



TENDER DOCUMENT FOR EXECUTION

Particulars	Details
Client	Nashik Municipal Smart City Development Corporation Limited
Project Name	Smart Road Pilot Project
Name of Work	Development of road from Trimbak Naka to Ashok Stambh under smart road pilot project in Nashik (Maharashtra)
Cost of Blank Tender Form	Rs.5,000/- (Rupees Five Thousand Only) + GST
Estimated Cost	Rs.16,15,04,998/- (Rupees Sixteen Crore Fifteen Lakhs Four Thousand Nine Hundred and Ninety Eight Only) Inclusive of GST
Earnest Money Deposit	Rs.8,07,525/- (Rupees Eight lakh seven thousand five hundred and twenty five Only)
Initial Security Deposit	Rs. 32,31,000/- (Rupees Thirty two Lakhs Thirty one thousand Only)
Document Issue Date	
Document Number	

Nashik Municipal Smart City Development Corporation Limited

Nashik Municipal Corporation, Rajiv Gandhi Bhavan, Sharanpur Road, Nashik - 422001

December 2017

RFP for development of smart road pilot project in Nashik

TENDER NOTICE

Online digitally signed Bids in '**B2**' Form (item rate) for the below mentioned work is invited by NMSCDCL from the Bidders. The Tender Document is available on the website <https://mahatenders.gov.in>

1	Description of work	Development of road from Trimbak Naka to Ashok Stambh under smart road pilot project in Nashik (Maharashtra) (Design life expectancy of 50 years.)
2	Estimated cost	Rs.16,15,04,998/- (Rupees Sixteen Crore Fifteen Lakhs Four Thousand Nine Hundred and Ninety Eight Only))
3	Cost of Blank Bid form/ TD Fee (Non-Refundable)	Rs.5,000/- (Rupees Five Thousand Only) + GST per set (Tender Document can only be downloaded from https://mahatenders.gov.in using credit card/ debit card / net banking)
4	Period of Contract	Construction: 6 (six) months, including rainy season; and Defect Liability Period: 60 (sixty) months
5	NMSCDCL Contact Details	Nashik Municipal Smart City Development Corporation Limited Nashik Municipal Corporation, Rajiv Gandhi Bhavan Purandare colony, Sharanpur Nashik Email: pmc@nashiksmartcity.in
6	Bid Validity Period	The Bid shall remain valid for a period of 120 days from the Bid Deadline
7	Bid Security/ Earnest Money Deposit	The EMD is Rs.8,07,525/- (Rupees Eight lakh seven thousand five hundred and twenty five Only) and is to be deposited online using credit card/ debit card / net banking at https://mahatenders.gov.in

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1. TENDER SCHEDULE

Period of Availability of Bidding Document on Web Site	From <u>24/01/2018</u> , <u>15:00</u> hrs. To <u>07/02/2018</u> , <u>15:00</u> hrs.
Last date and address for submission of letters seeking clarifications or suggest amendments to RFP in writing	Date: <u>30/01/2018</u> , Time: 11:00hrs Email ID: pmc@nashiksmartcity.in Address: NMSCDCL Office, Rajiv Gandhi Bhavan, NMC, Nashik-422001
Time and date of Pre-Bid Conference	Date: <u>30/01/2018</u> , Time: 11:00hrs.
Last date and time for Online Receipt of Bids	Date: <u>07/02/2018</u> , Time: <u>15:00</u> hrs.
Date and time for physical/ hard copy receipt of Bids	Date: <u>08/02/2018</u> , Time: <u>14:00</u> hrs.
Time and date of opening of Envelope I and Technical- Bids (Bids will be opened Online by the authorized officers)	Date: <u>08/02/2018</u> , Time: <u>15:00</u> hrs.
Time and date of opening of commercial Bids (Bids will be opened online by the authorized officers)	To be intimated separately to the technically qualified bidders
Officer inviting Bids	Chief Executive Officer, Nashik Municipal Smart City Development Corporation Limited

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Notes:

- The changes / corrigendum, if any will only be published on <https://mahatenders.gov.in>.
- Right to reject any or all bids without assigning any reasons thereof is reserved by NMSCDCL.
- The Bids shall be accepted through hard copy as well as soft copy in the prescribed format as follows.
 - Hard Copy to be submitted - Envelope I and II – Technical Bid
 - To be uploaded online – Envelope I, II and III – Technical Bid and Financial Bid
- All requisite information required for the submission of documents is available in the aforementioned website.
- For any queries related to tender documents, please contact NMSCDCL.

**Chief Executive Officer
NMSCDCL**

DISCLAIMER

1. Though adequate care has been taken while preparing the Tender Document (TD), the Bidders should satisfy themselves that the document is complete in all respects. Intimation of any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder within 7 (seven) days from the date of notification of TD/ Issue of the TD, it shall be considered that the TD is complete in all respects.
2. The information contained in this TD and subsequently provided to the Bidders in documentary form by NMSCDCL shall form the integral part of this TD.
3. NMSCDCL reserves the right to modify, amend or supplement this TD.
4. The issue of this TD does not imply that NMSCDCL is bound to select a Bidder or to appoint the Selected Bidder. NMSCDCL reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever.
5. The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, uploading delivery fees, expenses associated with any demonstrations or presentations which may be required by NMSCDCL or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and NMSCDCL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation for submission of the Bid, regardless of the conduct or outcome of the Selection Process.
6. This TD is not an agreement or an offer by NMSCDCL to the prospective Bidders or any other person. The purpose of this TD is to provide interested parties with information that may be useful to them in the formulation and submission of their Bids pursuant to this TD.
7. This TD may not be appropriate for all persons and it is not possible for NMSCDCL and its employees to consider the objectives, technical expertise and particular needs of each party who reads or uses this TD. The assumptions, assessments, statements and information contained in this TD, may not be complete, accurate, adequate or correct. Each Bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments and information contained in this TD and obtain independent advice from appropriate sources. Information provided in this TD to the Bidders may be on a wide range of matters, some of which may depend upon interpretation of law. The information given is not intended to be an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law.

LETTER OF INVITATION

TD No. _____; Date: _____

Dear Bidder,

On behalf of NMSCDCL, the Chief Executive Officer invites sealed bids in 'B2' form (item rate) from the Bidders for the work as described below:

Name of work	Estimated Cost (in Rs. inclusive of all Taxes)	Earnest money (In Rs.)	Initial Security Deposit (In Rs.)	Time limit in months	TD Fess (Rs.)
Development of road from Trimbak Naka to Ashok Stambh under smart road pilot project in Nashik (Maharashtra)	Rs.16,15,04,998/- (Rupees Sixteen Crore Fifteen Lakhs Four Thousand Nine Hundred and Ninety Eight Only))	Rs.8,07,525/- (Rupees Eight lakh seven thousand five hundred and twenty five Only)	Rs. 32,31,000 /- (Rupees Thirty two Lakhs Thirty one thousand Only)	Construction:6 (six) months, including rainy season	Rs.5000/- (Rupees Five Thousand only) plus GST

1. NMSCDCL is the implementing agency for the smart city proposal of Nashik. One of the task therein is development of smart roads. NMSCDCL is thus desirous of development of smart road pilot project. Accordingly, NMSCDCL hereby invites Bids from the Bidders to participate in the TD for "***Development of road from Triambak Naka to Ashok Stambh under smart road pilot project in Nashik (Maharashtra)***" for a Design Life Expectancy of 50 (Fifty) Years.
2. Bidder will be selected under item rate basis and in a Bid format as described in this TD.
3. Bidders are advised that the selection of Contractor shall be on the basis of an evaluation by NMSCDCL through the Selection Process specified in this TD. Bidders shall be deemed to have understood and agreed that no explanation or justification for any aspect of the Selection Process will be given and that the decisions of NMSCDCL are without any right of appeal whatsoever.
4. The Bids shall be accepted through hard copy as well as soft copy, as follows:
Hard Copy to be submitted - Envelope I and II– Technical Bid
To be uploaded online – Envelope I, II and III - Technical Bid and Financial bid
5. The Bid will be rejected in case the Bidder has submitted the conditional Bid and/or the Bid is not in adherence to the TD.
6. The Bidders should submit their Bid along with all supporting documents complete in all aspect on or before Tender Schedule in the prescribed format.

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7. Bidder shall submit Bid along with non-refundable TD fees and EMD as prescribed above.
8. The Technical Bids will be opened on as provided in the Tender Schedule in presence of authorized representatives of Bidders who wish to be present. Bids received without or lesser than the prescribed TD fee and EMD will be declared invalid and rejected. In the event of any date indicated in the Tender Schedule is a declared holiday, the next working day of NMSCDCL shall become operative for the respective purpose mentioned herein for which no prior intimation will be given.
9. The TD can be downloaded from website: <https://mahatenders.gov.in>. Any amendment/ corrigendum/ clarifications with respect to this TD shall be uploaded only on <https://mahatenders.gov.in>. The Bidder should regularly follow up for any amendment/ corrigendum/ clarification on the above website.
10. The Bidders will submit the Bids by the date and time indicated in Tender Schedule and as per the Instructions to Bidders (refer Section 1 of Volume I of this TD).
11. The TD includes the following documents:
 - Volume 1**
 - Section 1: Instructions to Bidders, Sample Formats
 - Section 2: Scope of Work
 - Section 3: Bills of Quantities
 - Volume 2**
 - Section 1: Contract Agreement
 - Section 2: General Conditions of Contract and Special Conditions of Contract
 - Section 3: Technical Specifications
 - Section 4: Drawings
12. NMSCDCL shall not be responsible for any delay in receiving the documents on account of any reasons and NMSCDCL reserves the right to revise or amend this letter of invitation and or the TD fully or partly prior to the Bid Deadline. NMSCDCL further reserves the right to reject any or all Bids without assigning any reasons.

Chief Executive Officer
Nashik Municipal Smart City Development Corporation Limited
Nashik Municipal Corporation
Rajiv Gandhi Bhavan
Purandare colony
Sharanpur
Nashik
Email: ceo@nashiksmartcity.in

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VOLUME I

SECTION 1: INSTRUCTIONS TO THE BIDDERS

1.1 DEFINITIONS

The words and expressions defined in this TD shall, unless the context otherwise requires, have the meaning hereinafter respectively assigned to them:

- (i) **“Bid”** shall mean the documents submitted by a Bidder pursuant to this TD, including the Technical Bid and Financial Bid along with all documents/ credentials/ attachments/ annexure etc., in response to this TD, in accordance with the terms and conditions hereof;
- (ii) **“Bidders”** shall mean a Company or a Consortium that has submitted the Bid in response to this TD. For avoidance of doubt, any reference to the Bidder includes its successors, executors and permitted assigns as the context may require;
- (iii) **“Bidding Process”** shall mean the process governing the submission and evaluation of the Bids as set out in Section 1 of Volume I of the TD;
- (iv) **“Bid Deadline”** shall mean the last date and time for submission of hard copies of Bid in response to this TD as specified in Tender Schedule;
- (v) **“Bid Validity Period”** shall have the meaning as set forth in Clause 1.23.1 of Section 1 of Volume I;
- (vi) **“BIS Code”** means the code issued by Bureau of Indian Standards;
- (vii) **“BOQ”** means Bills of Quantities as set out in Section 3 of Volume I of this TD;
- (viii) **“CC Roads”** means cement concrete road;
- (ix) **“Chartered Accountant”** shall mean a person practicing in India or a firm whereof all the partners practicing in India as a Chartered Accountant(s) within the meaning of the Chartered Accountants Act, 1949;
- (x) **“Construction Period”** means the period of 6 (six) months including rainy season;
- (xi) **“Contractor”** means the Successful Bidder selected by NMSCDCL pursuant to this TD for the Project, with whom the contract has been executed;
- (xii) **“Consortium”** means association of 2 (two) Companies that have entered into an consortium agreement as prescribed in Annexure 13 of this TD;
- (xiii) **“Company”/ “Companies”** shall mean organization(s) incorporated in India under the Companies Act, 1956 or Companies Act, 2013 including any amendment thereto;
- (xiv) **“CPWD”** means Central Public Works Department, Government of India;

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- (xv) **“Engineer”/ “Engineer-in-Charge”** means the engineer appointed/ nominated by NMSCDCL;
- (xvi) **“Estimated Cost”** shall mean the cost of the Project estimated by NMSCDCL i.e. Rs.16,15,04,998/- (Rupees Sixteen Crore Fifteen Lakhs Four Thousand Nine Hundred and Ninety Eight Only))
- (xvii) **“Financial Eligibility Criteria”** shall have the meaning as set forth in Clause 1.4 of Section 1 of Volume I hereof;
- (xviii) **“Financial Bid”** means the Bid submitted online in accordance with Annexure 15 by the Bidder and as envelope III as prescribed in Clause 1.22.1 of Section 1 of Volume I of this TD;
- (xix) **“EMD”** shall mean the online deposit of money on the e-tendering portal submitted along with the Bid by the Bidder under Clause 1.25 of Section 1 of Volume I hereof;
- (xx) **“GSB”** means granular sub base;
- (xxi) **“LoA”** means Letter of Award;
- (xxii) **“L1 Bidder”** shall have the meaning as set forth in Clause 1.28.5 of Section 1 of Volume I hereof;
- (xxiii) **“L2 Bidder”** shall mean the Qualified Bidder who has submitted the second lowest Financial Bid.
- (xxiv) **“Lead Bidder”** shall mean the member who has been designated as lead bidder in the consortium agreement executed by the consortium members submitting the Bid pursuant to this TD;
- (xxv) **“Liquid Assets”** shall mean cash in hand or an asset that can be readily converted into cash;
- (xxvi) **“Maharashtra PWD”** means Maharashtra State Public Works Department, Government of Maharashtra;
- (xxvii) **“MORTH”** means Ministry of Road Transport and Highways, Government of India;
- (xxviii) **“MMRDA”** means Mumbai Metropolitan Region Development Authority, Government of Maharashtra;
- (xxix) **“MCGM”** means Municipal Corporation of Greater Mumbai;
- (xxx) **“MSRDC”** means Maharashtra State Road Development Corporation Limited,

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Government of Maharashtra;

- (xxxix) **"MSEDCL"** means Maharashtra State Electricity Distribution Company Limited, Government of Maharashtra;
- (xxxvii) **"MES"** means Military Engineer Services;
- (xxxviii) **"NHAI"** means National Highways Authority of India, an autonomous agency of the Government of India;
- (xxxiv) **"NMSCDCL"** shall mean Nashik Municipal Smart City Development Corporation Limited;
- (xxxv) **"Project"** means construction and development of the road from Trimbak Naka to Ashok Stambh admeasuring 1.1 Km. under smart road pilot project at Nashik, Maharashtra in accordance with Volume II of this TD;
- (xxxvi) **"Contract Price"** shall mean the price offered by the Contractor for the Project;
- (xxxvii) **"PQC"** means Pavement Quality Concrete;
- (xxxviii) **"Qualified Bidder"** shall mean the same meaning as set forth in Clause 1.5.1 of Section 1 of Volume I hereof;
- (xxxix) **"RCC chambers"** means recompression chamber, a chamber used to treat divers from decompression sickness;
- (xl) **"Selection Process"** means the process set forth in Clause 1.28.5 of Section 1 of Volume I hereof;
- (xli) **"MS Bus Stop"** means a stoppage point for the buses;
- (xlii) **"Site"** means the road from Trimbak Naka to Ashok Stambh under the Project;
- (xliii) **"Successful Bidder"** shall mean the L1 Bidder selected by NMSCDCL pursuant to this TD for implementation of Project, and to whom the LoA has been issued;
- (xliv) **"TD"** shall mean this tender document comprising of volume I and Volume II as defined herein;
- (xlv) **"TD fee"** shall mean the non-refundable fee to be paid online by the Bidders for the blank TD;
- (xlvi) **"Technical Bid"** means the bid comprising of documents listed in envelope II of Clause 1.22.1 of Section 1 of Volume I of this TD;
- (xlvii) **"Technical Eligibility Criteria"** shall have the meaning as set forth in Clause 1.3 of

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Section 1 of Volume I hereof;

- (xlviii) **“Tender Schedule”** shall mean the list of dates prescribed in page 3 of this TD;
- (xlix) **“Volume I”** comprises of Section 1 (instruction to the Bidders, sample formats), Section 2 (scope of work) and Section 3 (bills of quantities) of this TD;
- (l) **“Volume II”** comprises of Section 1 (contract agreement), Section 2 (general conditions of contract and special conditions of contract) Section 3 (technical specifications) and Section 4 (drawings) of this TD.

1.2 INTERPRETATIONS

- a) Words comprising the singular shall include the plural and vice versa.
- b) Words referring to one gender shall means reference to all the genders.
- c) An applicable law shall be construed as reference to such applicable law including its amendments or re-enactments from time to time.
- d) A time of day shall save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time.
- e) Different parts of this TD are to be taken as mutually explanatory and supplementary to each other and if there is any differentiation between or amongst the parts of this TD, they shall be interpreted in a harmonious manner so as to give effect to each part.
- f) The table of contents and any headings or sub-headings in the TD has been inserted for reference only and shall not affect the interpretation of this TD.

1.3 TECHNICAL ELIGIBILITY CRITERIA

1.3.1 The Bidder (Lead Bidder in case of a consortium) should be in operation in India for a period of at least 10 (ten) years as on 31st March 2017. In case of a consortium, the member other than the Lead Bidder should be in operation in India for a period of at least 5 (five) years as on 31st March 2017.

1.3.2 The Bidder (All members of the consortium) should not be black listed/ debarred by Central Government/ any State Government/ Public Sector Undertaking entity in India for unsatisfactory past performance, corrupt, fraudulent or any other unethical business practices as on date of submission of the Bid. An undertaking in this regard should be furnished on a non-judicial stamp paper of appropriate value as per the format provided in Annexure 14.

1.3.3 The Bidder (Lead Bidder in case of a consortium) shall be a 'AA' class registered contractor with Maharashtra PWD/ MSRDC/ MES/ Railways/ CPWD/ MMRDA/ NHAI/ Urban Local Body. The Registration Certificate should be valid as on date of submission of the Bid.

1.3.4 The Bidder (Any member of the consortium) should have carried out at least one similar work having value at least equal to 80% of the Estimated Cost or 2 similar works each of value equal to 50% of the Estimated Cost or 3 similar works with value of each work as at least 40% of the Estimated Cost in the previous 3 (three) financial years i.e. 2014-15, 2015-16 and 2016-17

The term 'similar work' means one work of cement road construction.

1.3.5 The Bidder (All member of the consortium) shall provide documentary evidence towards the ownership or the arrangement for hiring of machinery before the commencement of the Project as provided in Clause 17 of Special Conditions of Contract.

1.4 FINANCIAL ELIGIBILITY CRITERIA

1.4.1 The Bidder (Any member of the consortium) should have an average annual turnover of at least Rs.10,00,00,000/- (Rupees Ten Crores only) over the last three financial years i.e. 2014-15, 2015-16 and 2016-17 out of which average turnover of at least Rs.5,00,00,000/- (Rupees Five Crore only) should be from the "specific business areas" mentioned below

The term 'specific business areas' means one work of cement road construction or CC road consortium

1.4.2 The Bidder (Lead Bidder in case of a Consortium) should have positive net worth as per the audited financial statements in each of the last 3 (three) financial years i.e. 2014-15,

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2015-16 and 2016-17. It is clarified that in case of consolidated annual financial statements, only the net worth of the entity that is submitting the Bid shall be considered.

1.4.3 The formula for calculation of net worth shall be:

Net-worth = (Paid up share capital) + (Free reserves) + (Share premium) - (Revaluation of reserves) - (Intangible assets) - (Miscellaneous expenditure to the extent not written off and carry forward losses).

1.4.4 The Bidder (each member in case of a Consortium) should have Liquid Assets of minimum 10% of Estimated Cost. A certificate issued by the Chartered Accountant towards this should be submitted.

1.5 INSTRUCTION TO THE BIDDER

1.5.1 Bidder will be declared as a Qualified Bidder based on meeting the Technical Eligibility Criteria as demonstrated based on documentary evidence submitted by the Bidder along with the Bid.

1.5.2 Rate analysis of each item separately shall be submitted by the L1 Bidder within 7 (seven) days after opening of the Financial Bid. In case the L1 Bidder fails to provide the rate analysis of each item then NSCDCL reserves the right to invite the L2 Bidder for the negotiations or it may also cancel the Tender Document.

1.5.3 In case the Financial Bid of the Successful Bidder is lesser than 15% of the Estimated Cost, then an additional bank guarantee from the scheduled commercial bank is to be provided (along with the Security Deposit as per clause 1.26) within 15 days of issuance of LoA. The amount of security deposit shall be worked out as per following formula.

The percentage of Additional Security Deposit to be provided = $85 - (\text{Financial Bid} / \text{Estimated Cost} * 100)$

1.5.4 All the Bidders are required to deposit EMD, any exemption to this is not permissible.

1.5.5 All Bidders are required to mention GST rates for each item separately in bid form.

1.6 COST OF BIDDING

The Bidder shall bear all the costs associated with the preparation and submission of its Bid. NMSCDCL will in no case be responsible or liable for those costs, under any conditions. The Bidder shall not be entitled to claim any costs, charges and expenses of

and incidental to or incurred by the Bidder through or in connection with its submission of Bid even though NMSCDCL may elect to modify/ withdraw the Tender Document.

1.7 SITE VISIT

The Bidder at its own responsibility and risk is encouraged to visit and examine the Site and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract. The costs of visiting the Site and collecting the necessary information shall be borne by the Bidder. No claim will be entertained on this account.

1.8. BID SUBMISSION BY THE BIDDER

1.8.1 The Bidders shall submit a signed and complete Bid comprising the documents and forms as set out in Clause 1.22 and 1.23 of Section 1 of Volume I of this Tender Document.

1.8.2 Bids are invited on a competitive bidding process adopting e-tendering method wherein Bidders shall be required to submit the Financial Bid online. Further, the Bidders shall also submit in a single sealed cover envelope containing Envelope-I and Envelope-II duly sealed separately. It is clarified that the Financial Bid shall be submitted only online. The envelopes should contain the documents as detailed in Clause 1.22 of Volume I above.

The 2 (two) envelopes shall be kept in an outermost Envelope. All the envelopes should be super scribed as **“Bid for Smart Road Pilot Project”**

1.8.3 The Bidders have the option of sending their Bid either by registered post, or speed post, or courier, or by hand delivery, so as to reach NMSCDCL within the Bid Deadline. Bids submitted by telex/ telegram/ fax/ e-mail shall not be considered under any circumstances. NMSCDCL shall not be responsible for any delay in receipt of the Bid. Any Bid received after the Bid Deadline shall be returned unopened by NMSCDCL. ***It should be noted that Envelope I and Envelope II shall not contain any information/ document relating to the Financial Bid.***

1.8.4 All pages of the Bid and any other document executed on non-judicial stamp paper, forming part of the Bid and corrections in the Bid, if any, must be signed by the authorized signatory on behalf of the Bidder. It is clarified that the same authorized signatory shall sign all pages of the Bid. However, any published document submitted with the Bid shall be signed by the authorized signatory at least on the first and last page of such document. The Bidders shall submit the Bid in original, duly signed by the authorized signatory of the Bidder. No change or supplemental information to a Bid will be accepted after the Bid Deadline, unless the same is requested for by NMSCDCL.

The Bid shall contain no interlineations or overwriting, except as necessary to correct errors made by the Bidder themselves. In the event of such corrections, the authorized

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representative of the Bidder who has signed the Bid shall initial such corrections. The letters in the Bid should be submitted as per the formats provided in the Tender Document.

1.8.5 If the outer cover envelope or Envelope I (Covering Envelope) or Envelope-II (Technical Bid) is/are not closed/ sealed and not super scribed as per the specified requirement, NMSCDCL will assume no responsibility for the Bid's misplacement or premature opening.

1.8.6 All the envelopes shall be sealed properly and shall indicate the name and address of the Bidder. The Bid must be complete in all technical and commercial respect and should contain requisite certificates, drawings, informative literature etc. as per the terms of the Tender Document. Any term/ condition proposed by the Bidder in its Bid which is not in accordance with the terms and conditions of the Tender Document shall be considered as a conditional Bid and will make the Bid invalid.

1.8.7 The Bidder must submit the following:

1.8.7.1 Online Submission

- a) Scanned copy of original Technical Bid in pdf format, online payment of EMD, Power of Attorney, online payment of TD fees and the Financial Bid
- b) The information and/or documents shall be submitted by the Bidder as per the formats specified in Annexures to this Tender Document.

Strict adherence to the formats wherever specified, is required. Wherever information has been sought in specified formats, the Bidder shall refrain from referring to brochures/ pamphlets. Non-adherence to formats and/ or submission of incomplete information may be a ground for declaring the Bid as non-responsive. Each format has to be duly signed and stamped by the authorized signatory of the Bidder.

1.8.7.2 The Bidder shall furnish documentary evidence in support of meeting Financial Eligibility Criteria to the satisfaction of NMSCDCL.

1.9 BID SUBMITTED BY A BIDDER

The Bidder should designate/ nominate one person to represent the Bidder in its dealings with NMSCDCL.

The person should be duly authorized to perform all tasks including, but not limited to providing information, responding to enquires, signing of Bid etc. The Bidder shall submit, along with its Bid, a Power of Attorney in original (as per Annexure 11 and Annexure 12, if applicable) authorizing the signatory of the Bid.

1.20 CLARIFICATIONS AND PRE-BID MEETING

1.20.1 NMSCDCL will not enter into any correspondence with the Bidders, except to furnish clarifications on Tender Document, if necessary. The Bidders may seek clarifications or suggest amendments to Tender Document in writing, through a letter or soft copy by e-mail to reach NMSCDCL at the address, date and time mentioned in the Tender Schedule in the format prescribed in Annexure 8.

1.20.2 The Bidder(s) or their authorized representative(s) is/are invited to attend pre-bid meeting(s), which will take place on date(s) as specified in Tender Schedule, or any such other date as notified by NMSCDCL.

1.20.3 The purpose of the pre-bid meeting will be to clarify any issues regarding the Tender Document including in particular, issues raised in writing and submitted by the Bidders.

1.20.4 NMSCDCL shall endeavor to respond to the questions raised or clarifications sought by the Bidders. However, NMSCDCL reserves the right not to respond to any question or provide any clarification, in its sole discretion and is not under any obligation to entertain/ respond to suggestions made or to incorporate modifications sought for.

1.20.5 Minutes of the pre-bid meeting including the list of the questions raised and the responses given during the meeting together with any response prepared after the meeting will be hosted on <https://mahatenders.gov.in> and the same shall be treated as part of Tender Document.

1.20.6 Pursuant to the pre-bid meeting, if NMSCDCL deems necessary to amend the Tender Document, it shall be done by issuing amendment/ corrigendum.

1.21 AMENDMENTS TO TENDER DOCUMENT

1.21.1 At any time prior to the Bid Deadline, NMSCDCL may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the TD by issuing clarification(s) and/or amendment(s) to the TD.

1.21.2 The clarification(s)/ amendment(s), if any will be notified on

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<https://mahatenders.gov.in> at least two (2) days before the last date of online submission of the Bid. If any amendment is required to be notified within last two (2) days of the online date of submission of the Bid, the Bid Deadline may be extended for a suitable period of time.

1.21.3 NMSCDCL will not bear any responsibility or liability arising out of non-receipt of the information regarding amendments in time or otherwise. Bidders must check the website for any such amendment(s) before submitting their Bid.

1.21.4 No verbal clarifications and information provided by NMSCDCL or its employee(s) or its representative(s) or its consultant(s) shall in any way be binding on NMSCDCL unless subsequently confirmed through the issuance of corrigendum(s)/ amendment(s) or any other written communication by NMSCDCL.

1.22 BIDDING PROCESS

1.22.1 BID FORMATS

The Bid in response to this TD shall be submitted by the Bidders in the manner provided clause 1.8.3 of Section 1 of Volume I. The Bid shall comprise of the following:

(A). ENVELOPE- I (COVERING LETTER, TD FEES, EMD, POWER OF ATTORNEY, CONSORTIUM AGREEMENT AND BIDDER FORMAT EXCEL SHEET)

- (i) Covering Letter as per the prescribed Annexure 2.
- (ii) General particulars of the Bidders as per Annexure 7.
- (iii) Copy of PAN and TAN certificates of Bidder.
- (iv) Copy of GST registration.
- (v) TD fee of Rs.5,000/- (Rupees Five Thousand only) + GST
- (vi) Note: To be paid online by the Bidder and the proof of payment should be submitted in hard copy. Original power of attorney issued by the Bidder in favor of the authorized person signing the Bid, in the form attached hereto as Annexure 11 and Annexure 12, if applicable. However, NMSCDCL may accept general Power of Attorney executed in favor of Authorized signatory of the Bidder, if it shall conclusively establish that the signatory has been authorized by the Bidder to execute all documents on behalf of the Bidder.
- (vii) In case of consortium, the consortium agreement in the format prescribed under Annexure 13.
- (viii) EMD of Rs.8,07,525/- (Rupees Eight lakh seven thousand five hundred and twenty five Only) Note: To be paid online by the Bidder and the proof of payment should be submitted in hard copy.

(B). ENVELOPE- II TECHNICAL BID

- (i) Document in support of meeting Technical Eligibility Criteria.
- (ii) Documents evidencing that the Bidder (Lead Bidder in case of a consortium) is

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in operation in India for a period of at least 10 (ten) years as on 31st March 2017. In case of a consortium, the member other than the Lead Bidder is in operation in India for a period of at least 5 (five) years as on 31st March 2017.

- (iii) Documents evidence as per Annexure 14
- (iv) Valid Registration Certificate evidencing that the Bidder (Lead Bidder in case of a consortium) shall be a 'AA' class registered contractor with Maharashtra PWD/ MSRDC/ MES/ Railways/ CPWD/ MMRDA/ NHAI/ Urban Local Body.
- (v) Details for meeting Financial Eligibility Criteria along with documentary evidence for the same. The Bidder shall furnish its audited annual accounts in support of meeting financial requirement, which shall consist of balance sheet, profit and loss account, profit appropriation account, auditor's report, etc. for the last 3 (Three) financial years i.e. 2014-15, 2015-16, 2016-17 which are used by the Bidder for the purpose of calculation of annual turnover.
- (vi) Signed and stamped copy of the TD including amendments and clarifications by Authorized signatory on each page.
- (vii) Calculation of turnover and net worth shall be submitted on the Chartered Accountants letterhead, duly signed by the Chartered Accountant. For turnover only cost of civil works shall only be considered. Regarding experience of work, certificate shall be obtained from the competent authority having designation not lower than Executive Engineer.
- (viii) A list of works in hand and tendered for.
The Bidder (Any member of the consortium) should have carried out at least one similar work having value at least equal to 80% of the Estimated Cost or 2 similar works each of value equal to 50% of the Estimated Cost or 3 similar works with value of each work as at least 40% of the Estimated Cost in the previous 3 (three) financial years i.e. 2014-15, 2015-16 and 2016-17
- (ix) List of machinery and plants immediately available with the Bidder for use on this Project and list of machinery proposed to be utilized on this Project, but not immediately available and the manner in which it is proposed to be procured. The condition, cost and location of machinery shall be indicated.
- (x) Details of Technical personnel on the rolls of the Bidder giving details of experience and qualification of each of them and details of technical personnel to be appointed for this Project along with bio-data duly signed by the person to be appointed.
- (xi) A Bid submitted without work plan in the form of bar chart indicating milestone etc. would be considered as invalid and non-responsive. Work plans in bar chart format to be submitted along with Bid indicating the methodology planning with resources logistics and with indicative milestone shall be submitted duly signed by the Bidder. The Bidder should indicate requirement

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of machinery and man power in work plan.

Note: The detailed work programme for the Contractor will be finalized and approved by NMSCDCL after issuance of LoA.

- (xii) The Bidder shall submit its own programme, in the form of bar chart, indicating critical activities and PERT programme including phase wise deployment of man and machinery, power, cash flow etc.
- (xiii) The Bidder shall submit the valid certificate issued by the Asst. Director (Mech.) of Public Works Department to effect that specialized machinery enlisted in Clause 15 (Special Conditions of Contract) are in "Efficient Working Condition" and confirming to MORTH specifications. In absence of this certificate, the bid submitted by Bidder shall be treated as non-responsive.
- (xiv) The Bidder shall provide documentation about ownership/hiring of Batch Type RMC Plant.
- (xv) The Bidder shall provide documentary evidence towards the ownership or the arrangement for hiring of machinery before the commencement of the Project as provided in Clause 17 of Special Conditions of Contract hereof.
- (xvi) The Bidder shall submit the digitally signed Financial Bid online in format prescribed in Annexure 15.

Note: In case the Envelope I and/or Envelope II is/are submitted only in hard copy, the Bid shall be out rightly rejected.

(C) ENVELOPE III- FINANCIAL BID - TO BE SUBMITTED ONLY ONLINE

- (i) The Bidder shall quote for the Project as per details given online.

1.22.2 BID DUE DATE

The Bidder should submit the Bids so as to reach the address indicated on or before as specified in Tender Schedule, *at the*

O/o The Chief Executive Officer,
Nashik Municipal Smart City Development Corporation Limited,
Nashik Municipal Corporation,
Rajiv Gandhi Bhavan
Purandare colony,
Sharanpur,
Nashik-422002

1.23 VALIDITY OF BID

1.23.1 The Bid shall remain valid for a period of **120 (One hundred and twenty) days** from the Bid Deadline as prescribed in the Tender Schedule ("**Bid Validity Period**"), with Bidder having no right to withdraw, revoke or cancel its Bid or unilaterally vary the offer submitted or any terms thereof. In case of the Bidder revoking or cancelling its Bid or varying any term and conditions in regard thereof or not accepting LoA, NMSCDCL shall forfeit the EMD furnished by such Bidder.

