CORPORATION OF CHENNAI

ZONAL OFFICE - XV

FOR WORKS ABOVE 2 CRORES

(TWO COVER SYSTEM)

Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)

Package- 1 - (118 Roads)

Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)

Letter of Tender, Schedule and Conditions

(THIS TENDER DOCUMENT IS NOT TRANSFERABLE)

CORPORATION OF CHENNAI

ZONAL OFFICE - XV

FOR WORKS ABOVE 2 CRORES

BID DOCUMENT

TWO COVER SYSTEM

Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)

Package- 1 - (118 Roads)

Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)

Price: Rs16, 875/-(Rupees Sixteen Thousand Eight Hundred Seventy Five Only)

Inclusive of Plus S.T. at 10% and SC on ST @ 5%

Letter of Tender, Schedule and Conditions

(THIS TENDER DOCUMENT IS NOT TRANSFERABLE)

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CORPORATION OF CHENNAI
ZONAL OFFICE – XV
TENDER NOTICE

Corporation of Chennai

Sealed Tenders are invited for the following works as per details furnished below

The Tenderers may submit separate tenders for each of the following work/works mentioned below:

Sl. No.	Ref No	Name of work	Approx. value of work Rs. In lakhs	EMD Rs.	Cost of Tender Rs.	Eligible Class	Last Date & Time of Submission
1	**Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)**	**Package- 1 - (118 Roads) Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)**	**866.20**	**8,66,500**	**16875**	Class I Road registered Contractor	**05.07.2013 at 3.00 P.M.**

The Tenders can also be downloaded from website http://tender.tn.gov.in and www.chennaicorporation.com or obtained at the Tender Sales Counter, Ripon Buildings. Tenders will be opened on 05.07.2013 at 3.15 p.m Sale of tender will be closed 48 hours before the time fixed for submission of tender. The tender can be dropped in the tender boxes kept in any one of the offices viz., PRO, C.E.(Gl),V.O and Tender Sales Counter.

NOTE: For all the tenders which are more than Rs.10.00 lakhs in value, the tender document can also be downloaded from the websites www.tntenders.gov.in or www.tenders.tn.gov.in. The downloaded tender document shall be submitted without cost of tender document. In case of deviation is found in the tender document submitted by the tenderer from the content mentioned in the websites, his tender shall be liable for rejection at any stage of the contract.

If due date of tender happens to be Public Holiday, the tenders will be received upto .3.00. P.M and opened by .3.15. P.M. on the next Working day.

The Technical bid will be opened on 05.07.2013 at 3.15 PM.

Date & TIME OF OPENING PRICE BID WILL BE INTIMATED LATER AFTER SURUTINY OF TECHNICAL BID

Tender Document

TECHNICAL BID

Corporation of Chennai

ZONAL OFFICE –XV

NAME OF THE WORK	:	**Z.O.XV C.NO.B1/ 1047 /2013 Package- 1 - (118 Roads) Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)**
E.M.D.AMOUNT		Rs.**8,66,500/-**
PERIOD OF DOWN LOADING OF BID DOCUMENT	:	UPTO 3:00 PM, 03.07.2013
LAST DATE AND TIME FOR RECEIPT OF BID	:	DATE 05.07.2013 TIME : 3.00 PM
TIME AND DATE OF OPENING OF TECHNICAL BID	:	DATE 05.07.2013 TIME : 3.30 PM
PLACE OF OPENING OF TECHNICAL BID	:	Office of the Zonal Officer **ZONAL OFFICE – XV** Ripon Buildings Corporation of Chennai Chennai 600003
OFFICER INVITING BIDS	:	Zonal Officer **ZONAL OFFICE – XV** Ripon Buildings Corporation of Chennai Chennai 600003

CHECK LIST FOR SUBMISSION OF BID

Bidder shall check the submission of relevant details and documents as mandated in the tender document, before submission of bids.

