ground level.
- 8.21 Special aesthetic finishes like grooves etc. shall be given to the structures to the satisfaction of the Engineer-in-charge. Aesthetic finishes shall not form the part of structural requirement of any member.
- 8.22 The width of clear space provided in between the two end diaphragms of adjacent spans over a pier shall be sufficient to erect and dismantle the centering/shuttering required for concreting of deck slab in replacement of expansion joint in future, and shall be not less than 500mm.
- 8.23 Slender and tall pier shall be checked for the deflection under the horizontal forces and the piers, bearing and expansion joint shall be designed accordingly.
- 8.24 The curtailment of reinforcement of substructure/pier shall as per IRC SP:114 with latest amendment.
- 8.25 The slender substructure in longitudinal and transverse direction shall be avoided. Judicious and sound dimensioning of members shall be considered. IRC codal

provisions are taken as only guidelines and experiences of structural behavioral response shall be well addressed.

9 Superstructure (Refer Annexure-II for controlling dimensions)

- 9.1 Deck slab thickness shall not be less than 300 mm and not less than 250 mm at the tip of cantilever in transverse direction irrespective of the provisions elsewhere. The slab shall be checked for punching shear. The cantilever projection of the slab in transverse direction measured from the outer face of web of outer girder/ box girder to the outermost line of superstructure (representing kerb/parapet / crash barrier / railing / foot path etc. in plan) shall not be more than 1.80 m. Thickness of web shall not be less than 300 mm.
- 9.2 In case of voided slab structure, analysis & design shall be based on the provisions of IRC – SP - 64. The minimum thickness of concrete around the void for deck shall be 300 mm.
- 9.3 Minimum thickness of intermediate diaphragm where provided shall be 300mm and that of end diaphragm shall be 500mm for the cast-in-situ work. Opening shall be provided in the diaphragms for access inside the box.
- 9.4 Manholes shall be kept at the spacing of not more than 150 with arrangement for access inside the box.
- 9.5 In the absence of rigorous analysis for torsion and distortional moments and the forces due to warping at ends, the design live load moments and shear force in the longitudinal direction shall be increased by 20% and in the transverse direction by 5%.
- 9.6 For Pre-stressed Superstructure with box girders, the cross diaphragms shall be provided at each support and at each abrupt change in soffit geometry.
- 9.7 The provision for imparting 20% of design prestress at a future date, shall be made in the deck. Suitable anchorages, bulkheads, deviator blocks etc. shall be constructed for this purpose. Arrangement for external prestressing shall be got approved from Engineer-in-charge. Anchorage system proposed shall be clearly indicated. It is desirable to stress the cables from top of deck slab.
- 9.8 The combination of pre-cast and cast-in-situ construction shall be seriously dealt with, as the phenomena of differential creep & shrinkage and the forces at connection of pre-cast & cast-in-situ part pose lot of post construction problems. Adequacy of reinforcement at joints shall be ensured. Generally, one element (say a girder) shall be either pre-cast or cast-in-situ and not the combination of pre-cast & cast-in-situ.
- 9.9 In case of long bridges gaps in central verge shall be provided for emergency traffic problems. Such portions shall be suitably designed for traffic.
- 9.10 Deflection correction shall be worked out and provided in form of pre-camber to the shuttering supports during construction for RCC superstructure. Pre-camber shall be provided for the sagging effect due to 5 times dead load.
- 9.11 The superstructure shall be designed for 10mm differential lifting at bearing location and this shall be considered as an erection condition.
- 9.12 Proportioning of dimensions of box girder is given in **Figure-1**. The same shall be followed.

- 9.13 Continuity in deck slab is provided for alternate spans,
- 9.14 Special aesthetic finishes like grooves, chamfers etc. shall be given to the sides and soffit of superstructure to the satisfaction of the Engineer. Aesthetic finishes shall not form the part of structural requirement.
- 9.15 The entire box shall be a single unit without any construction joint in longitudinal direction.
- 9.16 75 mm dia holes properly protected from outside shall be provided in webs and soffit at a spacing of 2m c/c for ventilation purpose.
- 9.17 In addition to post tensioning as per IRC codes, precast segmental construction as well as pre-tensioned construction are also permitted as per B.S.:5400
- 9.18 Prestressing cables provided in PSC box girders shall be through type. Short cables anchored inside the box shall be avoided.
- 9.19 Any haunch in superstructure shall not be less than 300x150 mm.
- 9.20 Center to center spacing of girders shall not be more than 2.75 m.
- 9.21 Minimum three intermediate diaphragms shall be provided for girder system span in submersible bridge.
- 9.22 The soffit slab of box cell shall be designed for minimum load of 250 kg/m² loading spread over the entire soffit slab. The main steel shall not be less than 10 mm dia @ 150 mm c/c.

9.23 Prestressed Concrete

- 9.23.1 Minimum grade of concrete for any PSC unit shall not be less than **M-45**. This grade of concrete can be lowered by 5Mpa for Moderate Environmental exposure condition.
- 9.23.2 The permissible stresses in prestressing steel as given in IRC:112-2011 shall be applicable only in such cases where prestressing wires are not looped. The system having such loops in prestressing such as 'LEOBA' system are not acceptable.
- 9.23.3 Use of H.T. wires (7 mm/8 mm) is not permitted in severe exposure. Only strands are acceptable in severe exposure. Trumpet junctions are also not permitted.
- 9.23.4 Checks for ultimate strength shall be carried out as per IRC:112-2011.
- 9.23.5 All prestressed members shall have spare cables laid to the profiles approved by the design circle. The number of spare cables shall be at least 5% of the cables required as per design, subject to a minimum of one cable per girder/web. These cables shall be permitted to be removed fully or partly after the final stage of prestressing if they are not required and holes grouted. In case of saline atmosphere these cable holes shall not be grouted but only ends shall be closed properly.
- 9.23.6 In case of PSC superstructure, the stresses at different points at an interval of 0.05 L, where L = c/c distance of bearings, shall be calculated at various stages of load/ force applications. The effects at 100%, 90% and 110% prestressing force shall be clearly indicated in the design calculations.

9.23.7 Spacing of shear reinforcement from support to $0.25 L$ shall not be more than 150 mm.

9.24 Precast Construction

9.24.1 For ease and speed of construction precast superstructure may be adopted. While designing such elements/structure durability and less maintenance shall be kept in view.

9.24.2 Precast panel sub deck/girders and cast-in-situ slab construction shall be designed as composite construction.

9.24.3 Cross prestressing shall not be allowed. However, the nominal prestress provided to the extent of keeping various girders together will be allowed.

9.24.4 In precast construction, the performance of joints is especially critical for the integrity of a structural system. The geometric configuration of a joint, in addition to the selection of an appropriate interface material contributes to the proper short-term and long-term performance of the structure. The design of joints shall allow for movements due to shrinkage, thermal effects and possible differential settlements.

9.24.5 Proper lifting arrangements shall be made by the contractor for handling the precast unit. The components shall be designed for lifting and erection loads and stresses. Lifting and handling positions should be clearly defined particularly at critical locations. Indelible, identity, location and orientation marks shall be put on members as and when necessary.

10 Submersible Bridges

10.1 Suitably designed stoppers resting on pier cap with neoprene bearing shall be provided for preventing the bridge deck from sliding due to water current.

10.2 In case of ribbed slab, girder slab and box type superstructures, sufficient vent holes shall be provided for the entrapped air to escapes below:

10.2.1 Vent holes @ 1 no. 75 mm dia. per 3 sq.m in deck slab and webs.

10.2.2 Opening in soffit in each cell of box girder at each end of size 0.6m X 0.8m.

10.3 All hydraulic calculations while the floods are at OFL, Designed HFL, RTL, shall be done and stability of entire structure checked for worst condition.

10.4 The box girder shall be designed for additional silt load of 150 mm thickness with density equal to 1.5 t /m³ spread over the entire soffit slab.

10.5 The afflux at RTL as a static load shall be considered for design of all components.

10.6 The buoyancy shall be taken as 100%.

11 Bearings

- 11.1 Following type of Bearings shall be permitted, for the spans mentioned against each type.

1	Tar paper Bearing	For solid slabs simply supported with spans less than or equal to 10 m.
2	Elastomeric Bearing	For spans not exceeding 30 m.
3	POT – PTFE Bearing	For any span.
4	Spherical bearing	For any span.

- 11.2 Cut/segmental roller Bearings shall not be permitted. Use of different metals setting electrolytic actions inducing corrosion shall not be permitted.
- 11.3 The Bearings shall be easily accessible for inspection. Suitable arrangements for access to the bearings for inspection shall be designed and provided. Access platform shall be minimum 1.2 m wide and be provided with protective railing etc.
- 11.4 Scope for lifting the Superstructure for future replacement of bearings shall be provided for in the design and marked on the structure appropriately to avoid any mishandling.
- 11.5 End diaphragms shall be designed for lifting of superstructure by providing jack below it and 18R loading as per Annex A of IRC 6- 2017 shall also be considered in addition to DL and SID during the lifting.
- 11.6 It is preferable to use only Spherical bearings for all types of bridges with span more than 20m and situated in all types of climate/ environmental conditions. POT-PTFE type of the bearings with suitable protective measures to make it watertight, may be permitted in case of submersible bridges.
- 11.7 The installation of bearing on site under the supervision of manufacturer's representative shall be carried out.
- 11.8 The expected design life of bearing shall be taken from manufacturer and accordingly the planned year of replacement of bearing shall be provided to the field officers. Record to that effect shall be recorded by Executive Engineer in charge.

12 Expansion Joints

- 12.1 The expansion joints shall conform to MORTH Specifications as per IRC-SP69:2011. The detailed working drawing for the joint shall be in conformity with overall geometry of deck. Geometrical profile shall be achieved by adjusting the dimensions of Superstructure. The joint shall be jerk free. Differential deflection in bearings shall be considered while designing.
- 12.2 The expansion joints shall be leak proof. The joint shall be provided for the full width of the bridge i.e. including kerbs. Proper detailing of expansion joints at the kerbs shall be done.
- 12.3 Only modular strip seal type of the expansion joints shall be used for the bridges situated in the very severe climate.
- 12.4 It is preferable to provide simply supported span with strip seal type expansion joint to monitor the smooth riding quality. The decision of the Chief Engineer, Public Works

Department and/or Superintending Engineer (Bridge), Design Circle, to reduce the number of expansion joints, shall be final and binding on the bidders.

13 Railing / Parapet

- 13.1 GI Railing shall be provided for High Level submersible Bridges as indicated in the departmental drawing.
- 13.2 Crash barrier/GI Railing for this work shall be as per Annexure (I). Typical sketch of R.C.C. crash barrier is given as per Figure 2.
- 13.3 In case of Submersible Bridges, removable angle GI iron post & G. I. pipe railings are to be provided as indicated in Figure 3.
- 13.4 The crash barrier shall be designed as high containment category as per IRC:6

14 Water spouts

- 14.1 Normally the rainwater shall be disposed from the carriageway top to the nearest natural drain. The entire drainage plan shall be prepared by the contractor and shall be got approved from the Engineer-in-charge.
- 14.2 Waterspouts shall be as indicated in **Figure 4**. The waterspouts shall be provided @ 1 no. / 10 sq. m. plan area of the deck with Minimum spacing of 4.0 m. whichever is governing as per span and of plan area of the deck.
- 14.3 Waterspouts shall be connected to runner pipe of suitable diameter (Minimum 150 mm) on either side of roadway & taken down by down-take pipes of suitable diameter at approved locations. Water should not splash in air from rainwater spout.

15 Wearing Coat

- 15.1 A wearing coat of uniform thickness shall be provided for riding surface. It shall be as specified in **Annexure-1** of design criteria.
- 15.2 There is need to waterproof the deck slab (**E-DSR item**). Over it, RCC or BT wearing courses can be done over it.
- 15.3 It is always better to go integral type for RCC wearing course when spans are less than 15m.
- 15.4 RCC concrete wearing coat in M30, is of depth 75 mm which is to be casted within 24 hours from casting of Deck slab, to ensure proper bond, with 10mm TMT rebar 200mm both ways. **In this case deck slab waterproof is not required. If casting of integral type concrete wearing course is delayed, then waterproofing as per e-DSR item is required.**
- 15.5 In case BT type wearing course, preferably go for 50mm DBM and 30mm AC.

16 Durability Aspects

- 16.1 Durability is the ability of a structure to maintain its reliability over time and do not suffer from aging of materials. The stipulated measure based on construction experience in bridges and as per site condition shall be adopted to ensure the adequate durability of structure. (Section 14 of IRC:112:2011 covers the design for durability).

One of the main characteristics influencing the durability of concrete is its permeability to the ingress of water, oxygen, carbon dioxide, chloride, sulphate and other potentially deleterious substances. Degree of permeability is governed by the constituents, the mix proportion and workmanship used in making concrete. A suitably low permeability can be achieved by having adequate cement content, low water cement ratio and ensuring complete compaction of the concrete followed adequate curing. Use of blended cements will also help to achieve low permeability.

- 16.2 The environmental exposure condition shall be very severe for the concrete exposed to air borne chloride in marine/coastal environment.
- 16.3 Durability Recommendations for service life of at least 100 years for very severe exposure condition/ coastal Zone/ Highly polluted zone shall have minimum grade of concrete M40, maximum water cement ratio 0.40, minimum cement content 380 Kg/cum and minimum cover 50mm. (As per page no141/IRC 112)
- 16.4 The relative humidity for shrinkage and creep effect shall be taken as 70% for Coastal region and 50% for rest of Maharashtra.

17 Quality Control and Workmanship

- 17.1 The suitable/appropriate stipulated conditions shall be adopted based on experience and expert opinion of Quality Control authority. Section 18 of IRC:112:2011 has stipulated some specifications of materials to be used in construction of new concrete bridges and relevant standards to which they should conform. The same shall be referred by contractor under the directions of competent filed authority.
- 17.2 The provisions of IRC:112:2011 with relevant standards as mentioned in Annexure A-3 of IRC:112:2011 shall be adopted for construction durability, Quality and Workmanship.

18 Anticorrosive treatment to concrete and reinforcement

(Applicable in case of marine and severe environment.)

- 18.1 Entire structure shall be given anticorrosive protection, which shall be got tested from approved laboratory and shall be of approved quality, colour and shade.
- 18.2 The protection shall consist of:
 - 18.2.1 **Over mild steel liner to piles:** One coat of Zinc-rich Epoxy primer and two coats of Coal Tar Epoxy. (or advanced chemical like Zuolotic) (Total dry film thickness --50 + 80 + 80 = 210 microns) to outside surface. Aluminum based paints shall be prohibited as they have deleterious influence on the concrete surface.
 - 18.2.2 **Part of Substructure in contact with earth,** one coat of primer and two coats of Coal Tar Epoxy. (or advanced chemical Zuolotic)
 - 18.2.3 **Anti-corrosion treatment for steel:** For TMT bar – Provide bipolar concrete penetrating corrosion inhibiting admixture Polyalk CP 293. During concreting, a dose of 3 kg per cum of concrete (Sunanda chem./Chryso/Sika equivalent) shall be added in mixer. Inhibitor should have the ability to provide corrosion protection to both anodic & cathodic sites on steel surfaces. It should protect from corrosion induced by Chloride ions & Carbonation of

concrete. It should form a unimolecular protective layer on the surface of steel thereby inhibiting corrosion. Concrete Corrosion inhibitor admixture shall be used. Admixture shall be bipolar concrete penetration corrosion inhibiting admixture like Polyalk CP 293(Sunanda chem. / CRYSO/CIKA make or equivalent).

- 18.2.4 Required test report about Inhibitor shall be obtained from manufacturer from accredited laboratory indicating significant reduction in corrosion after accelerated corrosion test based on JIS Z 1535.
- 18.2.5 Reinforcement Steel shall be TMT steel Fe 500D grade.
- 18.2.6 Use of Galvanized reinforcement may be adopted with directions of competent authority.
- 18.2.7 Application of cathodic protection can be adopted for existing structures.
- 18.2.8 **Anti-corrosion treatment for concrete surface:** All parts of concrete Substructure and superstructure exposed to atmosphere shall be applied with high performance anti carbonation protective coating. Application of primer coat at an interval of 24 hrs between each coat shall be ensured. It should form 100% acrylic, waterproof & heat insulating layer on the surface of concrete. It should protect concrete surface against carbonation (Sunanda chem./Chryso/Sika equivalent).
- 18.2.9 **Crash Barrier:** Oil paint in two coats of approved quality and colour with one coat of primer. This coating needs periodic renewal.
- 18.2.10 **Inside of R.C.C/P.S.C Box:** Waterproof white cement-based paint in three coats of approved quality and colour.