1.23.2 In exceptional circumstances, NMSCDCL may in writing request the Bidders to extend the Bid Validity Period of their Bids. The request and the responses thereto shall be made in writing. The EMD provided by such Bidders shall also be extended by an equivalent period of time. A Bidder may refuse the request without forfeiting its EMD. A Bidder granting the request will neither be required nor permitted to modify its Bid in any manner. In case, if a Bidder rejects the option to give consent for extension of validity of its Bid, remaining Bidders will be considered for Bid evaluation.

1.24 COST OF BIDDING

The Bidder shall bear all the costs associated with the preparation and submission of its Bid and NMSCDCL will in no case be responsible or liable for those costs, under any conditions. The Bidder shall not be entitled to claim any costs, charges and expenses of and incidental to or incurred by the Bidder through or in connection with its submission of Bid even though NMSCDCL may elect to modify/ withdraw the Tender Document.

1.25 EARNEST MONEY DEPOSIT

The Bidder shall furnish the Interest free EMD of Rs.8,07,525/- (Rupees Eight lakh seven thousand five hundred and twenty five Only) through online payment using available net banking option/ credit card/ debit card on e-procurement portal of Govt. of Maharashtra i.e. <https://mahatender.gov.in> The initial validity of EMD shall be for a period of 8 (Eight) months from the Bid Deadline, which shall be extended in accordance

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with Clause 1.23.2 of Section 1 of Volume I. The EMD of unsuccessful Bidders shall be returned within 30 (thirty) days from the date of issue of the LoA to the Successful Bidder. The Bidders submitting EMD of an amount less than that required amount of Rs.8,07,525/- (Rupees Eight lakh two thousand seven hundred and seventy nine Only) will be rejected.

The Successful Bidder shall sign and stamp the LoA and return the duplicate copy of such LoA to NMSCDCL within 15 (fifteen) days from the date of issuance of such LoA

The entire EMD shall be forfeited without prejudice to the Bidder being liable for any further consequential loss or damage incurred to NMSCDCL under the following circumstances:

- a. If a Bidder withdraws/ revokes or cancels or unilaterally varies its Bid in any manner during the period of Bid Validity specified in the Tender Document,
- b. If the Successful Bidder fails to unconditionally accept the LoA within 15 (fifteen) days from the date of its issue, or
- c. If the Successful Bidder fails to furnish the "Performance Security" as per the Clause 1.26 of Section 1 of Volume I.

1.26 INITIAL SECURITY DEPOSIT/ PERFORMANCE SECURITY

Within 15 (fifteen) days from the date of issuance of LoA, the Successful Bidder shall furnish the Initial Security Deposit of Rs. 32, 31,000/- (Rupees Thirty two Lakhs Thirty one thousand only) and any additional performance security, if applicable.

The Initial Security shall be denominated in Indian Rupees and shall be in the form of a demand draft or a bank guarantee and it shall be confirmed for payment by the branch of the bank giving the bank guarantee. The Performance Security, if provided in the form of a Bank Guarantee, should be accompanied by a checklist provided in Annexure 10.

The Performance Security shall be forfeited as follows without prejudice to the Bidder being liable for any further consequential loss or damage incurred to NMSCDCL in accordance with the terms of the contract.

The Performance Security shall be valid for a minimum period of 2 (two) years from the date of issue of LoA and shall be renewed/ extended till the completion of the Project. It is clarified that the total tenure of the Bank Guarantee including renewal thereof shall be at least 6 months after the completion of the Project.

If the Financial Bid of the Successful Bidder is lesser than 10 % of the Estimated Cost, then additional performance security for an amount equal to 1% of estimated cost and demand draft should be submitted in envelope no. 3 (scan copy must be submitted

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online). If the financial bid of the successful bidder is more than 10% of the below estimated cost the additional performance security for an amount equal to more than 10% and 1% of estimated cost, should be submitted in envelope no. 3 (scan copy must be uploaded online).

For example:

14% below rate
Up to 10% below = 1%
& (14-10) % = 4%
Thus, Total = **5%**

The Additional Security Deposit, if any shall be valid for a period of 9 (nine) months and shall be returned on issuance of completion certificate of the work.

1.27 OPENING OF BIDS

All the Technical Bids will be opened online on the date specified in the Tender Schedule and all the documents of the Bid shall be downloaded. The down loaded documents will be considered for evaluation. It is clarified that in case of any discrepancy between the documents submitted in hard copy and in soft copy (online), the documents, except the power of attorney and consortium agreement, submitted online shall prevail.

The Envelope-I of the Bidders shall be opened at the venue specified in the Tender Schedule, in the presence of one representative from each of the Bidders who wish to be present.

The name of the Bidder, shall be read out to all the Bidders at the time of opening of Envelope-I.

1.28 BID EVALUATION

The evaluation process shall comprise of the following four steps:

1.28.1 RESPONSIVENESS CHECK OF TECHNICAL BID

Prior to the evaluation of Bids, NMSCDCL shall determine whether each Bid is responsive to the requirements of this Tender Document. A Bid shall be considered responsive if:

- a) It is received as per the format provided in the Tender Document;
- b) It is received before Bid Deadline;
- c) It is signed, sealed and marked as stipulated in clause 1.8 of Section 1 of Volume I;
- d) it is accompanied by EMD;
- e) it is accompanied by Tender Document fee;
- f) it is accompanied by the Power(s) of Attorney as specified in clause 1.22.1of Section 1 of Volume I;

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- g) it contains all the information (complete in all respects) as requested in this Tender Document (in formats same as those specified);
- h) it does not contain any condition or qualification; and
- i) it is not non-responsive in terms hereof.

NMSCDCL reserves the right to reject any Bid which is non-responsive and no request for alteration, modification, substitution or withdrawal shall be entertained by NMSCDCL in respect of such Bid. Provided, however, that NMSCDCL may, in its discretion, allow the Bidder to rectify any infirmities or omissions if the same do not constitute a material modification of the Bid.

1.28.2 PRELIMINARY EXAMINATION

NMSCDCL will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and stamped and whether the Bids are otherwise in order.

If there is a discrepancy between words and figures, the amount written in words will prevail.

1.28.3 EVALUATION OF BIDDER'S FULFILMENT OF TECHNICAL ELIGIBILITY CRITERIA

Evaluation of Bidder's eligibility will be carried out based on the information furnished by the Bidder as per the prescribed formats and related documentary evidence in support of meeting the Technical Eligibility Criteria. Non-availability of information and related documentary evidence for the satisfaction of Technical Eligibility Criteria may cause the Bid to be non-responsive and liable for rejection.

1.28.4 EVALUATION OF FINANCIAL BID

Financial Bid of only Qualified Bidders shall be opened in presence of the representatives of such Qualified Bidders, who wish to be present, on a date as may be intimated by NMSCDCL to the Bidders through <https://mahatenders.gov.in> or e-mail. The evaluation of Financial Bid shall be carried out based on the information furnished online. The Financial Bid submitted by the Bidders shall be scrutinized to ensure conformity with the Tender Document. Any Bid not meeting any of the requirements of this Tender Document may cause the Bid to be considered "non-responsive" at the sole decision of NMSCDCL.

1.28.5 SUCCESSFUL BIDDER(S) SELECTION/ SELECTION PROCESS

The Financial Bids of only the Qualified Bidders will be opened for evaluation.

Of all the Financial Bids opened, the Bidder whose Financial Bid is lowest (hereby referred to as 'L1 Bidder') for total line item (i.e. combined total) mentioned in the Financial Bid will be considered eligible for negotiations and award of contract after the negotiations.

However, if the L1 Bidder is not the lowest in any of the line item of the Financial Bid, then NMSCDCL has discretion to negotiate with L1 Bidder for that particular line item to match the lowest price for that line item.

If there is a discrepancy between words and figures, the amount in words shall prevail. For any other calculation/ summation error etc. the Bid may be rejected at the sole discretion of NMSCDCL.

The L1 Bidder with whom the final price is negotiated shall be the Successful Bidder. The Successful Bidder shall acknowledge the LoA and return duplicate copy with signature and stamp of the authorized signatory of the Successful Bidder to NMSCDCL within 7 (seven) days of issue of LoA.

The Successful Bidder will be given 15 (fifteen) days for entering into the Contract with

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NMSCDCL after issuance of LoA. If the Successful Bidder does not acknowledge the LoA or fails to enter into Contract within the said 15 (fifteen) days, NMSCDCL reserves the right to invite the second best Bidder for the negotiations or cancel the TD. In such a scenario, the EMD of such [original] L1 Bidder shall stand forfeited.

If the Successful Bidder, to whom the LoA has been issued, does not fulfill any of the conditions specified in TD, NMSCDCL reserves the right to annul/ cancel the award of the LoA of such Successful Bidder and forfeit the Performance Security/ EMD and can award the Project to the next Bidder as per the original list of preferences.

1.29 RIGHT TO WITHDRAW THE TD AND TO REJECT ANY BID

This TD may be withdrawn or cancelled by NMSCDCL at any time without assigning any reasons thereof. NMSCDCL further reserves the right, at its complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account.

NMSCDCL reserves the right to interpret the Bid submitted by the Bidder in accordance with the provisions of the TD and make its own judgment regarding the interpretation of the same. In this regard, NMSCDCL shall have no liability towards any Bidder. NMSCDCL shall evaluate the Bids in adherence to the evaluation process as set out in this TD, at its sole discretion. Any decision of NMSCDCL with regard to the evaluation of Bids shall be final and binding on the Bidders.

NMSCDCL reserves its right to vary, modify, revise, amend or change any of the terms and conditions of the Bid before submission. The decision regarding acceptance or rejection of Bid by NMSCDCL will be final.

1.30 ZERO DEVIATION

This is a zero deviation Bidding Process. Bidder is to ensure compliance of all provisions of the TD and submit its Bid accordingly. Bids in deviation to any of the provisions of TD shall be liable for rejection by NMSCDCL.

1.31 EXAMINATION OF TENDER DOCUMENT

The Bidder is required to carefully examine the Tender Document.

The Bidder shall be deemed to have examined the Tender Document to have obtained information on all matters whatsoever that might affect to execute the Project and to have satisfied itself as to the adequacy of its Bid. The Bidder shall be deemed to have known the scope, nature and magnitude of the supplies and the requirements of material and labor involved etc. and as to all supplies it has to complete in accordance with the Tender Document.

SAMPLE FORMATS

Checklist

List of all documents, forms, statements, conditions, schedules etc. should be submitted with the Bid.

The above list shall contain the following documents particularly otherwise the Bid is likely to be rejected.

Envelope I- to be submitted both online and offline

Sr. No.	Brief Details of Documents required	Whether Enclosed or Not
1	Covering Letter along with signed and stamped copy of TD including the amendments and clarifications, if any by the authorised signatory on each page	
2	Receipt generated for Payment of TD Fee through Payment Gateway System	
3	Copy of PAN and TAN (In case of Consortium to be provided for each of the members)	
4	GST Registration Certificate (In case of Consortium to be provided for each of the members)	
5	Proof of online payment of Earnest Money Deposit	
6	Power of attorney (Annexure 11 and Annexure 12, if applicable)	
7	In case of consortium, the consortium agreement in the format prescribed under Annexure 13	
8	General Particulars of Bidder as per format prescribed in Annexure 7	

Envelope II- to be submitted both online and offline

Sr. No.	Brief Details of Documents required	Whether Enclosed or Not
1	Details of Technical Personnel available with the Bidder and Personnel to be deployed on this Project (Annexure 6)	
2	Copy of Certificate of Incorporation and Memorandum of Association and Articles of Association (In case of Consortium to be provided for each of the members)	
3	Audited Financial Statements for last 3 financial years (2014-15, 2015-16 and 2016-17)	

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Sr. No.	Brief Details of Documents required	Whether Enclosed or Not
4	Details for Turn Over, Bid Capacity, Completion of Single Work, Quantity Completion, Bar Chart and Working Methodology	
5	Attested Copy of valid Registration Certificate	
6	Certificate for Liquid Assets (Solvency Certificate) of min. 10% of Estimated Cost.	
7	Certificate from Chartered Accountant for turnover and net worth	
8	Certificate from the Asst. Director (Mech.) of PWD	
9	Details of Plant and Machinery proposed to be deployed on the Project immediately (Annexure 5) along with the registered hire/ lease document or ownership document.	
10	The documentary evidence towards the machinery (ownership or the arrangement for hiring before the commencement of the Project) as provided in Clause 17 (Special Conditions of Contract), Section 2 of Volume II hereof.	
11	Financial Bid letter in the format prescribed under Annexure 15	

Envelope III- to be submitted only online

Sr. No.	Brief Details of Documents required	Whether Enclosed or Not
1	Commercial Format Given online	

Note: (i) All documents must be signed by the Bidder.
(ii) Information asked in prescribed Performa shall be submitted in prescribed format only.

COVERING LETTER

[The covering letter should be on the Letter Head of the Bidder (Lead Bidder in case of consortium)]

TD. No. _____ **Date:** _____

From: _____ **(Insert name and address of Bidder)**

Tel. #:

Fax#:

E-mail address#

The Chief Executive Officer
Nashik Municipal Smart City Development Corporation Limited
Rajiv Gandhi Bhavan,
Purandare colony,
Sharanpur,
Nashik - 422002

Sub: "Bid for Smart Road Pilot Project"

Dear Sir/ Ma'am,

1. We, the undersigned....[insert name of the 'Bidder'] having read, examined and understood in detail the Tender Document (TD) for Smart Road Pilot Project hereby submit our Bid comprising of Technical Bid and Financial Bid.
2. We give our unconditional acceptance to TD, issued by Nashik Municipal Smart City Development Corporation Limited, as amended. As a token of our acceptance to the TD the same have been initialed by us and enclosed to the Bid. We shall ensure that we execute the Project as per the provisions of the TD and provisions of such TD shall be binding on us.
3. The earnest money deposit towards this TD has been deposited online and the proof of online payment is attached herewith.
4. We have submitted our Financial Bid, without any deviations, conditions and without mentioning any assumptions or notes for the Financial Bid and in the format provided in Annexure 15 to TD.
5. **Acceptance**

We hereby unconditionally and irrevocably agree and accept that the decision made by Nashik Municipal Smart City Development Corporation Limited in respect of any matter regarding or arising out of the TD shall be binding on us. We hereby expressly waive any

and all claims in respect of Bidding Process.

We confirm that there are no litigations or disputes against us, which materially affect our ability to fulfill our obligations with regard to execution of Project.

8. Familiarity with Relevant Indian Laws & Regulations

We confirm that we have studied the provisions of the relevant Indian laws and regulations as required to enable us to submit this Bid and execute the contract, in the event of our selection as Successful Bidder. We further undertake and agree that all such factors as mentioned in TD have been fully examined and considered while submitting the Bid.

9. Contact Person

Details of the contact person are furnished as under:

Name:

Designation:

Company:

Address:

Phone Nos.:

Fax Nos.:

E-mail address:

*** We are enclosing herewith the Envelope-I (through online and offline) and Envelope-II (through online and offline) and Envelope III (only online) containing duly signed formats, each one duly sealed separately, in one original as desired by you in the TD for your consideration as per Clause 1.8 of Section 1 of Volume I.

It is confirmed that our Bid is consistent with all the requirements of submission as stated in the TD and subsequent communications from Nashik Municipal Smart City Development Corporation Limited. The information submitted in our Bid is complete, strictly as per the requirements stipulated in the TD and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our Bid. We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of 180 days from the Bid deadline. We confirm that we have not taken any deviation so as to be deemed non-responsive.

Dated the _____ day of _____, 20....

Thanking you.
Yours faithfully,

Details of work tendered for and in hand as on the date of submission of this tender

NAME OF THE BIDDER:

Sr. No.	Name of work	Place and Country	Work in hand		Anticipated date of completion	Works tendered for			Remarks
			Tendered cost	Cost of remaining work		Estimated cost	Date when decision is expected	Stipulated date or period of completion	
1	2	3	4	5	6	7	8	9	10

Annexure 4

Details of works of similar type and magnitude carried out by the Bidder

NAME OF THE BIDDER:

Sr. No.	Name of work	Cost of work	Date of starting	Stipulated date of completion	Actual date of completion	Remarks
1	2	3	4	5	6	7

Details of Plants and Machinery immediately available with the Bidder for this work**NAME OF THE BIDDER:**

Sr. No.	Name of equipment	No. of units	Kind and make	Capacity	Age and condition	Present location	Remarks
1	2	3	4	5	6	7	8

Details of Technical Personnel available with the Bidder.**NAME OF THE BIDDER:**

Sr. No.	Name of the person	Qualification	Whether working in field or office	Experience of execution of similar works	Period for which the person is working with the Bidder	Remarks
1	2	3	4	5	6	7

NOTE: The specific persons proposed to be deployed for this Site shall be nominated as Resident Engineer, Quality Control Engineer etc. along with Photographs, Signed Bio-data and Certificates.

Minimum Qualification for Resident Engineer shall be Diploma (Civil) with Minimum 10 Years' experience in Road works / B.E Civil minimum 5 Years' experience in Road works

Minimum Qualification for Quality Control Engineer shall be Diploma (Civil) with Minimum 5 Years' experience in QC testing for Road works / B.E Civil minimum 3 Years' experience in QC testing for Road works

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Annexure 7

DETAILS OF THE BIDDER (to be shared for all members of consortium)

S. No.	Particulars	Details
1.	Registration No. issued by Maharashtra PWD/ MSRDC/ MES/ Railways/ CPWD/ MMRDA/ NHAI/ NMSCDCL/ PCMC and other Government and Semi-Government organizations	
2.	Valid registration of Bidder in appropriate class through centralized registration of Maharashtra PWD/ MSRDC/ MES/ Railways/ CPWD/ MMRDA/ NHAI/ NMSCDCL/ PCMC and other Government and Semi-Government organizations	(Scanned copy of Registration to be provided)
3.	Name of the Bidder	
4.	Certificate of incorporation (in case of consortium for each of the members)	Attach relevant documents
5.	Address of Communication	
6.	Telephone Number with STD Code	
7.	Fax Number with STD Code	
8.	PAN	
9.	GST No.	
10.	TAN	
11.	EPF Registration	
12.	Mobile Number	
13.	E-mail Address for all communications	
	Details of Authorized Representative	
14.	Name	
15.	Designation	
16.	Postal Address with pin code	
17.	Telephone Number with STD Code	
18.	Fax Number with STD Code	
19.	Mobile Number	
20.	E-mail Address	

Signature of Bidder with Seal

Date: _____

FORMAT OF SENDING PRE-BID QUERIES***TD Reference No: XX***

Bidder's Request For Clarification				
Name and complete official address of Organization submitting query / request for clarification			Telephone, Fax and E-mail of the organization Tel: Fax: Email:	
Sr. No.	Clause No.	Page No.	Content of TD Requiring Clarification/ changes	Clarification required/ Change Requested
1				
2				

Signature:

Name of the Authorized signatory:

Company seal:

Date and Stamped

Note: Bidder(s) are requested to send the queries in PDF with Signature and Company Seal and also in MS Excel for making consolidation process easy.

FORMAT FOR PERFORMANCE BANK GUARANTEE

(To be on non-judicial stamp paper of appropriate value)

In consideration of the ----- [Insert name of the Bidder] submitting the response to TD for **Smart Road Pilot Project** (TD no..... dated.....) issued by Nashik Municipal Smart City Development Corporation Limited (hereinafter referred to as "NMSCDCL") and NMSCDCL considering such response to the TD of [Insert the name of the Successful Bidder] (which expression shall unless repugnant to the context or meaning thereof include its executers, administrators, successors and assignees) and selecting the [insert the name of the Successful Bidder] and issuing Letter of Allocation dated. ----- as per terms of TD and the same having been accepted by [insert the name of the Successful Bidder]

As per the terms of the TD, the _____ [insert name & address of bank] (hereinafter referred to as ' Guarantor Bank') hereby agrees unequivocally, irrevocably and unconditionally to pay to NMSCDCL forthwith on demand in writing from NMSCDCL or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees----- [Total Value] only, on behalf of M/s _____ [Insert name of the Successful Bidder]

This guarantee shall be valid and binding on this Bank up to and including..... and shall not be terminable by notice or any change in the constitution of the Bank or the changes in the term of contract or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs. _____

Our Guarantee shall remain in force until..... NMSCDCL shall be entitled to invoke this Guarantee till

The Guarantor Bank hereby agrees and acknowledges that NMSCDCL shall have a right to invoke this BANK GUARANTEE in part or in full, as it may deem fit.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand by NMSCDCL, made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to NMSCDCL.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by ----- [Insert name of the Successful Bidder]. The Guarantor Bank shall not require NMSCDCL to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against NMSCDCL in respect of any payment made hereunder

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Nashik shall have exclusive jurisdiction.

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The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly NMSCDCL shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against the [insert the name of the Successful Bidder] to make any claim against or any demand on the Successful Bidder or to give any notice to [insert the name of the Successful Bidder] or to enforce any security held by or to exercise, levy or enforce any distress, diligence or other process against the Successful Bidder.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs. _____ (Rs. _____ only) and it shall remain in force until We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if NMSCDCL serves upon us a written claim or demand.

Signature _____

Name _____

Power of Attorney No. _____

For

_____ [Insert Name of the Bank] ____

Banker's Stamp and Full Address.

Dated this ____ day of ____, 20__

Witness:

1.

Signature

Name and Address

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2.

Signature

Name and Address

CHECK LIST FOR BANK GUARANTEE

Sl. No.	Details of checks	YES/NO
A	Is the Bank Guarantee ("BG") on non-judicial Stamp paper of appropriate value, as per applicable stamp Act of the place of execution	
B	Whether date, purpose of purchase of stamp paper and name of the purchaser are indicated on the stamp paper? (The date of purchase of stamp paper should be not later than the date of execution of BG and the stamp paper should be purchased either in the name of the executing Bank or the party on whose behalf the BG has been issued.).	
C	Has the executing Officer of BG indicated his name, designation and Power of Attorney No. /Signing Power no./ other similar authorisation on the BG?	
D	Is each page of BG duly signed / initialed by executants and whether stamp of Bank is affixed thereon? Whether the last page	
E	Does the Bank Guarantees compare verbatim with the Performa prescribed in the TD?	
F	Are the factual details such as TD No. amount of BG and validity of BG correctly mentioned in the BG	
G	Whether overwriting/cutting if any on the BG have been properly authenticated under signature & seal of executants?	
H	Contact details of issuing bank including details of Branch Manager, email id, mobile number etc.	
I	Is the Jurisdiction of Court is restricted to Courts of Nashik	

POWER OF ATTORNEY

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.)

Know all men by these presents, We (name and address of the registered office of the Bidder as applicable) do hereby constitute, appoint and authorize Mr. /Ms. (name & residential address) who is presently employed with us and holding the position of..... as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid in response to the TD Nodated issued by Nashik Municipal Smart City Development Corporation Limited (NMSCDCL), including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which NMSCDCL may require us to submit.

The aforesaid Attorney is further authorized for making representations to NMSCDCL and providing information/ responses to NMSCDCL representing us in all matters before NMSCDCL and generally dealing with NMSCDCL in all matters in connection with Bid till the completion of the Bidding Process.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the TD.

Signed by the within named

..... **(Insert the name of the executants company)**

Through the hand of

Mr.

Duly authorized by the Board to issue such Power of Attorney

Dated this day of

Accepted

.....

Signature of Attorney

(Name, designation and address of the Attorney)

Attested

.....

(Signature of the executants)

(Name, designation and address of the executants)

.....

Signature and stamp of Notary of the place of execution

Common seal of has been affixed in my/our presence pursuant to Board of Director's

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Resolution dated.....

WITNESS

.....

(Signature)

Name.....

Designation

.....

(Signature)

Name.....

Designation

Notes:

- The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants(s) and the same should be under common seal of the executants affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executants(s) in this regard.
- Also, wherever required, the executants(s) should submit for verification the extract of the chartered documents and documents such as a Board resolution/ power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executants(s).

POWER OF ATTORNEY FOR LEAD BIDDER BY THE OTHER CONSORTIUM MEMBER

(On Non- Judicial Stamp paper of appropriate value to be purchased in the name of Consortium)

Know All Men By These Presents That We, the Members whose details are given hereunder..... have formed a Consortium and having our Registered Office(s)/ Head Office(s) at (hereinafter called the 'Consortium' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) do hereby constitute, nominate and appoint M/s..... having its Registered/ Head Office at as our duly constituted lawful Attorney (hereinafter called "Lead Bidder") to exercise all or any of the powers for and on behalf of the CONSORTIUM to participate in Bid for _____, as per the scope of work stipulated therein for which Bids have been invited by the Nashik Municipal Smart City Development Corporation Limited (NMSCDCL), to undertake the following acts:

- (i) To submit Bid, participate and correspond in respect of the aforesaid Bid on behalf of the "Consortium".
- (ii) To negotiate with NMSCDCL the terms and conditions for award of the contract pursuant to the aforesaid bid and to sign the contract with the NMSCDCL ("Contract") for and on behalf of the "CONSORTIUM".
- (iii) To do any other act or submit any document related to the above.
- (iv) To receive, accept and execute the Contract for and on behalf of the "Consortium".
- (v) To submit the performance security or additional performance security in the prescribed format and as per terms of the Contract.

It is clearly understood that the Lead Bidder shall ensure performance of the Contract and if either of the members fail to perform their respective portion of the Contract, the same shall be deemed to be a default by all the members.

It is expressly understood that this power of attorney shall remain valid, binding and irrevocable till completion of the Contract period i.e., _____ from the date of execution of the Contract.

The consortium hereby agrees and undertakes to ratify and confirm all the whatsoever the said Lead Bidder quotes in the Bid, negotiates and signs the Contract with the NMSCDCL and/or proposes to act on behalf of the Consortium by virtue of this Power of Attorney and the same shall bind the Consortium members as if done by itself.

In Witness Whereof, the members constituting the Consortium as aforesaid have executed these present on this day oftwo thousand seventeen.

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For and on behalf of the member of the Consortium

1.....

Accept

..... (Signature)

(Name, Title and Address of the Attorney)

Notes:

1. The mode of execution of Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.
2. Also, wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as a resolution / Power of attorney in favour of the Person executing this power of attorney for the delegation of power hereunder on behalf of the executant(s).

Consortium Agreement
Draft agreement executed by the members of the consortium
[On non-judicial stamp paper duly attested by notary public]

This agreement (Agreement) entered into this day of [Date] [Month] 201__ at [Place] between _____ (hereinafter referred to as "_____") and having office at [Address], India, as Party of the First Part and _____ (hereinafter referred to as "_____") and having office at [Address], as Party of the Second Part and _____ (hereinafter referred to as "_____").

_____ and _____ are individually referred to as 'Party' and collectively as 'Parties'.

WHEREAS Nashik Municipal Smart City Development Corporation Limited (NMSCDCL), has issued a Tender Document dated [Date] (TD) for development of the road from Trimbak Naka to Ashok Stambh admeasuring 1.1 Km. under smart road pilot project for a period of five years at Nashik, Maharashtra ("hereinafter referred to as the **"Project"**)

AND WHEREAS the Parties have had discussions for formation of a consortium for submitting the Bid for the Project and have reached an understanding on the following points with respect to each of the Parties' rights and obligations towards each other and their working relationship.

BASIS THE MUTUAL UNDERSTANDING OF THE PARTIES, IT IS HEREBY AGREED AND DECLARED AS FOLLOWS:

- i. The purpose of this Agreement is to define the principles of collaboration among the Parties to:
 - a. jointly Bid for the **"Project"** as a Consortium.
 - b. sign contract with NMSCDCL in case of award ("Contract").
 - c. provide and perform the supplies and services which would be ordered by NMSCDCL pursuant to the Contract.
- ii. This Agreement shall not be construed as establishing or giving effect to any legal entity. It shall relate solely towards NMSCDCL for **"Project"** to be performed pursuant to the Contract and shall not extend to any other activities.
- iii. The Parties shall be jointly and severally responsible and bound towards NMSCDCL for the Project in accordance with the terms and conditions of the TD and Contract.
- iv. ----- (Name of Party) shall act as Lead Bidder of the Consortium. As such, it shall act as the coordinator of the Party's combined activities and shall carry out the following functions:
 - a. To ensure the technical, commercial and administrative co-ordination of the Project;
 - b. To lead the Contract negotiations with NMSCDCL;

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- c. The Lead Bidder is authorized to receive instructions and incur liabilities for and on behalf of all Parties; and
- d. In case of an award, act as channel of communication between NMSCDCL and the Parties for execution of the Contract.
- v. That the Parties shall carry out all responsibilities in terms of the Project:

- vi. That the broad roles and the responsibilities of each Party as per each member's field of expertise at each stage of the bidding shall be as below:

Party A: _____

Party B: _____
- vii. That the proposed administrative arrangements (organization chart) for the management and execution of the Project shall be as follows:

- viii. That the profit and loss sharing ratio shall be _____.
- ix. That the Parties agree that all the members of the Consortium shall be jointly and severally liable for all obligations in relation to the Contract until the completion of the Project in accordance with the Contract.
- x. The Parties affirm that they shall implement the Project in good faith and shall take all necessary steps to see the Project through expeditiously.
- xi. That this Agreement shall be governed in accordance with the laws of India and courts in _____ shall have exclusive jurisdiction to adjudicate disputes arising from the terms herein.

In witness whereof the Parties affirm that the information provided is accurate and true and have caused this Agreement duly executed on the date and year above mentioned.

(Party of the first part) (Party of the second part)

Witness:

- i. _____
- ii _____

Format for Declaration by the Bidder for not being Blacklisted / Debarred
(In case of consortium, to be provided by all the members of the Consortium)
(On the non-judicial stamp paper of appropriate value)

Date: dd/mm/yyyy

To

Chief Executive Officer

Nashik Municipal Smart City Development Corporation Limited

Nashik Municipal Corporation

Rajiv Gandhi Bhavan

Purandare colony

Sharanpur

Nashik

Subject: Declaration for not being debarred/ black-listed by Central/ any State Government department in India as on the date of submission of the Bid

TD Reference No: XXXX

Dear Sir,

I, authorized representative of _____, hereby solemnly confirm that the Company _____ is not debarred / black-listed by any Central/State Government/ PSU entity in India for unsatisfactory past performance, corrupt, fraudulent or any other unethical business practices or for any other reason as on date of submission of the Bid.

In the event of any deviation from the factual information/ declaration, NMSCDCL reserves the right to reject the Bid or terminate the Contract without any compensation.

Thanking you.

Yours faithfully,

Signature of Authorized Signatory (with official seal)

Date :

Name :

Designation :

Address :

Telephone &Fax :

E-mail address

FINANCIAL BID FORMAT

Financial Bid Cover Letter

[To be submitted on the Letterhead of the Bidder (Lead Bidder in case of Consortium) only online]

Date: dd/mm/yyyy

To
Chief Executive Officer
Nashik Municipal Smart City Development Corporation Limited
Nashik Municipal Corporation
Rajiv Gandhi Bhavan
Purandare colony
Sharanpur
Nashik

Subject: Smart Road Pilot Project

TD Reference No: XXXX (“Tender Document”)

Dear Sir/ Ma’am,

1. We, the undersigned Bidder, having read and examined in detail, the Tender Document, the receipt of which is hereby duly acknowledged and we, the undersigned, offer to work in conformity with the Tender Document.
2. We undertake that the prices are in conformity with the specifications prescribed. The quote/ price are inclusive of all cost likely to be incurred for executing this Project. The prices are inclusive of all type of government taxes/duties as mentioned in the Bills of Quantities.
3. We undertake, if our Bid is accepted, to complete the Project in adherence to the Tender Document.
5. We have examined and have no reservations to the Tender Document, including any corrigendum/addendums issued by NMSCDCL.
6. We have submitted the commercial format online as per Envelope B
7. We hereby declare that in case the contract is awarded to us, we shall submit the initial security deposit/ performance security and additional performance security, if applicable, as prescribed in the Tender Document.
8. We agree to abide by this Bid for a period of 180 (One Hundred and Eighty) days from the Bid Deadline and it shall remain binding upon us and may be accepted at any time before the expiry of that period.

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9. Until a formal contract is prepared and executed, this Bid, together with NMSCDCL written acceptance thereof and notification of award by NMSCDCL shall constitute a binding contract between us.

10. We hereby declare that our Bid is made in good faith, without collusion or fraud and the information contained in the Bid is true and correct to the best of our knowledge and belief.

11. We understand that NMSCDCL is not bound to accept the lowest or any bid it may receive. We agree to all the terms and conditions as mentioned in the Tender Document and certify that we have not submitted any deviations in this regard.

In witness thereof, we submit this Bid under and in accordance with the terms of the Tender document.

Yours faithfully,

Name of the Authorised Signatory:

Designation of the Authorised Signatory:

Seal of the Bidder

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Instructions:

- a) NMSCDCL does not guarantee the quantity for the particular line items given above. The actual quantity for the given items may be more or less. The payment shall be made based on unit cost quoted for the particular item on actual work undertaken.
- b) Bidder should provide all prices as per the prescribed format.
- c) All the prices are to be entered in Indian Rupees ONLY.
- d) NMSCDCL reserves the right to ask the Bidder to submit proof of payment against any of the taxes, duties, levies indicated.
- e) NMSCDCL shall take into account all taxes, duties and levies for the purpose of evaluation.
- f) The Bidder needs to account for all out of pocket expenses, no additional payment shall be made by NMSCDCL whatsoever.
- g) Bidder should refer the TD for details on the technical requirements of the system and the benchmark specifications for the items mentioned in the financial formats.
- h) Any component/ fixtures/ labour work, ancillary/adjunct to any specified item or the Project as a whole, shall be deemed to have been included in the unit rates quoted above.

In case any line item is not provided in the Financial Bid, NMSCDCL shall assume that the Bid for such particular line item is already deemed to have been included in the total rate quoted.

SECTION 2: SCOPE OF WORK

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2.1 SCOPE OF WORK

The scope of work *inter-alia* includes the construction of various road way assets from Trimbak Naka to Ashok Stambh measuring 1100 meters designed and executed for a life expectancy of minimum 50 years in accordance to the below specified scope of work and Volume I, section 3 of the Tender Document, and maintaining them in good condition for 5 (five) years on the Site.

2.1.1 CC ROADS, FOOTPATH WORKS AND UTILITY CORRIDOR

Roads work includes dismantling and excavating existing flexible pavement and footpath area and to replace it with rigid pavement unreinforced CC roads made up of 28cm thick M40 grade PQC layer. This is to be overlaid on 15cm thick layers of GSB and DLC layers on 50cm thick cement stabilized earthen layer as per Maharashtra PWD/ MORTH specifications defined in the BOQ.

Footpath area on two sides of the carriage way are proposed to be excavated and re-laid with rubble filling, 10cm thick M15 grade cement concrete plain concrete (PCC), overlaid with 80mm thick interlocking paver tiles or any other similar material of construction in order to obtained the required texture as approved by the Engineer in charge and as per specifications in BOQ.

The finished top surface of roads shall be painted with the road markings to demarcate the carriage ways, lanes, Bus Stopovers, bicycle lane and pedestrian road crossings etc. and fixed with the signage boards. Traffic signal poles are proposed to be installed with electrical fittings at the junctions. The Bicycle lane shall be painted separately with hot pressed paint of color as advised by the Engineer in Chief.

Further, 4 (four) MS bus stops and 4 (four) e-toilets are proposed to be constructed at the Site along the stretch of 1100 meters. The locations for the same shall be as advised by the Engineer in Chief.

The Contractor must ensure that existing utility lines are not disturbed during Construction Period.

Utility Corridor- To be provided on both side of the streets in order to integrate and accommodate the modern infrastructure elements like, OFC, gas pipelines, electrical lines, water pipelines, Storm water drains, sewage lines in accordance to the details proposed in Volume II thereto.

2.2.2 WATER SUPPLY PIPE LINES

Ductile iron (DI) pipes of 100mm, 300mm and 400mm dia, 2.5 kms long, have to be laid fresh along with necessary specials and fittings along on the Site.

2.2.3 SEWER RCC PIPE LINES

300mm dia RCC pipelines, 2 kms. long have to be laid on the Site.

2.2.4 STREET LIGHTING

Street light luminaire side entry type, consisting of separate optical and control gear compartment with communication node & controller interface within the luminaire in the control gear compartment with a tool less opening of gear compartment as well as tool less gear tray replacement with a smart node.

PLUG and Play luminaire installation, no need to manually programming, commissioning or find adds to dashboard also no need to have skilled technician to operate the same. The luminaire can be remotely controlled & should allow remote lighting management, dimming calendar creation, up-to-date information on energy usage, and more. Luminaire should be having a cellular point to point communication between luminaire and server. Auto GPS location of luminaire on dashboard, auto network commissioning of luminaire making commissioning very simple. Auto lighting asset data upload on dashboard

The node should have a facility of metering accuracy of 2% as per EN 50470-3 Clause 8 Class A with a connectivity on GPRS 900/1800 MHz & complying to Approvals R&TTE directive 1999/5/EC with a stand by wattage of <1W. Embedded GPS location mapping and Astronomical Clock along with embedded photo sensor with bypass feature within the node & the controller must be able to retain no less than 7 days energy data in case of loss of connection.

2.2.5 LANDSCAPING

Divider and footpath area shall be planted with suitable species of plants as per landscape drawings and the schedules of items provided in BOQ. The final selection of the tree species and the type and pattern of tree guard shall be in consultation with the Engineer in Chief and the Chief Urban Planner appointed at NMSCDCL.

The contractor shall also be responsible to include and incorporate within the footpath works the area freed from encroachment if any as the work proceeds.

Name plates and signages as to the tree names, walkways, bicycle track, no-parking, crossings etc. to be instated as advised by the Engineer in Chief and the Chief Urban Planner appointed at NMSCDCL.

2.2.7 TRAFFIC MANAGEMENT DURING CONSTRUCTION

The Contractor shall at all times carry out work on the Site in a manner creating least interference to the flow of traffic while ensuring the satisfactory execution of the Project. For all works involving improvements to the existing highway, the Contractor shall, in accordance with the directives of the Engineer, provide and maintain, during execution of the work, a passage for traffic either along a part of the existing carriageway under improvement, or along a temporary diversion constructed close

to the highway. The Contractor shall take prior approval of the Engineer regarding traffic arrangements during construction.

Signs, lights, barriers and other traffic control devices shall be provided and maintained in a satisfactory condition till such time they are required as directed by the Engineer, so as to ensure smooth and safe traffic throughout the length. Necessary traffic arrangement at temporary diversions by signs, lights, barriers etc. is the responsibility of the Contractor.

The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the Engineer for information and protection of traffic approaching or passing through the section of the highway under improvement. Before taking up any construction, an agreed phased program for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer.

The barricades erected on either side of the carriageway/ portion of the carriageway closed for traffic, shall be of a strong design to resist violation and painted with alternate black and white stripes, red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings, painted drums or a similar device in adherence to the directions of the Engineer. At night, the passage shall be delineated with lanterns or other suitable light source.

One-way traffic operation shall be established whenever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic. This shall be done with the help of temporary traffic signals or flagmen kept positioned on opposite sides during all hours. For regulation of traffic, the flagmen shall be equipped with red and green flags and lanterns/ lights.

On both sides, suitable regulatory/ warning signs as approved by the Engineer shall be installed for the guidance of users of the road. On each approach, at least two signs shall be put up, one close to the point where transition of carriageway begins and the other 120m away. The signs shall be of approved design and of refractory type, if so directed by the Engineer.

Signs, lights, barriers and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time they are required as directed by the Engineer. The temporary travel way shall be kept free of dust by frequent applications of water, if necessary.

2.2.8 TRAFFIC SAFETY MEASURES DURING CONSTRUCTION

The Contractor should provide traffic safety arrangement required for the traffic near the Site before actual start of widening/ resurfacing work of road and during the work. The Contractor shall provide the traffic safety arrangement as per the detailed drawing. The traffic safety arrangements shall be

approved from the Engineer before taking any construction activities for widening or resurfacing of road. It will be sole responsibility of Contractor to provide for sufficient traffic wardens and barricades along the road edge.

The Engineer shall get himself satisfied about the traffic safety arrangement provided near the Site before allowing Contractor to commence the widening activity and a certificate to that effect shall be recorded in the measurement book. The following traffic signs shall be provided by the Contractor:

- a. sign No. 1 "SPEED LIMIT (20)" shall be placed at a distance of 120 m. away from point where the transition of carriageway begins. The sign board shall be in size 60 cm. dia. having white background and retro-reflective border red border and the numerals shall be in black color as per IRC: 67-1977. Distance between sign No. 1 and sign No. 2 shall be minimum 20 m.
- b. sign No. 2 cautionary boards indicating "NARROW ROAD AHEAD" shall be placed at a minimum distance of 80 m. away from the point of transition of carriageway. The signboard shall be of an equilateral triangle of size 90 cm. having white colour background. Retro-reflective border in red colour and non-reflective symbol in black colour as per IRC: 67-1977.
- c. sign No. 3 indicating "MEN AT WORK/ NMSCDCL ROAD WORK AHEAD" shall be placed at a distance of 40 m. away from the point of transition of carriageway. The signboard shall be of an equilateral triangle of size 90 cm. having white colour background. Retro-reflective border in red colour and non-reflective symbol in black colour as per IRC: 67-1977.
- d. sign No. 4 displaying the message "GO SLOW- WORK IN PROGRESS- SORRY FOR INCONVENIENCE" shall be placed at the point of transition of carriageway. The size of signboard shall be 1.0 m x 1.0 m. having red background and retro- reflective messages in white colour.

2.2.9 BARRICADING FOR WORK:

Proper barricading of the Site for construction shall be done by the Contractor by using the following devices and providing adequate number of persons/ wardens with flags/ whistles/ torches and reflective jackets for traffic control.

Sand filled plastic cones mounted with retro-reflective arrow hazard marker sign shall be placed as indicated in the Schedule VI. Plastic cone shall be 73 cm. in height having 39 cm. square/hexagonal bases. Cones shall be fluorescent orange and shall be made of a material that can be struck without damaging the vehicles on impact. For night time use, cones shall be retro-reflective or equipped with lighting devices for maximum visibility. Retro-reflection shall be provided by a white band 150 mm wide, no more than 100 mm from the top of the cone and an additional 100 mm white band a minimum of 50 mm below the 150 mm top band. The reflective sheeting used for bands shall be of Class B sheeting as per IRC- 67:2011.

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Retro-reflective strong inviolable stand type barrier shall be placed at either ends of the widening area up to the edge of the road to be laid on the Site. The barricades shall not be removed unless the permission is given by the Engineer or any other person authorized by him. The Barricade shall have two plates of size 1.30 m x 0.20 m. painted black and shall have white Retro-reflective Strips of Class B sheeting as per IRC-67:2011 and mounted on angle iron stand of 1.0 m. height. Minimum height of barricade shall be 1.50 m. alternatively, the barricading with continuous tin sheets fixed on wooden posts at distance of not more than 2 m and height not less than 1.5 m shall be used. The tin sheets shall be painted in alternate Black and Yellow paint and maintained in good condition during the widening work. All the excavated portions of the Site/ cross drainage work/ RCC chambers etc. shall be covered on all sides with painted tin sheet barricading.

Yellow light flasher shall be kept lit from sunset to sunrise, 2 nos. along transition line of traffic and 3 Nos. at barriers on both sides.

Informatory sign board indicating name of the Project, Contract Price, completion period, defect liability period, Contractor with telephone no. and name of junior engineer shall be provided at the starting point and end point of the stretch of road proposed for widening under the Project.

The signs, lights, barricades and other traffic control devices shall be well maintained, till such time that the traffic is commissioned on the widened road. The size, shape and colour of all the sign and caution boards shall be as mentioned above as per detailed drawings in accordance with the relevant IRC specifications and as per MORTH specifications.

In case the Contractor does not comply with the aforesaid conditions the following penalty shall be levied:

S. No.	Particulars	Penalty Amount (in Rs.)	Unit
1.	Non-fixing of barricade at Site	1,000/-	Rmt.
2.	Non-display of information board at Site @ 100m distance	500/-	Rmt.
3.	Non-providing of signage board and reflectory signage(s) at the Site	500/-	Rmt.
4.	Non-appointing of warden/ assistance at the crowded traffic road due to works at the Site.	200/-	Day
5.	After the utility service lines work gets completed, non-removal of excavated balance material/ soil from Site in time prescribed by the Engineer.	1,000/-	Day
6.	Not cleaning storm water/ drainage pipe line chamber, if excavated material falls in chamber	1,000/-	Chamber
7.	Damage to municipal Utility/ private property/ other utility	Actual Cost	-

SECTION 3: BILLS OF QUANTITIES

BOQ FOR CARRIAGEWAY CONSTRUCTION

S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.01	Portable barricade in construction zone Installation of a steel portable barricade with horizontal rail 300mm wide.2.5m in length fitted on a 'A" frame made with 45x45x5mm angle iron section, 1.5m height horizontal rail painted (2 coats) with yellow and white stripes, 150mm in width at an angle of 45 degree, 'A" Frame painted with 2 Coats of yellow paint, complete as per IRC:SP:55-2001 Complete as per specifications.	Nos.	901.00				
1.02	Dismantling of flexible pavements and disposal of dismantled materials stacking serviceable and unserviceable materials separately as per directions of Engineer in charge etc. complete.	Cum	17132				
1.03	Dismantling brick/Tile work /Paver Block in Cement Mortar Including T and P sorting and dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts complete and as per directions of Engineer in charge as per specification.	Cum	828.17				
1.04	Dismantling of existing structures like culverts, other structure comprising of masonry, cement concrete, woodwork, steel work, including TandP and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts complete as per specifications. and as per directions of Engineer in charge	Cum	2898.7				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.05	Excavation in earth, soil of all types, sand, gravel and soft murum , including removing the excavated material up to a distance of 50 m. beyond the building area and stacking and spreading as directed, dewatering, preparing the bed for the foundation and necessary back filling, ramming, watering including shoring and strutting etc. complete. (Lift upto 1.5 m.)	Cum	6887.7				
1.06	Excavation for foundation in earth, soils of all types, sand, gravel and soft murum , including removing the excavated material upto a distance of 50 metres beyond the building area and stacking and spreading as directed, dewatering, preparing the bed for the foundation and necessary back filling, ramming, watering including shoring and strutting etc. complete. (Lift from 1.5m to 3.0m)	Cum	710.36				
1.07	Disposal of above Excavated Material from Road With Lead of 10Km	Cum	28457				
1.08	Compacting the existing Subgrade with power roller including artificial watering etc. complete.	Sqm	28923				
1.09	Providing, laying and spreading soil on a prepared sub grade , pulverizing, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to	Cum	10751				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	form a layer of sub-base/base at all leads and lifts.						
1.1	Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work Site, spreading in uniform layers with motor grader / Paver on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401 -- Plant Mix Method and Grading -II Material at all leads and lifts.	Cum	3096.2				
1.11	Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate 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 suitable means as approved by Engineer-in-Charge , compacting with vibratory roller, finishing, curing and including preparation of sub-grade surface if required at all leads and lifts etc. complete.	Cum	2977.4				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.12	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 conforming to IS 383, using fine and coarse aggregates combined gradation as per Table 600-3 of MORTH Specification 2013, mixed in a batching and mixing plant/ non tilting mixer and Weigh batcher as per approved mix design, admixtures, transporting to Site, spreading, laying with approved make paver, compacted and finished in a continuous operation, 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 at all leads and lifts etc. complete.	Cum	5557.8				
1.13	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 mm.to 4 mm. joint) overlaid with bond breaking	Rmt	11075				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	tape as per detailed drawing. Item includes cleaning the joints with water jet / air compressor and allowing joint to become thoroughly dry before sealant is applied and applying primer.(A) Contraction and longitudinal joints (15 mm. deep x 8mm.wide)						
1.14	Providing rubble filling of trap/ granite/ quartzite gneiss stones for foundations including hand packing filling gravel / sand in the voids etc. complete. at all leads and lifts etc. complete.	Cum	3017.5				
1.15	Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for steps including steel centering, plywood/steel formwork, laying/pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc.complete. The Cement Mortar 1:3 plaster is considered for rendering uneven and honeycombed surface, only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.), with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/concrete Batch mix plant (Pan mixer) etc. complete. With natural sand/V.S.I. quality Artificial Sand at all leads and lifts etc. complete.	Cum	1266.9				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.16	Providing and laying in situ / ready mix / ready mix M25 RCC work with trap/ granite/ quartzite/ gneiss metal in well steining including shuttering, compacting by vibrating, finishing and curing etc. complete. (fully automatic micro processor based PLC with SCADA enabled concrete batch mix plant / pan mixer with natural /artificial sand, excluding reinforcement) at all leads and lifts etc. complete.	Cum	2442.1				
1.17	Providing, cutting, bending, hooking, tying and laying in position TMT FE 500 steel bars for reinforcement for all RCC works as per detailed drawings at all leads and lifts etc. complete.	MT	244.21				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.18	<p>Providing and fixing factory made Hydraulically pressed Mechanically vibrated and compacted precast inter locking cement concrete paving blocks 80MM thick in M-40 grade of approved size and shape for City streets, small /medium market roads, low volume roads, utility cuts on arterial roads etc. as specified and as per IS 15658:2006 including cost of all materials, manufacturing, curing, transportation of blocks to 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 blinding of fine sand over the prepared bed, compacting blocks by plate vibrator at all leads and lifts etc. complete.</p>	Sqm	7526.5				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.19	<p>Providing and fixing factory made Hydraulically pressed Mechanically vibrated and compacted precast inter locking cement concrete paving blocks 80MM thick in M-40 grade of approved colour (Blue), size and shape for City streets, small /medium market roads, low volume roads, utility cuts on arterial roads etc. as specified and as per IS 15658:2006 including cost of all materials, manufacturing, curing, transportation of blocks to 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 strata, spreading blinding of fine sand over the prepared bed, compacting blocks by plate vibrator etc. complete.</p>	Sqm	123.21				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.2	Footpaths and Separators -- Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, overlaid with pre-cast concrete Tactile tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel at all leads and lifts etc. Complete.	Sqm	398.41				
1.21	Providing and casting in situ or precast tapering R.C.C. M-20 Barrier 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 anywhere in city and redoing the surface as specified and directed by Engineering In-charge. Using Concrete Batching and Mixing Plant at all leads and lift etc. complete.	Rmt	5462.6				
1.22	Painting two coats after filling the surface with synthetic enamel paint in approved shades on new plastered concrete surfaces, with materials, labour complete as per specifications. MORTH Chapter 8	Sqm	1720.7				
1.23	Road Marking with Hot Applied Thermoplastic Compound with Reflectorizing Glass Beads on Bituminous Surface- Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorizing glass beads @ 250 gms per sqm area, thickness	Sqm	1475.7				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes complete.						
1.24	Providing second class Burnt Brick masonry with conventional/ I.S. type bricks in cement mortar 1:6 in superstructure including striking joints, raking out joints, watering and scaffolding etc. Complete	Cum	38.93				
1.25	Providing internal cement plaster 12mm thick in single coat in cement mortar 1:4 without neeru finish to concrete or brick surfaces, in all positions including scaffolding and curing etc. complete.	Sqm	213.52				
1.26	Providing and fixing machine cut machine polished 18 mm to 20 mm thick telephone black / Amba White / Cat bary brown / RBI red / Ocean Brown granite stone for treads and risers of steps and staircases and street seating furniture of approved colour and shade with rounded moulding and three grooved line for the treads on bed of 1:4 Cement mortar including float filling joints with neat cement slurry curing polishing and cleaning etc. complete	Sqm	64.38				
1.27	Providing and fixing M.S. Bus stop as per the specification and Drawings.	Nos.	4				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.28	<p>Providing and construction of E- toilet with specification</p> <ol style="list-style-type: none"> 1. Super structure of the electronic toilet to have asthetic ambience with inner room size 1.2 x 0.8 x 2.4 (LXWXH) meters 2. Size of electronic toilet overall size in meters 2.30x1.25x2.80 (LXWXH) Totl area 35 Sft. 3a. Built-access controlled main door and side walls made of SS Grade 304 3b. Toilet floor and closet are to be stainless steel grade 304. 4. Built-in water tank with minimum 225 Lit capacity. 5. Access control using coin validator for entering the unit based on automatic payment collection mechanism exit from the unit should be manual. 6. Automatic lights inside the unit with gloves on opening the door. 7. Automatic flushing system which includes <ol style="list-style-type: none"> a. Automatic Pre flush cleaning before use b. Automatic closet washing mechanism after use c. Automatic platform cleaning mechanism programmed after specific number of numbers. <p>In addition to these flush switch is to be provided for manual operation.</p>	Nos.	4				
	<ol style="list-style-type: none"> 8. Standard features should include heath faucet, exhaust fan and cloth hanger. 9. Alert to users-different indication on 'ready to use', busy are to be provided in the unit. 10. Web enabled support-GPRS based Real time data to be provided from the unit through web for knowing the health status like number of users per day and coins collected. 						

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	<p>11. Modular and portable design enabling easy assembling and installation at Site.</p> <p>12. Status display in LED, Printed instruction stickers are to be provided.</p> <p>13. Space for advertisement display to be provided on the exterior of the unit for income generation and sustainability.</p> <p>14. Voice guidance in the unit for users.</p> <p>15.Backup power facility like UPS is to be provided to supplement up to 30 Min</p> <p>16. Call center and web portal facilities for registering compliance and tracking usage, coin collection etc.</p> <p>17. Base of the unit to be placed on a suitable concrete structure with an aesthetic finish.</p> <p>10. Stainless steel Mirror panel.</p> <p>11. Stainless steel waste bin with push door to outside toilet cubicle.</p> <p>12.Vandal proof Fan and LED lights (activated only when the toilet is occupied)</p> <p>13.Pressure Boosting Pump (to generate required pressure for flushing and pressure cleaning) - 05HP</p>						

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.29	Providing and Installing Waste water treatment and recycling unit for E-Toilet: Bio digester tank suitable for maintenance free processing the soil waste with 2000 litre capacity, made of FRP. The bio digester shall be of anaerobic type with compartments followed by disinfection. The compartments shall have polygrass mats for protection of bacteria on side partition walls. The bio digester shall be fitted with ball valve or bypass arrangement. Dosed with approved microbial solution at recommended interval	Nos.	4				
1.3	Providing and fixing of S.S. Bollards(SS304) 450mm High(above ground)on footpath as specified and directed by Engineer -in-charge	Nos.	325				
1.31	Providing and fixing Cautionary/Warning sign boards in Equilateral Triangle size of 900 mm out of 2mm 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 X65 mm X 6 mm, 3.45 m long, duly	Nos.	42				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	<p>Painted 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>						
1.32	<p>Providing and fixing Cautionary/Warning sign boards in Octagone size of 900 mm out of 2mm aluminum sheet bonde 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 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</p>	Nos.	15				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	<p>painted 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 cutout 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>						
1.33	<p>Supply and Fixing of Traffic signal Straight pole of 6 mtr, inner dia 100 mm from resistant to peeling with base plate size of (LXWXT) 200mmX200mmX6mm painted with redoxide and double coat with synthetic enamel paint of yellow colour assembly G.I., class B, as per technical specification</p>	Nos.	46				
1.34	<p>Supply and fixing of Traffic signal Cantilever pole Class B having inner diameter of 100 mm or more with a height of 6m including extension arm assembly having outer diameter of 75mm with arm span of 4 mtr length and base plate of size 300mm X 300mm with thickness of 6 mm welded at the bottom of the pole base as per technical specification</p>	Nos.	15				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	and drawings.						
1.35	Supply and fixing of 300 mm dia – single source – LED retrofit - Red (blow) as per Specification	Nos.	29				
1.36	Supply and fixing of 300 mm dia – single source – LED retrofit - Amber (blow) as per Specification	Nos.	29				
1.37	Supply and fixing of 300 mm dia – single source – LED retrofit - Green (arrow/U-Turn) EN-12368 as per Specification	Nos.	29				
1.38	Supply and fixing of 300 mm dia – single source – LED retrofit - Red (ped. standing) EN-12368 as per Specification	Nos.	33				
1.39	Supply and fixing of 300 mm dia – single source – LED retrofit - Green (ped walking) EN-12368 as per Specification	Nos.	33				
1.4	Providing ISI standard R.C.C. pipes in standard lengths of following class and diameter suitable for either collar joints or rubber ring joints, including all taxes (Central and local), inspection charges, transport to departmental stores/Site, unloading and stacking etc. complete. as per IS 458/1988 Note ; One Collar shall be supplied with each full length plain ended	Rmt	504				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
	R.C.C. pipe, cost including in rates below. One rubber ring shall be supplied with each full length socketed pipe, cost including in rates below. for 300mm Dia						
1.41	Lowering, laying and jointing in proper grade and alignment R.C.C. pipes with collar joints in C.M.1:1 proportion or socketed R.C.C. pipes with rubber joints (excluding cost of rubber ring or R.C.C. collar,) including cost of conveyance from stores to Site of work, cost of jointing material, labour, giving hydraulic testing etc. complete as directed by Engineer-in-Charge (For all class of pipes.) Collar Joints.as per IS 783/1985. For 300mm Dia	Rmt	504				
1.42	Providing and supplying in standard lengths Polyethelene Pipes , confirming to I.S. 4984 / 14151 / 12786 / 13488 with necessary jointing material like mechanical connectors I.e. thread/ insert joint / quick release coupler joint/ compression fitting joint or flanged joint , including all local and central taxes, transportation and freight charges, inspection charges, loading / unloading charges, conveyance to NMSCDCL stores/ Site and stacking the same in closed shade duly protecting from sunrays and rains , etc. complete. for Dia 160mm	Rmt	533.2				

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S. No.	Description	Unit	Qty.	Basic Rate (without GST)	GST	Rate Including GST	Amount
1.43	Lowering laying and jointing HDPE /MDPE pipes in proper position including all specials by Compression fitting /Electrofusion and But fusion jointing procedure including hydraulic testing as per relevant IS Code complete with all materials for jointing procedures like Electrofusion machine, Electric mirror/heater /But fusion welding machine with hydraulic jack, top loading clamp etc. pump and accessories for hydraulic testing and all labours as directed by Engineer-in-Charge as per IS - 7634 Part II.	Rmt	533.2				
							0

BILL OF QUANTITIES (BOQ) WATER SYSTEM NETWORK

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE IN Rs.	GST	Rate Including GST	AMOUNT IN Rs.
1	Excavation for foundation / pipe trenches in hard murum and boulders, W.B.M. road including removing the excavated material beyond the area and lifts as below, stacking and spreading as directed by Engineer-in-Charge, normal dewatering, preparing the bed for foundation and excluding backfilling, etc. complete.						
i	Depth upto 1.50 m	Cum	1,545.00				
2	Providing and laying granular bedding for water supply lines as per drawing and specification complete as directed by engineer.	Cum.	309.00				
3	DI PIPES						
3A	Providing and supplying ISI mark D.I. SandS pipes (push on joints pressure pipes of D.I.of following class and diameters confirming to the I.S. specification inclusive cost of jointing						

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE IN Rs.	GST	Rate Including GST	AMOUNT IN Rs.
	materials (Rubber gasket of EPDM Quality) including all statutory duties and taxes levied by Gol and GoM in all respect, Education cess,VAT, Third party inspection charges of TPI Agency approved by MJP including Transit insurance, Railway freight unloading from railway wagon, loading into trucks, transportation to departmental stores / Site of work, unloading stacking etc. completed as directed by Engineer-in-charge(IS:8329/2000 for pipes and IS 158/1969 and IS 12820/1989 or latest edition/ revision with amendments for Rubber Gaskets.						
i	100 mm	Rmt	900.00				
ii	300 mm	Rmt	800.00				
iii	400 mm	Rmt	800.00				

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE IN Rs.	GST	Rate Including GST	AMOUNT IN Rs.
3B	Lowering laying and jointing with SBR rubber gaskets C.I. S/S pipes of various classes with CI / MS specials of following diameter in proper position, grade and alignment as directed by Engineer-in-Charge including conveyance of material from stores to Site of work, including cost of jointing materials and rubber rings labour, giving hydraulic testing etc. complete.						
i	100 mm	Rmt	900.00				
ii	300 mm	Rmt	800.00				
iii	400 mm	Rmt	800.00				
3C	All Specials						
		kg	1,870.00				

BILL OF QUANTITIES (BOQ) FOR SEWAGE COLLECTION NETWORK

Sr. No	Item Description	Unit	Quantity	Rate	GST	Rate Including GST	Amount in Rs
1.0	EARTHWORK EXCAVATION						
1.1	Excavation for foundation / pipe trenches in hard murum and boulders, W.B.M. road including removing the excavated material upto a distance of 50 M beyond the area and lifts as below, stacking and spreading as directed by Engineer-in-Charge, normal dewatering, preparing the bed for foundation and excluding backfilling, etc. complete.						
i	Depth upto 1.50 m	Cum	2,326.88				
ii	Deeper than 1.51 m to a depth of 3.00m	Cum	859.96				
iii	Deeper than 3.01 m to a depth of 4.50 m	Cum	2.62				
1.3	BACKFILLING						
	Refilling the trenches with available excavated stuff with soft material first over pipeline and then hard material in 15 cm layers with all leads and lifts including consolidation, surcharging, etc. complete.	Cum	2,961.42				
2.0	BEDDING						
2.1	Filling in plinth and floors / trenches with Contractor's murum for bedding in 15cm to 20cm layers including watering and compaction complete.	Cum	332.97				
3.0	PIPES						
3.1	Providing ISI standard R.C.C. pipes in standard lengths of						

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Sr. No	Item Description	Unit	Quantity	Rate	GST	Rate Including GST	Amount in Rs
	following class and diameter suitable for either collar joints or rubber ring joints, including all taxes (Central and local), inspection charges, transport to departmental stores/Site, unloading and stacking etc. complete. as per IS 458/1988 Note ; One Collar shall be supplied with each full length plain ended R.C.C.pipe, cost including in rates below.One rubber ring shall be supplied with each full length socketted pipe , cost including in rates below.						
i	300 mm	Rmt	2,010.76				
3.2	Lowering, laying and jointing in proper grade and alignment R.C.C. pipes with collar joints in C.M.1:1 proportion or socketed R.C.C. pipes with rubber joints (excluding cost of rubber ring or R.C.C. collar,) including cost of conveyance from stores to Site of work, cost of jointing material, labour, giving hydraulic testing etc. complete as directed by Engineer-in-Charge (For all class of pipes.) Collar Joints.as per IS 783/1985						
i	300 mm	Rmt	2,010.76				
4.0	MANHOLES						

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Sr. No	Item Description	Unit	Quantity	Rate	GST	Rate Including GST	Amount in Rs
i	Providing and constructing on sewer, B.B. masonry circular manhole concentric cone 1.2 M dia. at bottom and 0.5 M dia. at top and upto a depth of 2.00 M with 23 cm brick work in CM 1:4 proportion excluding excavation including foundation concrete 250 mm thick and haunches and channels in c.c.1:2:4 proportion, finishing channels in smooth rendering, providing C.I. dapuri type steps each weighing 5.5 kg., 1:2:4 coping and providing and fixing approved make and quality S.F.R.C. frame and cover of 56 cm.dia. etc. complete as directed by Engineer-in-Charge.A-Type Manhole 560 mm Dia depth 1.2m to 1.5m	Per Number	23.00				
ii	Providing and constructing on sewer, B.B. masonry circular manhole concentric cone 1.2 M dia. at bottom and 0.5 M dia. at top and upto a depth of 2.00 M with 23 cm brick work in CM 1:4 proportion excluding excavation including foundation concrete 250 mm thick and haunches and channels in c.c.1:2:4 proportion, finishing channels in smooth rendering, providing C.I. dapuri type steps each weighing 5.5 kg., 1:2:4 coping and providing and fixing approved make and quality S.F.R.C. frame and cover of 56 cm.dia. etc. complete as directed by Engineer-in-	Per Number	8.00				

RFP for development of smart road pilot project in Nashik

Sr. No	Item Description	Unit	Quantity	Rate	GST	Rate Including GST	Amount in Rs
	Charge. B-Type Manhole 1200 mm Dia depth 1.66 m to 2 m						
iii	Providing and constructing on sewer, B.B. masonry circular manhole concentric cone 1.5 M dia. at bottom and 0.5 M dia. at top and upto a depth of 5.00 M with 23 cm brick work up to depth of 2 M from top and 35 cm thick brick work for balance depth in CM 1:4 proportion with 20 mm thick smooth plaster on both side in cm 1:2 proportion excluding excavation including foundation concrete 250 mm thick and haunches and channels in c.c.1:2:4 proportion, finishing channels in smooth rendering, providing C.I. dapuri type steps each weighting 5.5 kg., 1:2:4 coping and providing and fixing approved make and quality S.F.R.C. frame and cover of 56 cm.dia. etc. complete as directed by Engineer-in-Charge. B-Type Manhole 1200 mm Dia depth 2.01 m to 2.3 m	Per Number	8.00				
iv	Providing and constructing on sewer, B.B. masonry circular manhole concentric cone 1.5 M dia. at bottom and 0.5 M dia. at top and upto a depth of 5.00 M with 23 cm brick work	Per Number	28.00				

RFP for development of smart road pilot project in Nashik

Sr. No	Item Description	Unit	Quantity	Rate	GST	Rate Including GST	Amount in Rs
	<p>up to depth of 2 M from top and 35 cm thick brick work for balance depth in CM 1:4 proportion with 20 mm thick smooth plaster on both side in cm 1:2 proportion excluding excavation including foundation concrete 250 mm thick and haunches and channels in c.c.1:2:4 proportion, finishing channels in smooth rendering, providing C.I. dapuri type steps each weighting 5.5 kg., 1:2:4 coping and providing and fixing approved make and quality S.F.R.C. frame and cover of 56 cm.dia. etc. complete as directed by Engineer-in-Charge. C-Type Manhole 1500 mm Dia depth 2.31 to 3m</p>						
v	<p>Providing and constructing on sewer, B.B. masonry circular manhole concentric cone 1.5 M dia. at bottom and 0.5 M dia. at top and upto a depth of 5.00 M with 23 cm brick work up to depth of 2 M from top and 35 cm thick brick work for balance depth in CM 1:4 proportion with 20 mm thick smooth plaster on both side in cm 1:2 proportion excluding excavation including foundation concrete 250 mm thick and haunches and channels in c.c.1:2:4 proportion, finishing channels in smooth rendering, providing C.I. dapuri type steps each weighting 5.5 kg., 1:2:4 coping</p>	Per Number	1.00				

RFP for development of smart road pilot project in Nashik

Sr. No	Item Description	Unit	Quantity	Rate	GST	Rate Including GST	Amount in Rs
	and providing and fixing approved make and quality S.F.R.C. frame and cover of 56 cm.dia. etc. complete as directed by Engineer-in-Charge.C-Type Manhole 1500 mm Dia depth 3.01 to 4.5 m						

BILL OF QUANTITIES (BOQ) FOR STREET LIGHTING SYSTEM

Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
1	Lighting fixtures						
1.1	Supplying and erecting LED street light fitting suitable above 26W to 36W lamp, including lamp, with PF > 0.95 class IP 65 and above Housing of pressure die cast aluminum alloy and heat sink extruded aluminum complete as per specification No FG-ODF/FLS2	200	Each				
1.2	Supplying and erecting LED street light fitting suitable for 160 -170 W, including lamp, with PF > 0.95 class IP 65 and above Housing of pressure die cast aluminum alloy and heat sink extruded aluminum complete per specification No FG-ODF/FLS-2 (Pathway)	90	Each				
1.3	Supplying and erecting LED Flood light fitting of 200W, including lamp, with PF > 0.95, class IP 65 and above Housing of pressure die cast aluminum alloy and heat sink extruded aluminum complete per specification No FGODF/ FLS-2	32	Each				

RFP for development of smart road pilot project in Nashik

Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
1.4	Supplying and erecting aviation obstruction light consisting of yellow painted die-cast aluminum alloy housing with Integral LED aviation light comprising of aluminum housing with polycarbonate enclosure complete.	4	Each				
2	Lighting Poles						
2.1	Providing and erecting 4 m high (clear height) galvanized OCTAGONAL pole with foundation bolts having bottom of 130 mm A/F, top 70 mm A/F on provided foundation as per specification No.OH-PL/OPL	200	Each				
2.2	Supplying and erecting steel tubular swaged pole 165.1 x 139.7 x 114.3 mm. dia with 4.5 x 4.5 x 3.65 mm thickness (5 + 2 + 2 m) length respectively and total 9 m long with pole cap, base plate in provided foundation (weight 147 kg) as per specification No. OHPL/ STP	60	Each				

RFP for development of smart road pilot project in Nashik

Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
2.3	Supplying and erecting 20 m (clear height) High Mast (Top- 150mm, Bottom- 410mm) with lowering and raising motorized unit, lantern carriage assembly suitable for max. 8 nos. luminaries and its control gear box, lightning finial, arrangement for fixing aviation light and foundation bolts on provided foundation as per specification No. OH-PL/HM (excluding luminaries and CG Boxes).	4	Each				
2.4	Supplying and erecting Street light bracket for erection of Double fitting on tubular welded pole with 40 mm.dia 1.0 m long "B" grade G.I. pipe along with pole cap of 125mm dia 600 mm long duly welded as per specification no. FG-BKT/BPC	28	Each				

RFP for development of smart road pilot project in Nashik

Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
2.5	Supplying and erecting Street light bracket for erection of Single fitting on tubular welded pole with 40 mm.dia 1.0 m long "B" grade G.I. pipe along with pole cap of 125mm dia 600 mm long duly welded as per specification no. FG-BKT/BPC	32	Each				
2.6	Supplying and erecting Street light bracket made from 40 mm. dia 'B' class G.I. Pipe, 0.6m. in length along with pole cap of 300 mm length and 80 mm dia duly welded with provided leads as per specification no. FG-BKT/BPC	200	Each				
2.7	Providing and casting of M- 20 grade reinforced cement concrete (RCC) foundation suitable for 3m to 5m high octagonal / conical G.I. pole considering the safe soil bearing capacity at Site as 10 T/sq m at 1.5 m depth including supply of steel, concrete, excavation and fixing provided nut bolts with the help of template as per design in an approved manner.	200	Each				

RFP for development of smart road pilot project in Nashik

Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
2.8	Providing cement concrete foundation including excavation for the poles 60 cm x 60 cm x 1.5 m deep in 1:3:6 cement concrete (20 x 25 mm stone metal) and 45 cm x 45 cm x 45 cm /45 cm dia. x 45 cm height plinth duly plastered and with necessary curing and finishing in an approved manner. (for 8.5 to 9 m poles)	60	Each				
2.9	Providing and casting M- 20 cement concrete foundation suitable for 20 m raising lowering high mast considering the safe soil bearing capacity at Site as 10 T/sq m at 2 m depth including excavation and fixing provided nut bolts with the help of template as per design in an approved manner.	4	Each				

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Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
2.1	Supplying and erecting Outdoor Stand Mounted Feeder Pillar for high mast of the same manufacturer with 63A TPN MCB incomer, single dial timer switch, 45 A TP contactor for automatic switching of luminaries, 2 no 9A contactors and raise/lower push button, and provision for termination of Incoming minimum 35 sq. mm and outgoing minimum 16 and 2.5 sq. mm cables complete erected in min. 14 gauge CRCA sheet box powder coated with supporting angles, self-lock, gasket and slanting top erected on CC foundation in an approved manner.	4	Job				
2.11	Supplying and erecting water tight terminal box of 1.6 mm (16 gauge) CRCA sheet of size 200 x 150 x 150 mm. complete on pole as per specification No. CB-SB	260	Each				
3	Lighting Panel						
3.1	Street Light Control Panel (SLCP)	1	No.				