19 Load test: As per MoRTH&IRC-SP-51

- 19.1 In case a structure or a component of structures proposed by the Contractor, in the opinion of the Superintending Engineer (Bridges), Designs Circle, is of unusual nature, then the Superintending Engineer (Bridges), Designs Circle shall have the right to call upon the Contractor to carryout model and/or load testing of the structure or component to prove its suitability. The cost of such test shall be borne by the Department if the test results are satisfactory. In case the test results are not satisfactory, the cost of testing shall be entirely borne by the Contractor.
- 19.2 Any defects noticed in the structure, or any damages done to the Bridge at the time of testing which affects or is likely to affect the strength of the Bridge shall be rectified by Contractor at his own cost by remedial measures or replacement as approved by the Engineer-in-Charge.

20 Structural Health Monitoring/Bridge Instrumentation

- 20.1 The bridge instrumentation such as strain gages, pressure meter, tiltmeter and any other advanced instrument shall be installed or provided as instructed by Chief Engineer/Superintending Engineer (Designs Circle) per maintenance requirements of bridge. The decision in this regard is to be taken by competent field officers with discussion with bidder and their appropriate planning of instrumentation. The cost of

instrumentation and maintenance shall be borne by department. The contractor shall assist to department for installation.

- 20.2 The Contractor shall install fixtures and fastenings provided by the department for housing any instrumentation that may be useful for the Department at his cost.

21 Documentation, Instrumentation

The following items are deemed to be included in the tender cost.

- 21.1 Triplicate set of Approved drawings and "As Built" final drawings including all design calculations shall be submitted in digital form and hard copy by the Contractor of work to the Engineer-in-Charge with one copy to the Superintending Engineer (Bridges), Design Circle. Also Tracing films of "As Built" drawings shall be supplied by the Contractor in triplicate. The final bill of contractor shall not be paid till receipt of it by Designs Circle.
- 21.2 Three pen drives, each having audio-visual 180-minute duration covering the different phases of construction of the bridge from start to finish shall be supplied by the Contractor. The Pen Drives containing audio-visual of construction at different stages shall be given to the Design Circle (Bridges). Three sets of still photographs of various activities of work duly captioned and dated in 4" by 6" size shall be submitted by the contractor to the Engineer-in-Charge in digital form and hard copy. One set shall be submitted to Design Circle (Bridges).
- 21.3 A "**Maintenance Manual**" describing Design methodology, brief details of important elements with respect to design & construction aspects, access arrangements, important obligatory precautions from the point of view of structural safety, and procedure for minor and major repairs of each component of the Bridge, renewals of finishes and periodical treatments shall be supplied in ten copies and soft copy in Pen drive by the Contractor. Typical drawings shall be enclosed.
- 21.4 A "**Quality Assurance Manual**" covering designs and drawings, mix-designs, materials, testing, soil and rock properties, statistical quality control, etc. shall be prepared by the Contractor well before starting the work. Construction methodology proposed to be adopted by the contractor shall be elaborated & got approved from Engineer-in-charge in advance. This manual shall be submitted along with submission of GAD approved by Chief Engineer of the region.
- 21.5 A "**Construction Diary /Manual**" covering various aspects of construction methods, difficulties faced and how they are overcome during execution etc. shall be supplied by the contractor at the time of finalization of work.
- 21.6 Wiring and fixing arrangement for internal and external lighting and ventilation shall be got approved from competent authority and executed accordingly. The directions shall be sought from competent field officers in this regard.
- 21.7 The fixing arrangement for suitable fenders to be provided to the navigational piers to reduce the barge impact shall be provided as detailed in Contract Document. The details of fixtures shall be obtained from the Department.

22 Procedure for checking detailed calculations & working drawings

- 22.1 Within one month of the receipt of work order, the Contractor shall submit a program of submission of designs. It shall be submitted to Engineer-in-Charge for submission to Design Circle (Bridges). The program of submission of designs of various components should be consistent with the program of work submitted by the Contractor and approved by the Department.
- 22.2 After issuing of work order, Engineer-in-Charge shall submit the copy of work order, certified bore data and geotechnical report, certified tender document, common set of deviation, approved General Arrangement drawing by the Chief Engineer of the region, letter of Appointing of consultant by the contractor, name and designation of authorized signatories of contractor and consultant, certified foundation level, rock level and SBC to Design Circle (Bridges) to take of design /proof checking the work in hand.
- 22.3 The foundation levels and Safe bearing capacity on site are to be confirmed by the Engineer-in-Charge. While approval of strata for foundations, during actual execution, Engineer-in-Charge in charge should keep records of passing of foundation levels and Safe bearing capacity on site.
- 22.4 To start with this, contractor shall submit the complete general layout of the structures along with the design assumptions and the methodology statement and "Quality Assurance Manual to the Superintending Engineer, Designs Circle (Bridges) to understand and appreciate and get it approved from him, before starting of the actual design. It shall be submitted through Engineer-in-Charge to Design Circle (Bridges).
- 22.5 The Design Consultant appointed by the contractor shall have the official versions of the software being used for design and the same shall be made available for scrutiny of design to the Designs Circle (Bridges) if demanded.
- 22.6 Detailed design calculations and working drawings of all the components of the Bridge shall be submitted well in advance of the execution, in accordance with the design submission program and execution sequence. Two sets of such design calculations and three sets of drawings accompanied by complete information and required data shall be submitted to the Superintending Engineer, Designs Circle (Bridges) for checking the design calculations. Simultaneously the soft copy of design calculations and drawing (only in edible formats) shall also be submitted. The scrutiny will be carried out only after receipt of above data/details. The designs and drawings for various component/ parts shall be submitted progressively according to design submission programme and actual construction progress at site. The dimensional drawing of superstructure and bearing layout shall be got approved from Design Circle (Bridges) before commencement of design of foundation and substructure. All designs and drawings shall be submitted through Engineer-in-Charge to Design Circle (Bridges).
- 22.7 If any in-house or any software-based program is used by consultant for design or analysis, the Contractor shall submit designs with the detailed description of method of analysis and explanatory notes and manually done sample calculations for adequate number of typical cases & soft copy. The Computer Program as submitted will be further tested/ validated by comparison with solutions of worked examples. If the contractor's consultant has used any special software(s) for designing special components of the bridge then the consultant should submit one licensed copy of such software(s) to the Designs Circle (Bridges) to verify the designs.

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In case the Engineering staff of Design Circle (Bridges) handling project is not well acquainted with software used by the consultant, a training programme for them shall be arranged by Consultant /Contractor without any extra cost.

The Contractor should submit along with his tender a note giving his design approach and construction scheme conforming to the basic requirements which shall be approved by the authorities while awarding the work to avoid the possibility of major changes being required in the design at a later date.

- 22.8 Drawings and designs shall be in SI units. Calculations shall be neat and clear and supplemented by full explanatory notes and sketches wherever required. The drawings of initial submissions and final approval shall be preferably stenciled and in A2/A1 only. It is entirely the responsibility of the Contractor to submit the designs at appropriate time to enable the Superintending Engineer (Bridges), Designs Circle, to approve them in time. No claims shall be granted on account of late approval to the design and consequent delay in the execution.

Schedule of reinforcement and rate of reinforcement per cum. of concrete quantity (and also percentage with respect to gross cross-sectional area of the component) should also be shown on each drawing.

- 22.9 The design calculations are generally prepared using worksheets, but it is found that the calculations are presented in the series of tables, and it becomes very difficult to trace out the formula used, and the parameters supplied in the formula to calculate a particular value.

BM =	1.913	tm
d required=	87.22	mm
d provided =	202	mm
Ast required=	452.648	sqmm
Min steel =	200	sqmm

The above calculations do not seem explanatory in hard copy, because only results are presented. Neither formula nor values of various parameters are given in the calculations. Assumptions, explanatory notes and manually done sample calculations will be mandatory submission in such case.

The calculations shall, instead, be preferably presented in the following manner. Formula used shall be visible in the Excel programming sheet.

BM	=	1.913	TM			
dreq =		$\frac{1.913 \times 1.00E+07}{2.515 \times 1000}$		=	87.220	mm
Dprov	=	250.00	- 40	- $\frac{16}{2}$	=	202
Ast req	=	$\frac{1.913 \times 1.00E+07}{0.87 \times 240.00 \times 202}$				
	=	452.648	sqmm			
Min steel	=	$\frac{0.12 \times 1000 \times 250.00}{100}$		=	300	sqmm

Presentation of design calculations in the above manner will save the time of checking and avoids the correspondence done for clarifications.

- 22.10 After initial approval, ten sets of approved working drawings with tracings along with four sets of approved design calculations and one soft copy in the pen drive shall be supplied by the Contractor which will be formally authenticated by the Designs Circle (Bridges), three copies of drawings and one set of design calculations for field officers, one set for the Contractor and three to be retained by the Designs Circle. These drawings shall be submitted in good quality and properly bound plastic folders and each set of calculations in files & bags. Only finally approved drawings shall be used for execution of work.
- 22.11 The contractor's design consultant shall ensure that the design calculations are as per the various Codal provisions / design criteria. Delay occurring due to wrong / improper submission of the designs / drawings shall be attributable to contractor and not to department.
- 22.12 After completion of each stage of work, three sets of record drawings based on the work as actually executed on site, shall be supplied by the Contractor, to the Engineer-in-Charge.
- 22.13 Approval to drawings and designs and design calculations by the Designs Circle (Bridges), shall not in any way relieve/absolve the Contractor of his responsibility for the correctness, soundness and structural stability and safety of the structure.
- 22.14 The approved drawings and the design calculations of the Bridge shall be the property of the Department.
- 22.15 The Contractor's designer or Consultant shall attend all the design Review meetings conducted by Departmental Officers and Design Circle (Bridges) from time to time, without any extra cost.
- 22.16 All design drawings and calculations done by the consultants shall reflect the signature, Name, date, and post of designers who prepare it, verify it and approve it from the organization of design consultant. Avoid giving initials like KVA, VBD the drawings. This procedure is applicable to Proof consultants to work also. Proof Consultant to work shall submit his own analysis, design calculations with the detailed description of method of analysis and explanatory notes and manually done sample calculations if required.
- 22.17 Consultant/Contractor shall necessarily submit his design proposal with editable Excel Sheet files without password protection for ease in checking of the same by engineers of design circle. If not provided proposal may be rejected and delay on account of the checking will not be attributable to design circle and its field units.

23 Dispute

- 23.1 In case of disputes arising between the contractor and the Superintending Engineer (Designs Circle), the matter may be referred to the Chief Engineer-in-charge. The decision of the Chief Engineer shall be final and binding on the contractor.

24 Special points

- 24.1 Detailed design calculations and working drawings of all component parts of the bridge shall be submitted, duly proof checked from a reputed Consultant appointed by the contractor in advance of execution in accordance with the above programme. The above two sets of design calculations should be submitted by the Contractor for approval to Superintending Engineer (Designs Circle).
- 24.2 It is Obligatory for the contractor to have a supervising engineer who is highly qualified and well experienced and expert in bridge design. It is supposed that contractor submit the detailed design and drawings after doing detailed soil exploration. Foundation proposed by contractor shall fulfill the requirement of all the points given DESIGN CRITERIA. If their remains any discrepancy/lacuna in any part of design and drawing, Contractor will be totally responsible. Approval given to drawing and design calculations and foundation proposed by contractor and approved by Designs Circle (Bridges) shall not in any way relieve the contractor of his responsibility. Correctness, soundness, structural stability, durability, and safety of the structure shall be the contractors' prime responsibility.
- 24.3 During Geological Investigations, continuity of strata below foundation level shall be at least 6 m. Bore log should continue 6m beyond proposed founding strata. Founding levels shall not be less than that shown in Department GAD.
- 24.4 The pseudo (nonstructural) cables with HDPE sheathing with aesthetic pleasant duct shall be provided as shown in department drawings. The Aesthetic appearance of portal frame shall be approved by field executive engineer.
- 24.5 The bridge shall be designed as a **Submersible bridge/ High-level** as per **Annexure I**.
- 24.6 Minimum dimension of bridge components shall be as per **Annexure II**.
- 24.7 Designs Circle shall be assisted for the payment of at least one draftsman till the completion of this project if requested.
- 24.8 If there is any query about the Design Criteria, the it shall be clarified from this office in the Prebid Meeting.
- 24.9 In case of any contradiction or conflict between the Departmental General Arrangement Drawing (GAD), the Tender Bill of Quantities (BOQ), and this Design Criteria, the Departmental GAD will prevail.
- 24.10 In case of any contradiction between main clauses and Annexures of this design criteria, provisions given in Annexures will prevail.

(V.A.WANODE)
Assistant Engineer Gr- I
Bridge Design Unit,
Nagpur.

(P.H.PATIL)
Executive Engineer,
Bridge Design Unit
Nagpur.

Digitally signed by
IQBAL MOHAMMAD
ISHAQ MOHAMMAD
KHAN
Date: 2026.03.13
11:44:37 +05'30'

(I.I.KHAN)
Superintending Engineer, (Designs)
P.W. Department,
Konkan Bhavan, Navi Mumbai.

25 Annexure-I
(Supplementary data)

1.0	Obligatory Provisions (20.726498/78.307179)			
	Bridge is to be designed as High-level Submersible type			
(i)	Length of Bridge as measured between inner faces of dirt wall	210m.		
(ii)	Soffit R.L. shall not be lower than	105.800m		
(iii)	Clear Roadway width	7.500m		
(iv)	Footpath width	1.050		
(v)	Overall width of Bridge (between outer edges of deck slab) Note: please refer departmental GAD final decision of site engineer is binding)	10.500 m		
(vi)	Vertical clearance for Navigational spans above HTL	-NA-		
(vii)	Horizontal clearance for Navigational spans.	-NA-		
(viii)	Clear linear waterway (Minimum required) [Clear linear water way is the length of water way between the inner face of abutment @ HFL for high level]	As shown in Departmental drawing.		
(ix)	The opening of box cells (refer departmental GAD)	26.5 m on both sides		
(x)	Design speed	80 Km/hr		
2.0	Hydraulic Data	To be designed for all following levels		
Sr. No.	Flood Level	R.L. (m)	Maximum Mean Compartmental velocity (m/sec)	Afflux (m)
(1)	(2)	(3)	(4)	(5)
(i)	OFL	104.600	2.800	0.300
(ii)	OHFL	107.500	4.460	-
(iii)	RTL	107.075	3.370	0.600
	Barrage Velocity	5.060 m/sec		
(iv)	Catchment area (sq. miles)	2525.123 Sqmiles		
(v)	Scour level RL			
	a) Pier	Scour up to Rock Top		
	b) Abutment	Scour up to Rock Top		
(vi)	Additional data for Coastal area			

	LTL RL	-----
	HTL RL	-----
3.0	Design Loads	
3.1	Loads due to Service lines:	0.1 t/m on one side
3.2	Temperature effects	As per IRC :6
3.3	Barge Impact	
	a) Navigation Piers	NIL
	b) Other Piers	NIL
3.4	Seismic Force	
	a) Seismic Zone	II
	b) Importance factor	1.0
3.5	Footpath: The bridge shall also be designed for IRC vehicle loading with assumption that the footpath provided, if any, will be removed in future for carriageway.	NA Loading as per IRC 6/ As mentioned in GAD
4.0	Exposure	MODERATE
5.0	a) For submersible Bridge	MS Pipe railing with discontinuous kerb
	b) For High level Bridge	Crash barrier as per IRC 6
6.0	Type of Anticorrosive Treatment: Anti carbonation paint and admixture of Corrosion inhibitor in concrete.	– Read clause 17 & 18
7.0	Maximum number of Expansion Joints	As per GAD
8.0	RCC WEARING COAT	AS PER GAD
9.0	Inspection Gallery all around Pier cap	YES
10.0	Annular Filling: Annular filling around pier/abutment formed due to excavation, shall be filled upto rock level by M-15 concrete. Rubble soling mixed with sand granular filling upto ground level shall be provided above it.	Should be considered if required
11.0	Crash barrier/GI pipe collapsible railing	As per IRC 6
12.0	The suitable handrails at the projected cantilevers in consultation of site engineer shall be provided.	As per directions

Annexure - II
Controlling Dimensions for various components of Bridge

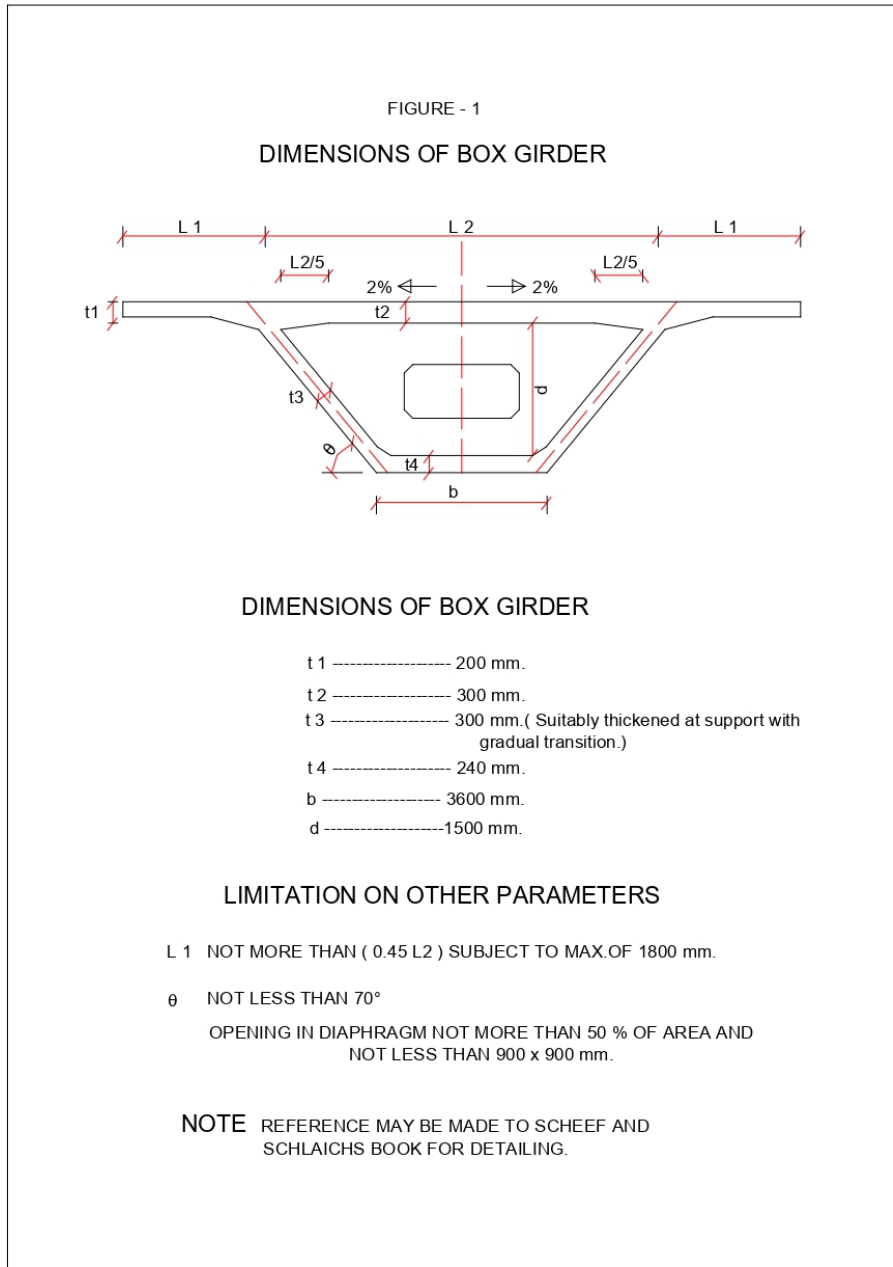
Sr. No.	Component	Controlling Dimensions	Remarks / Diagrams
A	Superstructure		
I	Solid Slab		
1	Span	≤ 10 m	For larger spans than 10m, it becomes uneconomical and creates staging problems.
2	Thickness at cantilever tip	≥ 200 mm	
3	Camber	2.5%	Shall be provided in shuttering of the deck slab only.
II	Spine Slab (to be proposed only for Submersible Bridges if economical.)		
1	Span	Between 10m to 20m	
2	Cantilever	≤ 1.5 m	
3	Thickness at cantilever tip	≥ 200 mm	
4	Camber	2.5%	Shall be provided in pedestal
III	Girder System		
1	Deck Slab Thickness	≥ 300 mm	For Cast-in-situ construction
		≥ 250 mm	For Precast construction
2	Deck Slab Thickness at tip	≥ 200 mm	
3	C/C distance between girders	≤ 3.00 m	Preferably shall be less than 3.0M
4	Clear cantilever of deck slab	≤ 1.85 m	
5	Web thickness for PSC/RCC	≥ 300 mm	
6	Web thickness at support for PSC/RCC	≥ 600 mm	
7	Bulb at bottom (for Precast Girders)		
a)	Depth	≥ 250 mm	
b)	Haunch Depth	≥ 150 mm	
c)	Width of Bulb	≥ 600 mm	
8	Haunch at top (for Precast Girders)		
a)	Depth	≥ 200 mm	
b)	Haunch Depth	≥ 100 mm	
c)	Width of Bulb	≥ 900 mm	
IV	Box Girder		Refer Figure 1

V	Diaphragms for Girder System and Box Girder		
1	Thickness of End Diaphragm	≥ 500 mm	
2	Thickness of Intermediate Diaphragm	≥ 300 mm	
3	No. of Intermediate Diaphragm	03 No.	
VI	Footpath		
1	Width	≥ 1.50 m	Shall be designed for vehicular load only, if directed.
VII	Deck continuity in Superstructure		
1	Deck continuity length	≤ 60 m	
B	Pedestal		
1	Offset from each side of bearing	≥ 150 mm	
2	Height	Between 300 mm to 500 mm	
3	Offset to pier cap	≥ 150 mm	
4	Concrete Grade	One grade higher than superstructure	
C	Pier Cap		
I	Hammer Head Pier Cap		
1	Depth at tip	≥ 600 mm	
2	Angle of sloping portion with horizontal	30 Degrees	
3	Clear cantilever	≤ 2.00 m	
4	All girders shall rest on pier cap with end diaphragm supported on pier cap only.		
II	Fully Supported Pier Cap		
1	Thickness	≥ 300 mm	
D	Pier		
1	Width in Traffic Direction	≥ 900 mm	(For Solid Slab)
		≥ 1200 mm	(For span 10m to 20 m & Height of Pier <4m)
		≥ 1500 mm	(For all other Superstructures)
2	Thickness of Diaphragm joining multiple columns of a pier	≥ 300 mm	
E	Abutment		
I	PCC Abutment		

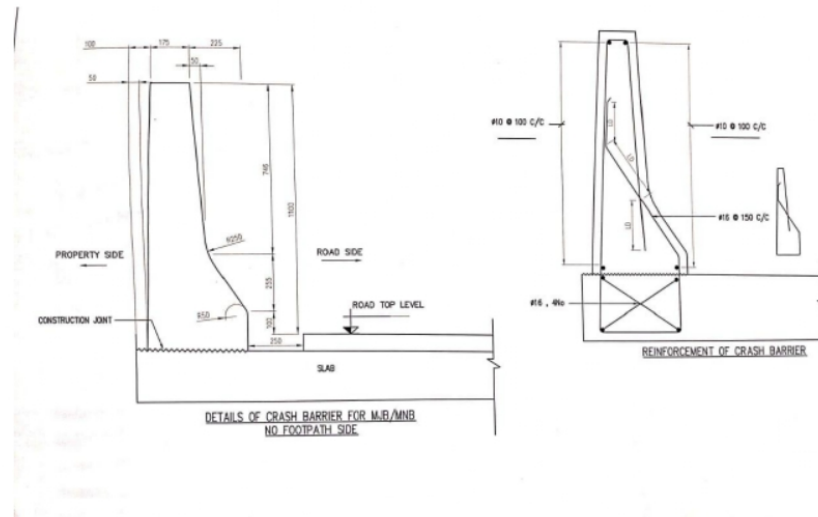
1	Top Width in Traffic Direction	≥ 1200 mm	
2	Height (RTL to FRL)	≤ 8.0 m	For Non-Seismic condition
		≤ 5.0 m	For Seismic condition
II	“C” Type RCC Abutment		
1	Thickness of Front Wall	≥ 600 mm	
2	Thickness of Side Wall	≥ 450 mm	
3	Height (RTL to FRL)	≤ 8.0 m	For Non-Seismic / Seismic condition
III	Box Type RCC Abutment		
1	Thickness of Front Wall	≥ 600 mm	
2	Thickness of Side Wall	≥ 400 mm	
3	Thickness of Intermediate Wall	≥ 300 mm	
F	Abutment cap / Dirt Wall		
1	Thickness of Dirt Wall	≥ 400 mm	
2	Thickness of Abutment Cap	≥ 300 mm	
G	Foundation		
I	File Foundation		
1	Pile Diameter (D)	≥ 1.20 m	(For river / creek bridges)
		≥ 1.00 m	(For Flyovers)
2	Pile Spacing	$\geq 2.50 \times D$	For End Bearing Piles
		$\leq 4.00 \times D$	
3	Thickness of Steel Liner	≥ 6 mm	For liner length upto 10m
		≥ 8 mm	For liner length between 10m to 20M
		≥ 10 mm	For liner length more than 20m
4	Pile Cap Thickness	$\geq 1.50 \times D$	
5	Offset of pile cap from pile	≥ 150 mm	
II	Well Foundation		
1	Well Steining	≥ 500 mm	
2	Well dredge hole	≥ 3.0 m	
3	Bottom Plug	≥ 300 mm + kerb height	
4	Top Plug	≥ 300 mm	
5	Well Diameter for Abutment	\geq Abutment length in	

		current direction	
6	Thickness of Well Cap	≥ 1000 mm	
III	Open Foundation		
1	Foundation Thickness	≥ 1000 mm	
2	Clear Cantilever	≤ 2.50 m	

26 Figure-1 – Dimensions of Box Girder



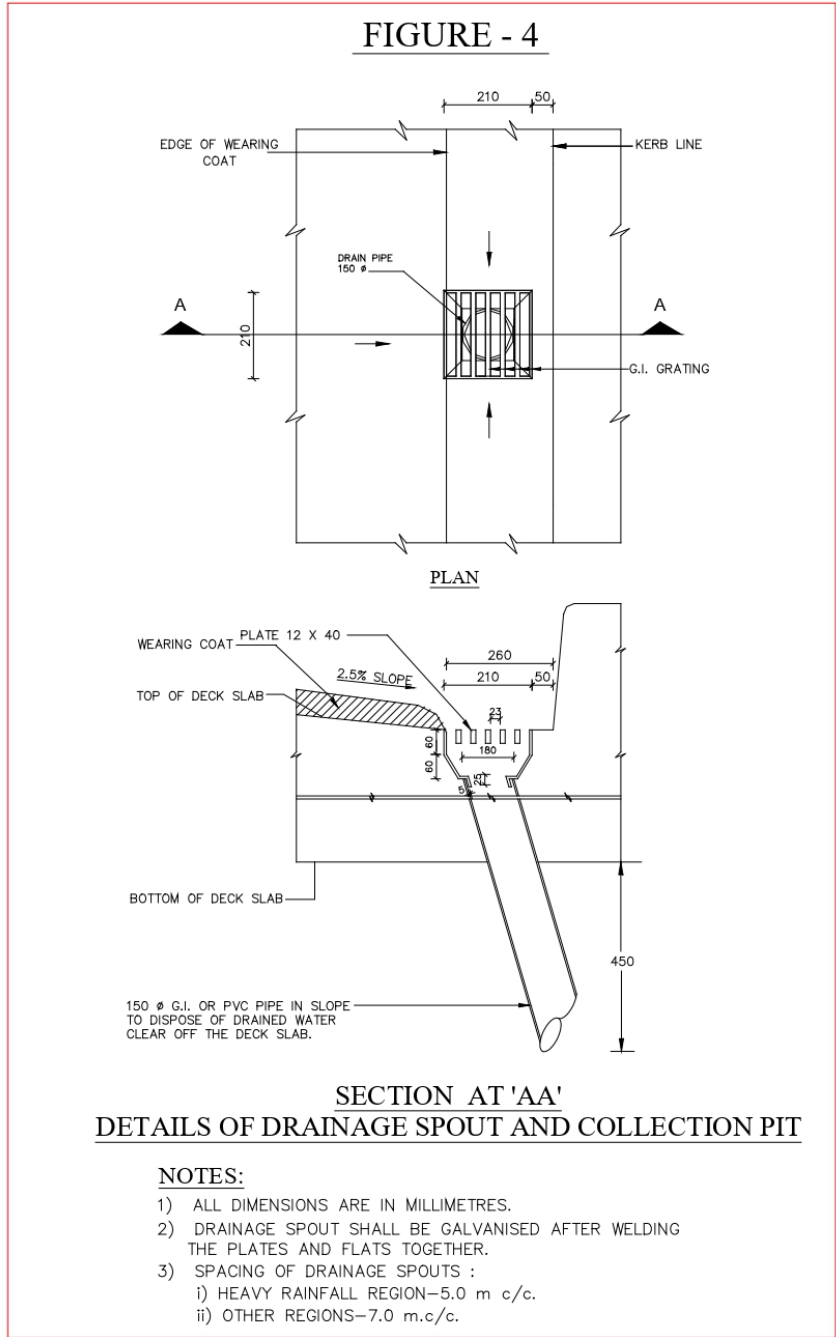
27 Figure-2 – RCC Crash Barrier



NOTE:- FOR 750 mm HEIGHT ABOVE THE ROAD SURFACE.
 THE CRASH BARRIER SHALL BE SOLID AND THE PORTION ABOVE
 MAY BE DESIGNED FOR BETTER AESTHETICS.
 THE IMPACT TO BE CONSIDERED FOR THE DESIGN SHALL BE OF 20t VEHICLE AT 64 kmph AND
 20 DEGREE ANGLE OF IMPACT AT TOP CRASH BARRIER

27 Figure-2 – RCC Crash Barrier

FIGURE - 4



28 Figure-3 – Drainage Spout

CHAPTER –IX
WORKS SPECIFICATIONS

1.	<p>The whole work shall be carried out strictly in accordance with the approved detailed drawings (unless otherwise directed by the Engineer In Charge) description of the items and the detailed specifications in the Standard Specifications Book (With Indian Standard Specifications indicated therein) of the Public Works Department, Government of Maharashtra, MORT & H (ivth revision) specification subject to the additional specifications and special specifications given for the relevant items. In case of inconsistency in the specifications given for the relevant items. In case of inconsistency in the specifications given for design in Chapter X and this Chapter the specifications given for design shall prevail. In case of error, omissions and/or disagreement between written and scaled dimensions on the drawing and specifications etc. the following order of preference shall apply.</p>
	<p>i) Between scaled and written dimension the latter shall be accepted, the discretion on the drawing shall prevail over both the above.</p>
	<p>ii) Between the dimension in the drawing and the corresponding one in the specification the former shall prevail. For disputes, if any, the Engineer – In –Charge’s decision shall be final and binding on the contractor.</p>
2.	<p>Additional Specification :</p>
	<p>2.1 Portland Pozzolana Cement : Deleted</p>
	<p>2.2 High strength ordinary Portland cement: [43 Grade] This shall conform to I.S. 8112 /1989. All other specification given in A- 2 in pertinent particulars.</p>
	<p>2.3 High Yield Strength Deformed Bars :</p> <p>TMT bars for reinforcement shall confirm to I. S. 1786 /1985. The specification A-10 standard specifications shall apply in pertinent particulars. The tensile strength of TMT bars shall be as specified in the special provision.</p>
	<p>2.4 COLD DRAWN INDENTED WIRES</p> <p>The cold drawn intended wire for use in prestressed concrete work shall confirm to I.S. 6003.</p>
	<p>2.5 UNCOATED STRESS RELIEVED STRANDS</p> <p>The un-coated stress relieved strands for use in prestressed concrete work shall conform to I.S. 14268 – 2000.</p>
	<p>2.6 SHEATHING</p> <p>The sheath shall be made from cold rolled cold annealed bright [CRCA] metal mild steel strips conforming to IS-513 or galvanized or lead coated mild steel strips or from any other specified materials. The minimum thickness of sheathing strips shall be as per provision given in IRC 18-2000.</p>

2.7 ANCHORGES FOR PRESTRESSING

These shall conform to relevant specifications i.e. Clause 1802.3 of MORTH Specification fourth Revision

2.8 ELESTOMERIC BEARINGS

The Bearing shall conform to the requirements mentioned in Clause No. 2005 of Section-2000 of MORTH Specification fourth Revision.

2.9 Polytetrafluoroethylene with Stainless Steel Bearings :

These shall conform to relevant specifications i.e. Clause No. 2006 of Section-2000 of MORTH Specification fourth Revision.

2.10 Controlled Concrete :

The specifications for controlled concrete shall be as per B-7 of Standard specifications of P. W. Department and Section 1700 of MORTH Specification fourth Revision & IRC 21/2000.

2.11 Prestressed Concrete :

The concrete to be used for prestressed concrete shall be as per specification 2.10 above. All other specifications for construction aspects shall be as per sections No. 1800 Ministry of Shipping and Transport (Roads wings) of Government of India's specification for Road and Bridge works. Strands will be permitted for prestressing. The specifications for grouting shall be as separately given in this chapter. Trumpet junctions are not permitted. Use of concrete anchorage is permitted only with wires as pre stressing steel. Use of concrete anchorage will be permitted with strands provided the anchorage is tested for dynamics loads,

(a) P.S.C. structure shall be designed as type-I with minimum residual compressive stress of 5 kg/cm² achieved under full design load shall be achieved.