RFP for development of smart road pilot project in Nashik

Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
	<p>Supply, installation, testing and commissioning of SLCP</p> <p>Shall be conforming following IS standards –</p> <p>IS: 2147 – 1962 Degree of protection</p> <p>Floor / wall/ structure mounted, free standing, suitable for cable entry from bottom side, dust proof, vermin proof, 3 phase and neutral, bus bar, aluminium, neutral bus shall be of same size as phase bus bars, Short circuit capacity for the bus bars and switches shall be 10 kA</p>						
4	Cabling						
4.1	<p>Supplying, erecting and terminating PVC armoured cable 3½ core 25 sq mm</p> <p>aluminium conductor with continuous 5.48 sq mm (12 SWG) G.I. earth wire complete erected with glands and lugs, on wall/ trusses/pole or laid in provided trench/ pipe as per specification no. CB-LT/AL</p>	3,450	Mtrs.				

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Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
4.2	Supplying, erecting and terminating PVC armoured cable 2 core 2.5 sq mm copper conductor continuous 5.48 sq mm (12 SWG) G.I. earth wire complete erected with glands and lugs, on wall/ trusses/pole or laid in provided trench/ pipe as per specification no. CB-LT/CU	2,424	Mtrs.				
4.3	Making trench in soft soil of suitable width and depth as per IS for laying provided L.T cable up to 25 sq mm complete. As per specification No. CW-EXN-CTR	2,000	m				
4.4	Making the trench in Hard murum/Tar road of suitable width and depth as per IS for laying provided L.T cable up to 10 sq.mm.complete. As per specification No. CW-EXN-CTR	100	m				
4.5	Supplying and erecting crimping type copper lugs for cable upto 16 sq mm complete as per specification No. CB-CL/CU	520	Nos.				

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Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
	Supplying and erecting crimping type aluminium lugs for cable 25 sq. mm complete as per specification No. CB-CL/AL	795	Nos.				
5	Earthing system						
5.1	Supply, Installation, Testing and commissioning of UL Certified / CPRI Tested Maintenance Free Earthing comprising of Electrode of 17.2 mm diameter Low Carbon Steel with 250 micron Molecular Copper Bonded Earthing Rod of Length 3m along with 25 kg Carbon Based environment friendly back fill Ground Enhancing compound required to fill up the excavated earth with required quantity as per specification no EA-MOBI	6	Each				

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Item No.	Description	Qty.	Unit	Rate	GST	Rate Including GST	Amount
5.2	Supplying and erecting GI strip of required size used for earthing on wall and/or any other purpose with necessary GI clamps fixed on wall painted with bituminous paint in an approved manner with joints required. As per specification No EA-EP.	600	Kg				

BILL OF QUANTITIES (BOQ) FOR LANDSCAPE										
Code No	Plant Name	Common Name	Spacing/Sq.mt	Height	Unit	Qty	Rates (Supply +labour)	GST	Rate including GST	Amount
Divider	As directed by the Engineer in Chief.									
A1			Position as shown	2.5 mt clear stem	No.	250				
A2			Position as shown	2.5 mt clear stem	No.	279				
A3			0.30m c/c		No.	12065				
A4			0.30m c/c		No.	12765				
Footpath	As directed by the Engineer in Chief.									
B1			Position as shown	2.5 mt clear stem	No.	6				
B2			Position as shown	2.5 mt clear stem	No.	10				
B3			0.23m c/c		No.	145				

CONTRACTOR

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CEO

Document No. : MAH-NAS-INT-07-RFP-04

NMSCDCL

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BILL OF QUANTITIES (BOQ) FOR LANDSCAPE										
Code No	Plant Name	Common Name	Spacing/Sq.mt	Height	Unit	Qty	Rates (Supply +labour)	GST	Rate including GST	Amount
B4			0.23m c/c		No.	242				
B5			0.23m c/c		No.	1098				
B6			0.23m c/c		No.	1039				
Compound Wall	As directed by the Engineer in Chief.									
C			As per Detailed drawing	0.6 mt	No.	25				
					Bras s	600				
					Bags (50K g)	300				

CONTRACTOR

Document No. : MAH-NAS-INT-07-RFP-04

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CEO

NMSCDCL

VOLUME II

SECTION 1: CONTRACT AGREEMENT

CONTRACT AGREEMENT

(To be executed on a non-judicial stamp paper of appropriate value)

THIS CONTRACT AGREEMENT ("Contract/Agreement") is made on this [●] day of [●] 2017 at [●], India.

BETWEEN

1. Nashik Municipal Smart City Development Corporation Limited having its principal office at [●] India hereinafter referred to as "**NMSCDCL**", which expression shall, unless repugnant to the context or meaning thereof, include its permitted successors and assigns) of One Part;

AND

2. {[●], a Company incorporated under the {Companies Act, 1956/Companies Act, 2013}¹, having its registered office at [●] (hereinafter referred to as {"**Contractor**"})² which expression shall, unless repugnant to the context otherwise requires, include its permitted successors and assigns) of Second Part.

OR

A consortium consisting of [●], a Company incorporated under the {Companies Act, 1956/Companies Act, 2013} ("**Lead Bidder**"), [●] and [●], a Company incorporated under the {Companies Act, 1956/Companies Act, 2013} ("**Consortium Member**") (hereinafter collectively referred to as {"**Contractor**"})³ which expression shall repugnant to, unless the context otherwise requires, include its permitted successors and assigns) of Second Part.}

Each of the parties mentioned above are collectively referred to as the '**Parties**' and individually as a '**Party**'.

WHEREAS:

- A. NMSCDCL has selected the Contractor through a competitive bidding process pursuant to a Request for Proposal dated [●] for implementing the Project (RFP).
- B. After evaluation of the bids received from the bidders, NMSCDCL accepted the Bid of the [bidder/consortium] on the basis of the Bid response as set forth in the Annexure [●] and issued its Letter of Award No. [●] dated [●] ("**LOA**") to the successful bidder, requiring the successful bidder, *inter alia*, to execute this Contract within the time period prescribed in the RFP.

¹ Notes:

- (i) *The provisions in curly brackets are to be retained in the Agreement and shall be suitably modified after the issue of LOA to reflect bid specific particulars in relation to a single Bidder/ Consortium.*
- (ii) *The provisions in square brackets and/or blank spaces shall be suitably filled after the issue of LOA in order to reflect bid specific particulars in the Agreement.*

² Applicable in case of a single bidder

³ Applicable in case of a consortium

RFP for development of smart road pilot project in Nashik

- C. The Successful Bidder has requested the NMSCDCL to accept it as the Contractor which shall undertake and perform the obligations and exercise the rights of the Successful Bidder under the LOA, including the obligation to enter into this Contract pursuant to the LOA for implementing this Project in accordance with the terms and conditions as set out in this Contract.
- D. NMSCDCL is desirous that the Contractor execute _____(name and identification number of Contract) (hereinafter called "the Works") and NMSCDCL has accepted the Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein, at a cost of Rs. [●].

NOW THEREFORE, in consideration of the mutual covenants, promises, assurances, representations and provisions set forth herein, the Parties hereto agree as follows:

1. In this Agreement, words and expression shall have the same meanings as are respectively assigned to them in the Conditions of Contract as set out in Section 2 of Volume II which shall be deemed to form an integral part of this Agreement and is to be read as a part and parcel of this Agreement.
2. In consideration of the payments to be made by NMSCDCL to the Contractor as hereinafter mentioned, the Contractor hereby covenants with NMSCDCL to execute and complete the Works and remedy any defects therein in conformity in all aspects with the provisions of the Contract.
3. NMSCDCL hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying the defects wherein Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
4. The following documents shall be deemed to form and be ready and construed as part of this Agreement viz.
 1. Conditions of Contract as set out in Section 2 of this Volume II:
 - A. General Conditions of Contract
 - B. Special Conditions of Contract.
 2. Technical Specifications as set out in Section 3 of this Volume II
 3. Drawings as set out in Section 4 of this Volume II
 4. Bill of Quantities of the Contractor as set out in Section 3 of the Volume I
 5. Scope of work for the Contractor as set out in Section 2 of Volume I
 6. Any other document (s), as specified.

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED For and on behalf of NMSCDCL by: (Signature) (Name) (Designation) (Address) (Fax No.)	SIGNED, SEALED AND DELIVERED For and on behalf of the Contractor by: (Signature) (Name) (Designation) (Address) (Fax No.)
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SECTION 2: CONDITIONS OF CONTRACT

A. General Conditions of Contract

DEFINITIONS: -

Terms and expressions used in this Contract shall have the meanings hereunder:

- 1.1 **"Contract/Agreement"** shall mean the agreement to be executed between NMSCDCL and the Contractor for execution of Works.
- 1.2 **"Construction Period"** means the period of 6 (six) months from the date of issuance of Work Order which includes rainy season, if any.
- 1.3 **"Completion"** means that the completion of the execution of Works by the Contractor on or before the expiry of the Construction Period pursuant to the issuance of the Completion Certificate by NMSCDCL in accordance with Clause 22.3.
- 1.4 **"Completion Certificate"** means the certificate issued by NMSCDCL to the Contractor, pursuant to Clause 21.
- 1.5 **"Contract Price"** shall mean the total amount payable to the Contractor for the Project as set out in Clause 5.1.
- 1.6 **"Contract Period"** means period comprising of the Construction Period of 6 (six) months including monsoon and defect liability period of 60 (sixty) months.
- 1.7 **"Damages"** shall have the meaning as set forth in Clause 2 (e).
- 1.8 **"Defect Liability Period"** means the period of 60 (sixty) months, as provided under Clause 22, of the warranties provided by the Contractor, during which the Contractor is responsible for rectification of the defects with respect to the Works.
- 1.9 **"Drawing"** means the drawings referred to in Section 4 of Volume II and includes any modifications of such drawings approved in writing by Engineer and such other drawings as may from time to time be furnished or approved in writing by NMSCDCL.
- 1.10 **"Engineer-in-Charge"/ "Engineer"** means the engineer appointed by NMSCDCL for the supervision and management of the Project.
- 1.11 **"NMSCDCL"** mean the Nashik Municipal Smart City Development Corporation Limited.
- 1.12 **"NMC"** means Nashik Municipal Corporation.
- 1.13 **"PQC"** means Pavement Quality Concrete.

RFP for development of smart road pilot project in Nashik

- 1.14** “**Programme**” shall have the meaning as set forth in Clause 13.1.
- 1.15** “**Project**” means the construction and development of the road from Trimbak Naka to Ashok Stambh admeasuring 1.1 Km. under smart road pilot project at Nashik, Maharashtra in accordance with the provisions of this Contract.
- 1.16** “**Site**” means the road from Trimbak Naka to Ashok Stambh under the Project.
- 1.17** “**Site Laboratory**” shall have the meaning as set forth in Clause 9.1.
- 1.18** “**Take Over**” means the successful handing over of the Project by the Contractor to NMSCDCL after the expiry of the Defect Liability Period and pursuant to the issuance of the Take Over Certificate.
- 1.19** “**Take Over Certificate**” means the certificate issued by NMSCDCL to the Contractor pursuant to Clause 22.3.
- 1.20** “**Technical Specification**” means the specifications as set out in the Section 3 of the Volume II.
- 1.21** “**Total Station**” means an electronic/optical instrument used for surveying construction.
- 1.22** “**Variation Order**” has the meaning ascribed to such term under Clause 59 when made in accordance with Clause 59, the Variation Order shall form a part of this Contract and shall be provided by and is enforced in the terms thereof unless specifically provided otherwise in the Variation Order.
- 1.23** “**Works**” or “**Work**” means works as set out in Section 2 of Volume I, to be executed by the Contractor, in accordance with the Technical Specifications and the terms and conditions of this Contract.

2. INTERPRETATIONS

In this Contract, unless the context requires otherwise:

- a. Words indicating one gender include all genders.
- b. Words indicating the singular also include the plural and vice versa.
- c. Provisions including the word “agree”, “agreed” or “agreement” require the agreement to be recorded in writing.
- d. “Written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record.
- e. the damages payable by either Party to the other, as set forth in this Contract, whether on per diem basis or otherwise, are mutually agreed genuine pre-estimated loss and damage likely to

be suffered and incurred by the Party entitled to receive the same and are not by way of penalty (the "**Damages**").

- f. The rule of construction, if any, that a contract should be interpreted against the Party responsible for the drafting and preparation thereof, shall not apply.

3. SCOPE OF THE PROJECT

This Contract is for the execution of the Works by the Contractor for NMSCDCL, as per the Technical Specification as set out under Section 2 of Volume II and in accordance with the terms and conditions of this Contract. The Contractor shall, during the term of this Contract, execute the Works and any other work, as may be required to fulfill its obligations under this Contract. The particulars of the Works to be performed/executed under this Contract are specified in Section 2 of Volume I.

4. TIME FOR COMMENCEMENT AND TERM

4.1 Commencement

The Contractor shall commence the execution of the Works immediately after the issuance of Work Order in accordance with the terms and conditions of this Contract.

4.2 Term

Subject to Clause 53, the term of the Project shall comprise of Construction Period and Defect Liability Period.

5. CONTRACT PRICE AND PAYMENT

- 5.1 NMSCDCL hereby agrees to pay to the Contractor for satisfactory discharge of its obligations under this Contract, an Item Rate amount of INR awarded. The Contract Price shall be the full and complete payment for the Contractor's performance of the obligations under this Contract and includes all costs necessary for execution of the Works.

- 5.2 The Contract Price shall be paid in accordance with this Clause 5.1 and in the manner provided in Section 3 of Volume I/ (Contract Price). For the avoidance of doubt, all the taxes and duties levied by the state government/ central government/ local bodies at the prevailing rates applicable on the date of LoA shall be fully borne by the Contractor and shall not be reimbursed to it by NMSCDCL on any account. The Contract Price shall be inclusive of all taxes and levies under applicable laws.

5.3 Effect of Payment

RFP for development of smart road pilot project in Nashik

Any payment of the Contract Price or part thereof, made by NMSCDCL, shall not be deemed to constitute acceptance by NMSCDCL of the Works or any part(s) thereof and shall not relieve the Contractor of any of its obligations under this Contract.

- 5.4 Subject to Clause 5.5, NMSCDCL shall make monthly payments to the Contractor as certified by the Engineer-in-Charge on completion of a stage, and valued in accordance to its milestone event or stage, set out in the Programme.
- 5.5 The Contractor shall submit an invoice for each month on or before the date fixed by the Engineer-in-Charge for all Work executed in the previous month in accordance with the Programme and the Engineer-in-Charge shall take or cause to be taken the requisite measurement for the purpose of having the same verified and the claim, so far as it is admissible, shall be adjusted, if possible, within 10 (ten) days from the presentation of the invoice. If the Contractor does not submit the invoice within the time fixed as aforesaid, the Engineer-in-Charge may depute a subordinate to measure up the said Work in the presence of the Contractor or his duly authorized agent whose counter signature to the measurement list shall be sufficient warrant, and the Engineer-in-Charge may prepare an invoice from such a list which shall be binding on the Contractor in all respects.
- 5.6 Subject to Clause 5.5, the Contractor shall submit all invoices in the printed forms and in .xls format soft copy (both to be submitted with the application) at the office of the Engineer-in-Charge. The charges to be made in the invoice shall always be entered at the rates specified in the Contract Price or in the case of any extra work ordered in pursuance of these conditions and not mentioned or provided for in Contract the rate for such extra Work shall be determined in view of the Contract Price.

5.7 Payment on intermediate certificate to be regarded as advances

No payment shall be made for any Works, estimated to cost less than Rs.10,000/- (Rupees Ten Thousand only) till such Work has been approved by the Engineer . But in the case of Works estimated to cost more than Rs.1,000/- (Rupees One Thousand only) the Contractor shall on submitting a monthly bill therefore be entitled to receive payment proportionate to the part of the Work then approved and passed by the Engineer-in-Charge, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the Contractor. All such intermediate payments shall be regarded as payment by way of advance against the final payment only and not as payment for Work actually done and completed and shall not preclude the Engineer-in-Charge from requiring any bad, unsound imperfect or unskillful work to be removed or taken away and reconstructed, or re-erected nor shall any such payment be considered as an admission of the due performance of the Contract or any part thereof in any respect or the occurring of any claim nor shall it conclude, determine or effect in any other way powers of the Engineer-in-Charge as to the final settlement and adjustment of the accounts or otherwise, or in any other way vary or effect the Contract. The final bill shall be submitted by the Contractor within one month of the date fixed for the completion of the Work, otherwise the Engineer-in-Charge's certificate of the measurements and of the total amount payable for the Work shall be final and binding on all Parties.

5.8 Right to Withhold

The Engineer may refuse to approve any payment because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously approved and paid to such extent as may be necessary in the opinion of the Engineer to protect him from loss because (a) The Work is defective, (b) Third party claims have been filed or there is reasonable evidence indicating probable filing of such claims, (c) of the Contractor's failure to make payment properly to sub-contractor or for labour, materials or equipment, (d) of damage to another Contractor, or to the property of other caused by the Contractor, (e) of reasonable doubt that the Work cannot be completed for the unpaid balance of the Contract Price, (f) of reasonable indication that the Work will not be completed within the Contract Period, (g) of the Contractor's neglect or unsatisfactory prosecution of the Work including failure to clean up. Once the reasons that enable or require the Engineer to withhold such payments are removed, payment will be made for amounts withheld due to such reasons to the extent the Contractor is entitled to.

5.9 Payment on reduced rates on account of items of Work not accepted as complete by the Engineer-in-Charge

The rates of several items of Work estimated to cost more than Rs.1000/- (Rupees One Thousand only) agreed to within, shall be valid only when the item concerned is accepted as having been completed fully in accordance with the Technical Specifications. In case where the item of Work are not accepted as so complete by the Engineer-in Charge. The payment may be made on account of such item at such reduced rates as it may be considered reasonable in the preparation of final bills.

6. PERFORMANCE SECURITY / INITIAL SECURITY DEPOSIT

- 6.1** The Contractor shall provide to NMSCDCL an unconditional and irrevocable bank guarantee/ demand draft of Rs. 32,31,000/- (Rupees Thirty two Lakhs Thirty one thousand Only) and any additional performance security, if applicable ("**Performance Security**").
- 6.2** The Contractor acknowledges and agrees that Performance Security shall be held by NMSCDCL as security for the satisfactory completion of the obligations of the Contractor in accordance with this Contract, including recovery of any amounts due to NMSCDCL from the Contractor till the issuance of Take over Certificate. NMSCDCL shall have the unconditional option under the Performance Security to invoke the same and shall be entitled to recover from Performance Security, liquidated damages and any other amounts which may become due to NMSCDCL from the Contractor.
- 6.3** In the event of invocation of Performance Security by NMSCDCL, on account of the Contractor's failure to discharge any of its contractual obligations, warranting the NMSCDCL, in its assessment to do so, the NMSCDCL would intimate the Contractor of the reasons/ circumstances for the invocation of Performance Security within 7 (seven) days after invocation of the same. In the event of any encashment and appropriation from the Performance Security, the Contractor shall, within 15 (fifteen)

days thereof, replenish, in case of partial appropriation, to its original level, and in case of appropriation of the entire Performance Security, provide a fresh Performance Security, failing which NMSCDCL shall be entitled to terminate this Contract in accordance with Clause 53.

7. CONTRACTOR'S OBLIGATIONS

7.1 The Contractor shall construct, install, fix, test and commission the Works in accordance with the Technical Specifications and the drawings as specified in the Contract.

7.2 The Contractor shall supply and take upon itself the entire responsibility of the sufficiency of the scaffolding, timbering, machinery, tools implements and generally of all means used for the execution of Works under this Contract.

7.3 Supervision and Superintendence

The Contractor shall at all times supervise and direct the execution of Works efficiently and with its best skill and attention. The Contractor shall be solely responsible for means, methods, techniques, procedures and sequences of the execution of Works. The Contractor shall co-ordinate all parts of the Works and shall be responsible to ensure that the Works are executed in accordance with the terms and conditions of this Contract and such instructions as the Engineer-in-Charge may issue during the execution of the Works.

7.4 Contractor's Verification

The Contractor shall establish at the Site, temporary benchmarks as directed by the Engineer-in-Charge and connect such temporary benchmarks to a permanent benchmark available in the area with known value. The Contractor will then carry out necessary surveys and leveling, covering its Works, in verification of the survey data on the working drawings furnished by the Engineer-in-Charge. The Contractor shall be responsible for establishing the correct lines and levels and verification of the lines and level furnished on the working drawings. If any error has erupted in the Works due to non-observance of this clause, the Contractor will be responsible for the error and bear the cost of corrective Work.

7.5 Permits, Fees, Taxes and Royalties

Unless otherwise provided in the Contract, the Contractor shall secure and pay for all permits, Government fees and licenses necessary for the execution and Completion. The Contractor shall pay all duties including Goods and Service Tax and any other levies required by law including all taxes. NMSCDCL will not take any responsibility of refund of such taxes/ fees and in case of disputes between taxing authority and the Contractor, NMSCDCL and its officers shall be indemnified by the Contractor. Any violation, in the legal provisions of taxes, duties, permits and fees, carried out by the Contractor and detected subsequently shall be the sole responsibility of the Contractor. Any increase in taxes, royalties etc. from time to time shall be borne solely by the Contractor and NMSCDCL shall not be responsible to reimburse towards any increase in taxes and duties.

7.6 Buried and Concealed Work

The Contractor shall be responsible for recording the precise location of all piping, conduits, ducts cables and any other Work that is buried, embedded in earth or concrete or masonry, or concealed in wood or metal frame walls and structures at the time of the execution of the Works and prior to the concealment. If the Contractor covers or buries such Work before such recording takes place, it shall uncover the unrecorded Work to the extent required by the Engineer-in-Charge and shall satisfactorily restore and reconstruct the removed Work with no change in the Contract Price or the Contract Period without any extra cost to NMSCDCL.

7.7 Warnings and Barricades

The Contractor shall provide and maintain G.I. sheet, barricades, guards, guard rails, temporary bridges and walkways, watchmen, headlights and danger signals illuminated from sunset to sunrise and all other necessary appliances such as blinkers, signals, red light and safeguards to protect the Works, life, property, the public, excavations, equipment and materials. Barricades shall be of substantial construction and shall be painted in Golden Yellow paint such as to increase their visibility at night. For any accident arising out of the neglect of above instructions, the Contractor shall be bound to bear the expenses of defense of every suit, action or other legal proceedings, at law, that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay all damages and costs which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of the Contractor be paid in compromising any claim by any such person.

7.8 Overloading

No part of the Work or new and existing structures, scaffolding, shoring, sheeting, construction machinery and equipment, or other permanent and temporary facilities shall be loaded more than its capacity. The Contractor shall bear the cost of correcting damage caused by loading or abnormal stresses or pressures.

7.9 Manufacturer's Instruction

The Contractor shall compare the requirements of the various manufacturers' instructions with requirements of the Contract, shall promptly notify to the Engineer in writing of any difference between such requirements and shall not proceed with any of the Works affected by such difference until an interpretation or clarification is issued by the Engineer. The Contractor shall bear all costs for any error in the Work resulting from its failure to respond to the various requirements and notify NMSCDCL of any such difference.

8. SITE

8.1 NMSCDCL shall only make the Site available to the Contractor on the date of issuance of Work Order. Possession of the Site confers on the Contractor a right to only such use and control as is necessary to enable the Contractor to perform the Works and shall exclude any purpose not connected with the Works. The Contractor acknowledges that it may not be given exclusive access to and possession of the Site and it must not create any encumbrances on the Site. The Contractor shall not demolish, remove or alter structures of other facilities on Site without the prior written approval of NMSCDCL.

8.2 The Contractor acknowledges and agree that no land is available with NMSCDCL to be given to Contractor for its establishment. The Contractor agrees and undertakes to make its own arrangements with regard to any land other than the Site. The Contractor shall obtain consent from property owners, make all arrangement and pay all costs for such land, areas of access and right of way without any liability to NMSCDCL. The Contractor will furnish and pay for the land, easements and right of way for the land required for the Work.

8.3 Discoveries

The Contractor agree and undertakes that all fossils, coins, articles of value of antiquity and structures or other remains or things of geological or archaeological interest or anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of NMSCDCL. The Contractor shall take reasonable precautions to prevent its workmen or any other person from removing or damaging any such article or thing and shall immediately upon discovery thereof and before removal acquaint the Engineer of such discovery and carry out the Engineer's instructions for dealing with them.

8.4 Sub-Surface Conditions

The Contractor shall promptly notify NMSCDCL in writing of any surface or latent physical conditions at the Site of any unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in constructions of the character provided for in the Contract. The Engineer will investigate those conditions and obtain such additional tests and surveys, as he may deem necessary. If the Engineer finds that the conditions differ significantly from those indicated in the Contract or from those inherent in the construction, a variation order may be issued to incorporate the necessary revisions. The Contractor shall satisfy itself about strata conditions before submission of detailed proposal and methodology of construction.

9. LABORATORY AND RELATED REQUIREMENT

9.1 The Contractor, at its own cost and expense, shall provide and maintain adequately equipped laboratory at the Site for control on the quality of materials used for execution of the Works upon prior written approval of the Engineer-in-Charge ("**Site Laboratory**"). The Site Laboratory shall have an area

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admeasuring 50 square meter and shall be equipped as directed by the Engineer-in-Charge. For the avoidance of doubt, the Contractor shall, at its own cost and expense, procure basic amenities such as water supply, electrical supply as may be required for the Site Laboratory.

9.2 The Contractor agrees and undertakes to setup and establish the Site Laboratory within 2 (two) weeks from the date of issuance of Work Order, failing which the Contractor shall pay to NMSCDCL a penalty of Rs.5000/- (Rupees Five Thousand only) per day.

9.3 The Contractor agrees and undertakes to provide, at its own cost and expense, basic test equipment as set out in Clause 9.4 below for carrying out routine tests at the Site Laboratory. The Contractor shall engage a well experienced lab-in-charge (bio-data to be approved by Engineer-in-Charge) for conducting day-to-day test as per MORTH and B.I.S. specifications at the Site Laboratory. All necessary codes shall be kept in the main laboratory. After Construction Period, the Contractor should demolish the Site Laboratory structure and remove all the equipment thereof as per the directions of the Engineer-in-Charge.

9.4 A list of equipment required for the Site Laboratory is as under:

Sr. No	Description	Unit	Qty.
	Main laboratory at SITE OFFICE		
	A) General Equipment		
1	Electronic Weight Machine 500gm Cap.	Nos.	1
2	Electronic Weight Machine 10 Kg Cap.	Nos.	2
3	Electronic Weight Machine 20 Kg Cap.	Nos.	2
4	Electronic Weight Machine 50 Kg Cap.	Nos.	1
5	Measuring Container 30 Ltr. Cap.	Nos.	1
6	Measuring Container 20 Ltr. Cap.	Nos.	1
7	Measuring Container 10 Ltr. Cap.	Nos.	1
8	Measuring Cylinders 1000 ml Cap.	Nos.	2
9	Measuring Cylinders 500 ml Cap.	Nos.	2
10	Measuring Cylinders 250 ml Cap.	Nos.	2
11	Digital Thermometer (0 to 250 °C.)	Nos.	3
12	All Dimensions GI Sieves 450mm Dia. Full Set	Set.	1
13	Brass Sieves, All Dimensions GI Sieves 200mm Dia. Full Set	Set	1
14	First aid box	Nos.	1
15	Hot Air Oven	Nos.	2
16	Air Conditioner 1.50 T capacity Voltas/LG/Blue Star/Whirlpool or equivalent	Nos.	1
	B) For Soil		
1	Atterberg limit apparatus	Nos.	1

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2	Compaction test equipment (Modified Proctor), 2250 cc mould and steel rammer	Nos.	2
	C) Dry bulk density test app.		
1	Sand replacement method, 100mm Dia.	Nos.	2
2	Sand replacement method, 200mm Dia.	Nos.	2
3	Cylinder Tray with hole and calibration equipment	Nos.	1
4	CBR Testing Machine with Plunger	Nos.	1
5	CBR Mould	Nos.	6
6	Cone Penetro Meter	Nos.	1
7	Dial Guage (Min. 25mm)	Nos.	2
8	Proving Ring (30KN Cap.)	Nos.	1
9	Proving Ring (25KN Cap.)	Nos.	1
10	Steel container (100gm Cap.)	Nos.	50
11	Moisture Container Bowl (500gm Cap.)	Nos.	3
12	GI Tray (300x300)	Nos.	8
13	GI Tray (450x450)	Nos.	4
14	GI Tray (600x600)	Nos.	4
15	Hammer	Nos.	2
16	Refill Box (20mm)	Nos.	1
17	Refill Box (40mm)	Nos.	1
18	Speedy Moisture Meter.	Nos.	2
19	Core Cutter apparatus with dolly and rammer for Asphalt and concrete.	Nos.	1
20	Camber board - 3m and 3m Straight edge	Nos.	1
21	Vacuum pump	Nos.	2
22	Specific gravity - pycnometer 1 litre capacity	Nos.	1
23	Specific gravity - 50ml Bottle	Nos.	1
	D) For Cement and Cement Concrete		
1	Vicat apparatus for testing setting time	Nos.	1
2	Slump testing apparatus and Air Meter.	Nos.	3
3	Concrete Baby Mixer (1cft. Cap. For Mix Design)	Nos.	1
4	Concrete cube moulds.150 x 150 x 150	Nos.	54
5	Mortar cube moulds 50 Sqcm.	Nos.	9
6	Concrete Beam moulds 150 x 150 x 700	Nos.	15
7	Cylindrical moulds 150 dia. and 300mm Length	Nos.	6
8	Glass Jar for silt content	Nos.	6
9	Mortar Cube Casting Machine	Nos.	1
10	Flexural Testing Machine (100 KN Cap.)	Nos.	1
11	Compressive Testing Machine Electrically Operated (Digital) 3000 KN Cap.	Nos.	1

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E) Aggregate			
1	Aggregate Impact Value App.	Nos.	1
2	Flakiness Gauge	Nos.	1
3	Elongation Gauge	Nos.	1
4	Pycnometer (1000ml Cap.)	Nos.	2
5	Wire Basket (6mm Mesh)	Nos.	1
6	Wire Basket (2mm Mesh)	Nos.	1
7	Los Angeles Abrasion App.	Nos.	1
8	Crushing Value App.	Nos.	1
9	Specific Gravity Bottle 50ML Cap.	Nos.	1
10	Specific Gravity Bottle 25ML Cap.	Nos.	1

The above listed equipment's shall conform to the relevant I. S. specifications are required to be supplied by the Contractor and installed at the Site office laboratory. The Site Laboratory shall be manned by the adequately qualified technical staff. The Quality Assurance Plan (refer Clause 15 of special conditions of contract) approved by NMSCDCL shall be strictly adhered to by the Contractor. The Quality Assurance Plan approved by NMSCDCL shall form part and parcel of this Contract. The cost of the equipment and also the salaries of the personnel manning the Site Laboratory shall be considered, as incidental to the Work and no separate payment will be made for the same to the Contractor.