(b) All prestressed members shall have spare cables laid to the profiles approved by the Department. The number of spare cables shall be 5% of the cables required as per design, subject to a minimum of one cable per girder/web. These cables shall be permitted to be removed fully or partly after the final stage of prestressing, if they are not required and holes grouted. In case of saline atmosphere these cable holes shall not be grouted but only ends shall be closed properly.

(c) The provision for imparting 20% of design pre stress at a future date shall be made in the deck and suitable anchorage, bulkheads diaphragms etc. shall be constructed for the purpose. Arrangement for external pre stressing shall be got approved from the Designs Circle.

2.12 Bored Cast-in-situ Piles :

The work shall be carried out generally as per P. W. Department standard specification B-15 and I.S. 2979 with following modifications an additions in pertinent particulars. The pile shall be necessarily cased pile

where in mild steel casing of thickness as shown in the drawing shall be driven up to soft rock and left permanently after concrete of the pile. The item will cover boring and drawing casting through all strata up to hard rock specified or shown in drawings. For vertical piles, the permissible positional deviation shall not be greater than 7.50 mm or D/10 whichever is more and exceed 50% from specified inclination for rakes piles the permissible positional deviation not exceed 7.50 Cm or D/10 whichever is more and shall not exceed 4% specified inclination. The tilts and shifts shall be measured with respect to the bottom of pile cap. Concreting under water shall be done necessarily with the use of

termite methods. The minimum cement content dose shall be as per I.S.2911 (Part I, Section 2) 1979 clause 6.3.3. One set of three 15 CM cubes shall be cast for the concrete poured in each pile if the Concreting is done uninterruptedly. In case Concreting is interrupted for any reasons one set of 3 cubes shall be cast for each lift of concrete. The load test shall be carried out as per I. S. 2911 part IV 1979. The load of complete sequence of pile shall be kept and furnished to department for each pile individually in typical date as per Appendix "D" of I. S. 2911 (Part I, Section 2) 1979.

2.13 Pneumatic Sinking of Wells :

The work shall generally carried out as per the B-14 of Standard Specifications of Govt. of Maharashtra with additional precautions given in clause 1207.6 of MORT & H specifications for Roads & Bridge works (IVth revision). In addition, safety provision contained in . S. 4138 (Latest edition) shall be compiled with. The item shall include providing at site one set of pneumatic sinking plant for a period specified in the item including all accessories, fixing plant, removing plant, sinking of well under working pressure as specified in the item of excavation below cutting edge for sump under working pressure as specified, plugging of well or rendering the well air-tight or keeping well pressurized and depressurisation of the well, employing working gang sand equipment / including doctor, lock attendant, maintaining records as per the provision of I.S.I, code in Various registers and submitting copies there of to the Department, taking all precautions, removing excavated stuff outside the well etc.

2.14 Providing And Fixing Restrained Electrometric Bearing Pads As Per Design And Detailed Drawing

The item cover supply and fixing of restrained elastomeric bearing pads of required thickness and size as per approved drawing in position including carrying out necessary test and as per IRC-83/2003 (Reprint)

MATERIAL

Materials shall confirm to specification vide Para No. 2.8 above for supply of elastomeric bearings.

FIXING AND INSTALLATION

The method of placing of Neoprene bearing in position shall be as per standard specification part II issued by Design Circle, Government of Maharashtra revised in 1974

- a) The continuous strip of sufficient width and depth of 10 to 15 mm shall be left in pier and abutment cap when the concrete is green. This strip shall be filled by neat cement mortar 1.1Proportion with W.C. ratio not exceeding the: of concrete used in cap few days before placing of superstructure. Sand used forcemeat

mortar shall be below 3 mm. The top surface shall be perfectly leveled. The mortar shall be cured for at least 7 days and bearing shall be fixed in its true position by using epoxy ground at top and bottom. The area around the bearing shall be filled with well rammed fine sand covered under polythene layer sides sealed by timber packing places. Every care shall be taken during concreting of the superstructure to avoid puncturing of polythene layer and displacement of bearing. It shall be ensured that slurry from concrete will not flow in the sand below and make its removal difficult, after 14 days from the casting of superstructure timber packing shall be removed and sand drained out, by water jet and scraping completely and thoroughly. The bearing shall be placed in exact position as per the drawing truly leveled. In case of prestress superstructure or RCC long span bridge initial strains in bearing due to shrinkage and elastic shortening shall be removed by lifting the superstructure.

The item shall include supply of bearing, test pieces, test certificate, fixing in position, carrying out test, layout materials, use of tools and plants and scaffolding if any necessary for carrying out the item satisfactorily and maintaining the same till completion of work. Item will also include relieving the initial strains in case of prestress concrete superstructure and long span bridge by lifting of superstructure

2.15 SPECIFICATION FOR GROUT AND GROUTING FOR PRESTRESSING CABLES

The item 1 to 7 below shall be in confirmation as per provision appendix 2 of IRC 18/ 2000 and Appendix 1800 / III of MORTH specification (IV revision).

1) MATERIAL FOR GROUT

Material for grout shall comply with the following requirements.

a) Cement normally used shall be Ordinary Portland cement or high strength cement, Pozzolana cement shall not be used for grouting prestressed cables

b) Sand is to be used only in large ducts exceeding internal diameter 150 mm

c) Acceptable admixture conforming to I. S. 9102 may be used if test have shown that their use improves the properties of the grout, e.g. increasing fluidity workability, reducing bleeding, entraining air or expanding the grout. Admixture shall be free from chlorides, Nitrates sulfides, sulfates and any other material liable to affect the steel or the grout itself. It is advisable to use expanding agent which do not contain, chlorides. Aluminum powder is not recommended

d) Water shall be potable, clean and free from harmful matter. Wherever possible it shall be obtained from public supply, seawater shall not be used in grout.

2) PROPERTIES OF THE GROUT

a) Where a cement based grout is used, the water / cement ratio shall be as low as possible consistent with adequate workability, The water / cement ratio shall not exceed 0.45 and it should be preferably between 0.34 and 0.40. It is recommended that fluidity of the grout should be measured on the site as a method of control

b) Before grouting the properties of the grout mix should be tested in a laboratory for following tests
c) The compressive strength of 100 mm Cubes of the grout shall not be less than 17 Mpa at 7 days. Cubes shall be cured in a moist atmosphere for the first 24 hours and subsequently in water.
d) Grout not used within 30 minutes of mixing should be rejected.
3) DUCTS:
The duct shall be as per provision of appendix 2 of I.R.C. 18 2000.
a) Vent should be provided at any changes of section and at intervals of not more than 15 meters in straight reaches. Vent should also be provided at high and low point of the ducts.
b) Threaded entries shall be provided at the ducts end to permit use of screwed connector from the grout pump
c) Before grouting, the duct shall be thoroughly cleaned and shall be free of water, any dirt other foreign materials.
d) Ducts formed without metal sheathing shall be flushed with water before grouting, and all surplus water removed by compressed air injection.
e) The anchorage's shall be thoroughly sealed with mortar or strength equal to that of the grout, to prevent ingress of air into the duct during grouting operation.
4) MIXING GROUT
a) The cement (the aggregates, if used) shall be measured by weight.
b) The mixing equipment shall be of a type capable of producing grout of uniform and if possible, colloidal constancy.
c) Water shall be added to the mixer first and then the cement. After these have been thoroughly mixed, sand and additives if any, shall be mixed.
d) The water content of the mix shall be kept as low as possible and the water / cement ratio of 0.34 to 0.40 will be preferable when using a neat cement grout.
e) The approximate proportion of the mix shall be one part of cement to 0.74 part sand if to be used, the exact proportion being adjusted to form a grout giving proper consistency
f) Mixing time depends on the type of mixer.
g) Mixing shall continue for at least two units minutes a uniform consistency is obtained.
h) After being mixed, the grout should be kept in continuous movement. It is essential -that the grout should be free from lumps, prior of introduction into the pump grout, should passed through a 14 – 16 mesh

screen.

i) Mixing by hand shall be prohibited.

5) PREPARTION BEFORE GROUTING

Grouting can be successful only if there is a well-defined inlet and outlet leakages as well as blockages in the length of the duct must first be eliminated.

The problem arms can be conveniently located by putting water under pressure in one duct at a time. These area required careful inspection and local repairs, so that finally each cable become an independent and desecrate void with a specific inlet and outlet. Grouting has to be done be a little delay as possible after tensioning(Preferably 24 hours after stressing especially in aggressive environment unless temporary measured to protect against corrosion are taken). The cables are often coated with water soluble oils which have to be cleaned by profuse water flushing. This should be followed by blowing in compressed air to removed water traces prior to common cement of grouting. The efficiency of air vents must check in advance. These air vents can also from auxilarialy injection points for fables where there are blockages or other problems

6) INJECTION GROUT

a) Injection shall be carried out with as little delay as possible after tensioning of the steel If for structural reasons, it has to be put-off, protection of the steel by methods or products which will not prevent the ultimate adherence of the injection grout shall be ensured.

b) The method of injection shall ensure complete filling of the ducts and complete surrounding of the steel. To check this, it is advisable to compare the volume of the spaces to be filled by grout actually injected. Equipment for this check shall be installed at the entry and exit point of the grout.

c) Injection by compressed air shall be forbidden.

d) The pump shall be fitted with ineffective control against built up of excessive pressure. The pump should of a positive displacement time. It should be fitted with a pressure gauge.

e) Sufficient pressure shall be used to force the grout completely through the duct, care being taken not to ruptur the ducts. The minimum at which grout should be pumped shall be 10 kg / cm²and the grout pump shall have a relief arrangement for bypass for the grout in case of built up of pressure beyond 20 kg /cm². The capacity of grout pump should be such as to achieve a forward speed of grout of about 5 to 10 metres minute. Ash and pump are incapable of providing the above requirements, they shall not be used for grouting.

f) In all cases, the duct should be cleaned out by compressed air before grouting. Before injecting grout in unlined ducts, it is advisable to flushed the duct with water to wet the concrete, except in cold weather. After flushing excess water shall be removed by suitable means. Direct feed high pressure water pump should be available at site for emergency. In case of any problem in grouting of the ducts such as pump shall

	be immediately connected to the tendon and all grout flushed by used of high-pressure water
	g) The injection tubes shall be topped up with cement grout if any wastage or subsidence of grout accepts when the pump is disconnected.
	h) The connection between the nozzles of the injection pipe and the duct shall be hermetic so that air cannot be sucked in.
	i) Injection must be continuous and shall not be interrupted. It should be slow enough to avoid producing segregation of the grout.
	7) THE GROUTING PROCEDURE
	<p>The following procedure is recommended for proper injection of grout. The ducts should first be flushed with cleaned water preferably containing about one percent lime. During this operation, it is possible to check the water tightness of the duct systems against leakages. This should be followed by blowing with oil free compressed air. Grouting can now be commenced initially with a low pressure of injection of approximately 4 kg / cm² increasing it until the grout comes out at the other end. Then the pressure can be slowly brought to the designed pressure. The grout should be allowed to flow freely from the other end until the consistency of the grout at the point of injection is the same as the consistency of grout at the other end. When the grout flow at the other end, it should be closed off and the build up of pressure commenced. Full injection pressure shall be maintained for at least one minute before closing the injection pipe. It is recommended practice to provide a standpipe at the highest point of tender profile to hold all water displaced by sedimentation or bleeding. If there is a built up of pressure much in excess of 10 kg / cm² without flow of grout coming at the other end, the grouting should be discontinued and the entire duct flushed with high pressure water.</p>
	<p>8) PRECAUTION FOR EFFECTIVE GROUTING REDUCING EXPOSURE TIME FOR PRESTRESS CABLES</p> <p>Threading of cables should preferably be done as late as possible into the duct after hardening of the concrete. Only where unavoidable, the cable may be threaded in advance of concreting.</p>
	<p>AVOIDING BLOCKAGES</p> <p>It is good practice to move the cable in both directions during the concreting operations. This can be easily done by hammering the ends of cables during concreting. It is also advisable that 3 to 4 hours after concreting the cable should be moved both ways through a distance approximately 30 cm with such movements. Any leakage of mortar which has taken place in spite of all precautions loosens bond with the cable, those reducing the chance of blockage. This operation can also be done by fixing prestressing jacks at once and pulling the entered cable and the fixing the jack at the other end. During concreting the empty ducts must be filled with several small diameters bars, rigid PVC pipes of inflatable rubber tubes to avoid collapse of the empty duct and to prevent it checking because of leakage's or vibratory damage during concreting.</p>
	FLUSHING

24 hours after completion of concreting, the cable should be flushed by air under pressure. It is also possible to use the grout pump and inject water through the sheathing of ensure flushing. All water should however be drained either through the lowest drain pipe or by blowing compressed air through the lowest drain pipe or by blowing compressed air through the duct.

END PROTECTION

After completing the concreting operations, the end faces of the cable are to be properly blocked to prevent curing water from entering the cables. This can be done by sealing the cable in bitumen impregnated in clean gunny bag or waterproof paper or alternatively, by building a brick pedestal plastered on all faces enclosing the exposed wires outside the anchorage.

GROUTING IN HOT WEATHER

Grouting should be carried out during cool hour of the day or night. At high temperature approaching 38° c, grouting must be prohibited in all cases, if necessary water must be cooled, so that the grout temperature remains bellow 33° c.

STAGE PRESTRESSING

In case of stage prestressing, cable tensioned in the first stage should not remain un routed till or all cable are stressed. It is possible to complete the grouting of the cable in the first stage of filling up or by running water through the remaining cable while grouting of the first stage cable is undertaken. The water in the remaining cable should be retained till the grout in the first stage cable has set

LOCATION AND SPACING OF CABLES

The location and spacing of cable is of utmost importance to ensure proper concreting and compaction. Sufficient clears between cables should be available to allow flow of concrete and to prevent voids. Grouping of cable should be avoided where possible, where grouting is an avoidable is in manner to ensure proper concreting compaction and adequate concrete cover. Where stage grouting required to be done, the grouting should be such that cable to be grouted at different stages are separated by as much distance as possible for there entire length

USE OF SHEATHING

It shall be as per IRC 18 – 2000.

FILLING UP OF RECESSES

End faces were anchorages are located are vulnerable points of entry of water. They have to be necessarily protected with an effective barrier superior than a “Patch up” operation by mortar plastering. Recesses should be dry packed with mortar and where possible painted with epoxy or bitumen.

AVOIDING BLOCKAGE AT ANCHORAGES DURING CONCRETING

It is essential to seal the end face of the female cones / bearing plated of the prestressing tenders from ingress of concrete or mortar during the concreting operations. It can be done by plugging the opening in the female cone / bearing clean waterproof gunny bags or other suitable materials.

9) PRECAUTION TO BE TAKEN AFTER GROUTING

a) In cold weather or if there is a danger of the temperature falling below 20 o C within 48 hours of injection, the work should be protected to avoid frost effects

b) In all cases, after final injection opening and vents shall be hermetically sealed, so as to avoid the ingress of water deicing materials and other corrosive agents.

c) Adjoining cables shall be cleaned by flushing with water to clear any grout that might have entered the cables.

2.16 SAMPLING AND TESTING

In the case of materials procured by the contractor, testing as required by the codes and specification shall be arranged by him at his own cost. Testing shall be done in the presence of an authorized representative of the Engineer-in- charge at the nearest approved laboratory. Contractors will be allowed to carry out concrete cube testing at site in the laboratory established by him. However 30 % of the cubes shall also be tested at approved Government laboratory. Testing high tensile steel will be at manufacturer’s laboratory. If additional testing other than as required by specifications is ordered, the testing charges shall be born by the department, if test result are satisfactory, and by the contractor if the same are not satisfactory.

i) All materials to be used on work such as cement, aggregates, steel,stone, asphalt, and other construction material shall be got approved in advance from the Engineer-in-charge and shall pass the tests andanalysis required by him.

ii) The contractor shall at his risk and 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 tests or for analysis to the nearest approved laboratory may and bear all charges and cost of testing. Such samples shall also be deposited with the Engineer-in-charge till sent for testing.

iii) The contractor shall and when required submit at his cost the samples of materials to be tested or analyzed an if so directed shall not make use of incorporate in the work and material represented by the samples until the required for tests or for analysis have been made after the test of materials finally accepted by the Engineer-in-charge.

iv) Frequency of testing of the construction material and the percentage of testing from the Government laboratory shall be as under

a) Where the field Lab. certified by the concerned Executive Engineer is established at the work at work site 80% tests as per total frequency required shall be carried out in the said field laboratory & 20% tests shall be

	<p>carried out at the vigilance & quality control laboratory of PWD Govt. of Maharashtra for the materials. The entire responsibility of the sample testing as per required frequency including testing charges will be borne by the contractor.</p>
	<p>b) Where field laboratory is not established at works site 100% tests as per frequency shall be carried out in the Vigilance & Quality Control Laboratory of P.W.D. Govt. of Maharashtra.</p>
	<p>c) Testing of cement and steel 100% in V & Q.C.C. Lab, is compulsory.</p>
	<p>d) It is mandatory to submit the test reports of material used for the work as per the frequency along with the bill. If the test results are not submitted alongwith the bill , an amount equal to five times the testing charges shall be deducted from the bill.</p>
	<p>2.17 STRIP SEAL EXPANSION JOINT.</p> <p>Strip seal expansion joint shall be as per Clause 2607 of Section 2600 of MORT & H specification IVth revision.</p>
	<p>2.18 LOAD TESTING</p> <p>In addition to satisfying the Department about the base on the contractor's alternative, supported by design adequacy of the provisions in design calculations, the Engineer- in- charge shall have right to call upon the contractor to carry out a load test in any one span</p> <p>in accordance with the procedure prescribed in the Codes. For this the contractor may quote his rate on tonnage basis of the test load. The load for such load test shall be full dead load (Excluding self load of the member under test) plus 125 % of maximum design live load</p> <p>(including impact) in case of R.C. Bridges. However, for Prestressed concrete members, the test load shall be full dead load (Excluding self load of the member under test) plus</p> <p>maximum design live load (Including impact). Generally, the acceptance criteria shall be as specified in BR-58 of Standard Specifications (Red Book). If the results of the load test are not found to be satisfactory, the contractor shall modify and revise the Design and strengthen the member already cast at his own cost and also bear the cost of the load test. Not withstanding the above, the Engineer-incharge is empowered to order load testing of the bridge or its component whenever there is doubt about the workmanship or safety of the bridge / component or whenever there is need to confirm the workmanship and the safety of structure by carrying out load test. The load testing shall be carried out as per the specification BR – 58 of the book of Standard Specification published by Public Works Department (B& C), Government of Maharashtra with such specifications as ordered by Engineer - in- charge and Para No. 16 of Design Criteria.</p>
	<p>2.19 The contractor immediately on receipt by him, of the work order, shall be at his own expense clear the site and take up a provisional and final setting out and lining out of the work under the supervision of his responsible representative and shall provide necessary material labour tools instruments etc. required for the same. The lining and setting out shall be done accurately and the contractor, shall be fully responsible</p>

for correctness of the position, levels, dimensions, alignments etc. of all parts of the work and if at any time during the execution any error appears or arises, the same shall be rectified by the contractor at his own cost. The checking by Departmental staff will not absolve in any way the contractor of his own responsibilities for the correctness thereof. The contractor shall project and preserve all benchmarks, site fails, pegs etc. used for setting out the work. One tentative abutment location will be indicated by Engineer-in-charge and center line of the bridge shall be defined by him, the contractor will then have to fix of the location of other abutment. The abutment location will then be verified by the Department and may be adjusted. Once the final location of abutments is so finalized, it will be contractor's responsibility to line and locate the remaining foundations. Before starting the work on any foundation, it shall be obligatory for the contractor to drill at least one trial bore at his foundation location going minimum 5 m below be foundation levels proposed by him. The cost of such bores shall be included the tendered price. The contractor's lump sum price shall include cost of taking such bores, preserving the samples, and testing the sample. The bores shall be taken with drilling machines with double /triple tubs by diamond bits taking out cores of Nx size. The Engineer In

charge may examine the cores obtained from trial bores and may carryout any other test including crushing test on the cores and the cores may also be subjected to Geological examination.

2.20 Admixture :

The admixture such as plastisizer / Super Plastisizers, confirming to MORT & H / IS/IRC specifications, for concrete M-25 and above may be used with prior permission from Engineer-In-Charge depending upon the specific requirement. No extra payment on this account will be admissible.

2.21 Reinforced Concrete

i) The cement used shall invariable be any of the following type complying with the provisions of the relevant Indian standards.

l] Ordinary Portland cement conforming to I.S. 269/15.8112 & 12269.

b] Prestressed concrete, as per MORT & H Spec No. Section 1800.

ii] Agreegates.

Aggregates to be used for reinforced concrete shall not contain any materials liable to attack the steel reinforcement Marine aggregates shall not be used in concrete in fresh water and have a sufficiently low shale and chloride content. The aggregate shall confirm to provisions contained in Clause 302.2 of I.R.C. 21-2000 [Bridge code Sect.III] the maximum size of aggregate shall not exceed the value of concrete cover or 20 mm. whichever is less. In well

foundation with concrete staining the maximum size of aggregate shall not exceed 40mm. I.S.2386 [Part-VIII] gives standard test methods for alkali dealing with suspicious aggregate. Under unavoidable circumstances, se water may be used for curing in such reinforced constructions which are permanently under sea water.

2.23 Reinforcement steel.

All reinforcement shall be clean and free from loose material dust, loose rust and coats of paints, oil or other containing which may destroy or reduce load, the surface conditions of the steel reinforcement at the time of its placing in concrete, affects its corrosion rate. If the reinforcement is contaminated with salt or badly corroded, the corrosive action on reinforcement after placement in concrete is aggravated and prooked rapidly. Hence care shall be taken to protect the reinforcement from exposure to saline atmosphere during storage. The reinforcement steel shall be protected by watering of cement wash. Slight rust may be removed by rubbing the rods with gunny cloth or use of rust removing jelly and phosphate coating given by tank phosphating. Of application of phosphating jelly. Anticorrosive treatments shall be provided to all mild/HYSD bar being used in the work. The treatment shall be as described in Appendix-B of I.S. 9077-1979.

2.24 Prestressing Tendons

The prestressing steel shall not be stored over lorig periods. It shall be provided with suitable protective coating when stored. In case of highly aggressive environments such as chemically polluted atmosphere near the sea prestressing steel be given a coating of water soluble oils of proven specification, if available. During and after the installation of prestressing tendons, the

precautions to be taken, consist of producing the best possible tendom environment during the period between installation and the provision of final protection and of keeping this period to a minimum. The diameter of prestressing tendons in no case be less than 7mm.

2.25 Sheathing :

Metal sheathing to be used for prestressing concrete work shall be of galvanized type. It shall be free from rust. Rigid or semi rigid water tight metals heating could be used. It shall be spliced with the tightly fitting sleeves and the joints bound with water proof tape. For semi rigid type of metallic sheathing thickness shall not be less than 0.4m. Vents shall be provided at any changes of section and at high and low points of the duct for the sheathing.

2.26 Anchorages :

Anchorages shall be suitably protected immediately after completing the prestressing work by applying a dense mortar layer of at least 15mm thickness to safeguard against corrosion.

2.27 Grout :

Grout shall carried out as soon as possible but not later than 2 week safter stressing. Wherever it is necessary to have one side of formwork of girders open for laying reinforcement or any other purpose, the open side shall be the lowered side. The grout shall be of non shrink type with ordinary Portland cement devoid of mixtures containing chlorides, nitrates, sulphates and any other material liable to cease corrosion. The detailed specifications for grouting shall be as per provisions.

2.28 Concrete :

The cement content should be sufficient to provide adequate workability with a lower water/ cement ration so that concrete can be completely compacted with means available shutter vibrators will be preferable to ensure good compactions in areas sheltered from pin vibrators by reinforcing bars for parts of structures subjected to sea spray the removal of side form should be delayed to protect green concrete from sea water. Construction and supervision must be such as to ensure a consistently high standard of workmanship & quality as per I.S.-456-2000 shall be strictly followed For reinforced concrete structural members the minimum cement content shall be as follows:

Zone Minimum cement Max. water Content cément Ratio.

Splash zone 360 kg/cum 0.45

Atmospheric zone 290 kg/cum 0.55

Submerged zone 290 kg/cum 0.35

For well steining the minimum cement content shall be 412 kg/cum irrespective of the zone.

Cement content in excess of 50 kg/cum shall not be used unless special consideration has been given to the increased risk of cracking due to drying trackage in the section or to thermal stresses in thickness sections.

2.29 Strength :

All concrete shall be controlled concrete. For reinforced concrete structural members the minimum concrete cube strength [28 days work strength] shall be 200 kg/cm². For well steining concrete of minimum M.25 may be used. The bottom and top plugs of wells shall be of minimum grade M-25.

2.30 Curing of concrete :

Special attention shall be paid to curing of concrete in order to ensure maximum durability and to minimize cracking, Concrete should be cured with fresh water whenever it is possible to ensure that the concrete surface can be kept wet despite wind etc. care should be taken to avoid repid lowering of concrete temperatures caused by applying cold water to hot concrete surface (thermal shock) sea water shall not used for curing reinforced concrete or prestressed concrete.

2.31 Cover to Reinforcement:

The cover must be of the same quality impermeability and strength as the rest of the concrete, particular care must be taken to ensure this specially in beam and slab soffits. The cover must be uniform throughout and its thickness shall be exclusive of plaster of other decorative finishes.

2.32 Concreting Operation.

In the case of substructure, construction joints in the splash zone shall be preferably avoided. In case of perkiest members, the cast in situ connection shall always be located above the splash zone

2.32 Miscellaneous items :

	<p>i] Binding Wires;</p> <p>All ends of binding wires shall be carefully turned inwards so that they do not project out of concrete to start rusting action. Galvanized wires are preferable. Where possible polythene binding string and ploythene bars grip should be used, after making sure that these do not result in loss of bond or chemical reaction with concrete,</p>
	<p>ii] Cover Blocks:</p> <p>Good circular shaped concrete cover blocks of the same strength as the main concrete shall invariably be used both at bottom as well as sides. Rain water pipes should be taken below soffit level of bridge decks to drain of the water without spray on the structure. A.C. pipes should be preferred to G.I.Pipe.</p>
	<p>iii] Pier and well caps.</p> <p>Top of pier cap and well caps should be sloped on all sides to drain off water.</p>
	<p>iv] Hollowness in Concrete :</p> <p>After concreting is complete the concrete surface particularly, where there is congestion of reinforcement, should be tested by light hammering or if possible by Schmidt hammer. Any portion showing signs of hollowness should be grouted immediately.</p>
	<p>v] Expansion joints :</p> <p>Absolute water tightness should be ensured at expansion joints. Expansion joints Shall be easily replaceable. The exposed metallic components or expansion joints shall be galvanized.</p>
	<p>vi] Bearings :</p> <p>Corrosion resistant bearings such as electrometric or P.T.E. type shall be preferred. However, where metallic bearings are used they shall be properly greased and protected from rusting in addition to galvanizing Bearings, provided shall be easily, replaceable.</p>
	<p>vii] Protective coatings and corrosion inhibitors :</p> <p>The addition of lanes to the substructure columns on outside would be particularly advantage for jetties where weak concrete cover is also subjected to accidental impact of floating crafts despite provision of fenders. The part of lines to the substructure columns on outside would be particularly advantage for jetties where weak concrete cover is also subjected to accidental impact of floating crafts despite provision of fenders. The part of substructure in the splash zone shall be given a protective paint. The superstructure shall be treated with following protective coating</p>
	<p>1 Parapets Cement based paint in two coats</p>
	<p>2 Beams of girders and soffit slab Epoxy paint in two coats. Of box girder with the web upto</p>

Soffit slab top.
3 rest of the exposed parts of Flat oil paint in two coats
<p>Superstructure</p> <p>The contractor immediately on receipt by him, of the work order, shall be at his own expense clear 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 material, labour, tools instruments etc. required for the same. The lining and setting out shall be done accurately and the contractor, shall be fully responsible for the correctness of the positions, levels, dimensions, alignment etc. of all parts of the work and if anytime during the execution any error appears of arise the same shall be rectified by the contractor at his own cost. The checking by Department staff will not absolve in anyway the contractor of his own responsibility for the correctness thereof. The contractor shall project and preserve all bench marks, site fails, pegs etc. used for setting out the work. One tentative abutment location will be indicated by Engineer-in-charge and the center line of abutment. The abutment location</p> <p>Once the final location of abutments is so finalized, it will be the contractor's responsibility to line out and for the contractor to drill at least one trial bore at each foundations locations going minimum 5 meter below the foundations levels proposed by him. In case of foundation consisting of more than one well, one bore shall have to be taken for each well, and for piles, at least one bore well shall be taken by contractor per group of pipes covered by each 10m x 10m. area in plain. The cost of such bores shall be include the cost of taking such bores, preserving the samples, and testing the samples, the bores shall be included in the tendered price., The contractor's lumpsum price shall include the cost of taking such bores, preserving the samples, and testing the samples, the bores shall be taken with drilling machines with double/ triple tubes by diamond bits taking out cores of NX size, the Engineer in-charge may examine the cores obtained from trial bores and may carry out any other test including tests on the cores and the cores may also be subjected to geological examination</p>
2.34 Priority wise references :
In case any dispute in the specification to be followed for any item of work, the following references shall be adopted in the order of preference as they appear below.
i) Standard specification of Government of Maharashtra.
ii) Ministry of shipping and Transport of Government of India (Road wing) Specifications for Road & Bridge Works.(IVth revision)
iii) Indian Road Congress specification.
iv) I.S.. codes.
v) P.W.D. Handbook of Government of Maharashtra.
vi) British Standard Specifications.

vii) American Standard Specification.

viii) Any other Standard Specification approved by Engineer –Incharge or as directed by Engineer- In- charge.

CHAPTER X

SCHEDULE OF ITEMS

SCHEDULE OF ITEMS FOR EXTRA WORK FOR WHICH RATES ARE TO QUOTED BY THE CONTRACTOR ALONG WITH THE TENDER.

Sr. No.	Item of work	Tender rate		Unit	Remarks
		in figure	in words		
1)	Foundation of piers and abutments complete in all respect.				
i)	Extra over lump-sum quotation for taking the base of the foundation below the corresponding levels arrived as per design Criteria clause 6 .1.2				
	a) For each pier foundation for				
	1) First 3 meters depth			Per metre	
	2) Next 3 to 6 Mtr. Depth.			Per metre	
	3) for more than 6 Mtr. Depth.			Per metre	
	b) For each abutment foundation				
	1) First 3 meters depth			Per metre	
	2) Next 3 to 6 Mtr. Depth.			Per metre	
	3) for more than 6 Mtr. Depth.			Per metre	
ii)	Rebate over lump-sum quotation for taking the base of the foundation below the corresponding levels alternative designs.				

Sr. No.	Item of work	Tender rate		Unit	Remarks
		in figure	in words		
	a) For each pier foundation for				
	1) First 3 meters depth			Per metre	
	2) Next 3 to 6 Mtr. Depth.			Per metre	
	3) for more than 6 Mtr. Depth.			Per metre	
	b) For each abutment foundation				
	1) First 3 meters depth			Per metre	
	2) Next 3 to 6 Mtr. Depth.			Per metre	
	3) for more than 6 Mtr. Depth.			Per metre	
2)	Extra / Rebate for increase decrease in the approved length of the bridge, if required, including provision and construction of bridge components required thereof conforming to the design data, not more than 10% of the bridge length.			One metre length	
3)	Extra / Rebates for raising / lowering the bridge formation up to 1.5 meters inclusive of raising / reducing the height of the piers and other connected members as required.			One metre length	
4.1	SINKING OF WELL BY PNEUMATIC PROCESS				
	a) For working pressure up to 1.75 kg/ Sq. cm.			per Cum of material taken out	
	b) For working pressure exceeding 1.75 kg/ Sq. cm. up to 2.5 kg / Sq. Cm.			per Cum of material taken out	
	c) For working pressure exceeding 2.5 kg/ Sq. cm. up to maximum of 3.5 kg / Sq. Cm.			per Cum of material taken out	
4.2	Cutting for excavation below the level of				

Sr. No.	Item of work	Tender rate		Unit	Remarks
		in figure	in words		
	cutting edge if required to form a sump with pneumatic process				
	a) For working pressure up to 1.75 kg/ Sq. cm.			per Cum of material taken out	
	b) For working pressure exceeding 1.75 kg/ Sq. cm. up to 2.5 kg / Sq. Cm.			per Cum of material taken out	
	c) For working pressure exceeding 2.5 kg/ Sq. cm. up to maximum of 3.5 kg / Sq. Cm.			per Cum of material taken out	
4.3	Plugging well under pneumatic conditions if required (Excluding cost of concrete.)			Per 8 Hours shift.	
	OR				
	Rendering well air tight by plastering or by Guniting well (Excluding cost of sand and cement.)			Per 8 Hours shift.	
	OR				
	For keeping well pressurized for any purpose other than actual pneumatic sinking.			Per 8 Hours shift.	
5)	Carrying out load test on superstructure including making all arrangements required.			per one MT Load	
6)	Unit rates for valuation of extra work done not covered in the Schedule of items for extra work.			Per One Cubic Metre.	
	a) In situ concrete in prestressed decking / girders (grade required shall be specified.)			Per One Cubic Metre.	
	b) M-45 Controlled concrete M-45 above water level.			Per One Cubic Metre.	