10. DEPLOYMENT OF STAFF BY THE CONTRACTOR

10.1 Subject to Clause 10.2, the Contractor, at its own cost and expense, shall deploy the following personnels ("Key Personnels") on the date of issuance of Work Order at the Site for the purpose of execution of the Works:

Sr. No.	Staff Position	Minimum Qualification	Minimum Experience (in Year)	Minimum No. of personnel's	Road and Bridge Experience
1	Project Manager	B.E. (Civil)	15 years	1 Nos.	12 Years
2	Resident Engineer	B.E. (Civil) /DCE	8-12 years	2 Nos.	7 Years
3	Planning Engineer	B.E. (Civil)	5-7 years	1 Nos.	5 Years
4	Quantity Surveyor	B.E. (Civil) / DCE	5-8 years	1 Nos.	5 Years
5	Quality Control Engineer	B.E. (Civil)	8-10 years	1 Nos.	7 Years
6	Lab	B.E. (Civil) / DCE	3-6 years	1 Nos.	3 Years

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	Technician				
7	Sr. Site Engineers	B.E. (Civil) / D.C.E.	5-7 years	1 Nos.	3 Years
8	Site Engineers	B.E. (Civil) / D.C.E.	3-5 years	3 Nos.	2 Years
9	Surveyors	Having Knowledge of Total Station	3-5 years	2 Nos.	3 Years
10	Supervisors	Min. 12 th	3-6 Years	5 Nos.	2 Years

10.2 The Contractor shall provide NMSCDCL with the curriculum vitae of the Key Personnels for its approval within 5 (five) days from the execution of this Contract, failing which the Contractor agrees and undertakes to pay a penalty of INR [1000] per day. NMSCDCL shall approve the curriculum vitae of the Key Personnels within [5 (five) days] from the submission of the curriculum vitae of the Key Personnel.

10.3 Except as NMSCDCL may otherwise agree, no changes shall be made in the Key Personnel by the Contractor. If, for any reason beyond the reasonable control of the Contractor, it becomes necessary to replace any of the Key Personnel, the Contractor shall forthwith provide as a replacement to a person of equivalent or better qualifications.

10.4 Workmen

The Contractor shall at all times enforce strict discipline and good order among its employees/workmen and shall not employ any unfit person or anyone not skilled and experienced in the assigned task for the purpose of the execution of Works.

10.5 Work during Night or on Sundays and Holidays

Unless otherwise provided, none of the permanent Works shall be carried out during night, Sunday or authorized holidays without permission in writing issued by NMSCDCL. However, under exceptional circumstances when execution of Works is unavoidable or necessary for the safety of life and/or priority of works, the Contractor may carry out the permanent Works with the prior approval of the Engineer.

10.6. Workmanship

The quality of workmanship produced by skilled knowledgeable and experienced workmen, machines and artisans shall be excellent. Particular attention shall be given to the strength, appearance and finish of exposed Work. All concrete work shall be form finished.

Contractor shall appoint experienced structural engineer for preparing design and detailing of formwork, centering etc. and shoring and strutting etc. and supervise the Work of preparation and providing formwork, centering, shoring strutting etc. All designs shall be got approved from the Engineer-in-Charge. The structural engineer resume shall be got approved by the Contractor from NMSCDCL.

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Structural Engineer shall have experience of a minimum of 20 (twenty) years and have carried out such Work in the field and design office.

- 10.7 The Contractor acknowledges and agrees that the Project Manager shall be appointed as a part of the Key Personnels. The Project Managers shall be the Contractor's representative at the Site and shall have authority to act on behalf of the Contractor. All communications, instructions and directions given to the Project Manager shall be binding as if given to the Contractor by the Engineer not otherwise required to be in writing.

11. CONTRACTOR'S RISKS

- 11.1 The Contractor agrees and undertakes that all risks of loss of or damage to physical property and/or of personal injury and death which may arise during and as a consequence of execution of Works shall solely be attributable to the Contractor.
- 11.2 The Contractor agrees and undertakes that all risks and consequences arising from the inaccuracies or falseness of the documents and/or information submitted by the Contractor shall be the responsibility of the Contractor alone, notwithstanding the fact that designs/ drawings or other documents have been approved by NMSCDCL.
- 11.3 If any accident, any injury or physical harm to any person is caused during the execution of Works by the Contractor during the Contract Period, the Contractor shall be solely responsible and shall bear all the cost associated with such eventualities. The Contractor also agrees and undertakes to indemnify and keep indemnified NMSCDCL, its directors/ employees/ agents.

12. COMPLIANCE WITH STATUTORY LAWS

- 12.1 The Contractor should comply with all applicable laws and rules of Government of India/ Government of Maharashtra/ Urban Local Bodies.
- 12.2 The Contractor shall also ensure that all manpower deployed by them shall be given mandatory weekly off and payments as required under the applicable laws. However, no separate payments will be made by NMSCDCL for working on sundays, festivals and other holidays.
- 12.3 The Contractor shall be solely responsible for complying with all statutory provisions relating to manpower engaged for this Contract and in the event of any liability on NMSCDCL by virtue of its being principal employer owing to the failure of the Contractor to comply with all applicable laws, the Contractor shall indemnify and reimburse the amount payable to NMSCDCL on this account.
- 12.4 The Contractor shall be solely responsible notwithstanding any stipulations by NMSCDCL or Engineer for initiating, maintaining and supervising all safety precautions and programmes, in connection with the Work and shall comply with all laws, ordinance, code rules, regulations and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damages, injury or loss during the entire Contract Period including non-working hours.

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- 12.5 The Contractor shall in respect of labour employed by it comply with or cause to be complied with the provisions of various labour law and rules and regulations as applicable to it in regard to all matters provided therein and shall indemnify NMSCDCL in respect of all claims that may be made against NMSCDCL for non-compliance thereof by the Contractor.
- 12.6 The Contractor shall conform in all respects, including by the giving of all notices and the paying of all fees, with the provisions of: any national or state statute, ordinance, or other law, or any regulations, or bye-law of local or other duly constituted authority in relation to the execution and Completion and remedying of any defects therein and the rules and regulations of all public bodies and corporations whose property or rights are affected or may be affected in any way by the Works.

13. PROGRAMME AND PROGRESS SCHEDULE

- 13.1 The Contractor shall submit to NMSCDCL an item-wise monthly programme (“**Programme**”) as may be mutually agreed between the Contractor and NMSCDCL laying out the specifics for the purpose of executing and completing Works in accordance with the terms and conditions of this Contract. The Programme shall provide the information as to required approvals to the methodology, drawing, samples, materials, equipment and their time of submissions to Engineer-in-Charge. The Contractor shall ensure that the trial run period is incorporated in the Programme.
- 13.2 The Contractor agrees and undertakes to submit a monthly progress report to NMSCDCL against the Program indicating the amount of Works completed (“**Progress Report**”).
- 13.2 In the event the amount of Works completed as per the Progress Report fall below the target(s) as set out in the Programme, the Contractor agrees and undertakes to increase its resources i.e. machinery and labour at the Site so as to achieve the target(s) set out in the Programme at no extra cost.
- 13.3 In case, where the updated and revised Programme is required, the Contractor shall submit such updated and revised Programme to the Engineer-in-Charge for its approval which shall indicate and provide details of the potential physical and financial implication(s) in relation to the Project including men, materials and machinery requirements.

14. DRAWINGS AND TECHNICAL SPECIFICATIONS

- 14.1 Any Work that may be reasonably inferred from the Drawings or Technical Specifications as being required to produce the intended result shall be undertaken by the Contractor whether or not it is specifically called for. The Contractor shall furnish and pay for all labour, supervision, materials, transportation, construction, equipment and machinery tools, appliances, water, fuel, power, energy, light, heat, utilities, telephone, storage, protections, safety provisions, and all other facilities, services and incidentals of any nature whatsoever necessary for the satisfactory and acceptable execution, testing, and Completion in accordance with the provisions of this Contract. The cost of all these arrangements shall be deemed to be included in the Contract Price and no separate payment shall be made by NMSCDCL in this regard.

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- 14.2 Written clarifications or interpretations necessary for the proper execution or progress of the Works, in the form of drawings or otherwise, will be issued with reasonable promptness by the Engineer and in accordance with any schedule agreed upon. Such clarifications or interpretations shall be consistent with or reasonably inferable from the intent of the Contract and shall become a part thereof. Where, there is a discrepancy between the drawings and the specifications, the Contractor shall obtain the interpretation of the Engineer, which shall be binding on the Contractor.
- 14.3 The drawing provided in Section 4 of this Volume II are for reference and guidance. Figured dimensions on drawings shall only be followed and detailed drawings shall govern over general drawings. The structural drawings for execution of the Works will be supplied by the Engineer-in-Charge in duplicate progressively. The Contractor shall keep an approved set of drawings at the Site and copies of the approved drawings shall be made available to Engineer or his representative for checking record etc.
- 14.4 The Drawings shall be valid only if it is under proper attestation of the Contractor and the Engineer or unless it has been sent to the Contractor by the Engineer with a covering letter confirming that the Drawing is an authority for purpose of execution of the Works in the Contract.
- 14.5 The work, materials or equipment required in Works shall have a well-known trade or technical meaning shall be deemed to refer to such recognized meanings.
- 14.6 The Contractor shall be responsible for any discrepancies, errors or omissions in the drawings and other particulars, supplied by it, whether such drawings and particulars have been approved by the Engineer or not, provided that such discrepancies, errors or omissions be not due to inaccurate information or particulars furnished in writing to the Contractor by the Engineer.
- 14.7 The Work specified in this Contract shall include all general work, preparatory to the construction of said road like constructing temporary approach roads etc. and any kind of work necessary for the due and satisfactory construction and Completion.
- 14.8 Being city road, many structures like box type subways, culverts, retaining walls and other concrete works are part of the Project. The design for centering and formwork with material shall be prepared by Contractor and be approved by a NMSCDCL approved consultant and from the Engineer-in-Charge well in advance.
- 14.8 The Contractor shall appoint an experienced structural engineer for preparing the design of centering and various formwork and getting it approved from NMSCDCL . He shall also prepare design of shoring and strutting etc. required for excavation work. The work of centering and formwork, shoring and strutting shall be done under supervision of the structural engineer of the Contractor and get it approved from the Engineer. The cost of such engineer is incidental to work and deemed to be included in the rate. No claim in this regard shall be paid by NMSCDCL.

15. LINE OUT OF THE WORK

The Contractor shall provide free of charge all labour and material required and Total Station equipment for lining out, surveying, inspection decided by the Engineer as considered necessary for the proper and systematic execution of the Work. NMSCDCL will only show the changed points on the alignment of road. It will be the responsibility of the Contractor to correctly align the road straight between points including setting out curves by Total Station though NMSCDCL will render necessary assistance. Likewise, only one bench mark with definite value of R.L. will be shown to Contractor who shall have to provide for a network of temporary benchmark all along the road and near C.D. works for executing the Work. The Contractor shall be responsible for the provision, accuracy and maintenance of such temporary bench mark. The Contractor shall be responsible for the correctness of the position, levels, dimensions and alignments of all parts of the Works and provision of necessary instruments and labour in connection with it, suitably pointed bamboo or wooden stack shall be provided at its cost and firmly fixed at every 50 meters on both sides of embankment to indicate final as well as intermediate height of the embankment. Any errors in position levels, dimensions and all alignment etc. shall be rectified by the Contractor at its own cost and expenses. The checking or inspection of any setting out of any line or level or work by Engineer or its representative shall not in any way relieve the Contractor of its responsibility or correctness thereof. The Contractor shall carefully protect and preserve all bench marks, rails, pegs and stones etc. used in setting out the Works. Marking out the centerlines of C.D. works necessary approaches etc. shall be done by the Contractor at its own cost as directed by the Engineer.

16. SAFETY AND PROTECTION

- 16.1 The Contractor acknowledges and agrees that the use of blasting is not permitted for the purpose of the execution of the Works.
- 16.2 The Contractor agrees and undertakes to take due regard of the traffic on the adjoining slip roads during the execution of Works and shall undertake necessary precautions for ensuring the safety of such traffic.
- 16.3 The Contractor shall undertake all such precautions, furnish and maintain protection to prevent damage, injury or loss to other persons who may be affected thereby, all the Works and all materials and equipment to be incorporated therein whether in storage on or off the Site, under the care, custody or control of the Contractor or any of its sub-contractor and other improvements and property at the Site or where Work is to be performed including building, trees and plants, pole lines, fences, guard rails, guide posts, culvert and project markers, sign structures, conduits, pipelines and improvements within or adjacent to streets, right-of-way or easements, except those items required to be removed by the Contractor in the Contract.
- 16.4 The Contractor agrees and undertakes to include all the safety precautions and other necessary forms of protection and the notification of NMSCDCLs of utilities and adjacent property at the Site during the Contract Period.

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16.5 The Contractor shall protect adjoining area against structural, decorative and other damages that could be caused by the execution of Works and make good at its cost any such damages that could be caused by the execution of Works and make good at its sole cost and expense any such damages within reasonable time. The Contractor shall take necessary insurance policy to cover the risk of accident and loss to Work, or any other persons or properties and indemnify NMSCDCL.

16.6 Measure for prevention of fire

The Contractor shall not set fire to any standing jungle, trees, bush woods or grass near the Site without a written permit from the Engineer in charge. When such permit is given and also in all cases when destroying cut or dug up trees bush wood, grass etc. by fire, the Contractor shall take necessary measure to prevent such fire spreading to or otherwise damaging surrounding property near the Site.

16.7 On the occurrence of an accident arising out of the Works which result in death or which is so serious as to be likely to result in death, the Contractor shall within [one hour] of such accident intimate in writing to the Engineer the facts stating clearly and with sufficient details the circumstances of such accidents and subsequent action taken by it. All other accidents arising out of the Works involving injuries to the persons or property other than that of the Contractor shall be promptly reported to the Engineer clearly and with sufficient details setting out the facts of such accidents and the action taken by the Contractor.

16.8 The Contractor shall submit the following plans to the NMSCDCL for its approval within 15 (fifteen) days from the execution of this Contract:

- (i) traffic safety plan,
- (ii) safety plan,
- (iii) disaster management plan and
- (iv) pedestrian safety plan

Failing to do so, a fine of [Rs.5000/- (Rupees Five Thousand only)] per day for each of the plan shall be imposed on the Contractor.

16.9 The Contractor shall, throughout the Project shall:

- (a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under its control) and the Works (so far as the same are not completed or occupied by NMSCDCL) in an orderly state appropriate to the avoidance of danger to such persons;
- (b) Provide barricading for the Site as per the drawings and specifications provided by Engineer-in-Charge;
- (c) Provide and maintain at its own cost all lights, guards, fencing, warning signs and watchmen, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others; and
- (d) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of its methods of operation.

17. UTILITIES AND SUB-STRUCTURES

The Contractor agrees and undertakes to carry out shifting of utilities and services as per the directions of the Engineer. If any utility of service is found not covered under the Bills of Quantities as set out in Section 3 of Volume I, the Contractor shall carry out the Works as per the directions of the Engineer including necessary co-ordination with concerned services provider, payment for the same will be made as per provision in this Contract. NMSCDCL will assist it in the matter. Some of the utilities to be shifted are included in the Drawings. In case utilities are unknown, with the permission of NMSCDCL and user department, the Contractor may be asked to remove the services at accepted rate. The quantities of items pertaining to various known utilities may increase or decrease. The Contractor will not be paid anything extra for variation in quantities of the known utilities.

18. Materials and Equipment

- 18.1 The Contractor shall ensure that all materials and equipment incorporated in the Work shall be new and of best quality. Materials and equipment not covered by detailed requirements in the Contract shall be of the best commercial quality suitable for the purpose intended and approved by NMSCDCL prior to use in the Works .
- 18.2 The Contractor shall ensure that only one brand, kind or make of material and equipment shall be used for each specific purpose through-out the Works, notwithstanding that similar material or equipment of two or more manufacturers or proprietary items may be specified for the same purpose.
- 18.3 The Contractor agrees and undertakes that all materials to be used for execution of Works shall be approved [10 days] prior to such usage from the Engineer-in-Charge. The Contractor shall ensure that such materials shall pass the test and or analysis required by the Engineer-in-Charge, which will be as specified in the specification for the items concerned and or as specified by the Indian Road Congress (IRC), Standard Specification or MORTH Specification, Code of Practice for Road and Bridges or BIS Specifications (whichever and wherever applicable) or such recognized specifications accepted to the Engineer-in-Charge as equivalent thereto or in absence of such recognized specifications. Such requirement test and/or analysis as may be specified by the Engineer-in-Charge in order of precedence given above.
- 18.4 The Contractor shall, at its own risk and cost, make all arrangement and/or shall provide for all such facilities as the Engineer-in-Charge may require for collecting and preparing required number of samples for tests or for analysis at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost for such testing. Such samples shall also be deposited with the Engineer-in-Charge. The Contractor shall ensure that at least 10 percent of samples must be tested and approved for quality and strength by an independent third party construction testing laboratory as approved by NMSCDCL The Contractor shall also be responsible for the geotechnical testing and reports on in-situ basis at the start of the Works, after the excavation and removal of the

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thickness of existing bituminous pavement as specified and at every subsequent stage of backfill and compaction of earthen material during the process of construction as directed by the Engineer-in-Charge.

- 18.5 The Contractor shall if and when required submit at its 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 represented by the samples until the required tests or analysis have been made and the materials, finally accepted by the Engineer-in-Charge.
- 18.6 The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the Works or due to any corrective measures required to be taken on account of and as a result of testing of the materials.
- 18.7 The Contractor or its authorized representative will be allowed to remain present in the laboratory while testing samples furnished by it. However, the results of all the tests carried out in laboratory in the presence or absence of the Contractor or his authorized representative will be binding on the Contractor.

19. Inspection

- 19.1 The Contractor shall inform the Engineer in writing when any portion of the Work is ready for inspection giving it sufficient notice to enable the Engineer to inspect the same without affecting the further progress of the Work. 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 or in any way affect the Engineer even to reject the Work which is alleged to be of inferior quality and to suspend the issue of the Completion Certificate until such alternations and modifications or reconstruction have been affected at the cost of the Contractor as shall enable the Engineer to certify that the Work has been completed to his satisfaction.
- 19.2 The Contractor after Completion shall have to clean the Site of all debris and remove all unused materials other than those supplied by NMSCDCL and all plant and machinery, equipment, tools etc. belonging to the Contractor within one month from the date of Completion, or otherwise the same shall be removed by NMSCDCL at the risk and cost of the Contractor.

20 Completion Certificate

- 20.1 The Contractor shall take full responsibility for the care of the Works and material and plant for incorporation therein during the Construction Period. Subject to Clause 21.4, NMSCDCL shall issue a 'Completion Certificate' to the Contractor for the whole Works provided that:
- (a) the Engineer-in-Charge has satisfied itself that the Works have been successfully completed by the Contractor in accordance with the provisions of the Contract; and

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(b) successful completion of the Site test:

The various Works envisaged in the Contract needs to be tested at Site during the Construction Period. This testing is to be done as per the standard procedure laid down in the relevant IRC /MORTH /I.S. or any other standard approved by the Engineer-in-Charge. The detailed specification shall also be taken into consideration while carrying out the testing. The frequency and type of test on various material and completed item shall be as per MORTH specifications for road and bridge latest edition.

Sr. No.	Materials	Type of Test
1	Coarse aggregate	Sieve analysis, density, water Absorption etc. Moisture Content. Flakiness Index, aggregate Impact
2	Fine aggregate	Sieve Analysis, Silt Content, Organic Impurities etc. and Moisture Content, Aggregate Impact
3	Cement Concrete	Slump Test, Compression Test, Flexural Strength Test
4	Other Site tests	As when required by the Engineer/Engineer-in-Charge

- 20.2 If the Engineer issues a Completion Certificate for any section or part of the permanent Works the Contractor shall cease to be liable for the care of that section or part from the date of issue of the Completion Certificate, when the responsibility for the care of that Section or part shall pass to NMSCDCL, and the Contractor shall take full responsibility for the care of any outstanding works and material and plant for incorporation therein which it undertakes to finish during the Defect Liability Period until such outstanding Works have been completed.
- 20.3 If any loss or damage happens to the Works, or any part thereof, or materials or plant for incorporation therein, during the period for which the Contractor is responsible for the care thereof, from any cause whatsoever, the Contractor shall, at its own cost, rectify such loss or damage so that the permanent Works conform in every respect with the provisions of the Contract to the satisfaction of the Engineer. The Contractor shall also be liable for any loss or damage to the Works occasioned by it in the course of any operations carried out by it for the purpose of complying with its obligations under this Contract and during defect liability period.
- 20.4 It is clarified that the Completion Certificate shall neither be given to the Contractor nor shall the whole Works be considered as complete until the Contractor has removed from the Site (including adjoining premises) all scaffolding, surplus materials and rubbish, and shall have cleaned off, the dirt from all wood work, doors, windows, wall, floor or other parts of any building in or upon which the Work has been executed, or of which it may have had possession for the purpose of executing the Work, nor until the Work shall have been measured by the Engineer-in-Charge or where the measurements have been taken by its subordinates until they have received approval of the Engineer-in-Charge, the said measurements being binding and conclusive against Contractor. If the Contractor fails 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 date fixed for the Completion, the Engineer-in-Charge may at the expense of the Contractor, get removal of such scaffolding, surplus material and rubbish and dispose of the same as he thinks fit and clean off as and the risk and cost of the Contractor. It is clarified that the Contractor shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

21 DEFECT LIABILITY PERIOD

- 21.1 If during the period of 60 (sixty) months from the date of issuance of the Completion Certificate , in the opinion of the Engineer-in-Charge, the said Work is defective in any manner whatsoever, the Contractor shall forthwith on receipt of notice in that behalf from the Engineer-in-Charge, duly commence execution and completely carry out at its cost in every respect or the Work that may be necessary for rectifying and setting right the defects specified therein including dismantling and reconstruction of unsafe portion strictly in accordance with and in the manner prescribed and under the supervision of the Engineer-in-Charge.
- 21.2 In the event of the Contractor failing or neglecting to commence execution of the said rectification work within the period prescribed thereof in the said notice and/or to complete the same as aforesaid as required by the said notice, the Engineer-in-Charge shall get the same executed and carried out internally or by any other agency at the risk and cost of the Contractor. The Contractor shall forthwith on demand pay to NMSCDCL the amount of such cost, charges and expenses sustained or incurred by NMSCDCL of which the certificate of the Engineer in charge shall be final and binding on the Contractor. Such cost, 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 aforesaid remedies of NMSCDCL the same maybe recovered from the Contractor as arrears of land revenue. NMSCDCL shall also be entitled to deduct the same from any amount, which may then be payable or which may thereafter become payable by NMSCDCL to the Contractor either in respect of the said Work or any other work whatsoever or from the amount of Performance Security retained by NMSCDCL.
- 21.3 Upon expiry of the Defect Liability Period, NMSCDCL shall issue a 'Take Over Certificate' to the Contractor certifying the Take Over of the Project provided that:
- (a) the Contractor has completed the outstanding Works, in accordance with the provisions of the Contract, to the satisfaction of NMSCDCL during the Defect Liability Period;
 - (b) The Contractor has performed all of its obligations during the Defect Liability Period under this Contract to the satisfaction of NMSCDCL.

22. INSURANCE

22.1 The Contractor shall take a Contractor All Risk Insurance Policy (CAR) for the Works and keep it in force throughout the Construction Period. The CAR policy shall also cover accident that may occur to the vehicle plying on the adjoining bridge/ approach road, cross road and slip roads etc.

22.2 The Contractor shall insure against such liabilities and shall continue such insurance during the whole of the time any persons employed by it on the Works, provided that in respect of any persons employed by any sub- Contractor, the Contractor's obligations to insure as aforesaid under this sub-clause shall be satisfied if the sub-Contractor shall have insured against the liability in respect of such persons in such manner that Contractor and NMSCDCL are indemnified under the policy, but the Contractor shall require such sub-Contractor to produce to NMSCDCL, when required, such policy of insurance and the receipt for the payment of the current premium.

22.3 Evidence and Terms of Insurance

The Contractor shall provide evidence to the NMSCDCL prior to the start of Work at the Site that the insurances required under the Contract have been effected and shall, within 7 (seven) days of the issuance of Work Order, provide the insurance policies to NMSCDCL, the Contractor shall notify the Engineer of so doing. Such insurance policies shall be consistent with the general terms agreed at the time of issuance of LoA. The Contractor shall effect all insurances for which it is responsible with insurers and in terms approved by NMSCDCL.

22.4 Adequacy of Insurance

The Contractor shall notify the insurers of charges in the nature, extent or programme for the execution of the Works and ensure the adequacy of the insurances at all times in accordance with the terms of the Contract and shall, when required, produce to NMSCDCL the insurance policies in force and the receipts for payment of the current premiums.

22.5 Remedy on Contractor's failure to insurance

If the Contractor fails to effect and keep in force any of the insurance required under the Contract, or fails to provide the policies to NMSCDCL as may be required by NMSCDCL within the prescribed time period and in any such case NMSCDCL, at the cost and expense of the Contractor, may effect and keep in force any such insurances and pay any premium as may be necessary for that purpose.

23. INDEMNITY

23.1 LIABILITY FOR ACCIDENTS TO PERSON

The Contractor agrees and undertakes to hold harmless and indemnify NMSCDCL, against all action, suits, claims, demands, costs etc. arising in connection with injuries suffered by any persons employed by the Contractor or its subcontractor for the Works whether under the Applicable Law or under Workman's Compensation Act, 1923 or any other statute in force at the time of dealing with the question of the liability of employees/ workmen for the injuries suffered by employees/ workmen and to have taken steps properly to ensure against any claim thereunder.

23.2 The Contractor shall keep NMSCDCL indemnified against all penalties and liability of every kind for breach of any applicable laws.

23.3 In the event of an accident in respect of which compensation may become payable by the Contractor, such sum of money as may, in the opinion of the Engineer, be sufficient to meet such liability will be kept in deposit. On the receipt of award from the labour commissioner in regard to the quantum of compensation, the difference in the amount will be adjusted.

24. ENGINEER'S STATUS DURING CONSTRUCTION AND AUTHORITY OF THE ENGINEER

24.1 The Engineer shall have the authority to enforce compliance of the Contract. On all questions relating to quantities, the acceptability of materials, equipment, or works, the adequacy of the performance of the Work and the interpretation of the drawings and specifications, the decision of the Engineer shall be final and binding and shall be precedent to any condition under the Contract unless otherwise provided in the Contract. The Engineer shall have the authority to stop / suspend the Work or any part thereof as may be necessary to ensure the proper execution of the Work, disapprove or reject the Works which is defective, to require the uncovering and inspection or testing of the Works to require re-examination of the Works, to issue interpretations and clarifications, to order changes or alterations in the Works and other authority as provided elsewhere in the Contract.

24.2 The Engineer shall not be liable for the results of any ruling, interpretation or decision rendered, or request, demand, instruction or order issued by him in good faith. The Contractor shall promptly comply with requests, demands, instructions and orders from the Engineer. The whole of the Works shall be under the directions of the Engineer, whose decision shall be final, conclusive and binding on all Parties to the Contract, on all questions relating to the construction and meaning of plans, working drawings, sections and specifications connected with the Work. The Engineer shall have the power and authority from time to time and at all times make and issue such further instructions and directions as may appear to him necessary or proper for the guidance of the Contractor and the good and sufficient execution of the Works according to the terms of specifications. The Contractor shall receive, execute, obey and be bound by the same according to the true intent and meaning thereof; fully and effectually. The Engineer may order any of the Works contemplated thereby to be omitted,

with or without the substitution of any other Works in lieu thereof, or may order any Works or any portion of Works executed or partially executed, to be removed, changed or altered and if needful, may order that other Works shall be substituted instead thereof and the difference of expenses occasioned by any such diminution or alteration so ordered and directed shall be deducted from or added to the amount of this Contract.

- 24.3 In case the progress of the Contractor is found to be less than the programme given by it at any point of time and if the Engineer is convinced that the balance work cannot be executed within the balance period of time by the Contractor, a written notice of 30 (thirty) days will be issued to improve the progress. In case there is no improvement, a further notice of 7 (seven) days will be given and thereafter a part or whole of the Work will be withdrawn from the Contractor and will be carried out by NMSCDCL at the risk and cost of the Contractor. The right of Engineer in this respect shall be unquestionable. On expiry of the 7 (seven) days' notice, as above, the Contractor shall remove its materials, men, equipment, plant and management from the Site, within 7 (seven) days so that the new agency can take over immediately. Failing to this, NSCDCL will remove the aforesaid things at the risk and cost of the Contractor.

25. DUTIES OF ENGINEER'S REPRESENTATIVE

- 25.1 The duties of the representative of the Engineer are to check, inspect and supervise the Work and to get testing of any materials to be used or workmanship employed in connection with the Works. He shall furnish the drawings and information to the Contractor, approve the Contractor's drawings recommend and approve the interim certificates and taking over certificates after thorough checking and inspection and recommend extra job required and extension of time.
- 25.2 Approval for or acceptance of any Work or material or failure to disapprove any Work or material by the representative of the Engineer shall not prejudice the power of the Engineer thereafter to disapprove such Work or material and to order removal or modification thereof. If the Contractor shall be dissatisfied with any decision of the representative of the Engineer, he shall be entitled to refer the matter to the Engineer, who shall thereupon confirm, reverse or vary such decision.

26. RECORDS AND MEASUREMENTS

- 26.1 The Engineer shall except stated therein, determine by measurement the value in accordance with the Contract. All items having a financial value shall be entered in a measurement book, level book, computerized systems etc. as prescribed by the Engineer so that a complete record is obtained of all Work performed under the Contract. Measurements shall be checked and confirmed by the Engineer or his authorized representative and by the Contractor or its authorized representative. Before taking measurement of any Works the Engineer or the person deputed by him for the purpose shall give reasonable notice to the Contractor. If the Contractor fails to attend or send an authorized representative for measurement after such notice or fails to countersign or record the objection within a week from the date of measurement, then in any such event measurements will be taken by the

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Engineer, or by the person deputed by it shall be taken to be correct measurements of the works and shall be binding on the Contractor. The Contractor shall, without any extra charge, provide assistance with every appliance and other things necessary for measurements, such as leveling instruments (Auto setting), Total Station etc. The Total Station shall be made available by the Contractor from the beginning of the Work till the completion of the Work, along with tapes, staves, video cameras/camera, paints, brushes and required labour etc.

- 26.2 Measurements shall be signed and dated by both the parties each day (for taking measurement) on the Site on completion of measurements. The Contractor shall take up still colour photographs and video graphs at intervals during the execution of Works so that a history of development and each activity of the Project is maintained.
- 26.3 Set of dated photographs and video graphs, in three copies of each photographs, shall be submitted to the Engineer-in-charge every month. This generation of record shall provide the used methodology of working and highlight the quality of material and workmanship. The cost of the said Work shall be borne by the Contractor. It shall be the property of NMSCDCL and shall not be used for campaigning, advertising without the permission of NMSCDCL.
- 26.4 The Contractor shall submit the following before any part of the Work is started:
- (a) 2 Section and cross section of road as directed by the Engineer.
 - (b) All levels along the L-section and cross section as directed and duly verified by Engineer. Methodology of construction for each part of Work.
 - (c) Bar bending schedules for each component of the Work and get the same approved.
 - (d) Detailed measurement of concrete and steel quantities shall be given on weekly basis.
 - (e) Detail measurement of excavation in each strata, test reports of materials to be used for each part of Work in the prescribed format.

27. USE OF COMPLETED PORTIONS

NMSCDCL shall have the right, upon written notice to the Contractor to take possession or occupancy of and use any completed or partially completed portions of the Work, notwithstanding that the time for completing the entire Work or such portions may not have expired but such taking possession or occupancy and use shall not deemed to waive of any requirement of the Contract or a waiver or acceptance of any Work not completed in accordance with the Contract.

28. CLEANING UP

The Contractor shall at all times during the Work keep the Site, adjoining property and public property free from accumulations of waste materials, rubbish and other debris resulting from the Works and at the Completion shall remove all waste materials, rubbish and debris from and about the Site and adjoining property as well as all tools, construction equipment and machinery and surplus materials, and shall leave the Site and premises, clean, tidy and ready for occupancy by NMSCDCL. The Contractor

shall restore to its original condition those portions of the Site not designated for alteration by the Contract paved ways, parking areas and roadways disturbed by the construction shall be redone by filling the excavation, if any, by sand compacted material and bringing it to its original shape as directed and approved by the Engineer. No waste material shall be buried or disposed-of on NMSCDCL's property unless so approved in writing by the Engineer-in-charge. Before the Contractor applies for final inspection and acceptance of the Work, all items of work shall be complete, ready to operate and in a clean condition as determined by the Engineer. All slip roads and adjoining area must be kept free of metal/ sand and to that extent regular sweeping of the road shall be done by the Contractor at its cost.

29. NMSCDCL RIGHT TO CLEAN UP

If the Contractor fails to satisfactorily clean up the Engineer may get the same cleaned up and charge the cost thereof to the Contractor, as the Engineer shall determine to be just.