Sr. No.	Item of work	Tender rate		Unit	Remarks
		in figure	in words		
	c) M-35 controlled concrete M-35 above low water level			Per One Cubic Metre.	
	d) M-30 Controlled concrete M-30 above low water level.			Per One Cubic Metre.	
	e) M-25 Controlled concrete M-25 above low water level.			Per One Cubic Metre.	
	f) Ordinary grade concrete M-15 above low water level			Per One Cubic Metre.	
	g) Ordinary grade concrete M-15 above / below low water level			Per One Cubic Metre.	
	h) Controlled concrete M-25 below water level.			Per One Cubic Metre.	
	i) Controlled concrete M-30 above low water level.			Per One Cubic Metre.	
	j) Shuttering above low water level.			Per One Cubic Metre.	
	k) Shuttering below low water level			Per One Cubic Metre.	
	l) TMT FE -500 steel Reinforcement inclusive of cost of steel bars and binding wire and labour for binding and fixing.			Per MT	
	m) High yield strength deformed bars and binding reinforcement including of cost of steel bars and binding fixing.			Per MT	
	n) H. T. wires for PSC works including prestressing			Per MT	
	o) Structural steel work for cutting edge etc.			Per MT	
	p) Open excavation in strata other than mentioned in "P" and "Q" up to depth of 3 metre. Including			Per one Cum	

Sr. No.	Item of work	Tender rate		Unit	Remarks
		in figure	in words		
	dewatering.				
	q) Open excavation in soft rock			Per one Cum	
	r) Open excavation in hard rock.			Per one Cum	
	s) Timber shoring for foundation in the dry.			Per one Cum	
	t) Carrying out load test.			Per Test	
	For Approaches and Road work				
	A) i) Earth work in Embankment with 97% PD			Per One Cubic Metre.	
	A) ii) Excavation for Road way by mechanical means			Per One Cubic Metre.	
	B) Watering and compacting the embankment formed			Per One Cubic Metre.	
	C) Conveying materials obtained from road cutting including			Per One Cubic Metre.	
	D) Construction of granular sub-base by providing <u>Grading-II Material</u>			Per One Cubic Metre.	
	E) W.B.M by Grade I crusher broken metal			Per One Cubic Metre.	
	F) W.B.M by Grade II crusher broken metal			Per One Cubic Metre.	
	G) Supplying soft murum with spreading, compaction for side berms			Per One Cubic Metre.	
	H) Providing and applying prime coat			Per One Square Metre.	
	I) Providing, laying Built up spray grout 75 mm thick including tack coat			Per One Square Metre.	
	j) Providing and laying hot mix hot laid bituminous macadam 50 mm thick with tack coat			Per One cubic Metre	

Sr. No.	Item of work	Tender rate		Unit	Remarks
		in figure	in words		
	k) Providing and laying hot mix hot laid bituminous Dence Macadam 50 mm thick with tack coat			Per One cubic Metre	
	L) Providing and laying hot mix hot laid bituminous concrete 30 mm thick with tack coat			Per One cubic Metre	
	M) Providing dry rubble stone pitching 23 cm (about 9") thick			Per One Square Metre.	
	N) Providing dry rubble stone pitching 30 cm (about 12") thick			Per One Square Metre.	
	O) Providing dry quarry spall pitching 60 cm (about 24") thick			Per One Square Metre	
	P) Providing and laying cement concrete pipe of IS 456/2003 N.P. 3 class of 900 mm			Per Running Meter	
	Q) Providing and laying cement concrete pipe of IS 456/2003 N.P. 3 class of 1000 mm			Per Running Meter	
	R) Providing and fixing informatory sign boards of size 0.90 x 0.60 m made out of 14 guage Aluminum sheet bonded with IRC Specified colour of retro reflective sheeting boards			Per Square Meter	
	R) Providing and fixing sign boards of size 90cm having shape of an equilateral triangle made out of 14 gauge sheet with retro reflective sheeting Boards			Per Number	
	S) Providing and fixing cautionary / warning sign board of size 60 cm. having shape of equilateral triangle			Per Number	
	T) Providing and fixing cautionary / warning sign board of size 60 cm. having shape of equilateral triangle			Per Number	

Sr. No.	Item of work	Tender rate		Unit	Remarks
		in figure	in words		
	U) Providing and fixing Cautionary/Warning sign boards in Octagon size of 750 mm made out of 2 mm aluminum sheet			Per Number	
	V) Providing and fixing Mandatory / Regulatory sign board of circular shape of size 60 cm. dia. prepared on 16 gauge M.S. sheet			Per Number	
	W)Providing and fixing Road junction / Information sign board of size 1.20 m x 0.90 m. prepared on 16 gauge M.S. sheet			Per Square Meter	
	x) Metal Beam Crash Barrier -- Type - A, W : Metal Beam Crash Barrier (Providing and erecting a W metal beam crash barrier comprising of 3 mm thick			Per Running Metre	
	Y) Road Marking with Hot Applied Thermoplastic Compound with Reflectoring Glass Beads			Per Square Meter	
	Z) Road Delineators: Supplying and installation of delineators (Roadway Indicators, Hazard markers, Object markers) 80 to 100 cm high			Per Number	

Note : These rates are inclusive of supply of cement and steel by the contractor of his own cost.

Name of Work : CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..

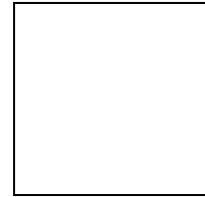
DECLARATION OF CONTRACTOR

I / We hereby declare that I / we have made myself / ourselves thoroughly conversant with the Sub-soil conditions, the local conditions regarding all materials (such as stones, murum, sand, etc.) and labour and accordingly I / We have based my /our rates for this tender. The specifications, conditions, bore results and lead of materials to be used 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 Executive Engineer P.W.Division Wardha** . or his duly authorized representative before starting the work and to abide by his decision, maintain / rectify the entire works as per standard specification book and MORT & 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

Annexure-I

Contractor Photo



(Format of Self declaration to be given on Plain paper.)

Self Declaration

I,.....

(Name of Contractor/ person,) Aged aboutyears, residing
at.....

(Postal Address) do hereby declare that I am the proprietor/Partner of (Name of company/firm) Registered
at.....

I do hereby declare that, the documents submitted in envelope No. 1 of the
tender document for the work of "CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI,
DAHEGAON, PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA,
DISTRICT WARDHA.. "

are true correct and complete.

In case, the contents of envelope No. 1 and other documents pertaining to the tender submitted
by me are found to be incorrect or false, I shall be liable for action under the relevant provision of Indian
Penal Code and other relevant laws.

Signature of Authorised person/Contractor

Applicant/Contractor Name

Address.....

Place:-

Date:-

E-mail.....

Mobile No.....

Website.....

ANNEXURE II

(Format of affidavit to be given on Rs.100 Non-Judicial Stamp Paper)

AFFIDAVIT / NOTIRIZED

I,..... Age years, address
..... (Authorised signatory to sign the contract),
hereby submit, vide this affidavit in truth, that I am the owner of the contracting firm/
authority signatory and I am submitting the documents in envelope no.1 for the purpose of scrutiny of the
contract **(Name of Work: CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON,
PULGAON TO AMRAVATI DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT
WARDHA..** I hereby agree to the conditions mentioned below:-

1. I am liable for action under Indian Penal Code for submission of any false / fraudulent paper /
information submitted in envelope No.1.
2. I am liable for action under Indian Penal Code if during contract period and defect liability period,
any false information, false bill of purchases supporting proof of purchase, proof of testing
submitted by my staff, subletting company or by myself, I will be liable for action under Indian
Penal Code.
3. I am liable for action under Indian Penal Code if any papers are found false /fraudulent during
contract period and even after the completion of contract (finalisation of final bill).

Signature of Authorised person

Applicant/Contractor

Name.....

Address.....

Place :-.....

Date :-

Email.....

Mobile No.....

Website.....

Annexure-III

FINANCIAL RULE – FORM 2 A

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

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(See Rule 51-4)

GUARANTEE BOND FOR SECURITY DEPOSIT.

In consideration of the Governor of Maharashtra (herewith referred to as ' THE GOVERNMENT') having agreed to exempt (herewith referred to as 'THE CONTRACT') form depositing with the Government in cash, the sum of Rs. _____(Rs. _____ only) being the amount of security deposit payable by the contract to the Government under terms and conditions of the agreement dated the _____ day of _____ and made between the Government on the one part and the contractor on the other part (hereinafter referred to as the "the observance and performance by the Government a Guarantee in the prescribed from a scheduled Bank in India being in fact these present in the like sum of Rs. _____(Rs. _____). We _____ Bank / Limited registered in India under _____ Act and having one or our local head office at _____ do hereby –

1. Guarantee of 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, damage, costs, charges, penalties and expenses payable to the Government by the contractor under or in respect of the said agreement.

2. Under to pay to the Government on demanded and without demure and notwithstanding any court or tribunal relating there to the said sum of Rs. _____ (Rs. _____ only) or such less sum may be demanded by the Government from us our liability hereunder being absolute and unequivocal and agree that –

(A) The guarantee herein contained shall remain in full force and effect during the subsistence of the said agreement and that same will continue to be enforceable till and 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 Government

certifies that the terms and conditions of the said agreement have been fully property carried out by contractor.

(B) We shall not be discharged or released from the liability under this Government 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 or conditions contained in the said agreement.
- (v) Any time given to the contractor or –

I Our liabilities hereunder shall be joint and several with that of the contract as if we were the principal debtors in respect of the said sum of _____ Rs. _____ (Rs. _____ only).

(D) We shall not revoke this guarantee during its currency except with the previous consent in writing of the Government IN WITNESS WHERE OF The Common Seal of _____ has been here into affixed this day of _____ The common seal of _____ was pursuant to the resolution to of the Board of Directors of the company dated the _____ day of _____ herein affixed in the presence of who in token have here to set their respective hands in the presence of –

(1)

(2)

ANNEXURE – IV

QUALITY CONTROL TESTS & THEIR FREQUENCIES

Sr. No.	Material	Test	Frequency of Testing	Remarks
1	Sand	i)Fineness Modules	At the beginning & if there is change insource	
2	Metal	i)Crushing Value	One test per200Cumor part hereof	P.W.D.handbookI.S.2386Part –IV
		ii)Impact Value		
		iii)Abrasion Value		
		iv)Water Absorption		
		v)Flakiness Index		
		vi)Stripping value		
		vii)Gradation		
3	Cement Concrete	Compressive Strength	Upto5Cum–1set	M.O.R.T.&H.Specification.1716 (Fourthrevision01)
			6-15–2sets	
			16-30–3sets	
			31-50–4sets	
			51&Above–4sets+1additional 50Cum or part thereof	
4	Cement	i)Compressive Strength	One test for each consignment of150 MT(3000bags)or part thereof.	I.S. 8112– 1989
		ii)Initial Setting Time		
		iii)Final Setting Time		
		iv)Specific Gravity		
		v)Soundness		
		vi)Fineness		
5	Steel	i)Weight per meter	One test for every5.0 M.T. or part thereof for each diameter.	I.S. 432 IS1786-1985
		ii)Ultimate Tensile Stress		
		iii)Yield Stress		
		iv)Elongation		

Sr. No.	Material	Test	Frequency of Testing	Remarks
6	Granular Sub-Base	i) Gradation	One test per 200cum	MORT&H Specification Table 900-3 (Fourth Revision 2001)
		ii) Atterberg limits	One test per 200cum	
		iii) Moisture content prior to compaction	One test per 250cum	
		iv) Density and compacted layer	One test per 500Sqm	
7	Water Bound Macadam	i) Aggregate impact value	One test per 200cum	MORT&H Specification Table 900-3 (Fourth Revision 2001)
		ii) Gradation	One test per 100cum	
		iii) Flakiness index & Elongation index.	One test per 200cum	
		iv) Atterberg limits of binding material.	One test per 25cum Of binding material.	
		v) Atterberg limits of portion of aggregates passing 425 Micron.	One test per 100cum of aggregate	
8	Prime coat/tack coat/forspray	i) Quality of Binder	No. of samples per lot and tests as per I.S. 731, S. 217 and I.S. 8887 as applicable.	MORT&H specification Table 900.4 (Fourth Revision 2001)
		ii) Binder Temperature	At regular close intervals,	
		iii) Rate of spread of binder.	1 test per 500sqm. And not less than two tests per day.	
9	Seal coat/ Surface Dressing	i) Quality of Binder	Same as mentioned under Sr.No.8	MORT&H specification Table 900.4 (Fourth Revision 2001)
		ii) Impact Value/Los Angle's Abrasion value	1 test per 50cum of aggregate.	
		iii) Flakiness & Elongation Index	1 test per 50cum.	
		iv) Stripping value of aggregate (Immersion tray test)	Initially 1 set of 3 representative specimen for each source of supply subsequently when warranted by change in the quality of aggregates.	
		v) Water Absorption		
		vi) Water sensitivity of mix (if required)		
		vii) Gradation.	1 test per 25cum	

Sr. No.	Material	Test	Frequency of Testing	Remarks
		viii) Soundness.	Initially one determination by each method for each source of supply, then as warranted by change in the quality of aggregate.	
		viii) of binder	At regular close intervals,	
		x) Rate of spread of materials	1 test per 500 Sqm. And not less than 2 tests per day.	
		xi) Percentage of fractured faces	When gravel is used. One test per 50 cum.	
10	Open graded premix surfacing/ Close graded premix surfacing	i) Quality of Binder	Same as per Sr. No.8	MORT&H specification Table 900.4 (Fourth Revision 2001)
		ii) Impact Value/Los Angle's Abrasion value	Same as per Sr. No.9	
		iii) Flakiness & Elongation Index	Same as per Sr. No.9	
		iv) Stripping value	Same as per Sr. No.9	
		v) Water Absorption	Same as per Sr. No.9	
		vi) Water sensitivity of mix	Same as per Sr. No.9	
		vii) Gradation.	Same as per Sr. No.9	
		viii) Soundness.	Same as per Sr. No.9	
		ix) Temp. of binder	At regular close intervals	
		x) Binder content	1 test per 500 Sqm. And not less than 2 tests per day.	
		xi) Rate of spread of materials	Regular control through checks of layer thickness.	
		xi) Percentage of fractured faces	Same as per Sr. No.9	
11	Bituminous Macadam/ BM	i) Quality of Binder	Same as per Sr. No.8	MORT&H specification Table 900.4. (Fourth revision 2001) FoBBM- Annexure-A on page 102.
		ii) Impact/ Abrasion value	Same as per Sr. No.9	
		iii) Flakiness/ Elongation Index	Same as per Sr. No.9	
		iv) Stripping value	Same as per Sr. No.9	

Sr. No.	Material	Test	Frequency of Testing	Remarks
		v)Water sensitivity of mix	Same as per Sr. No.9	
		vi)Water absorption	Same as per Sr. No.9	
		vii) Soundness	Same as per Sr. No.9	
		viii)Percentage of fractural faces	Same as per Sr. No.9	
		ix) Gradation	2 tests per day per plant both on individual constituents and mixed aggregates from dryer.	
		x) Binder content & aggrt . Grading	Periodic subject to minimum of 2testspers day plant.	
		xi) Control of temp of binder& aggregates for mixing & of the mix at the time of laying & rolling.	At regular close intervals.	
		xii) Density of compacted layer	Regular control through check of layer thickness. As directed by the Engineer-in- charge.	
12	Bitumen(Pure)	i)Penetration ii)Ductility iii)Softening point iv)Flash/fire point v)Specific gravity	2testper lot asper I.S.73	

Annexure-V

Name of Plantation of Trees

Sr.No.	Botanical Name	Local Name
1	Kegelia Pinnata	Indian Sases Tree

2	Dalbergia Sisoo	Shisvi
3	Hardwiekia Binnata	Anjan
4	Azadirachta Indica	Kadu Nimboo
5	Ficus Bengalesis	Vad
6	Ficus Elegiosa	Pimpad
7	Tamarindus Indica	Chinch
8	Terminalia Belarica	Behda
9	Milletia Ovatifolia	Kada Shisham
10	Milling Tonia Hortensis	Buchache Jhad
11	Colvilles Acemosa	Call Viliya
12	Jacaranda Mimosaefolia	Nil Mohar
13	Peltophorum Ferrugineum	Pit Mohar

**NAME OF WORK :- CONSTRUCTION OF MAJOR BRIDGE ON WARDHA RIVER DEOLI, DAHEGAON, PULGAON TO AMRAVATI
DISTRICT BORDER ROAD SH-322 A, IN KM 9/500 IN DEOLI TALUKA, DISTRICT WARDHA..UR .**

SCHEDULE 'C'

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
1	Excavation for foundation in earth, soils of all types, sand, gravel, soft murum including shoring and strutting, dewatering as necessary and disposing off excavated stuff as directed etc. complete. (By Mechanical Means)	BR.3 Page Number 102	
2	Excavation for foundation in hard murum and boulders including shoring and strutting, dewatering as necessary and disposing off excavated stuff as directed etc. complete.	BR.3 Page Number 102	
3	Excavation for foundation in soft rock including shoring and strutting, dewatering as necessary and disposing off excavated stuff as directed etc. complete.	BR.3 Page Number 102	
3.1	a) Lift upto 1.50 m.	BR.3 Page Number 102	
3.2	b) Lift upto 1.50 to 3.00 m.	BR.3 Page Number 102	

CONTRACTOR

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
3.3	c) Lift upto 3.00 to 4.50 m.	BR.3 Page Number 102	
3.4	d) Lift upto 4.50 to 6.00 m.	BR.3 Page Number 102	
4	Excavation for foundation in hard rock by chiselling and wedging or line drilling including shoring and strutting, dewatering as necessary and disposing off excavated stuff as directed etc. complete.	BR-3 Page Number 102	
4.1	a) Lift upto 1.50 m.	BR-3 Page Number 102	
4.2	b) Lift upto 1.50 to 3.00 m.	BR-3 Page Number 102	
4.3	c) Lift upto 3.00 to 4.50 m.	BR-3 Page Number 102	
4.4	d) Lift upto 4.50 to 6.00 m.	BR-3 Page Number 102	

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NO. OF CORRECTION

EXECUTIVE ENGINEER

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
5	Dewatering on BHP basis by using water pump including diversion of stream, providing cofferdams, earthen bunds etc. as may be necessary for foundation and other parts of the the works and pumping out water during and after excavation as may be required by using 5.0 to 9.0 BHP pump etc. complete. (prior approval of Superintending Engineer will be necessary)	BR 4 Page No 103	As directed by Engineer in-charge
6	Providing and laying PCC in M15 grade levelling course of remained thickness 100 mm thick below pile cap and for foundation with fully automatic micro processor PLC with SCADA enabled reversible drum type mixer/ concrete batch mix plant (pan mixer) etc. complete.	M.O.R.T and H - 1100, 1700	BR.5 page No.105
7	Providing and laying plain in situ / ready mix M-30 cement concrete of trap/ granite/quartzite/gneiss/crushed stone metal mechanically mixed, placed in foundation and compacted by vibration including necessary bailing out water, curing curing concrete batch mix plant / pan mixer with fine aggregates of required specifications (VSI sand finely washed etc) (excluding dewatering by pump) for 14 days RCC Grade.With Concrete Mixer	MORT&H (5th Rev.) 1700	
8	Providing and filling annular space around footing in rock by using concrete of M15 grade etc. complete.	M.O.R.T and H - 2100	
9	Providing and laying in situ / ready mix M-30 cement concrete of trap /granite/quartzite/ gneiss metal for cast in situ R.C.C. solid piers,column etc . including provision of V shaped false joints to form suitable panels on the faces to approve design with compacting by vibrating and curing complete. Including plywood/steel formwork, centering (excluding	MORT&H (5th Rev.) 1700, 2204, 2304	

CONTRACTOR

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	dewatering by means of pump) and including bailling out water and including CM 1:3 curing complete. i) height up to 5.0 m		
9.1	ii) Height 5 to 7.50 m,	MORT&H (5th Rev.) 1700, 2204, 2304	
9.2	iii) Height 7.50 to 10 m,	MORT&H (5th Rev.) 1700, 2204, 2304	
10	<p>Providing and laying in situ / ready mix M-30 cement concrete of trap metal for cast in situ R.C.C. Abutment, returns,wing walls etc . including provision of V shaped false joints to form suitable panels on the faces to approve design with compacting by vibrating and curing complete. Including plywood/steel formwork, centering (excluding dewatering by means of pump) and including bailling out water and including CM 1:3 curing complete as directed by Engineer in charge.</p> <p>a) Height upto 5 M. (With Concrete Mixer)</p> <p>i) Height up to 5 m, normal rate.</p> <p>ii) Height 5 to 7.50 m, add 5 percent extra over basic rate.</p> <p>iii) Height 7.50 to 10 m, 7.50 percent extra.</p> <p>iv) Over 10 m Height, add 10 percent extra for every 2.50m rise.</p>	MORT&H (5th Rev.) 1700, 2204, 2304	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
11	Providing and laying in situ / ready mix controlled M-30 cement concrete of of trap / granite / quartzite/ gniess metal for reinforced cement concrete caps over piers and abutments including necessary sacffolding plywood/steel formwork, compacting by vibrating, finishing in CM 1:3 and curing etc complete (Excluding reinforcement) With reversible drum type mixer/ concrete batch mix plant (pan mixer) . with fine agreeegates of required specifications (VSI sand finely washed etc)	MORT&H(5th Rev.) 1700, 2205, 2304	
12	Providing and laying in situ / ready mix M30 RCC of trap/ granite/ quartzite/ gneiss metal for RCC work of ballast walls, kerbs and box returns including scaffolding, compaction, formwork finishing and curing etc. complete. (excluding reinforcement, with fully automatic micro processor based PLC with SCADA enabled concrete batch mix plant / pan mixer with fine agreeegates of required specifications (VSI sand finely washed etc) RCC work of Ballast Walls	BR.50 Page Number 143 and B. 7, Page Number38	
12.1	Providing and laying in situ / ready mix M35 RCC of trap/ granite/ quartzite/ gneiss metal for RCC work of ballast walls, kerbs and box returns including scaffolding, compaction, formwork finishing and curing etc. complete. (excluding reinforcement, with fully automatic micro processor based PLC with SCADA enabled concrete batch mix plant / pan mixer with fine agreeegates of required specifications (VSI sand finely washed etc) RCC work of Kerbs	BR.50 Page Number 143 and B. 7, Page Number38	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
13	Providing cast in situ / ready mix M30 grade cement concrete for head walls of CD work / retaining walls etc. including necessary form work, compaction, finishing and curing etc. complete. (with reversible drum type mixer/ concrete batch mix plant (pan mixer) with SCADA	CD 3 Page 160	
14	Providing and laying in situ / ready mix M-40 cement concrete of trap / granite / quartzite/ gniess metal for reinforced cement concrete block below the bearing including necessary scaffolding, plywood/steel formwork, compaction by vibrating, finishing in CM 1:3 and curing complete (Excluding reinforcement) Using reversible drum type mixer/ concrete batch mix plant (pan mixer) with fine agreegates of required specifications (VSI sand finely washed etc)	MORT&H (5th Rev.) 1700, 2205, 2304	
15	Providing and fixing neoprene bearing as per detailed drawings etc. complete.	As directed by Engineer in charge.	
16	Providing, cutting, bending, hooking, tying and laying in position TMT FE 500 steel bars for reinforcement for all RCC works as per detailed drawings etc. complete.	BR.35 Page Number 134	TMT Fe 500 steel bars shall be provided.
17	Back filling behind abutment, wing wall and return wall as per drawings and technical specifications etc. complete. (by granular material)	MORT and H 2200 &- 710.1.4 of iRC 78	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
17.1	Back filling behind abutment, wing wall and return wall as per drawings and technical specifications etc. complete. by using excavated/dismantled granular material (Labour rate)	MORT and H 2200 &- 710.1.4 of iRC 78	
18	<p>Providing and laying in situ / ready mix M-35 controlled cement concrete of trap metal for RCC work in main/ cross girders, diaphragms etc. including ramming, vibrating, curing, formwork, centering and finishing in cement plaster excluding reinforcement etc. complete. (with fully automatic micro processor based PLC with SCADA enabled concrete batch mix plant / pan mixer and fine aggregates of required specifications (VSI sand finely washed etc)</p> <p>i) Height above 5m to 7.5m</p> <p>ii) Height above 7.5m to 10 m</p>	As Directed by Engineer in charge.	
19	Providing and laying in situ / ready mix M-35 controlled cement concrete of trap/ granite/ quartzite/ gneiss metal for RCC work in solid/ deck slab etc. including ramming, vibrating, curing, formwork, centering and finishing in cement plaster excluding reinforcement etc. complete. (with fully automatic micro processor based PLC with SCADA enabled concrete batch mix plant / pan mixer and fine aggregates of required specifications (VSI sand finely washed etc)	BR.38(a) Page Number 135 and B. 7, Page Number38	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	i) Height above 5m to 7.5m ii) Height above 7.5m to 10 m		
20	Providing, cutting, bending, hooking, tying and laying in position TMT FE 500 steel bars for reinforcement for all RCC works as per detailed drawings etc. complete.	BR.35 Page Number 134	
21	Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm to be installed by the manufacturer / supplier to their authorized representative ensuring compliance to the manufacturers instruction for installation as per approved drawings and standard specifications etc. complete.	MORT and H 2600	
22	Providing and laying weep holes of 100 mm diameter PVC pipes as per drawing for abutment returns, return walls etc. Complete.	MORT&H (5th Rev.) 2705, 2706	
23	Providing and laying of filter media with granular materials/ stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2 of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition as per drawing and technical specifications etc. complete.	MORT and H 2200 &- 710.1.4 of IRC 78	

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
23.1	Labor rate for Providing and laying of filter media with granular materials/ stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2 of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition as per drawing and technical specifications etc. complete,by using dismantled stone obtained from dismantling of existing structure.	MORT and H 2200 &- 710.1.4 of IRC 78	
24	Providing and laying in situ / ready mix M 30 CC of trap metal for wearing course 8cm thick including compacting, finishing, curing and filling in joints with bitumen etc. complete. (with fully automatic micro processor based PLC with SCADA enabled concrete batch mix plant / pan mixer with fine aggregates of required specifications (VSI sand finely washed etc)	BR.47(a) Page Number 140 and B. 7, Page Number38	
25	Providing and fixing heavy duty inter locking concrete Grey paving blocks of 60 mm thickness of having a strength of 300 Kilogram/Sq.cm. of approved quality and shape on a bed of crushed sand of 25 to 30 mm thick including skirting joints	A directed by Engineer in charge	
26	Providing and fixing in position Guard Railing as per Drg. No. 15 Type C dt. 20-4-79, with 3 rows of 40mm dia. G.I. pipe 30cm a part and fixed in M.S. channels of section 100 x 50 x 6 mm spaced 2.5 C/c 1:2:4 c.c. bedding of size 45 x 30 x 30cm. as per detailed drawing, with	MORTH 2703	As directed by Engineer Incharge

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	3 coats of approved of yellow and black paint including necessary excavation in any strata.		
27	Providing railing of mild steel angle post 2.0m center to center of section 75mm x 75mm x 10mm or equivalent I/C section of height 1.05 above bridge surface with minimum anchor length of 30cm including hold fast of 25mm diameter MS bar welded at the bottom and concreting of 1:3:6 of size 30cm x 30cm x 30cm with three rows of 40mm B class GI pipe provided at 30cm on center to center including scaffolding and one coat of anticorrosive paint with two coats of oil painting, curing of concrete etc. complete.	B.R.51(b) Page Number 145	
28	Providing and laying 0.90 meter thick metal mat consisting of rubble, oversize metal and normal size metal in specified thickness as per detailed drawing including supplying all materials, hand packing of rubble, spreading metal in layers and hard murum including watering and compaction with power roller etc. complete.	As directed by Engineer in charge	
29	Providing and fixing 90 cm x 60 cm Marble plate engraving 10 cm. height letter, figures including painting the lefters/figures with approved colour and shade complete	Bd.W.7 Page Number586	
30	Providing and applying two coats (exterior quality) of flat oil paint of approved colour and shade to the concrete/ masonry plastered surface including scaffolding if necessary, cleaning the surface and preparing surface etc. complete. (including providing and applying primer coat on the prepared surface.)	Bd 0.7 Page No. 406 and As directed by Engineer- in-charge.	

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NO. OF CORRECTION

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
31	Providing detailed geological reports of proposed site by maintaining geotechnical investigation of structure stratification collecting soil, rock and ground water samples for laboratory tests to arrive the foundation design parameters . Rock properties such as type of rock, jointing fractures, etc. complete with suggestion about the site foundation and remedies.	As directed by Engineer in charge	
32	Taking trial bores 75 to 100 mm for 53.0 to 88.9 mm core dia over burden (by diamond drilling machine) such as soil of all sorts, soft murum,hard murum and boulders and in soft rock including all materials such as casing pipes and accessories oil, grease, steel, rods, and such other materials as required (including conveying the material to site of work) . Preserving the loose sample in glass jar and core sample serially on site of work and conveying the same to HQ of concernring office as directed. a) over burden 0 to 50 meter	As directed by Engineer in charge	
33	Taking trial bores 75 to 100 mm for 53.0 to 88.9 mm core dia in rocks as specified below including all necessary materials such as oil,grease,steel boostan and such other materials as required (including conveying the material to site of work) and Preserving the core sample serially on site of work and conveying the same to HQ of concernring office as directed. Quartzite with diamond drill with Nx Bit 0 to 50 metre	As directed by Engineer in charge	
34	Providing tun tappa core boxes of jungle wood of size1.25mx 0.35x 0.15m for preserving core sample with all fixtures and fastening handles including locking arrangement etc . complete.	As directed by Engineer in charge	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
35	Dismantling the R.C.C. Work 1:2:4 and sorting out the materials such as steel etc. as directed and stacking them within the specified lead as directed etc. complete.	As directed by Engineer in charge.	
36	Dismantling stone masonry in lime or cement mortar including stacking the materials as directed with all leads, lifts etc.	As directed by Engineer in charge.	
37	Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.	MORTH 201	
38	Excavation for roadway in earth, soil of all sorts, sand, gravel or soft murum including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stacking as directed.	MORTH 301	
39	Transportation of Unsuitable material obtained from excavation including loading, unloading and conveying and disposing as directed beyond 2.5km lead.	As directed by Engineer in charge	
40	Providing earth work in embankment with approved materials obtained from departmental land upto lead of 50m. including all lifts, laying in layers of 20cm. to 30cm. thickness breaking clods, dressing to the required lines, curves, grades & section, watering and compaction with	MORTH 305	

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	vibratory roller to achieve not less than 97 % of standard proctor density etc. complete (Material obtained from departmental Land)		
41	Providing earth work in embankment with approved materials obtained from other sources having CBR more than 10 % including all lead and lifts, laying in layers of 20cm. to 30cm. thickness breaking clods, dressing to the required lines, curves, grades & section, watering and compaction with vibratory roller with V-Sat attachment to achieve not less than 97 % of standard proctor density etc. complete (Material obtained from Other sources)	MORTH 305	
42	Watering and compacting of embankment formed of materials obtained from the road cutting within a lead of 50 m, not less than 97 % of standard Proctor density after laying them in layers of 20 cm. to 30 cm. with vibratory roller.	MORTH 305	
43	Conveying materials obtained from road cutting including all lifts, laying in layers of 20cm to 30cm. breaking clods, dressing to the required lines, curves, grades and section, watering and compacting to not less than 97% of standard Proctor density for a lead of over 50m. to 300m. inclusive from the site of excavation to the site of deposition as directed.	MORTH 305	Rd 18 A page no. 197
44	Conveying materials obtained from road cutting including all lifts, laying in layers of 20cm. to 30cm. breaking clods, dressing to the required lines, curves, grades and section, watering and compacting to not less than 97% of standard proctor density for a lead of 300m. to 500m. inclusive, from the site of excavation to the site of deposition as directed.	MORTH 305	Rd 18 A page no. 197

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
45	Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader / Paver on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- By Mix in Place Method and Grading - II Material	MORTH 401	
46	Supplying hard murum/ kankar at the road site, including conveying and stacking complete.	MORTH 408 and As Directed by Engineer in charge.	
47	Spreading hard murum/ soft murrum/ gravel or kankar for side width complete	MORTH 408 and As Directed by Engineer in charge.	
48	Compacting the hard murum side widths including laying in layers on each side with vibratory roller including artificial watering etc. complete.	MORTH 408 and As Directed by Engineer in charge.	
49	Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate (natural sand/ VSI grade finely washed crushed sand) conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, , cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant/ Weigh batch mixer, transported to site with all leads and lifts, laid with a paver with electronic sensor /by	MORTH 601	