30. IMPORT LICENSE AND PROCUREMENT OF IMPORTED MATERIALS

The Contractor shall use the indigenous equipment only, as far as possible for the Work contracted. Foreign exchanges and import licenses, if any, required shall have to be arranged by the Contractor itself, independently. Delay in getting any material, will not be entertained for extension of time limit nor the risk of foreign exchange variation will be covered by NMSCDCL.

31. MACHINERY REQUIRED

All machinery required for erection / execution purposes such as concrete batching plant, excavator with rock breaker unit, cranes, trucks, etc. shall be arranged by the Contractor at its own cost and expense. NMSCDCL will not take any responsibility for providing such machinery even on rental basis. Execution of any part of the Work will be allowed only after the required machinery as directed by the Engineer-in-Charge is made available in working condition.

32. DISCREPANCIES AND OMISSIONS

The drawings and specifications shall be considered as complimentary and explanatory, of each other and together shall form the technical requirements and stipulations under the Contract. Detailed drawings shall have preference over small- scale drawings. Similarly, detailed specifications shall have preference over general specifications. Should any discrepancy arise as to the meaning, intent or interpretation of any specification or drawing the decision of the Engineer-in-Charge shall be final and binding on the Contractor.

33. NO INTEREST ON DUES

No interest shall be payable by NMSCDCL on amounts, due to Contractor pending final settlement of claim. Further, no interest shall be payable by NMSCDCL on any delayed amount/ payment. No interest shall be payable on the Performance Security or withheld amount.

34. SETTLEMENT OF DISPUTE

If any dispute of any kind whatsoever arises between NMSCDCL and the Contractor in connection with or arising out of the Contract including without prejudice to the generality of the foregoing, any question regarding the existence, validity or termination, the parties shall seek to resolve any such dispute or difference by mutual consent.

If the parties fail to resolve, such a dispute or difference by mutual consent, within 45 (forty five) days of its arising, then the dispute shall be referred by either party by giving notice to the other party in writing of its intention to refer to arbitration as hereinafter provided regarding matter under dispute. No arbitration proceedings will commence unless such notice is given. Any dispute, in respect of which a notice of intention to commence arbitration has been given, shall be finally settled by arbitration.

In case the Contractor is a public sector enterprise or a government department.

In case the Contractor is a Public Sector Enterprise or a Government Department, the dispute shall be referred for resolution in Permanent Machinery for Arbitration (PMA) of the Department of Public Enterprise, Government of India. Such dispute or difference shall be referred by either party for arbitration to the sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary / Additional Secretary, when so authorized by the Law Secretary, whose decision shall bind the parties finally and conclusive. The parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.

In case the Contractor is not a public sector enterprise or a government department.

In all other cases, any dispute submitted by a party to arbitration shall be heard by an arbitration panel composed of three arbitrators, in accordance with the provisions set forth below:

- a. NMSCDCL and the Contractor shall each appoint one arbitrator and these two arbitrators shall jointly appoint a third arbitrator, who shall chair the arbitration panel. If the two arbitrators do not succeed in appointing a third arbitrator within 30 (thirty) days after the latter of the two arbitrators

has been appointed, the third arbitrator shall, at the request of either party, be appointed by the President, Institution of Engineers (“**Appointing Authority**”).

- b. If one party fails to appoint its arbitrator within 30 (thirty) days after the other party has named its arbitrator, the party which has named an arbitrator may request the Appointing Authority to appoint the second arbitrator.
- c. If for any reason an arbitrator is unable to perform its function, the mandate of the Arbitrator shall terminate and a substitute shall be appointed in the same manner as the original arbitrator.
- d. Arbitration proceedings shall be conducted in accordance with the provisions of The Arbitration and Conciliation Act, 1996. The language of the proceedings shall be English. The venue of arbitration shall be Nashik.
- e. The decision of a majority of the arbitrators shall be final and binding and shall be enforceable in any court of competent jurisdiction as decree of the court. The parties hereby waive any objections to or claims of immunity from such enforcement.
- f. The arbitrator(s) shall give reasoned award.
- g. Notwithstanding any reference to the arbitration herein, the parties shall continue to perform their respective obligations under the agreement unless they otherwise agree.
- h. Cost of arbitration shall be equally shared between the Contractor and NMSCDCL.

35 Continuing Obligation of the Contractor

The Contractor's obligation to perform and complete the Works in accordance with the Contract is and shall be absolute. Neither the observation during construction and final inspection of the Works by the Engineer, nor any use or occupancy of the Works or any part thereof by the Engineer, nor any act of acceptance of the defective work by the Engineer shall constitute acceptance of the Works in accordance with the Contract.

36. ALTERATIONS IN SPECIFICATIONS AND DESIGNS NOT TO INVALIDATE CONTRACT

The Engineer-in-Charge shall have the power to make any alterations in or additions to the Technical Specifications, Drawings, designs and the instructions that may appear to it to be necessary or advisable during the progress of the Work and the Contractor shall be bound to carry out the Works in accordance with any instructions in this connection which may be given to it in writing signed by the Engineer-in-Charge and such alterations shall not invalidate the Contract, and any additional Work which the Contractor may be directed to do in the manner above specified as part of the Work shall be carried out by the Contractor on the same conditions in all respects on which he agreed to do the main Work, and

if the additional and altered Work includes any class of work for which no rate is specified in the Contract, then such work or class shall be carried out at the rates entered in the Schedule of Rates, if tender is quoted above and at the tendered rate if tender is quoted below or for which no rate is entered in the rates agreed upon then the Contractor shall within 7 (seven) days of the date of receipt by it the order to carry out the Work, inform the Engineer- in-charge of the rate proposed for such class of work, and if the Engineer- in-Charge does not agree to this rate proposed by the Contractor he shall by notice in writing be at liberty to carry out such class of work and arrange to carry out in such manner as he may consider advisable provided always that if the Contractor shall commence work or incurred any expenditure in regard thereto before the rates shall have been determined as lastly hereinbefore mentioned, then in such case it shall only be entitled to be paid in respect of the Work carried out or expenditure incurred by it prior to the date of determination of the rate as aforesaid according to such rate or rates as shall be fixed by the Engineer-in-Charge in the event of a dispute, the decision of NMSCDCL will be final.

Where, however, the Work is to be executed according to the designs, drawings and specifications recommended by the Contractor and accepted by NMSCDCL/ Engineer the alterations above referred to shall be within the scope of such designs, drawings and specifications.

37. EXTENSION OF TIME IN CONSEQUENCE OF ADDITIONS OR ALTERATIONS

The time limit for the Completion shall be extended in the proportion that the increase in its cost occasioned by alterations, or additions bears to the cost of the original contract work, and the certificate of the Engineer- in-Charge as to such proportion shall be conclusive.

38. NO CLAIM TO ANY PAYMENT OR COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK

If at any time after the execution of the Contract, the Engineer shall for any reason whatsoever (other than default on the part of the Contractor for which NMSCDCL is entitled to rescind the Contract) desires that the whole or the part of the Work specified in the Contract should be suspended for any period or that the whole or part of the Work should not be carried out at all, the Engineer 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 stage at which the Work should be stopped or suspended so as not to cause any damage or injury to the Work already done or endanger the safety thereof provided that the design of the Engineer as to the stage at which the Work or any part of it could be or could have been safely stopped or suspended shall be final and conclusive against the Contractor. The Contractor shall have no claim to any payment or compensation whatsoever by reason of or suspension, stoppage or curtailment except to the extent specified thereafter.

Where the total suspension of work ordered as aforesaid continued for a continuous period exceeding 90 (ninety) 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 (ten) days prior

notice in writing to the Engineer, within 30 (thirty) days of the expiry of the said period of 90 (ninety) days, of such intention and requiring the Engineer to record the final measurements of the Work already done to pay the final bill. Upon giving such notice the Contractor shall be deemed to have been discharged from its obligation to complete the remaining un-executed Work under the 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 the period of 90 (ninety) 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 provisions of this clause.

39. WORKS TO BE OPEN FOR INSPECTION

All Works under or in course of execution or executed in pursuance of the Contract shall at all times be open to the inspection and supervision of the Engineer-in-Charge and his subordinates, and the Contractor shall at all times during the usual working hours, and at all other times at which its subordinates to visit the Works shall have been given to the Contractor, either itself be present to receive orders and instructions or have responsible agent duly authorized in writing present for that purpose. Orders given to the Contractor duly authorized agent shall be considered to have the same force and affect as if they had been given to the Contractor himself.

40. NOTICE TO BE GIVEN BEFORE WORK IS COVERED UP

The Contractor shall give not less than 5 (five) days' notice in writing to the Engineer-in-Charge or his subordinate in charge of the Work before measurement any Work in order that the same may be measured and correct dimensions thereof taken before the same is so covered up or place beyond the reach of measurement and shall not cover up or place beyond the reach of measurement any Work without the consent in writing of Engineer-in-Charge or his subordinate in charge of the Work and if any Work shall be covered up or placed beyond the reach of measurement, without such notice having been given or consent obtained the same shall be uncovered at the Contractor expense and in default thereof no payment or allowance shall be made for such Work or for the materials with which the same was executed.

41. DIRECTION AND CONTROL OF ENGINEER-IN-CHARGE

All Works to be executed under the Contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge for the time being, who shall be entitled to direct at what points and in what manner they are to be commenced and from time to time carried on.

42. EMPLOYMENT OF FAMINE LABOUR ETC.

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

43. CLAIM FOR COMPENSATION FOR DELAY

- 43.1 No compensation shall be allowed for any delay caused in the starting of the Work on account of acquisition of land or in the case of clearance works on account of any delay in according to sanction of estimates.
- 43.2 No compensation shall be allowed for any delay in the execution of the Work on account of water standing in borrow pits or compartments the rates are inclusive for hard or cracked soil Excavation in mud, sub soil, water standing in borrow pits and no claim for an extra rate shall be entertained, unless otherwise expressly specified

44. MINIMUM AGE OF PERSONS EMPLOYED, THE EMPLOYMENT OF ANIMALS AND PAYMENT OF FAIR WAGES

- 44.1 The Contractor shall not employ any person who is under age of 18 Years. The Engineer-in-Charge or his agent is authorized to remove from the Work any person found working who does not satisfy this condition and no responsibility shall be accepted by NMSCDCL for any delay caused in the Completion by such removal.
- 44.2 The Contractor shall not use animals for any part of the Project.
- 44.3 The Contractor shall pay fair and reasonable wages to the workmen employed by it for the Contract under taken by it. In the event of any dispute arising between the Contractor and its workmen on the grounds that the wages paid are not fair and reasonable, the dispute shall be referred without delay to the Engineer-in-Charge who shall decide the same. The decision of the Engineer-in-Charge shall be conclusive and binding on the Contractor but such decisions shall not in any way affect the conditions of contract regarding the payment to be made by NMSCDCL.
- 44.4 The Contractor shall provide drinking water facilities to the workers similar to the amenities provided to the workers engaged on large work in urban areas.
- 44.5 The Contractor to take all precaution against accidents on the Site.

45. EMPLOYMENT OF SCARCITY LABOUR

If Government declares a state of scarcity or famine to exist in any village situated within 10 miles of the Work, the Contractor shall employ upon such parts of Work, as are suitable for unskilled labor, any person certified to him by the Engineer in charge, or be any person to whom the Engineer in charge may have delegated this duty in writing to be in need of relief and shall be bound to pay to such person wages not below the minimum which government may have fixed in this behalf. Any disputes which may arise in connection with the implementation of this clause shall be decided by the Engineer in charge whose decision shall be final and binding on the Contractor.

46. CONDITION FOR MALARIA ERADICATION

- 46.1 The anti-malaria and other health measures shall be as directed by the joint director (Malaria and Filarial) of Health Services, Pune.
- 46.2 Contractor shall see that mosquitozenic conditions are not created so as to keep vector population to minimum level.
- 46.3 Contractor shall carry out anti-malaria measures in the areas per guidelines prescribed under national malaria Eradication Programmed and as directed by the joint director (M&F) of Health services, Pune.
- 46.4 In case of default in carrying out prescribed anti-malaria measures resulting increase in malaria incidence, Contractor shall be liable to pay Government on anti-malaria measures to control the situation in addition to fine.
- 46.5 Relation with public authorities: the Contractor shall make sufficient arrangements for draining away the salvage water as well as water coming from the bathing and washing places and shall dispose of this water in such a way as not to cause any musicale. He shall also keep the premise clean by employing sufficient of sweepers. The Contractor shall comply with all rules, regulations, bye laws and direction given from time to time by any local or public authority connection with this work and shall pay fees or charges which are livable on him without any extra cost to Government.

47. NO CLAIM

If the Project is shelved by NMSCDCL before issuance of Work Order, the Contractor will have no right to claim any loses or compensation due to the same and for whatsoever reasons.

48. SEVERABILITY

It is stated that each paragraph, clause, sub-clause, schedule or annexure of this Contract shall be deemed severable and in the event of the unenforceability of any paragraph, clause sub-clause, schedule or the remaining part of the paragraph, clause, sub-clause, schedule annexure and rest of the contract shall continue to be in full force and effect.

49. COUNTERPARTS

This Contract may be executed in one or more counterparts, each of which shall be deemed an original and all of which collectively shall be deemed one and the same instrument.

50. RIGHT AND REMEDIES UNDER THE CONTRACT ONLY FOR THE PARTIES

This Contract is not intended and shall not be construed to confer on any person other than NMSCDCL and the Contractor hereto, any rights and/ or remedies herein.

51. APPLICABLE LAW AND JURISDICTION

The Contract shall be interpreted in accordance with the laws of India and courts at Nashik shall have the exclusive jurisdiction

52. LIQUIDATED DAMAGES:

If the Construction Period is delayed beyond six months from the date of issuance of Work Order for reasons attributable to Contractor, the Contractor shall pay to NMSCDCL as liquidated damages and not as penalty, a sum calculated at the rate of [0.025% (zero decimal zero two five percent) of the Contract Price, for every day of delay or part there of up to a maximum of 10% (ten percent) of the Contract Price].

53. TERMINATION

- 53.1 If the Contractor fails to carry out any obligation under the Contract, the Engineer-in-Charge/ NMSCDCL may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time.
- 53.2 NMSCDCL shall be entitled to terminate the Contract if the Contractor
- a) Abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract;
 - b) the Contractor is declared as bankrupt or goes into liquidation other than for approved reconstruction or amalgamation;
 - c) without reasonable excuse fails to comply with the notice to correct a particular defect within a reasonable period of time;
 - d) the Contractor does not maintain a valid instrument of Performance Security (and additional performance security, if any), as prescribed;
 - e) the Contractor has delayed the Completion by such duration for which the maximum amount of liquidated damages is recoverable;
 - f) If the Contractor fails to deploy machinery and equipment or personnel or set up a field laboratory as specified in the Contract.
 - g) if the Contractor, in the judgement of NMSCDCL has engaged in corrupt or fraudulent practices in competing for or in executing the Contract;
 - h) Any other breach as specified in the Contract.
- 53.3 In any of these events or circumstances, NMSCDCL may, upon giving 14 (fourteen) days' written notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in the case of sub paragraph (b) or (g) of clause 53.2, the Contract may be immediately terminated.
- 53.4 Notwithstanding the above, NMSCDCL may terminate the Contract for convenience by giving 30 (thirty) days' written notice to the Contractor.

54. PAYMENT UPON TERMINATION

- 54.1 If the Contract is terminated under clause 53.2, the Engineer-in-Charge shall issue a certificate for value of the Work accepted on final measurements, less advance payments and penalty as indicated in the Contract. The amount so arrived at shall be determined by the Engineer-in-Charge and shall be final and binding on both the Parties.
- 54.2 Payment on termination under clause 53.4 above, the Engineer-in-Charge shall issue a certificate for the value of the Work done, the reasonable cost of removal of equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the Contract and less taxes due to be deducted at source as per applicable law.
- 54.3 If the total amount due to NMSCDCL exceeds any payment due to the Contractor, the difference shall be recovered as per clause 97 below.

55. Check Measurements

- 55.1 NMSCDCL reserves to itself the right to prescribe a scale of check measurement of Work in general or specific scale for specific works or by other special orders.
- 55.2 Checking of measurement by superior officer shall supersede measurements by subordinate officer(s), and the former will become the basis of the payment.
- 55.3. Any over/ excess payments detected, as a result of such check measurement or otherwise at any stage during the Term, shall be recoverable from the Contractor, as per clause 54 above.

56. Language

All notices required to be given by one Party to the other Party and all other communications, documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other data which are in any way relevant to this Contract shall be in writing and in the English language.

57. Communications

- (a) Any notice or other document which may be given by either Party under this Contract shall be given in writing in person or by pre-paid recorded delivery post, email or by facsimile transmission. The notice sent by facsimile (fax) or other electronic means (email) shall also be effective on confirmation of the transmission. The notice sent by registered post or speed post or in person shall be effective on delivery of the notice.

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(b) In relation to a notice given under this Contract, any such notice or other document shall be addressed to the other Party's principal or registered office address as set out below:

Engineer Tel: [●] Fax: [●] Email: [●] Contact: [●] With a copy to NMSCDCL: {Insert Address} Tel: [●] Fax: [●] Email: [●] Contact: [●]	Contractor {Insert Address} Tel: [●] Fax: [●] Email: [●] Contact: [●]
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For the avoidance of doubt, the Contractor shall

(d) Either Party to this Contract may change its address, telephone number, facsimile number and nominated contact for notification purposes by giving the other reasonable prior written notice of the new information and its effective date.

58. Force Majeure

The term "Force Majeure" means an exceptional event or circumstance:

- a) Which is beyond a Party's control,
- b) Which such Party could not reasonably have provided against before entering into the contract,
- c) Which, having arisen, such Party could not reasonably have avoided or overcome, and
- d) Which is not substantially attributed to the other Party

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

- (i) War, hostilities (whether war be declared or not), invasion, act of foreign enemies;
- (ii) Rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war;
- (iii) Riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel;
- (iv) Munitions of war, explosive materials, ionising radiation or contamination by radio activity, except as may be attributed to the Contractor's use of such munitions, explosives, radiation or radio activity; and
- (v) Natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

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In the event of either Party being rendered unable by Force Majeure to perform any duty or discharge any responsibility arising out of the Contract, the relative obligation of the Party affected by such Force Majeure shall upon notification to the other Party be suspended for the period during which Force Majeure event lasts. The cost and loss sustained by either Party shall be borne by respective Parties.

For the period of extension granted to the Contractor due to Force Majeure the penalty clause shall not apply.

The time for performance of the relative obligation suspended by the Force Majeure shall stand extended by the period for which such cause lasts. Should the delay caused by Force Majeure exceed 3 (three) months, the Parties to the Contract shall be at liberty to foreclose the Contract after holding mutual discussions.

59. **Variation Order**

- 59.1 The Contractor acknowledges and agree that NMSCDCL shall have the right to issue a Variation Order during the performance of this Contract to change the scope of work as stipulated under this Contract.
- 59.2 Any Variation Order by NMSCDCL which has the effect of addition or deletion of a significant scope of work as stipulated under this Contract and which results whether on its own or cumulatively with any other Variation Order issued by NMSCDCL under this Contract in the past in an increase or a reduction of the Contract Price not exceeding 20 % (twenty percent) shall be acceptable to the Contractor on terms and conditions as may be stipulated by NMSCDCL in such Variation Order.
- 59.3 Any Variation Order by NMSCDCL which has the effect of addition or deletion of a significant scope of work as stipulated under this Contract and which results whether on its own or cumulatively with any other Variation Order issued by NMSCDCL under this Contract in the past in an increase or a reduction of the Contract Price exceeding 20 % (twenty percent) shall be acceptable to the Contractor on terms and conditions mutually agreed between NMSCDCL and the Contractor at the time of issuance of such Variation Order.

B. Special Conditions of Contract

1. Royalty Charges

We hereby agree to pay royalty charges as per the prevailing rates at the time of procurement on consumed minerals in this work like rubble, metal, sand, murum etc. to revenue department, Govt. of Maharashtra. We hereby agree to produce receipts of payments of such royalty charges or N.O.C. from concerned revenue department to NMSCDCL.

We agree that if the evidence for payment of royalty charges for this work is not produced by us, the NMSCDCL reserves the right to deduct from any money which is due to us and pay the necessary royalty charges and penalty if any, to the appropriate Authorities, if said authority is asked to recover Royalty Charges.

In case the receipts of payments of such royalty charges or no-objection certificate from concerned revenue department is not produced by the Contractor, NMSCDCL reserves the right to deduct from any money which is due to the Contractor on account of royalty charges and penalty if any, to the appropriate authorities, if said authority asks NMSCDCL to recover Royalty Charges or otherwise.

2. The concrete work for the Works shall be carried out from Batch Type Ready Mix Concrete Plant only.
3. Plant calibration shall be valid for one year subject to the consistent supply of metal. Cost of calibration shall be borne by the Contractor. Whenever required by NMSCDCL, recalibration of the plant shall be done by the Contractor at its own cost.
4. The Contractor shall submit the Request for Inspection (RFI) to the Engineer-in- Charge one day in advance before starting of any Concrete related work. In no case shall the Concrete work be started without submitting the RFI one day before the activity and without the prior approval of Engineer-in-Charge. The Contractor shall submit the previous day's Progress on the following day by 11.00 a.m. positively in the standard format approved by Engineer-in-Charge.
5. The Contractor shall submit the regular printouts from the Batch Type Ready Mix Concrete Plant and RMC Plant indicating the following details for each batch: date, time and location; weight of batch and individual aggregate fractions and cement with filler and water cement ratio of the batch.
6. In case of non-conformance to the quality control checks in accordance to the quality assurance plan for concrete related works, no payment shall be made to Contractor for non-conformance of Work.
7. It is evident that there shall be live utilities under the Site. The Contractor shall repair and restore damaged utility lines viz. telephone, electricity, OFC, water line, drainage line etc. if damaged during the execution of Work. No separate payment shall be made to the Contractor for utility repair.
8. The source of material viz. the quarries shall be approved by NMSCDCL/ Engineer/ consultant appointed by NMSCDCL.

9. The Works shall be primarily carried out only in day time unless otherwise authorized by the Engineer-in-Charge.
10. The longitudinal and cross sectional of Work be taken along with the photographs before starting and after satisfactory completion of the Work along with identification of all the main hole covers of existing services and steel / cement concrete grating storm water drains etc.
11. The original invoice of bitumen of manufactures shall be submitted to NMSCDCL along with the test certificate of the manufactures and the bitumen be tested at plant/ Site before it is put in to use if applicable.
12. It will be sole responsibility of Contractor to provide for sufficient traffic wardens and barricades.
13. Contractor must carry out survey of Site using Total Station before commencing the first layer of resurfacing work in presence of NMSCDCL/ Engineer. The levels should be taken at longitudinal interval of 10 m cross sectional interval (depending on the road width 2.00m to 5.00 m) submit the detail cross section to Engineer for cross check. This same procedure of levels will be applied after each layer of bitumen mix. For checking density of compacted layer, Cores will have to be taken for each layer at the rate of one core per 700 Sqm in presence of NMSCDCL/ Engineer/ third party quality assurance agency.
14. The Contractor shall also provide complete videography of the Site before the commencement of the Work and during submission of each RA Bill along with change-wise coloured photographs in hard copy and soft copy.

15. QUALITY ASSURANCE PLAN

The Contractor shall provide a quality assurance plan designed to document the processes and procedures for assuring quality throughout the course of Project [within 10 days from date of issuance of Work Order] for the approval by NMSCDCL. The approved quality assurance plan shall form part and parcel of this Contract.

16. TIME MANAGEMENT PLAN

The Contractor shall provide a time management plan including a detailed Work schedule alongwith the basis [within 10 days from date of issuance of Work Order] for the approval by the NMSCDCL. The approved time management shall form part and parcel of this Contract.

17. The Contractor must deploy the requisite machinery as directed by Engineer-in-Charge. Any other machinery required to carry out the Work should be deployed by Contractor on the directions of Engineer-in-Charge at no extra cost.

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The minimum equipment required with the Contractor (Ownership / hire purchase Documents of all the machinery are to be attached) is as follows.

List of Equipment and Machinery required is enlisted in Table Below.

Sr. No	Type of Equipment	Max. Age as On 01/07/2017	Capacity	Nos. Require	Owned / Hired
1	Excavators with Rock breaker	10	Min 1.25 m ³	2	Min. 3 Owned
2	Backhoe Loader/JCB	5	Min 0.3 m ³	3	Owned/Hired
3	Motor Grader	10	-	1	Owned/Hired
4	Paver Finisher with Electronic Sensors for Grade and level control	5	Capable of paving 7m. width	1	Owned
5	Vibratory Tandem Roller (with intelligent compaction system)	5	Minimum 10 Ton operating wt.	4	Owned
6	Vibratory soil Compactor	5	Minimum 10 Tonn operating wt	4	Min. 1 Owned
7	Mini Vibrator Roller	5	4/6 Tonn	2	Owned
8	Pneumatic Roller	5	Wt = 8-10 Tonn 8 –Tyred	1	Owned/Hired
9	Water Tanker/ Sprinklers	-	-	2	Min. 1 Owned
10	Dumper/ Tippers	5	Minimum 6 cum	8	Min. 2 Owned
11	RMC Batch Mix Plant	10	30 cum/hr.	1	Owned/Hired
12	Transit Mixers	3	6 cum	6	Min. 4 Owned
13	Concrete Pump	5	-	2	Owned
14	Fix Form Paver	5	-	1	Owned
15	Internal Concrete Vibrator	5	-	6	Owned/Hired
16	Mechanical Broomer	-	-	1	Owned/Hired
17	Air Compressor	5	Min capacity 250 cum	1	Owned/Hired
18	Survey Equipments				
	i) Total Station	3	-	1	Owned

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	ii) Auto Level	3	-	2	Owned
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The Contractor shall provide Ready Mix Batch Type plant (RMC) for all concrete work within 40 kms. from the Site. The batch mixing plant shall sense all the data like aggregate weight, cement content, W/C Ratio for all batches through digital sensors and logic controller. Complete details of each batch (generated by the printer at the RMC Pant) shall be available online as well as along with each transit mixer on Site. The plant register provided on the web application shall have the following information. Batch ID, quantity of all aggregates, time and date, work identification number, agency name, temperatures (in case of asphalts), W/C ratio for concrete and any other information asked by the Engineer-in-Charge. The plant can be shared among multiple works and or multiple contractors. The plant register shall have all data for which work Contractor a particular batch is processed.

The Contractor shall not be allowed to commence the Project without the implementation of the above systems for the Project.

If the Contractor fails to establish/ hire RMC Plant within 3 months (within 40km from the Site) from issue of Work Order, then the Contractor will be penalized Rs.1,00,000/- per day. If the Contractor fails to establish its RMC Plant within 15 (fifteen) days of issue of Work Order, then NMSCDCL reserves the right to terminate the Contract and forfeit the security deposit of the Contractor.

Section 3: Technical Specifications

GENERAL TECHNICAL SPECIFICATIONS

1. The General Technical Specifications comprise the Technical Specifications - Road Works annex-1, "Specification for Road and Bridge Works" (Fifth Revision 2013) issued by the Ministry of Road Transport and Highways (MORTandH), Government of India and published by the Indian Road Congress, New Delhi and for items not covered by these specification Standard Specifications edition, 1979, published by the Public Works Department, Govt. of Maharashtra, deemed to be bound into this document, unless and otherwise specifically relaxed wholly or partly through a special clause in the Contract and relevant BIS codes of practice.

2. Specifications Interlocking Cement Concrete Paver Blocks

2.1 The interlocking concrete blocks should be procured from manufacturer approved by NMSCDCL and satisfying the following criteria. IRC SP 63 2004 shall be used as guideline for Paver Block work.

2.2 Manufacturer shall have fully automatic vibro pressing plant with vertical vibration system to ensure maximum compaction to achieve required strength. The grade of concrete should be M-40, thickness 80mm M-30, thickness 60mm and M-50, thickness 100mm.

2.3 Manufacturer shall have adequate capacity mixer with digital water meter/ moisture control system to maintain constant water/ cement ratio.

2.4 Manufacturing plant shall have complete automation with computerized weigh batching system for consistent quality of paving blocks.

2.5 Blocks shall be moist cured for initial 24 hours and then water cured for at least 15 days before dispatch to Site.

2.6 Manufacturer shall have complete laboratory setup for testing blocks as per IS 15658-2006 and should be on approved list of MMRDA, MCGM, PCMC or equivalent organization.

2.7 Manufacturer shall possess GST registration certificate.

The General Technical Specifications comprise the "Specification for Road and Bridge Works" (Fifth Revision) issued by the Ministry of Road Transport and Highways (MORT&H), Government of India and published by the Indian Road Congress, New Delhi and for items not covered by these specification Standard Specifications edition, 1979, published by the Public Works Department, Govt. of Maharashtra, deemed to be bound into this document, unless and otherwise specifically relaxed wholly or partly through a special clause in the contract document. & relevant BIS codes of practice.

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Abbreviations Used –

a) LM / Lm / RMT/Rgm:	Linear Meter / Running Meter
b) Cum.:	Cubic Meter
c) Sqm.:	Square Meter
d) Cum /cc:	Cubic Centimeter
e) No.:	Numbers
f) MT / Tonne:	Metric Tonne
g) Hr:	Hours
h) Ha:	Hector
i) MoRT&H:	Ministry of Road Transport & Highways
j) IRC:	Indian Roads Congress
k) BIS:	Indian Standards.

- Rate shall be inclusive of taxes including work contract tax, duties, royalty etc.
- The special provision in detailed specifications or wording of any item shall gain precedence over corresponding contradictory provision (if any) in the standard specifications or P.W.D. Hand Book where reference to such specifications is given without re-producing the details in contract.
- It is presumed that the Contractor has gone carefully through MORTH Specification & P.W.D. Hand Book and the Schedule of Rates of the Division and studied the site conditions before arriving at rates quoted by him. Decision of the Engineer-in-charge shall be final as regards interpretation of specifications.
- Stacking and storage of construction 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 material against atmospheric actions, fire and other hazards. The materials likely to be carried away by wind shall be stored in suitable stores or with suitable barricades and where there is likely-hood of subsidence of soil, such heavy materials shall be stored on approved platforms.

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- For road and grade separator works the contractor shall in addition to the specifications cited here, comply with requirements of relevant I.R.C. Code Practice. Latest edition of MORTH specification and BIS codes shall be applicable for this work.
- The contractor shall be responsible for making good the damages done to the existing property during construction by his men.
- If it is found necessary from safety point of view to test any part of the structure, the test shall be carried out by the contractor with the help of the Department at his own cost.
- The contractor shall provide, maintain, furnish and remove on completion, temporary shed for office on work site for the use of Project Engineer's representative.
- Defective work is liable to be rejected at any stage. The contractor on no account can refuse to rectify the defects merely on reasons that further work has been carried out. No payment shall be made for rectification.
- General directions or detailed description of work, materials and all coverage of rates given in the specification are not necessary repeated in the Bill of Quantities. Reference is however, drawn to appropriate section clause(s) of the General specifications accordance with which the work is to be carried out.
- In the absence of specific directions to the contrary, the rates and prices inserted in the terms are to be considered as the full inclusive rates and prices for the finished work described there-under and are cover all labour, materials, wastage, temporary work, plant overhead charges and profiles, as well as the general liabilities, obligations and risks arising out of the General Conditions of Contract.
- The quantities set down against the item in the Schedule 'B' are only estimated quantities of each kind of work included in the Contract and are not to be taken as a guarantee that the quantities schedule will be carried out or required or that they will not be exceeded.
- All measurements will be made in accordance with the methods indicated in the specification and read in conjunction with the General Conditions of Contract.
- The details shown on drawings and all other information pertaining to the work shall be treated as indicative and provisional only and are liable to variation as found necessary while preparing working drawing which will be supplied by the contractor before execution. The contractor shall not, on account of such variation be entitled to any increase over the ones quoted in the tender which are on quantity basis. The contractor has to make his own investigation before quoting for the work.

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- The recoveries if any from contractor will be affected as arrears of land revenue through the Collector of the District.
- Specifications of Road and Bridge works adhered herewith will be applicable to works as per Schedule 'B' unless specified otherwise in the detailed specifications of the relevant items.
- All materials used in the construction shall conform to the requirement of Specification Clause under Section-100 "Materials for Structures" of Specification of Road and Bridge Works MORTH New Delhi.
- Protection of underground telephone cable and aerial telephone wires and poles, transmission towers, electrical cables and water supplying lines. During the execution of work, it is likely that the contractor may meet with telephone cable, electrical cables, water supply lines etc. it will therefore be the responsibility of the Contractor to protect them carefully. All such cases should be brought to the notice of the Engineer-in-charge by the contractor and also to the concerned department. Any damage whatsoever done to these cables and pipe lines by the contractor shall be made good by him at his cost.

Order of precedence, clarifications and interpretations:

- When various specifications and codes referred to in presiding portion are at variance with each other following order of precedence will generally be accepted.
- Special conditions of contract, Item wise specifications, revised specifications if provided and execution drawing notes etc.
- MoRT&H Specifications (Specifications for Roads & Bridge work)
- I.S. Codes of practice.

Standard specification 1979 PWD Govt. of Maharashtra. In case of items for which specifications are not available in the above mentioned specifications good sound engineering practice shall be followed and in such case specifications given by the employer consultants shall be final & binding on the contractor.

Specifications for materials :

- All material to be used in work shall satisfy provision of relevant specifications of Road and Bridge.

Method of MEASUREMENT:

- The method of measurement and payment shall be as described under various items and bill of quantity where specific definitions are not given, the method described in MoRT&H Specification

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will be followed.

- All works shall be carried out in line & level as shown on execution drawing and as directed by Engineer.

Clearance of SITE:

The work of site clearance before & after completion of work shall be as per Section 200 of MoRT&H specifications. Contractor shall visit the site before submitting his offer and assess the quantum of work for clearing the site before execution, during execution & after completion of work. Mode of measurement & payment for this item is on lump sum basis and include all type of site clearance as required by the Engineer, and include cost of labour material etc.