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	suitable means as approved by Engineer-in-charge , compacting with vibratory roller, finishing, curing and including preparation of sub-grade surface if required etc. complete. with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete.		
50	Providing and laying 125 micron Low Density Polyethylene (LDPE) sheet confirming to IS 3395 : 1997 below concrete pavement including all materials and labour complete.	MORTH 602.5	
51	Providing and laying in-situ M40 Grade unreinforced plain cement concrete pavement over a prepared sub base with 43 grade cement , coarse and fine aggregate (natural sand/ VSI grade finely washed crushed sand) conforming to IS 383, using fine and coarse aggregates combined gradation as per Table 600-3 of MORTH Specification 2013, mixed in a Tilting type Concrete Mixer as per approved mix design, admixtures, spreading, laying compacting and finished in a continuous operation without paver machine, finishing to lines and grades as directed by Engineer-in-charge and curing by curing compound /by providing cement vata in cement Mortar 1:8 @0.6m X 0.6m centre to centre, admeasuring 80 mm at bottom and 40 mm at top with depth of 75mm and maintaining the same throughout curing period by any other method approved by Engineer-in-charge. with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete.	MORTH 602	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
52	Providing and fixing in position TMT FE 500, 32 mm dia dowel bars precoated with anticorrosive epoxy paint of required Dia. 60 cms. Long and at 30.00 cm. C/C and wherever directed including handling, straightening, necessary cutting supported by TMT FE 500, chairs with proper alignment by using properly designed assembly of Bulkheads lubricating half length with bituminous paint as directed etc. complete.	MORTH 602.6.5	
53	Providing and fixing in position TMT FE 500, tie bars precoated with anticorrosive epoxy paint of 12 mm dia. 70 cms.long and at 30.00 cm. C/C and wherever directed including handling, straightening wrapping with paper of approved quality for half length, necessary cutting, handling, straightening , supported by assembly of TMT FE 500, chairs with proper alignment etc. complete.	MORTH 602.6.4.2	
54	Cutting transverse contraction joints 3 to 4 mm wide and depth 60mm. .in concrete slab using concrete cutting machine with diamond studded saw within 48 hours of casting of bay / slab etc. complete including subsequent widening of the groove 8 to 10 mm. wide at top having depth of 15 mm. as directed by Engineer incharge.	MORTH 602.6.3 & 602.6.4	
55	Providing to contraction joints polysuphide sealent (Pouring grade) confirming to BS : 5212 - 1989 into sawed groove widened at top for sealent reservoir of specified size and shape as per detailed drawing including fixing Polyethylene foam backer rod of required diameter (appraox. 25% larger than the initial 3 mOne Metric Tonneo 4 mm. joint) overlaid with bond breaking tape as per detailed drawing. Item includes cleaning the joints with water jet / air compressor	MORTH 602.6.3 & 602.6.4	

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	and allowing joint to become thoroughly dry before sealent is applied and applying primer. (A) Contraction and longitudinal joints (15 mm. deep x 8 mm.wide)		
56	Providing expansion joints with 25mm thick bituminous pad as per detailed drawings etc. complete.	BR.43 Page Number 138	
57	Providing and laying filter material underneath pitching in slopes as per drawings and technical specifications etc. complete.	MORT and H-2500	
58	Providing and laying filter material underneath pitching in slopes as per drawings and technical specifications using available dismantled / excavated material etc. complete(labour rateonly).	MORT and H-2500	
59	Providing and laying pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and technical specifications etc. complete. (by stone/boulder)	MORT and H-2500	
60	Providing and laying pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and technical specifications using available dismantled / excavated material etc. complete. (by stone/boulder)(labour rate)	MORT and H-2500	
61	Conveying materials obtained from excavation /dismantling including all lifts for a lead of 50 m to 300 m inclusive from site of excavtion/dismantling to the site of deposition as directed by	As directed by Engineer in charge	

CONTRACTOR

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	Engineer in charge		
62	Construction of dry rubble stone masonry including all materials, rubble, chippings, transportation etc. complete.	Rd.74 page no.247	
63	Providing and fixing factory made Hydraulically pressed Mechanically vibrated and compacted precast inter locking cement concrete paving blocks 100MM thick in M-50 grade of approved size and shape for City streets and roads with high volume/ heavy traffice as specified and as per IS 15658:2006 including cost of all materials, manufacturing, curing, transportation of blocks to work site including loading, unloading and stacking as directed, laying paving blocks in position over prepared bed of natural sand / crushed sand of 50 mm thickness including necessary excavation in all stratas, spreading blindge of fine sand over the prepared bed, compacting blocks by plate vibrator etc. complete.	IRC-SP-63	
64	Providing and casting in situ or precast tapering R.C.C. M-20 Mountable type Kerb without gutter (as per IRC 86 1983) embedded 125mm below ground level over M-10 PCC finished neatly with C.M. 1:2, setting the same in C.M. 1:2, including the required excavation in any strata and removing the excavated stuff any where in city and redoing the surface as specified and directed by Engineering In-charge. Using Concrete Batching and Mixing Plant	MORTH 409	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
65	Providing and laying cement concrete pipe of IS 458:2003 NP-2 class of 450mm diameter in proper line, level and slope including providing and fixing collars in cement mortar 1:2 and curing etc. complete.	CD.7 Page.No. 162	MORTH 2900
66	Metal Beam Crash Barrier -- Type - B, THRIE : Metal Beam Crash Barrier (Providing and erecting a Thrie metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 810)""	MORTH 811	As directed by Engineer in charge
67	Excavation for catch / side water gutter in all sorts of soils to the specified section including stacking the excavated stuff in a regular bund and disposing of unsuitable or excess stuff as directed all sorts of soils.	MORTH 309	
68	Providing soling using 80 mm size trap metal in 15 cm. layer including filling voids with Crushed sand/grit, ramming, watering etc. complete.	As directed by Engineer in charge.	
69	Providing and laying in situ / ready mix cement concrete of M-10 proportion with trap metal in foundation including necessary form work, compacting and curing etc. complete. (with reversible drum type mixer with SCADA with fine agreeegates of required specifications (Natural	CD.-3 Page.No. 160	

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	sand / VSI sand finely washed etc)		
70	Providing and laying in situ / ready mix M-20 controlled reinforced cement concrete of trap metal for raft slab including "V" haunches, formwork, scaffolding, compaction by vibrating, finishing curing etc. complete. concrete batch mix plant / pan mixer with fine aggregates of required specifications (VSI sand finely washed etc) etc. complete. (excluding reinforcement). a) RCC Grade with reversible drum type mixer/ concrete batch mix plant (pan mixer) .	MORT&H (5th Rev.) 1700, 2304	
71	Providing cast in situ / ready mix M20 grade cement concrete for head walls of CD work / retaining walls and walls of drain etc. including necessary form work, compaction, finishing and curing etc. complete. (with reversible drum type mixer/ concrete batch mix plant (pan mixer) with SCADA	CD 3 Page 160	
72	Providing and fixing pressure relief pipes of 110 mm diameter of PVC as per drawing for R.C.C Raft, galleries returns, abutments, wing wall etc complete.	MORT&H (5th Rev.) 2705, 2706	
73	Providing and laying in situ / ready mix M-20 controlled cement concrete of trap/ granite/ quartzite/ gneiss metal for RCC work in solid/ deck slab etc. including ramming, vibrating, curing, formwork, centering and finishing in cement plaster excluding reinforcement etc. complete. (with fully automatic micro processor based PLC with SCADA enabled concrete batch mix plant / pan mixer and fine aggregates of required specifications (VSI sand finely washed etc)	BR.38(a) Page Number 135 and B. 7, Page Number38	

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NO. OF CORRECTION

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	Height up to 5 m.		
74	Providing and fixing R.C.C 200m / ordinary kilometre stones as per I.R.C. standard including fixing in standard size in C.C 1:4:8 block including curing, painting lettering etc. complete.	0	
74.1	RCC 200 meter Stone in CC 1:4:8	MORTH 805	
74.2	Fixing 1:2:4 ordinary km. stones in C.C. 1:4:8	MORTH 805	
75	Supplying and Fixing of Molded Shank Raised Pavement Markers / Cat's Eye made of polycarbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg tested in accordance to ASTM D 4280 Type H and complying to Specifications of Category A of MORTH Circular No RW/NH/33023/10-97 DO III Dt 11.06. 1997. The height, width and length shall not exceed 50 mm, 100 mm and 102 +/- 2 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 +/- 2 mm and height not less than 30+/- 2 mm) from the body is to be a minimum value of 500 Kg. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer.The contractor shall submit a two year warranty for satisfactory field	MORTH 804	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	performance including stipulated retro-reflectance of the reflecting panel, to the Engineer.		
76	Providing and Laying hot applied thermoplastic road marking strip on Bituminous Surface of specified shade/ colour of 2.5 mm thick including 1.5 Refractive index reflectorizing glass beads @ 250gm/sqm .Thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35:2015. Initial Dry reflectivity RL shall be > 250 mcd/sqm/lux measured in the initial 7 days and sustained reflectivity RL of 100 mcd/sqm/ lux and Qd of 100 mcd/sqm/ lux measured at the end of 2 years by means of a Standard Reflectometer of Zehntner, Easylux, Delta make capable of measuring RL & QD both according to IRC 35:2015 clause 15.5. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-in-charge and in accordance with applicable specifications.(Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015).	MORTH 803.4	
77	Metal Beam Crash Barrier -- Type - A, W : Metal Beam Crash Barrier (Providing and erecting a W metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810)""	MORTH 811	As directed by Engineer in charge

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
78	<p>Providing and fixing Mandatory/Regulatory sign boards in circular shape of 900 mm dia made out of 2 mm aluminum sheet bonded with white retro reflective sheeting of Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) having pressure sensitive/heat activated adhesive retroreflective specified back ground, border and back side retroreflective symbols, letters, numerals, arrow as per IRC:67-2012 Table No 8.3 Supported with back support frame 25mm x 25mm x 3mm, duly painted on back side with grey stove enamel paint and supported on one no. of M. S. angle iron post of size 65 mm X 65 mm X 6 mm, 3.45 m long, duly painted with with flat oil paint having alternate black and white bands of 25 cm width including G.I. fixtures etc; fixing the boards in M25 grade concrete block of size 60cm X 60cm X 75cm including transportation etc; complete. Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) shall have 7 years written warranty from the manufacturer and authorised distributor/convertor issued for field performance including the screen printed areas and cut-out sheeting and cut-out durable transparent overlay film and this warranty certificate in original should be submitted to the Engineer in charge by the contractor/supplier.</p>	MORTH 801	
79	<p>Providing and fixing Cautionary/Warning sign boards in Equilateral Triangle size of _900_ mm made out of 2 mm aluminum sheet bonded with white retro reflective sheeting of Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) having pressure sensitive/heat activated adhesive retroreflective specified back ground, border and back side retroreflective symbols, letters, numerals, arrow as per IRC:67-2012 Table No 8.3 Supported with back support frame 25mm x 25mm x 3mm, duly painted on back side with grey stove enamel paint and supported on one no. of M. S. angle iron post of size 65 mm X 65 mm X 6 mm, 3.45 m</p>	MORTH 801	

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	long, duly painted with with flat oil paint having alternate black and white bands of 25 cm width including G.I. fixtures etc; fixing the boards in M25 grade concrete block of size 60cm X 60cm X 75cm including transportation etc; complete. Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) shall have 7 years written warranty from the manufacturer and authorised distributor/convertor issued for field performance including the screen printed areas and cut-out sheeting and cut-out durable transparent overlay film and this warranty certificate in original should be submitted to the Engineer in charge by the contractor/supplier.		
80	Providing and fixing Cautionary/Warning sign boards in Octagone size of 900_mm made out of _2_mm aluminum sheet bonded with white retro reflective sheeting of Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) having pressure sensitive/heat activated adhesive retroreflective specified back ground, border and back side retroreflective symbols, letters, numerals, arrow as per IRC:67-2012 Table No 8.3 Supported with back support frame 25mm x 25mm x 3mm, duly painted on back side with grey stove enamel paint and supported on one no. of M. S. angle iron post of size 65 mm X 65 mm X 6 mm, 3.45 m long, duly painted with with flat oil paint having alternate black and white bands of 25 cm width including G.I. fixtures etc; fixing the boards in M25 grade concrete block of size 60cm X 60cm X 75cm including transportation etc; complete. Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) shall have 7 years written warranty from the manufacturer and authorised distributor/convertor issued for field performance including the screen printed areas and cut-out sheeting and cut-out durable transparent overlay film and this warranty certificate in	MORTH 801	

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EXECUTIVE ENGINEER

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	original should be submitted to the Engineer in charge by the contractor/supplier.		
81	<p>Providing and fixing of retro- reflectorised informatory sign board rectangular/Square in shape having area less than 0.9 One Square Meter made out of _2_mm aluminum sheet bonded with white retro reflective sheeting of Class _B (Type IV High intensity micro-prismatic grade sheeting-HIP) having pressure sensitive/heat activated adhesive retoreflective specified back ground, border and back side retoreflective symbols, letters, numerals, arrow as per IRC:67-2012 Table No 8.3, supported with back support frame 25mm x 25mm x 3mm, duly painted on back side with two coats of grey stove enamel paint and supported on one no. mild steel angle iron post 75 mm x 75 mm x 6 mm, 3.5 mt long firmly fixed to the ground by means of properly designed foundation with M25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing The angle iron post shall be duly painted with one coat of epoxy primer and two coats of epoxy finish paints having alternate black and white bands of 25 cm width including GI fixtures and transportation etc.complete.The nut bolts of board with angle iron post/supporting structure after fixing at site has to be electrically welded. Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) sheeting shall have 7 years written warranty from the manufacturer and authorised distributor/convertor issued for field performance including the screen printed areas and cut-out sheeting and cut-out durable transparent overlay film and this warranty certificate in original should be submitted to the Engineer in charge by the contractor/supplier.</p>	MORTH 801	

SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
82	<p>Providing and fixing of retro- reflectorised informatory sign board rectangular/Square in shape having area greater than 0.90 square meter 2 mm aluminum sheet bonded with white retro reflective sheeting of Class B_ (Type IV High intensity micro-prismatic grade sheeting-HIP) having pressure sensitive/heat activated adhesive retoreflective specified back ground, border and back side retoreflctive symbols, letters, numerals, arrow as per IRC:67-2012 Table No 8.3, supported with back support frame 25mm x 25mm x 3mm, duly painted on back side with two coats of grey stove enamel paint and supported on two no. mild steel angle iron post 75 mm x 75 mm x 6 mm, 3.5 mt long firmly fixed to the ground by means of properly designed foundation with M25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing The angle iron post shall be duly painted with one coat of epoxy primer and two coats of epoxy finish paints having alternate black and white bands of 25 cm width including GI fixures and transportation etc.complete.The nut bolts of board with angle iron post/supporting structure after fixing at site has to be electrically welded. Class B (Type IV High intensity micro-prismatic grade sheeting-HIP) sheeting shall have 7 years written warranty from the manufacturer and authorised distributor/convertor issued for field performance including the screen printed areas and cut-out sheeting and cut-out durable transparent overlay film and this warranty certificate in original should be submitted to the Engineer in charge by the contractor/supplier.</p>	MORTH 801	
83	<p>Road Delineators: Supplying and installation of delineators (Roadway Indicators, Hazard markers, Object markers) 80 to 100 cm high above ground level, painted black and white in 15 cm wide strips, fitted with 80x100mm rectangular or 75mm dia. Circular reflectorised panels at</p>	MORTH 806	

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

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SR. NO.	ITEM	Reference to standard Specification book vol.I&II 1981of Govt. of Maharashtra and M.O.R.T.H/ I.R.C/ I.S and other specification	Additional Specification, if any
	the top, buried or pressed into the ground and confirming to I.R.C. 79 and the drawings		
84	Providing and laying cement concrete pipe of IS 458:2003 NP-2 class of 1000mm diameter in proper line, level and slope including providing and fixing collars in cement mortar 1:2 and curing etc. complete.	CD.7 Page.No. 162	MORTH 2900
85	Providing and laying in PCC M15 grade leveling course below approach slab and for foundation complete with fully automatic micro processor PLC with SCADA enabled reversible drum type mixer/ concrete batch mix plant (pan mixer) as per drawings and Technical specifications etc. complete with fine aggregates of required specifications (VSI sand finely washed etc)	MORT and H 1700 and 2700	BR.5 page no.105
86	Providing and laying in situ / ready mix M-30 controlled reinforced cement concrete of trap metal for raft slab including "V" haunches, formwork, scaffolding, compaction by vibrating, finishing curing etc. complete. concrete batch mix plant / pan mixer with fine aggregates of required specifications (VSI sand finely washed etc) etc. complete. (excluding reinforcement). a) RCC Grade with reversible drum type mixer/ concrete batch mix plant (pan mixer) .	MORT&H (5th Rev.) 1700, 2304	

TS Estimate No.176/CE/2025-26

Sub Divisional Engineer
Public Works Sub Division
Pulgaon

Executive Engineer
Public Works Division
Wardha

Superintending Engineer
Public Works Circle
Chandrapur

CONTRACTOR

NO. OF CORRECTION

EXECUTIVE ENGINEER

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CONTRACTOR

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