Excavation for ROAD:

As per the respective BOQ items & their specifications mentioned. Contractor shall note that the water table may be at higher level which will necessitate the dewatering. Dewatering and removal of water is incidental to item of work. No separate payment for dewatering etc. will be made by NMSCDCL.

- **Setting Out :** After site is cleared and leveled, alignment & location shall be mark and excavation limit shall be set out true to lines and section as shown on working drawings. The contractor shall provide all labour, survey instrument i.e. Total station and materials required for setting out.
- **Disposal of excavated material :** All excavated material shall be used in work as directed. Usable surplus material shall be stacked properly as directly. Unusable excavated material shall be disposed of by the contractor as specified & directed by the Engineer.
- **Measurement :** Excavation work shall be measured for depth below existing road / ground level. Measurement shall generally confirm to MoRT&H Specification Section –300 Clause 304.40. Each change of strata shall be got certified by the Engineer in charge. Measurement for excavation shall be as required for the exact width length and depth as shown on the drawing or as directed by the Engineer. No excess excavation will be considered for payment and extra work occasioned shall be done at contractor risk & cost.

FOLLOWING SPECIFICATION SHALL BE ADOPTED FOR ITEM WORKS

1. Setting out of work - Section 100 Clause 109
2. Material - Section 1000 & BIS
 - a) Cement - Clause 1006
 - b) Steel - Clause 1009.3
 - c) Aggregate Course - Clause 1007 (I.S. Code 383)
 - d) Aggregate Fine - Clause 1008 (I.S. Code 383)
 - e) Water - Clause 1010
3. Storage of materials cement, steel, H.T. steel, aggregate, prestressing material. - Section 1000 Clause 1014
4. Excavation for structure and foundation - MOST Section 300 Clause 304
5. Concrete for PCC, RCC work - Section 1700
6. Pavement Quality Concrete (PQC) - Section 602, 900 & 1000.
7. Steel H.Y.S.D. reinforcement - Section 1000 Clause 1009.3 & IS 1732
8. Protection, bending, placing etc. for steel - Section 1600
9. Polypropylene Fibers - ASTM C-1116, Type III 4.1.3. ASTM C-1116, Performance Level 1 ASTM C-1399 (min. average residual strength of 0.35 Mpa).
10. Expansion Joint - Section 2600
11. Construction Joint - Section 1700 Clause Appendix – 1700 / I 12 Asphalt Wearing coat Section 500 & Section 900
 - a). Prime Coat - Section 500 Clause 502
 - b). Tack Coat - Section 500 Clause 503
 - c). Bitumen Macadam - Clause 504
 - d). Dense Bitumen Macadam - Clause 507
 - e). Asphaltic / Bitumen Concrete - Clause 509
 - f). Mastic Asphalt - Clause 515
12. Weep Hole - Section 2700 Clause 2706
13. Drainage Water Spout - Section 2700 Clause 2707

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14. Metal beam crash barrier - Section 800 Clause 810
15. Traffic sign marking and other road appurtenances Section 800
16. Item not covered above Relevant - Clause of MoRT&H Specification for Road & Bridge & IRC Codes and relevant I.S. code and specification.

SPECIFICATIONS INTERLOCKING CEMENT CONCRETE PAVER BLOCKS

The interlocking concrete blocks should be procured from manufacturer approved by PSCDCL and satisfying the following criteria. IRC SP 63 2004 shall be used as guideline for Paver Block work.

- a. Manufacturer shall have fully automatic vibro pressing plant with vertical vibration system to ensure maximum compaction to achieve required strength. The grade of concrete should be M – 40, thickness 80mm M – 30, thickness 60mm and M – 50, thickness 100mm.
- b. Manufacturer shall have adequate capacity mixer with digital water meter / moisture control system to maintain constant water/ cement ratio.
- c. Manufacturing plant shall have complete automation with computerized weigh batching system for consistent quality of paving blocks.
- d. Blocks shall be moist cured for initial 24 hours and then water cured for at least 15 days before dispatch to site.
- e. Manufacturer shall have complete laboratory setup for testing blocks as per IS 15658- 2006 and should be on approved list of MMRDA, MCGM, PCMC or equivalent organization.
- f. Manufacturer shall possess excise registration certificate.

TRAFFIC MANAGEMENT DURING CONSTRUCTION

- The Contractor shall at all times carry out work on the road in a manner creating least interference to the flow of traffic while consistent with the satisfactory execution of the same. For all works involving improvements to the existing highway, the Contractor shall, in accordance with the directives of the Engineer, provide and maintain, during execution of the work, a passage for traffic either along a part of the existing carriageway under improvement, or along a temporary diversion constructed close to the highway. The contractor shall take prior approval of the Engineer regarding traffic arrangements during construction.

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- Signs, lights, barriers and other traffic control devices shall be provided and maintained in a satisfactory condition till such time they are required as directed by the Engineer, so as to ensure smooth and safe traffic on the road throughout the length. Necessary traffic arrangement at temporary diversions by signs, lights, barriers etc. is also included in the scope
- The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the Engineer for information and protection of traffic approaching or passing through the section of the highway under improvement. Before taking up any construction, an agreed phased program for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer. The barricades erected on either side of the carriageway/portion of the carriageway closed to traffic, shall be of strong design to resist violation, and painted with alternate black and white stripes, Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise. At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings, painted drums or a similar device to the directions of the Engineer. At night, the passage shall be delineated with lanterns of other suitable light source. One-way traffic operation shall be established whenever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic. This shall be done with the help of temporary traffic signals or flagmen kept positioned on opposite sides during all hours. For regulation of traffic, the flagmen shall be equipped with red and green flags and lanterns/lights. On both sides, suitable regulatory/warning signs as approved by the Engineer shall be installed for the guidance of road users. On each approach, at least two signs shall be put up, one close to the point where transition of carriageway begins and the other 120 m away. The signs shall be of approved design and of refractory type, if so directed by the Engineer.
- Signs, lights, barriers and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time they are required as directed by the Engineer. The temporary travelled way shall be kept free of dust by frequent applications of water, if necessary.

TRAFFIC SAFETY MEASURES DURING CONSTRUCTION

This includes providing traffic safety arrangement required for traffic control near the stretch of road where widening or resurfacing work is being taken up, before actual start of widening/ resurfacing work of road and during the actual work. The contractor will have to provide the traffic safety arrangement as per the detailed drawing. The traffic safety arrangements will have to be got approved from the Engineer by the contractor before taking any construction activities for widening or resurfacing of road. It will be sole responsibility of bidder to provide for sufficient traffic wardens and barricades along the road edge. The Engineer shall get himself satisfied about the traffic safety arrangement provided on the work site before allowing contractor to commence the widening activity and a certificate to that effect shall be recorded in the Measurement Book. The following traffic signs shall be provided by the contractor.

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- I. The sign No. 1 **“SPEED LIMIT (20)”** shall be placed at a distance of 120 m. away from point where the transition of carriageway begins. The sign board shall be in size 60 cm. dia. having white background and red border and the numerals shall be in black color as per IRC: 67-1977. Distance between sign No. 1 and sign No. 2 shall be minimum 20 m.
- II. The sign No. 2 cautionary boards indicating **“NARROW ROAD AHEAD”** shall be placed at a distance of 80 m. away from the point of transition of carriageway. The signboard shall be of an equilateral triangle of size 90 cm. having white color background. Retro-reflective border in red color and non-reflective symbol in black color as per IRC: 67-1977.
- III. The sign No. 3 signboard indicating **“MEN AT WORK / PSCDCL ROAD WORK AHEAD”** shall be placed at a distance of 40 m. away from the point of transition of carriageway. The signboard shall be of an equilateral triangle of size 90 cm. having white color background. Retro-reflective border in red color and non-reflective symbol in black color as per IRC: 67-1977.
- IV. The sign No. 4 the board displaying the message **“GO SLOW- WORK IN PROGRESS– SORRY FOR INCONVENIENCE”** shall be placed at the point of transition of carriageway. The size of signboard shall be 1.0 m x 1.0 m. having red background and retro- reflective messages in white color.

BARRICADING FOR WORK:

- The proper barricading of the construction zone for road widening or resurfacing shall be done by contractor by using the following devices and providing adequate number of persons with Flags / Whistles and reflective jackets for traffic control.
- Sand filled plastic cones mounted with Retro-reflective Arrow Hazard Marker sign shall be placed as indicated in the drawing. Plastic cone shall be 73 cm. in height having 39 cm. square/hexagonal bases. Sand filled plastic cones shall be placed along the work is in progress as shown in the drawing. Cones shall be fluorescent orange and shall be made of a material that can be struck without damaging vehicles on impact. For night time use, cones shall be retroreflective or equipped with lighting devices for maximum visibility. Retro reflection shall be provided by a white band 150 mm wide, no more than 100 mm from the top of the cone, and an additional 100 mm white band a minimum of 50 mm below the 150 mm top band. The reflective sheeting used for bands shall be of Class B sheeting as per IRC-67:2011.
- Retro-reflective Strong Inviolable Stand Type Barrier shall be placed at either ends of the widening area up to the edge of the Road. The barricades shall not be removed unless the permission is given by the responsible officer of the rank not less than Deputy Engineer. The Barricade shall have two plates of size 1.30 m x 0.20 m. painted black and shall have white Retro-reflective Strips of Class B sheeting as per IRC-67:2011.and mounted on Angle Iron Stand of 1.0 m. height. Minimum height of barricade shall be 1.50 m. alternatively, the barricading with continuous Tin sheets fixed on wooden posts at distance of not more than 2 m and height not less than 1.5 m shall be used. The tin sheets shall be painted in alternate

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Black and Yellow paint and maintain in good condition during the widening work. All the excavated portions of road / CD work/ RCC chambers etc shall be covered on all sides with painted Tin Sheet barricading.

- Yellow light flasher shall be kept lit from sunset to sunrise, 2 Nos. along transition line of traffic and 3 Nos. at barriers on both sides.
- Informatory sign board indicating Name of work, Contractor, Consultant, Amount of contract, completion period, Defect Liability period, and Telephone No., name of Junior Engineer, Consultant and Contractor Engineer with Telephone No. shall be provided at the starting point, end point of the stretch of road proposed for widening as per the scope of the agreement.
- The signs, lights, barricades and other traffic control devices shall be well maintained, till such time that the traffic is commissioned on the widened road. The size, shape and color of all the sign and caution boards shall be as mentioned above as per detailed drawings in accordance with the relevant IRC Specifications and as per Ministry of Road Transport & Highway (MORT&H) Specifications.
- The sign shall be erected when the maintenance or minor construction activity extends over longer period of time and is of a more stationary nature. It may also be used at intermediate locations on long construction areas to set apart certain road sections having a higher degree of construction activities than observed in other intersections.

Specifications for the electrical work

The following work will be carried out by the Contractor

- The Contractor shall carry out and complete the said work under this Contract in every respect in conformity with the current rules and regulations of the local electrical authority, the Indian Standard Institution and with the directions of and to the satisfaction of the Engineer in Charge. The Contractor shall furnish all the labour and install all materials, appliances, equipment necessary for the completion, and testing of the whole electrical installation as specified herein and shown on the drawings and bill of materials. This also includes any material, appliances, equipment not specifically mentioned herein or noted on the drawings as being furnished or installed but which are necessary and customary to make complete installation in all respect as shown on the drawings or described in specification or bill of material herein, properly connected and in working condition. The work shall include all incidental jobs connected with electrical installation such as excavation of trenches and back filling, cutting/drilling and grouting for fixing of fixtures, equipment etc. Further all the liaison work with the Supply Authorities for obtaining electrical load sanction, obtaining the released order from supply authority for release of supply and other bodies like Electrical Inspector etc. including submitting all relevant tests, reports, Installation compliance, drawings etc. shall be done by the Contractor without any extra cost. No separate amount towards the same will be paid by the NMSCDCL.

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- The drawings attached along with the tender documents are indicative drawings. Contractor has to submit detail shop drawings to the Engineer in Charge for approval before commencement of work. All the drawings to be prepared in latest version of AutoCAD only.
- Further the Contractor has to do the Liaison work with the supply authority for getting the load sanctions and release of L.T Supply to the premises and to individual owners. NMSCDCL will assist the Contractor for giving the necessary data for filling the forms. The Electrical Contractor shall be solely responsible for submission of application along with all necessary documents to supply authority. Further he shall be also responsible for follow up of the application and getting the release of the supply to the lighting installation street lighting. The necessary cost involved for the said work is to be included in the cost of the work. No separate payments will be made by the clients towards the same.
- The Contractor shall be also responsible for getting the necessary approvals from the various bodies such as Supply authority, Electrical Inspector, PWD, MSEDCL, Government of Maharashtra and any other statutory bodies. The cost involved for getting the necessary approvals is to be included in the cost of the overall work. No separate payment towards the same will be paid to the Contractor. NMSCDCLs will be reimbursed the official fees paid by the Contractor to the various departments. The Contractor will have to submit the original copies of the bills/ challans and copy of the receipt of the payment made to the various departments.
- The Contractor will have to carry out the entire electrical work to the satisfaction of the Engineer in Charge. The brief description of the work is as follows: -
 - Main Cabling: -

The Contractor will have to lay the LT XLPE armored cables from the feeder pillar to street light poles, junction boxes, lighting fixtures etc. as shown in the drawings. Before laying this cables the Contractor will have to do necessary voltage drop calculations for each size of the cables and get it approved from Engineer in Charge. The termination of the cables will be carried out using good quality heavy-duty brass double compression glands of approved makes and the heavy-duty tinned copper crimping lugs. The Cost of all the cables will be included in the scope of the contract. After laying of the cables, all the cables will have to be neatly dressed using necessary clamps. The cable indemnification tags shall be provided at both ends and at every 15-20 meters.
 - Feeder Pillar: -

The Feeder Pillar for the said work is to be supplied by the Contractor. The Feeder Pillar will be outdoor duly fabricated using minimum 10 SWG white CRCA Sheets and the same shall be double door type with rain canopy fixed on top. The Feeder Pillar will undergo the seven tank painting process. It will be painted using powder coated granule finish Siemens gray PAL 7032 colour shade. Bus-bars used for the same will be tinned copper with colour code and heat shrinkable sleeve only. A separate compartment with

necessary sealing arrangements for the MSEDCL equipment to be provided. The Feeder Pillar shall have bottom cable entry and top copper bus bar chamber. The Feeder Pillar shall be installed on the concrete pedestal of minimum 450 mm. height from the finished road level. The Contractor will have to submit the necessary drawings in detail to the Engineer in Charge for his approval before fabrication work started. All the cost towards the supply, installation, testing and commissioning including all necessary civil work will be borne by the Contractor. Before the Feeder Pillar is dispatched to the Site the same shall be inspected and tested at the manufacturers' works. The Contractor at Site shall carry out the necessary pre - commissioning tests before the final commissioning. The 22 KV HT Feeder Pillar shall be as per MSEDCL specifications and drawing No. PUZ/TDU-154R dated 20.02.1995 with latest amendments, if any.

○ Earthing System :-

Prior to starting the Earthing work the Contractor will have to submit detail Earthing calculations for the approval of Engineer-in-Charge. 2 Nos. Earthing pits with plate type of earthing to be provided for the feeder pillar, pipe earthing system to be provided for all high each lighting tower. The Earthing results should be less than 1.0 Ohms.

3.2 Shifting of MSEDCL HT / LT Overhead Lines / Underground Cables and DTC.

- The Electrical Contractor and supervisors carrying out this work should be licensed electrical Contractor / supervisor approved by Maharashtra State Government.
- While road widening execution work, existing HT / LT OH and UG Cables and DTCs will have to be shifted outside of road width of 61.5 meter (ROW). Wherever possible the existing overhead lines will be shifted outside of ROW as overhead lines along the highway. However, if there is no possibility of taking overhead lines along the highway and for land crossings across highway will be carried out by underground cables as per estimates of MSEDCL.
- The design and specifications of material / equipment will be as per approved drawings of MSEDCL and will have to be of MSEDCL approved make. The same will be provided to the Contractor.
- The Contractor should obtain prior approval of samples of fabricated items, equipment, cables, wires, conductors etc. from concerned MSEDCL officers and NMSCDCL before actual use at Site.
- The distribution transformers should be procured from MSEDCL approved manufacturers only. MSEDCL will carry out stage inspection / testing of such transformers at the works of manufacturer.
- The Contractor should submit proof of purchase (invoice / challans) of all electrical items procured to MSEDCL and NMSCDCL.

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- The Contractor should arrange shut downs on MSEDCL lines on weekly off days for carrying out shifting works well in advance in coordination with local MSEDCL offices.
- The Contractor should submit the required drawings and documents to the electrical inspector for the works carried out and obtain approval from him before charging the lines / DTCs.
- After completing the works inventory location wise to be prepared and material account to be submitted for verification of consultant of NMSCDCL along with as built drawings.
- The Contractor should hand over the new lines / equipment / cables / DTC etc. to MSEDCL as per their procedure with necessary bond on the stamp paper. Handing over note duly signed by MSEDCL engineers should be submitted to consultant / NMSCDCL.

3.3 Applicable Codes and Standards

The following Codes and Standards shall be applicable for continuous performance of all electrical equipment's to be supplied, delivered at Site, erected, tested and commissioned. The Electrical equipment's offered shall comply with the relevant Indian Standard Specifications, Fire Insurance Regulations, Tariff Advisory Committee's Regulations, and in particular to Indian Electricity Rules in all respects with all its latest amendments up-to-date.

For guidelines to the tender's, few of the Indian Standards are indicated below:

IS 116	Circuit Breakers for AC System.
IS 159	Busbars and Busbar connections.
IS 3043	Code of Practice for earthing.
IS 3072	Code of Practice for Installation of Switchgear.
IS 3106	Code of Practice for Selection, Installation and Maintenance of Fuse (upto 650 Volts)
IS 3202	Climate Proofing of Electrical Equipment
IS 3427	Metal enclosed Switchgear and Control Gear.
IS 3837	Accessories for rigid steel conduits.
IS 4047	Heavy Duty Air Break Switches and composite Switch Fuse Units for voltage not exceeding 100 Volts.
IS 4064	Switch Fuse Units for Industries etc.
IS 4237	General requirements for Switchgears not exceeding 1000 Volts.
IS 4615	Switch Socket Outlets.
IS 5133	(Part-I) Sheet Steel Boxes.
IS 5216	Guide for safety procedures and practices in electric work
IS 5578	Guide for marking of insulated conductors.

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IS 5820	Pre-cast concrete cable covers
IS 5908	Method of measurement of electrical installation in building
IS 6381	Specifications for construction and testing of electrical apparatus.
IS 1818	Isolator and Earthing Switches.
IS 1947	Flood Lights.
IS 2147	Degree of Protection provided for enclosure for Switchgear.
IS 2208	HRC Cartridge Fuse Units upto 650 Volts.
IS 2251	Code of Practice for Danger Notice Plates.
IS 2268	Call Bells/Buzzers.
IS 2274	Code of Practice for wiring installations (exceeding 650 Volts)
IS 3854	Switches for domestic and similar purpose.
IS 2312	Exhaust fans.
IS 2309	Code of Practice for Lightning Protection.
IS 2418	Tubular fluorescent lamps for General Lighting Service
IS 2509	PVC Electrical conduits.
IS 2516	A.C. Circuit Breakers.
IS 2667	Fittings for rigid steel conduits for electric wiring.
IS 2675	Enclosed distribution fuse boards cutouts for voltage upto 1000 Volts.
IS 2705	Current Transformers.
IS 3070	(Part-I) Lightning Arrestors.
IS 2834	L. T. Capacitors.
BS 162	Electric Power Switchgear for Indoor and Outdoor Installations.
IEC Pub 26	Circuit Breakers
IS 374	Ceiling Fans.
IS 375	Marking and arrangement for Switchgear Boards Main connections and Auxiliary Wiring.
IS 415	Tungsten Filament lamps.
IS 694	PVC insulated cable and cords for Power/Lighting.
IS 722	Three Phase Watt Hour meters with MDI.
IS 732	Electrical wiring installation (upto 650 Volts)
IS 1087	Single pole tumbler switch 5 Amps.
IS 1248	Direct acting Electrical Indicating Instruments.
IS 1293	3 Pin Plugs and Socket Outlets.

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IS 1554	PVC Insulated Cables - Heavy Duty.
IS 1567	Metal Clad Switches upto 100 Amps.
IS 1651	Lead Acid Cell Batteries.
IS 1653	Rigid Steel Conduits for Electric Wiring
IS 1771	Industrial Light Fittings with accessories.
IS 6946	Pliable (flexible) non-metallic conduits for electricals.

The entire electrical installation work shall be strictly complied with the Codes Standards, Rules and Regulations framed under the Indian Electricity Act. Further, it shall be carried out as per the Regulations and Rules set out by "Tariff Advisory Committee and / or Fire Insurance Regulations".

Any other IS Codes as applicable at the time of execution over and above whatever stated above.

Some of the Rules framed under Indian Electricity Rules of 1956 and all amendments thereof more particularly complied to: - 35, 43, 44, 44-A, 45 (Part-I), 50, 51, 59, 61 (a), 61 (c), 62, 63 (2), 65, 66, 67, 68, 69 and 92 (2)

3.4 Specifications for ALUMINIUM/COPPER L.T. XLPE/H.T. XLPE ARMoured/ UNARMoured CABLES

3.4.1 Codes and Standards:

The design, manufacture, testing and supply of the cables under this specification shall comply with the latest revisions including amendments of the following standards.

- IS : 7098-I XLPE insulated heavy duty cables for working voltages upto 1100 Volts.
- IS : 3961-II Recommended current ratings for cables.
- IS : 8130 Conductors for insulated cables.
- IS : 5831 XLPE Insulation and outer sheath of electric cables.
- IS : 7098-I Test Procedures for cables.
- IS : 10418 Specification for drums for electric cables.
- IS : 3975 Mild steel wire, strips and tapes for armoring of cables.

3.4.2 Technical Requirements:

- a) All XLPE Aluminium /Copper Power cables shall be 1100 Volts grade, multi core constructed as per IS: 7098 Part-I of 1988 as follow:
- Stranded Aluminium /Copper conductor in case of 10 sq.mm and above and solid conductor in case of 10 sq.mm and below.
 - All Aluminium/Copper XLPE cables insulation shall be of high grade Cross-linked Polyethylene from insulation for extrusion process.
 - Cores laid up
 - The inner sheath should be bonded over with thermo-plastic material for protection against mechanical and electrical damage.
 - Armoring should be provided over the inner sheath to guard against mechanical damage. Armoring should be Galvanised steel wires or galvanised steel strips. (In single core cables used in A.C. system armoring should be non-magnetic hard aluminium Wires/Strips.
 - Round steel wires should be used where diameter over the inner sheath does not exceed 13 mm; above 13 mm flat steel armour should be used. Round wire of different sizes should be provided against specific request.)

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- The outer sheath should be specially formulated heat resistant black PVC compound conforming to the requirement of type ST2 of IS: 5831- 1984 extruded to form the outer sheath.
- b) Conductor shall be of electrolytic Aluminium/ Copper conforming to IS: 8130 and are compact circular or compact shaped.
- c) Insulation shall be of XLPE type as per latest IS general purpose insulation for maximum rated conductor temperature 70 degree centigrade.
- d) In Inner sheath, laid up cores shall be bonded over with thermoplastic material for protection against mechanical and electrical damage.
- e) Insulation, inner sheath and outer sheath shall be applied by extrusion and lapping up process only.
- f) Armouring shall be of galvanised steel wire/flat.
- g) Repaired cables shall not be used.
- h) Current ratings of the cables shall be as per IS: 3961.

3.4.3 XLPE cables:

- a) The XLPE insulated cables shall conform to latest revision as read along with this specifications.
- b) The Conductor shall be stranded Aluminium/ Copper circular/ sector shaped and compacted.
- c) In multi core cables the core shall be identified by red, yellow, blue and black coloring of insulation.
- d) The XLPE insulated 1100 Volts grade power cables shall conform to latest IS and shall be suitable for a steady conductor temperature of 70 degree centigrade.
- e) The conductor shall be stranded Aluminium/ Copper as called for in the Schedule of quantities.
- f) The outer sheath shall be as per the requirement of type ST-2 of IS: 5831 of 1984.

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3.4.4 Supply and laying of cables:

- a) The cables shall be suitable for laying in racks, ducts, trenches, conduits and underground buried installation with uncontrolled back fill and chances of flooding by water.
- b) Progressive automatic in line sequential marking of the length of cables in meters at every one meter shall be provided on the outer sheath of all cables.
- c) Cables shall be supplied in non-returnable wooden drums as per IS: 10418.
- d) Both ends of the cables shall be properly sealed with PVC/ Rubber caps so as to eliminate ingress of water during transportation, storage and erection.

3.4.5 Test and tests reports:

Cables shall be subjected to type tests, acceptance tests and routine tests as per 7098 Part - I. The Engineer in Charge reserves the right to witness any or all the tests for which at least 20 days advance notice shall be given by the Contractor. Six (6) copies of all test reports shall be submitted for approval by Engineer in Charge before despatch of the materials from works.

3.4.6 Drawings and data:

The Contractor shall furnish technical particulars of cables, type, make and catalogue for the approval by Engineer in Charge.

The product should be coded as per IS - 7098 Part-I and the codes should be as follows:

Aluminium Conductor	A
XLPE Insulation	2X
Steel round wire armour	W
Steel strip armour	F
Steel Double round wire armour	WW
Steel Double strip armour	FF
Non-magnetic (Al.) round wire armour	Wa
Non-magnetic (Al.) strip armour	Fa
PVC outer sheath	Y

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3.5 HT Cables

3.4.1 Standards:

No.	Indian Standard	Description
1.	IS 7098	XLPE insulated electric Cables
2.	IS 5831	PVC insulation and sheath of electric cables
3.	IS 3975	Mild steel wires, strips and tapes for armouring of cables.
4.	IS 1753	Aluminum conductors for insulated cables

3.4.2 Other Considerations

The HT cable sizing shall be based on fault level at 11 kV. The short circuit withstand duration shall be 1.0 sec for all feeders.

3.4.3 Technical parameters

Voltage grade	11kV (E) grade (Earthed system) laid from transformer to 11 kV panel (suitable for 11 kV induction motors to be started through Soft starter)
Impulse level	75 kVp
No. of cores	Single core
Nominal area of conductor	300 mm ²
Conductor	Aluminium conductor complying with the requirements specified in I.S.
Type of insulation	Cross linked polyethylene (XLPE)
Shielding	Conductor shielding and insulation shielding
Armoured or Unarmoured	Unarmoured
Cables to be used in earthed or unearthed system	Earthed system

3.4.4 Conductor

The conductor shall be made from high electrical purity Aluminium of circular shape. Conductor construction and testing shall comply to latest I.S.

3.4.5 Insulation

High quality XLPE insulating compound of natural colour shall be used for insulation and shall be chemically cross linked by continuous vulcanisation process. The cables shall be manufactured with dry cure system. This shall comply to latest IS.

3.4.6 Shielding

The XLPE cables shall be provided with both conductor shielding and insulating shielding.

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Both conductor shielding and insulation shielding shall consist of extruded semiconductor compound. Additional insulation shall be provided with semiconductor tape and non-magnetic tape screen over the extruded insulation conductor shielding. XLPE insulation and insulation shielding shall be extruded in one operation by a special process ensuring perfect bonding of inner and outer shielding with insulation.

3.4.7 Drawing and documents required Cable catalogue

3.5 Earthing

3.5.1 Scope

- Earthing system to be provided shall comprise of earth electrode of copper plate or hot dipped Galvanized plates in earth pits, earth bus/grid of copper flats or GI Flats or Aluminum flats as called for and bare copper earth wires or Galvanized earth wires or aluminum earth wires as called for, for acting as earth continuity conductor.
- Lightning Protection system shall comprise of earth electrode of Cu or GI plate in earth pits, earth bus of down conductors of Cu or GI flats.
- Earthing of Compound, Flood Lighting and Road Lighting poles shall be done by using Cu or GI plates in earth pits near pole and 8G size galvanized stranded wire for connecting to the pole or as specified in the Schedule or in drawings.
- Entire earth system shall conform to the Code of Practice as per IS. 3043 of 1987.

3.5.2 General Requirement

Enclosures and frame work of all current carrying equipment and accessories, structural steel/columns shall be adequately earthed to a single earthing system, unless separate earthing systems are specifically stipulated. All electrical equipment shall be earthed at two distinct points.

Earth loads and risers shall follow as direct and short a path as possible. Suitable risers shall be provided as directed if equipment is not available when earthing is installed.

3.5.3 Earth Electrodes in Earth Pits:

Plate electrodes of Copper shall be 600 x 600 x 3 mm thick and 600 x 600 x 6 mm thick for GI unless otherwise specified.

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3.5.4 Earth Bus and Earth Continuity Conductor:

- Earth bus is a copper strip or flat of specified size interconnecting all earth electrodes.
- Switchgears and Power Distribution Boards shall be earthed by a copper flat strip/Hot Dipped Galvanized Iron strip or Wire.
- Panels, fused DBs and motors up to 30 KW rating shall be earthed by a continuity conductor, as specified. Minimum size of continuity conductor shall be 25 x 3 mm bare copper strip/ 25 x 6mm bare GI strip, soft drawn.
- Road Lighting Poles shall be earthed with 8SWG GI wire.

3.5.5 Earth Bus Station

Earth Bus Station shall be provided to facilitate tapping of earth continuity conductor from earth bus/grid very conveniently. It will comprise of 400 mm long 50 x 6 mm bare GI strips/flat fixed with rawal plugs/bolts securely on wall/column above floor level. Spacers of 20 mm to 25 mm shall be provided to keep the flat away from wall and facilitate connections of earth conductor for which 6 mm dia holes 8 to 10 numbers to be provided with proper size brass nuts, bolts, and washers. Earth bus shall be connected to it.

3.5.6 Artificial treatment of soil

If the earth resistance is too high and the multiple electrode earthing does not give adequate low resistance to earth, then the soil resistivity immediately surrounding the earth electrodes shall be reduced by adding sodium chloride, calcium chloride, sodium carbonate, copper sulphate, salt and soft coke or charcoal in suitable proportions.

3.5.7 Resistance to Earth

The Contractor shall measure the resistance of the individual earthing pit and report to the Engineer in Charge. The Contractor, after due consultation with the Engineer in Charge, will make No. of Earth pits, such that, the overall resistance in the earth mat does not exceed 1.0 ohm.

3.5.8 Earthing Station

- **Plate Electrode Earthing:**

Earthing electrode shall consist of a tinned copper plate not less than 600 x 600 x 3 mm thick, or, 600 x 600 x 6 mm G.I. as called for in the drawings. The plate electrode shall be buried as far as possible below permanent moisture level but in

any case not less than 3 mts. below ground level. Wherever possible earth electrode shall be located near the water tap, water drain or a down take pipe. Earth electrodes shall not be installed in proximity of a metal fence. It shall be kept clear of the buildings foundations and in no case shall it be nearer than 1 meter from the outdoor face of the wall. The earth plate shall be set vertically and surrounded with 150 mm thick layer of charcoal dust and salt mixture. 20 mm G.I. pipe shall run from the top edge of the plate to the ground level. The top of the pipe shall be provided with a funnel and a mesh for watering the earth through the pipe. The main earth conductors shall be connected to the electrode just below the funnel, with proper terminal lugs and checks nuts. The funnel over the G.I. pipe and earth connections should be 300 mm wide and 300 mm deep. The masonry chamber shall be provided with a cast iron cover resting over a C.I. frame embedded in masonry.

▪ **Pipe Electrode Earthing:**

Earthing electrode shall consist of a G.I. Pipe (Class 'B') Indian Tube Company make/ Zenith or approved equal, not less than 40 mm dia and 2.5 metres long or 20 mm dia G.I. rod. G.I. Pipe electrode shall be cut tapered at the bottom and provided with holes. The electrode shall be in one piece and no joints shall be allowed in the electrode. The necessary double GI wire No. 8 SWC along with GI nut bolts etc. connected to nearest earth terminal of pole / switch gear etc.

3.5.9 Lighting Fixtures

3.5.9.1 Scope

Manufacture, Test, Supply and Delivery at Site, the specified Light Fittings.

3.5.9.2 Standards:

1	Finish	Aesthetically designed housing with Silver Grey color corrosion resistant polyester powder coating RAL 7040
2	Fixture Cover	Tempered Glass Cover on the Optical compartment.
3	Glare control details	Luminaire should be Semi/ full cutoff as per IS 1944
4	Protection (Ingress & Electrical) & Impact Resistance	Optical and Control gear compartment-IP 66,>/= IK 08, Class I & RoHS Compliant+D8
5	Optical assembly	Structured LED array for optimized roadway photometric distribution with individual photometric lenses (on lens plate) designed to optimize application efficiency and minimal glare
6	Constant Operating voltage	120V-270V (Operating at 150V)
7	Frequency	50 Hz
8	Power factor	>= 0.95 (Nominal)

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9	Working temperature	Range -30 to +50-degree C
10	Working Humidity	Upto 95% RH
11	Total Current Harmonic distortion	Total Current Harmonic Distortion \leq 20 %
12	Total system wattage and lumens of Fixture including Driver	Nominal value to be printed in the label and within +/- 10% variation from the printed value
13	LED efficacy (lumen/watt)	Efficacy of LED should be greater than 130 lumens / watt.
14	LED Luminaire efficacy	>100 lumen/watt
15	Power efficiency / LED driver efficiency	The efficiency shall be more than 85 % in all cases at all times during project period.
16	Lumen maintenance	L70 @ 50,000 hours
17	Correlated Color temperature	Correlated Color Temperature shall be nominal 3000K per ANSI C78.377A CCT standard.
18	CRI	The value of CRI shall be more than 70.
19	Make of LED	Make of LED: CREE / Lumileds / Osram. The LED shall be of Surface Mounted Design (>1W<3W)
20	Lens	Lens should be provided for each LED on lens plate
21	LED Drive Current	Not more than 85% of the rated current carrying capacity of LED (1000mA - 700mA)
22	Driver Specification	120V-270V universal electronic potted drivers with internal surge protection of 4 kV & an External surge protection of 10KV (DM/CM) within an enclosure in the luminaire.
23	Electrical safety as per IEC.	As per IEC safety standards IEC61000, 61547, 61347
24	Conformation standards of luminaire	The luminaire conforms to IEC 60598 / 10322
26	Test reports of luminaire & Serial number	<p>(a)The luminaire should be tested as per IEC 60598 standards and following test reports should be submitted: Heat Resistance Test, Thermal Test, Ingress Protection Test, Electrical / Insulation Resistance Test, Endurance Test, Humidity Test. The luminaire should be tested for 'Drop test' as per IEC 60068-2-31/IS9000 Part 7 / Sec 3 standards. The luminaire should be tested for 'Vibration test' as per ANSI/IEC 68-2-6 standards.</p> <p>(b) Should comply to IESNA LM-79 (Approved method for the Electrical and Photometric Measurements of Solid-State Lighting Products)</p> <p>(c) The LED' used should comply to LM-80 standards (IESNA: Approved Method for Measuring Lumen Maintenance of LED Light Sources and LED lumen depreciation time to L70 based on LM-80 data)</p>

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(d) Copy of above test certificates should be submitted with tender.

(e) CB IEC 60598, CQC, AS/NZS 1158

(f) Random samples from supplied lot should be tested at NABL accredited laboratory and report submitted for acceptance as requested by the department

(g) LED street light fitting should be supplied with serial number which should be attached to the fitting. The label should mention: Name of Manufacturer, model name and number, system lumen pack, nominal CCT, Wattage of fitting, Date of Manufacture, and other labeling details as per IS.

TECHNICAL SPECIFICATIONS FOR ERECTION/ INSTALLATION

4 Installation of Feeder Pillar.

Before erecting the Feeder Pillar at Site, a thorough inspection shall be done by the Contractor and reported to the Engineer in Charge if any difficulties are envisaged for erection. Thereafter, an erection sketch shall be prepared, indicating the dimensions and the clearances between the Boards. A similar marking will also be made at Site.

Feeder Pillar shall be tested for mechanical endurance. After checking wiring and cable connections the entire boards, shall be erected in places indicated and marked on the plan. All touching up work of points shall then be done and foundation bolts grouted. All necessary holes and civil works shall be done as per directions. The Feeder Pillar after duly testing shall be put to commission for trial.

4.1 Installation of MV cables:

4.1.1 General

MV Cables shall be inspected prior to laying, laid tested and commissioned in accordance with drawings, specifications, relevant Indian Standards Specifications and cable Manufacturer's instructions. The Cable shall be delivered at Site in original drums with manufacturer's name clearly written in the drum.

The recommendations of the cable manufacturer with regard to jointing and sealing shall be strictly followed.

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4.1.2 Inspection

All cables shall be inspected upon receipt at Site and checked for any damage during transit.

While selecting cable routes, corrosive soils, ground surrounding sewage effluent etc. shall be avoided; where this is not feasible, special precautions as decided by the Engineer in Charge, shall be taken. Street lighting and Service line to each area have separate route.

4.1.3 Proximity to communication cables

Power and communication cables shall as far as possible cross at right angles. Where power cables are laid in proximity to communication cables the horizontal and vertical clearances shall not normally be less than 60 cms.

4.1.4 Laying methods

- Cables shall be laid direct in ground, in pipes/closed ducts, in open ducts or on surface depending on environmental and Site conditions.
- During the preliminary stages of laying the cables, consideration should be given to proper location of the joint position so that when the cables are actually laid the joints are made in the most suitable places. As far as possible water logged locations, carriage ways, pavements, proximity to telephone cables, gas of water mains, inaccessible places, ducts pipes racks etc. shall be avoided for joint position.

4.1.5 Laying direct in ground

General: This method shall be adopted where the cable route is through open country, along roads/lanes etc. and where no frequent excavations are encountered and where re-excavations is easily possible without affecting other services.

4.1.6 Trenching:

- (i) **Width of trench:** The width of the trench shall first be determined on the following basis.
 - The minimum width of trench for laying single cable shall be 35 cm.
 - Where more than one cable is to be laid in the same trench in horizontal formation, the width of trench shall be increased such that the inter-axial spacing between the cables, except where otherwise specified shall be at

least 20 cm.

- There shall be a clearance of at least 15 cm between axis of the end cables and the sides of the trench.

(ii) Depth of Trench

The depth of the trench shall be determined on the following basis:

- Where cables are laid in single tier formation, the total depth of trench shall not be less than 75 cm. for cables upto 1.1 KV and 1.20 m for cables above 1.1 KV.
- When more than one tier of cables is unavoidable and vertical formation of laying is adopted, depth of trench in above shall be increased by 30 cm for each additional tier to be formed.

(iii) Excavation of Trenches

- The trenches shall be excavated in reasonably straight lines. Wherever there is a change in direction, suitable curvature shall be provided complying with the requirements of the manufacturer.
- Adequate precautions should be taken not to damage any existing cable(s), pipes or other such installation in the proposed route during excavation. Wherever bricks, tiles or protective covers or bare cables are encountered, further excavation shall not be carried out without the approval of the Engineer in Charge.
- If there is any danger of a trench collapsing or endangering adjacent structures, the sides should be well shored up with timbering and/or sheeting as the excavation proceeds. Where necessary, these may even be left in places when back filling the trench.
- Excavation through lawns shall be done in consultation with the staff of NMSCDCL concerned.
- The bottom of the trench shall be level and free from stone, brick bats etc. The trench shall then be provided with a layer of clean, dry sand cushion of not less than 8 cm in depth.

(iv) Laying of Cable in trench

- At the time of issue of cable for laying the cores shall be tested for continuity and insulation resistance.

- When the cable has been properly straightened, the cores are tested for continuity and insulation resistance and the cable is then measured. The ends of all lead sheathed cables shall be sealed with solder immediately. In case of PVC cables suitable moisture seal tape shall be used for this purpose.
- Cable laid in trenches in a single tier formation shall have a covering of clean, dry sand of not less than 17 cms. Above the base cushion of sand before the protective cover is laid.
- In the case of vertical multi-tier formation after the first cable has been laid, a sand cushion of 30 cms. shall be provided over the initial bed before the second tier is laid. If additional tiers are formed, each of the subsequent tiers also shall have a sand cushion of 30 cms. as stated above. The top most cable shall have a final sand covering of not less than 17 cms. before the protective cover is laid.
- At the time of original installation, approximately 3 m of surplus cable shall be left on each end of the cable and on each side of underground joints (straight through/ Tee/Termination) and at entries and places as may be decided by the Engineer in Charge. The surplus cable shall be left in the form of a loop. Where there are long runs of cable length, loose cable may be left at suitable intervals as specified by the Engineer in Charge.
- Unless otherwise specified, the cables shall be protected by second class bricks of not less than 20 cm x 10 cm x 10 cm (nominal size) protection covers placed on top of the sand, (bricks to be laid breadth wise) for the full length of the cable to the satisfaction of the Architect / Consultants. Where more than one cable is to be laid in the same trench, this protective covering shall cover all the cables and projects at least 5 cm. over the sides of the end cables.

4.1.7 Back filing

The trenches shall be then back filled with excavated earth free from stones or other sharp edged debris and shall be rammed and watered, if necessary, in successive layers not exceeding 30 cm. Unless otherwise specified, a crown of earth not less than 50 mm. in the center and tapering towards the sides of the trench shall be left to allow for subsidence. The crown of earth however should not exceed 10 cm. so as not to be a hazard to vehicular traffic. The temporary reinstatements of roadways should be inspected at regular intervals, particularly during the wet weather, and any settlement should be made good by further filling as may be required. After the

subsidence has ceased, trenches cut through roadways or other paved areas shall be restored to the same density and material as the surrounding area and repaved to the satisfaction of the Engineer-in-Charge.

Where road cutting, excavation in lawns kerb stones displaced etc., the Same shall be repaired and made good except turfing/ asphaltting to the satisfaction of the Engineer in Charge and all surplus earth or rock removed to places as specified.

4.1.8 Route Marker:

Route marker shall be provided along straight runs of the cables at locations approved by the Engineer in Charge and generally at intervals not exceeding 100 m. Markers shall also be provided to identify change in the direction of the cable route and also for location of every underground joint.

Route markers shall be made out of 100 mm x 100 mm x 5 mm GI / Aluminum plate, welded or bolted on to 35 mm x 35 mm x 6 mm angle iron 60 cm. long. Such plates marker shall be mounted parallel to and 0.5 m or so away from the edge of the trench.

The word 'cable' and other details such as voltage grading size etc. as furnished by the Engineer in Charge shall be inscribed on the marker.

4.1.9 Laying in Pipes/Closed Ducts

In locations such as road crossing, entry to buildings, on poles, in paved areas etc. cables shall be laid in pipes or closed ducts.

Stone ware pipes, GI, CI or Spun reinforced concrete pipes shall be used for such purposes. In the case of new construction, pipes as required shall be laid along with the Civil Works, and jointed as per the instructions of the Engineer in Charge. The size of the pipe shall be decided by the Engineer in Charge and shall not be less than 10 cm in diameter for a single cable and not less than 15 cm for more than one cable.

These pipes shall be laid directly in ground without any special bed except for SW pipe which shall be laid over 10 cm. thick cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate of 40 mm nominal size) bed. No sand cushioning or tiles need be used in such situations. Unless otherwise specified, the top surface of pipes shall be at a minimum depth of 1 m. from the ground level when laid under roads, pavements etc. Where steel pipes are employed for protection of single core cables feeding AC load, the pipe should be large enough to contain both cables in the case of single phase system and all cables in the case of polyphase system.

Pipes for cable entries to the building shall slope downwards from the building and suitably sealed to prevent entry of water inside the building. Further, the mouth of the pipes at the building end shall be suitable sealed to avoid entry of water.

All chases and passage necessary for the laying of service cable connections to buildings shall be cut as required and made good to the original finish and to the satisfaction of the Engineer in Charge.

Cable grips/draw wires and winches etc. may be employed for drawing cables through pipes/closed ducts etc.

4.1.10 Laying in open ducts

Open ducts with suitable removable covers shall be preferred in sub-stations, switch rooms, plant rooms, workshops etc.

The cable ducts should be of suitable dimensions so that the cables can be conveniently laid. If necessary, cables may be fixed with clamps on the walls of the duct or taken in troughs in duct. The duct should be covered with removable slabs or chequered plates.

Ducts may be filled with dry sand after the cable is laid and covered as above or finished with cement plaster specially in high voltage applications.

Splices or joints of any type shall not be permitted inside the ducts.

As far as possible laying of cables with different voltage ratings in the same duct shall be avoided.

Where considered necessary, hooks or racks shall be provided for supporting the cables in masonry/concrete cable ducts, cable troughs. Otherwise cables shall be laid direct in the trench or trough etc. While deciding the layout of cables in such ducts, care should be exercised to ensure, that, unnecessary crossing of cables is avoided.

4.1.11 Laying on surface

The cables may be laid in troughs or brackets at regular intervals or directly cleated to wall/ceiling. When laid over bracket supports, the cables shall be clamped to prevent undue sag.

Cable clamps shall be made from materials such as mild steel, porcelain, wood, aluminium etc. In case of single core cables the clamps shall be non-magnetic

materials. A suitable non-corrosive packing shall be used for clamping unarmoured cables, to prevent damage to the cable sheath.

4.1.12 Cable Identification Tags

Wherever more than one cable is laid/run side by side, marker tags as approved, inscribed with cable identification details shall be permanently attached to all the cables in the manholes/open ducts etc. These shall also be attached to various cables laid direct in ground at suitable intervals as decided by the Engineer-in-Charge before trenches are filled up.

4.1.13 Jointing

- Jointing work shall be carried out only by a licensed/experienced cable joiner.
- At the preliminary stages of laying a cable, a proper jointing position should be selected.
 - Sufficient surplus cable shall be left on each side of joints.
- Joints shall be staggered by 2 to 3 m when two or more cables are laid together in the same trench.
- Jointing materials and accessories like conductor ferrules, solder, flux, insulating and protective tapes, filling compound, jointing boxes etc. of right quality and correct sizes, conforming to relevant Indian Standards, wherever they exist, shall be used. The design of the joint box and the composition of the filling compound shall be such as to provide an effective sealing against entry of moisture in addition to affording proper electrical characteristic to joints. Where special type of splicing connector kits or epoxy resin spliced joints are specified materials approved for such application shall be used and instructions of the manufacturer/supplier of such materials shall be strictly followed.
- Insulation resistance of cables to be jointed shall be measured with 500 Volts megger upto 1.1 KV grade and with 2,500/5,000 Volts megger for cables of higher voltage. Unless the insulation resistance values are satisfactory, jointing shall not be done.
- Cores of the cables must be properly identified before jointing.
- Where a cable is to be jointed with the existing cable, the sequence should be so arranged as to avoid crossing of cores while jointing.

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4.1.14 Jointing Procedure

While it would be best to follow strictly the instructions for jointing furnished by the Manufacturers /Suppliers of cable and joint boxes.

All outdoor jointing of PVC cable shall be done using best quality of compound and jointing materials. For indoor termination of PVC cables, joints with compression type glands shall be preferred.

4.1.15 Testing

All cables before laying shall be tested with a 500 Volts megger for 1.1 KV grade or with a 2,500/5,000 Volts megger for cables of higher voltages. The cable cores shall be tested for continuity, absence of cross phasing, insulation resistance to earth/sheath/armour and insulation resistance between conductors.

All cables shall be subjected to above mentioned tests during laying, before covering the cables by protective covers and back filling and also before the jointing operations.

In the absence of facilities for pressure testing, it is sufficient to test for one minute with 1,000 Volts megger for cables for 1.1 KV grade and with 2,500/5,000 Volts megger for cables of higher voltages.

4.1.16 Completion Plan and Completion Certificate

The work shall be carried out in accordance with the drawings enclosed with the tender and also in accordance with the modifications thereto from time to time approved by the Engineer in Charge.

- a) Layout of Cable Work.
- b) Length, size, type and grade of cables.
- c) Method of laying i.e. direct in ground, in pipes etc.
- d) Location of each joint with jointing method followed.
- e) Route marker and joint marker with respect to permanent land marks available at Site.
- f) Name of work, Job Number, accepted tender reference, date of completion, names of Division and Sub-Division, names of Contractor with their signature and scale of drawing.

4

LIST OF APPROVED BRANDS/ MAKES OF EQUIPMENT

The following are the list of approved brands/ makes of equipment required under this tender. Please note that wherever there is a multiple choice of brands/ makes approved, any one make as nominated by the Engineer-in-Charge will have to be supplied by the Contractor without any extra cost to the NMSCDCL. No deviation in this will be accepted by the NMSCDCL.

S. No.	Description	Approved Make
1.	Low Tension, XLPE/ PVC armoured, 1.1 KV grade, Aluminium/ Copper conductor cables type AYFY/YRY.	RPG CABLES/ UNIVERSAL/ FINOLEX
2.	Low Tension, TPN MCCB with 415 Volts, AC, 3 Phase, 50 Hz	ABB/ MERLIN GERIN/ SIEMENS/ MCCB
3.	Indicating Lamps Holders with LED type lamps.	TEKNIC/ VAISHNU/ SIEMENS
4.	Energy Meter.	SIMCO/ GE/ JAIPUR
5.	Panel wires, Gray/Black colour in 660/1100 Volts. grade	FINOLEX/ PYROFLEX/ ROLLIFLEX
6.	Cable Glands – Siemens Double Compression type.	COMMET/BRACO YASH
7.	Lugs, Crimping type, tinned copper heavy duty only	DOWELL'S/3D.
8.	HRC Control fuses with bakelite/ type moulded fuse holders.	GE/SIEMENS LandT/ABB
9.	Terminal Blocks, Clipon type.	ELMEX/CONNECTWELL
10.	MS fabricated Feeder Pillar	ARROWENGG/ STAR ENGG/ PULSAR ENGG.
11.	Miniature Circuit Breaker of 10 KA Breaking Capacity and Boards	LandT HAGER/MDS MERLIN GERIN/ABB
12.	Light Fittings and Lamps	Philips only
13.	GI Pole Boxes	PULSAR/ EVEREST
14.	High Mast	Philips or equivalent
15.	Any other Item.	Sample for approval of the Consultant

5 PLANNING OF UTILITY INFRASTRUCTURE

The vision of the Utility Plan is coherent with the preliminary planning of infrastructure carried out during the formulation of the Detailed Master Plan and Urban Design Guidelines. Further detailing has been carried out considering the concept and design basis formulated during the detailed planning stage. This report includes a description of the detailed engineering that has been carried out in preparation of the draft detailed infrastructure planning drawings for each infrastructure component including:

- Water Supply and Recycle Water Supply System
- Sewerage System
- Storm Water Management

The above components have been described separately in various sections of this report.

5.1 WATER SUPPLY SYSTEM

5.1.1 Introduction

Provision of safe, adequate water is a basic necessity for the healthy living of a community. In this section, demand of potable and non-potable water in the area based development (ABD) has been dealt with. On the basis of the current population, population forecasting, total water demand in ABD area in design years, identification of the water source, transmission and distribution system, storage reservoirs and pumping station etc. will be estimated for 24 x 7 water supply system.

5.1.2 Water Supply Norms Prescribed by CPHEEO

The per capita water requirements for domestic and Non-domestic uses as per norms prescribed by Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Urban Development, and Government of India is referred.

5.1.3 Water Demand

Based on projected population in design year and per capita/ area norms total water demand is computed for both potable and non-potable purpose for various types of users such as domestic, commercial, institutional and industrial areas.

As per current scenario and consideration of Smart Street of 1.1 km purpose, Water is supplied through Police head quarter ESR, Old RTO ESR and rising main of 700 mm diameter.

5.1.4 Planning of water supply system

Treated Water will be supplied through Bara Bungalow WTP premises and conveyed by rising main to the ESR and water distribution.

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Water from the clear water reservoir area will be conveyed through pumping to the respective Elevated service reservoirs present in each DMA zone.

Potable water supply pipelines have been proposed all along the utility corridor along the plot boundary as specified in street plan.

5.1.5 Design criteria

The transmission system from the clear water pumping station near the clear water service reservoir located in the Water treatment plant area will convey flow for ultimate demand up to ESRs. A minimum residual pressure of 2.0m will be considered over the full supply level of the service reservoir. The minimum design velocity will be 0.60m/s and the maximum will be 2.5m/s. Peak factor of 1.1 will be considered for transmission system.

5.1.6 Distribution system

The local distribution network downstream of the service reservoir is considered as a looped network on the road layout. The system is planned to supply water from the service reservoir to the individual parcel by gravity on 24 x 7 as per smart city proposal. Peak factor of 1.5 will be considered for distribution system. We have collected existing water distribution network in the area and received project report on water supply network modelling, water and energy audit report prepared by NJS consultants Pvt. Ltd.

5.1.7 Pipe Diameter

We have proposed existing water distribution network with same pipe diameter and pressure for the smart road from Ashok Stambh to Trimbak Naka. We will model the network considering the same pipe diameter. Accordingly, hydraulic modelling will be done for the DMA of ABD area.

5.1.8 Excavation Depth

In general, all distribution network pipes are generally laid below ground with the clear cover of 0.5m above the crown of the pipes.

5.1.9 Residual Pressure

The system will be designed for a minimum residual pressure of 7m at the nodes of distribution system for discharge into UG tanks of individual parcel.

5.1.10 'C' Value

This will be purely on the basis of the pipe material selected. For DI pipes a value of 130 is considered.

5.1.11 Software

Water Gem will be used for the modeling of the network with a looped network design.

5.1.12 Frictional Loss Formula

Based on prior experience, it is proposed to use Hazen William's equation for the network analysis.

Hazen William's Equation:

$$Q = 1.292 \times 10^{(-5)} \times C \times D^{2.63} \times (H_f/L)^{0.54}$$

Where

Q= Flow (cum/hr)

D= Diameter of pipe (mm)

H_f= Head loss (m)

L= length of pipe (m)

C= Hazen William's constant.

5.2 Pipe material

Pipes represent a large proportion of the capital investments of the water supply network. The pipe materials have to be judiciously selected not only from the point of view of durability, the overall installation and maintenance cost of the pipeline should also be considered to ensure the function and performance of the pipeline throughout the design life. Detailed economic analysis needs to be carried out before the selection of the pipe material.

Selection of pipe material will be based on the following considerations,

- Initial carrying capacity of pipe and its reduction with use i.e. Hazen William's coefficient C.
- Ability of pipe to resist internal pressure and external loads.
- Life and durability of pipe.
- Ease in transportation, handling and laying.
- Economy and availability of pipes and specials.
- Availability of skilled manpower in construction and commissioning of pipelines.
- Ease in operations and maintenance.

In general, the following pipe material will be considered for the quantum of flows to be handled for the distribution network for comparison purpose. The following pipe materials are generally available in the market, widely used in the water supply transmission and distribution mains in the water industry and hence evaluated in detail.

5.2.1 Ductile iron pipes (DI pipes)

Ductile Iron is made by a metallurgical process which involves addition of magnesium into molten iron of low sulfur content. Ductile Iron pipes are normally prepared using the centrifugal cast process. The Ductile Iron pipes are usually provided with cement mortar lining at the factory by centrifugal process. The pipes are available in the range of 80mm to 1000mm in diameter. Ductile Iron pipes have excellent properties of machinability, impact resistance, high wear and tear resistance, high tensile strength, ductility and corrosion resistance. The 'C' values of these pipes are about 130.

These pipes have been found useful for buried water pipelines exposed to heavy loads, shocks and unstable pipe bending.

5.2.2 High density poly ethylene pipes (HDPE pipes)

High density Poly ethylene and Medium density polyethylene pipes are generally used in the water supply schemes. These pipes are not brittle and come with detachable joints and can be detached at the time of shifting of pipeline from one place to another. The material is light, has very good impact strength, flexibility and corrosion resistance. The jointing can be butt welding or by flange jointing. HDPE pipes are tough and resilient and conform to the topography of land when laid above ground or in trenches. They can bend to some extent there by reducing the specials required. The pipe has a very high C value of 140 which does not deteriorate much with age. HDPE pipes shall conform to IS:4984.

5.2.3 Glass reinforced plastic pipes (GRP)

These pipes are in sizes ranging from 200 to 3000 mm as per IS 12709-1994 and have been introduced in India few years back. These pipes have been used abroad for many years with satisfactory performance.

The pipe is light weight, has good impact strength and has a very good corrosion resistance. The bedding of these pipes has to be formed using a granular material. Jointing methods consists of bell coupling, flanged jointing, mechanical coupling and butt strapping which is satisfactory but requires skilled manpower. It has a superior 'C' value of 140.

These pipes have greater durability and high resistance to internal and external corrosion unlike DI and MS which would require coatings to resist corrosion.

5.2.4 Recommendations on pipe material selection

From the table below, it is clear that the use of Ductile Iron pipes of k9 class are found to be more suitable for the transmission and distribution network system within the ABD area of NMSCDCL as they are more superior in quality compared to the rest of the material.

Table 5.1-1: Pipe Material Comparison

PARAMETERS	PIPE MATERIAL		
	DISTRIBUTION NETWORK AND PUMPING MAIN		
	HDPE	DI	GRP
Sizes (mm) as per IS	20 -1000	80-1000	200-3000
Lengths (m)	5-20	4-6	6-12
Applicable IS codes for Manufacture, Laying and Jointing, Fittings	4984	8239,9523, 12288, 5382	14402, 13916, 5382
Weight	Light	Medium	Light
Flexibility	Maximum	Medium	Medium

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PARAMETERS	PIPE MATERIAL		
	DISTRIBUTION NETWORK AND PUMPING MAIN		
	HDPE	DI	GRP
Available Working Pressure Range (kg/cm ²)	2.5-16	8-30	3-15
Tensile Strength	24	42	Longitudinal 102 1015 kN/m and Hoop 122-9115 kN/m depending upon size
Impact Strength	Very Good	Very Good	Good
C-Value	130-140	110-130	140-150
Corrosion Resistance	Very Good	More resistance with internal lining and zinc coating than other steel pipes	Very Good
Jointing Method	Butt welded joint, flanged joint, insert joint	Spigot and socket joint with rubber ring, flanged joint	Spigot and socket, Double Bell coupling joint with rubber ring
General Availability in India	Available	Available	Available
Availability of corrosion control techniques	NA	In very aggressive soils Cathodic protection needed	NA
Ease of locating for underground pipes	Not Easy	Easy	Not Easy
Special bedding requirements	Fine sand or screened excavated material	Special care needed in bedding and backfilling	Granular material compacted to specific Proctor

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PARAMETERS	PIPE MATERIAL		
	DISTRIBUTION NETWORK AND PUMPING MAIN		
	HDPE	DI	GRP
			density
Laying speed	Fast	Fast	Fast
Pipe performance experience	Good with reputed contractors	Good with reputed manufacturers	Good with reputed manufacturers
Basic cost economics	Cheaper than DI	Higher cost compared to HDPE	Costlier

6 SEWARAGE AND RECYCLING SYSTEM

6.1 Pipe material

- Gravity Sewers

For Gravity Sewers factors which will be considered in the selection of pipe materials are

- Availability of pipe in required sizes, lengths.
- Ease of handling and installation.
- Physical strength.
- Any special bedding requirements.
- Flow characteristics or friction coefficient.
- Joint water-tightness and ease of installation.
- Resistance to acids, alkalis, high temperature or corrosive wastes, and corrosive soils.
- Ease in Repairs and maintenance.
- Basic cost economics.

The pipe materials most often used for gravity sewers are High Density Poly Ethylene (HDPE), Glass Reinforced Plastic (GRP) and Reinforced Concrete (RCC). Major characteristics of various pipe materials considered for sewers are as follows.

- **HDPE**

HDPE pipes as per IS 14333 are available in sizes from 63 mm to 1000 mm OD. The length of each pipe is 5m to 10m. The material is light, has very good impact strength, flexibility and corrosion

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resistance. The jointing can be done by butt-welding, insert jointing or by flange jointing and requires skilled manpower. HDPE pipes are tough and resilient. HDPE pipes are easy to carry and install because of their lightness. Metallic tags could be fixed at regular intervals for ease in locating the pipe with a pipe locator. The pipe has an N-value of 0.011, which does not deteriorate much with age. The bedding material has to be free from sharp edges. Fine sand or screened excavated material is ideal.

- **GRP**

The GRP pipes as per IS 14402 are in sizes of 200 mm to 3000 mm. These pipes have been introduced in India a few years back. The commonly used sizes range from 300 mm to 1200 mm. The length of each pipe is 6 m to 12 m. The pipe is light, has good impact strength and has a very good corrosion resistance. The bedding of these pipes has to be formed using granular material compacted to a specific Proctor Density. This can be achieved with proper supervision and control during laying. Jointing methods consist of spigot and socket with rubber ring joints, double bell coupling and flanged jointing which is satisfactory but requires skilled manpower. It has N-value of 0.011, which is on par with HDPE pipes. The pipe has greater durability and high resistance to internal and external corrosion unlike RCC Pipes. The GRP pipes are costlier than RCC and HDPE pipes.

- **RCC**

RCC pipes as per IS 458 are available for NP2, NP3 and NP4 class pipes with dia. varying from 80 to 2600 mm. The length of each pipe is 2 m to 2.5 m. The jointing of pipes is done either by collar or S/S rubber ring joint, the later being more suitable from the point of view of flexible joint. The design N-value for these pipes is considered as 0.013. These pipes have good load carrying capacity with suitable bedding (such as granular, concrete cradle / encasement). Several manufacturers are available in India for these pipes. The comparison of materials is provided in Table 6-1.

Table 6-1 Pipe Material Comparison

Sr. No.	Parameter	Pipe Material		
		HDPE	GRP	RCC
1	Sizes (mm) as per IS	20 -1000	200-3000	80-2600
2	Lengths (m)	5-20	6-12	2-2.5
3	Applicable IS codes for Manufacture, Laying and Jointing, Fittings	14333	14402,13916,5382	458,783, 5382
4	Weight	Light	Light	Heavy
5	Flexibility	Maximum	Medium	Rigid
6	Available Working Pressure Range (kg/cm ²)	2.5-16	3-15	NA
7	Tensile Strength	24	Longitudinal 102-1015	NA

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Sr. No.	Parameter	Pipe Material		
		HDPE	GRP	RCC
			kN/m Hoop 122-9115 kN/m depending upon size	
8	Impact Strength	Very Good	Good	Medium
9	N-Value	0.011	0.011	0.013
10	Corrosion Resistance	Very Good	Very Good	Normally Good but prone to attack by soils with Sulphates
11	Jointing Method	Butt welded joint, flanged joint, insert joint	Spigot and socket, Double Bell coupling joint with rubber ring	S/S or Collar joints
12	General Availability in India	Available	Available	Available
13	Availability of corrosion control techniques	NA	NA	Use of Sulphate resisting cement, Epoxy paint
14	Ease of locating for underground pipes	Not Easy	Not Easy	Not Easy
15	Special bedding requirements	Granular material compacted to specific Proctor density	Granular material compacted to specific Proctor density	Granular, concrete cradle or full encasement
16	Laying speed	Fast	Fast	Slow
17	Pipe performance experience	Good with reputed contractors	Good with reputed manufacturers	Good with reputed manufacturers
18	Basic cost economics	Costlier than RCC cheaper than GRP upto 350 mm & costlier than GRP above 350 mm dia.	Costlier than RCC	Cheaper than GRP and HDPE

- **Bedding for Sewers**

The type of bedding (Granular Bedding, Plain Cement Concrete, and Reinforced Cement Concrete) depends on the weight of soil above the pipe based on width of trench, depth at which the sewer pipe is laid and the class of superimposed load considered based on the traffic condition. The typical bedding details are given in Figure 6-1.

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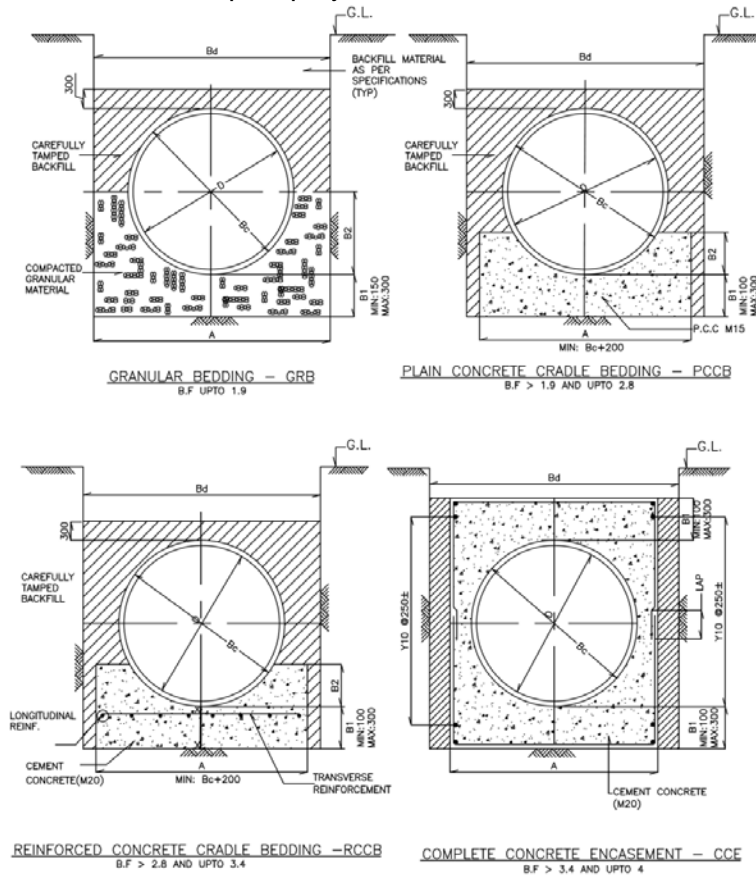


Figure 6-1 Typical Bedding Details for Gravity Sewers

- **Minimum size of sewers**

The minimum diameter of sewer pipe shall be considered as 200 mm along the road from the point of view of cleaning and maintenance.

- **Design capacity of sewers**

Sewers shall be designed to carry estimated peak flows generated in the design year and would be designed 80% full at ultimate peak flow. This is to ensure proper ventilation and prevent septicity.

- **Self-cleansing velocities**

Considering typical values of particle size and specific gravity, minimum partial flow velocities 0.6 m/s at present peak flows and 0.8 m/sec for design peak flow shall be considered. The maximum velocity of 2.5 m/s shall be considered in order to prevent scouring.

- **Depth of cover**

To provide protection to sewers from external loads, the minimum depth of cover to be provided over the top of pipe at the start of the sewers is 1.0 meters

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- **Manholes**

Circular manholes are stronger than rectangular and arch type manholes and thus are preferred. Manholes shall be provided at every change of alignment, gradient or diameter, at the head of all Sewage lines and branches and at every junction of two or more sewer lines. The center to center distance of manholes is proposed to be adopted as 30 m for ease of maintenance of sewers. The clear opening at the top in case of ordinary manholes should be equal to 560 mm. C.I steps shall be provided at 300mm c/c inside the manhole. The size of manhole shall depend on dia and depth of sewer.

The manhole frame and cover proposed is of Cast Iron on roads capable of withstanding heavy-duty loads, and Steel Fiber Reinforced Concrete (SFRC) conforming to the relevant IS codes. The material of construction of manholes may be sewer bricks conforming to IS 4885 or R.C.C.

- **Vent Shaft**

RCC vent shaft of 150 mm internal diameter shall be provided at the starting manhole and at major junctions for ventilation and to avoid septicity of sewage.

Continuing Obligation of the Contractor

The Contractor's obligation to perform and complete the Work in accordance with the Contract is and shall be absolute. Neither the observation during construction and final inspection of the Work by the Engineer, nor any payment to the Contractor under the Contract, nor any use or occupancy of the Work or any part thereof by the Engineer, nor any act of acceptance of the defective work by the Engineer shall constitute acceptance of Work not in accordance with the Contract.

SECTION 4: DRAWINGS