Sl. No.	Compliance criteria as per clause		Details	Check
1	15.1		Bid Security (Earnest Money Deposit Whether Bid Security at 1% of the Work value is enclosed? The Earnest Money Deposit shall be either in the form of Demand Draft or a irrevocable Bank Guarantee drawn from any Nationalized/Scheduled Bank in favour of the Commissioner, Corporation of Chennai;	YES / NO
2	3.4 (a) .1		Whether copy of Certificate of registration as Class I contractor(monitory limit above Rs.75.00 lakhs) in any of the Central/State Government Dept./Govt .undertaking is enclosed?	YES / NO
3	3.4 (a) .2		Whether the tenderer in the same name and style as prime contractor have successfully completed contracts (BT or CC Road Works) of not less than 40% of the value of proposed contract in any one year within the last five years (2007-08, 2008-09,2009-10,2010-11 & 2011-12)for Government Department/ Board/Government Undertaking enclosed?	YES / NO
4	3.4 (a) .3		Whether Proof for having an annual minimum financial turnover of not less than 40% of the value put to tender in any one financial year in the preceding “five” years (2007-08, 2008-09,2009-10,2010-11 & 2011-12) enclosed?	YES / NO
5	3.2 (G) 3.4 (d) .		Whether the proof/details of availability of Contractor’s Major Equipments proposed for carrying out the works is enclosed?	YES / NO
6	3.2 (G) 3.4 (d) .		Whether evidence of adequacy of working capital for this Contract is enclosed? (access to line(s) of credit and availability of other financial resources). **(15% of Package tender work value)**	YES / NO
7	3.4.4		**Assessed Available Bid capacity = (A x N x 2-B)**	

8			Whether all the certificates are Notarized	YES / NO
9			Whether the latest TIN return enclosed	YES / NO
10			Whether Qualification information 3 to 3.12 of section III have been enclosed duly filled in	YES / NO
11			Whether the bidder has signed in all pages of the tender document	YES / NO
12	17.1	**Sealing and Marking of bids in case of manual submission**		
		a	Whether the **Cover Number – 1** super scribed as **" Technical Bid "** contains Bid Security and Pre Qualification Documents . Tender document furnished by Corporation of Chennai to be submitted in **Cover-1**	YES / NO
		b	Whether the **Cover Number – 2** super scribed as **" Price Bid "** contains Price Bid Documents.	YES / NO
		c	Whether these **Technical Bid and Price Bid** are put in 2 separate envelope is sealed ?	YES / NO
		d	Whether both these sealed envelopes are put in to an outer envelope , sealed, addressing the Bid Authority,superscribing the name of work , list of enclosures, name and address of the bidder . and bear the following identification. Tender for **Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)** **Package- 1 - (118 Roads) Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)**	YES / NO

This Check List is only illustrative and not exhaustive. Hence the bidder is requested to go through the entire document and submit all relevant documents and details.

No Advance payment.

Section II

INSTRUCTIONS TO BIDDERS (ITB)

A. General

1. Scope of Bid

1.1 The Corporation of Chennai invites bids for the construction of works as described in the Bid Data Sheet. The name and identification number of the Contract is provided in the Contract Data.

1.2 The successful Bidder will be expected to complete the works by the completion date stipulated in the Contract Data.

2. Eligible Bidders

2.1 A Bidder shall be any Person, Company, Corporate body, Association, Body of individuals, Group of persons, Limited company, Firm, Organization either single or joint venture from India who are legally competent and entitled for entering into contract as per the law of contract prevailing in India. The Joint venture of Indian and foreign firms are permitted for externally funded Projects like World Bank, ADB etc.

2.1.1 In the case of a Joint venture/Consortium/ Group bidding:

2.1.1.1 There shall be a Lead Bidder. A Lead Bidder shall submit only one bid for the work. He shall not be a member in any other Consortium or joint venture for the same work. There shall be a joint venture or consortium or group agreement executed between the parties exclusively for the project and which shall be legally enforceable by way of attesting by a notary. This agreement shall be submitted along with the Bid.

2.1.1.2 All partners shall be jointly and severely liable for carrying out the work under the contract.

2**.1.1.3** The Lead Bidder shall be designated in the Joint venture/Consortium/Group agreement to be submitted along with the Bid. The Lead Bidder shall have the authority to conduct all business for and to act on behalf of any and all partners of the Joint venture/Consortium/Group, during the bidding process and in the event the contract is awarded.

2.1.1.4 The Lead Bidder shall be responsible for the submission of Bid and complete information required as per the described format, pertaining to each firm in the Joint venture/Consortium/Group and completion of contract documents and to furnish evidences admissible as per law. The Lead Bidder shall clearly identify the responsibility of other members of Joint venture/Consortium/Group.

. **2.1.1.5.** The Bid documents can be purchased by any one of the prospective members of a Consortium/Joint venture/Group but shall be signed by the Lead Bidder as specified in the Joint venture/Consortium/Group agreement which also forms the part of the Bid document.

2.2 The Contractors having registration in the class specified in the tender notice and above in the concerned Department of Corporation of Chennai, or intending Tenderer should be a registered contractor in any of the Centre / State Government Department / Government undertaking are eligible to participate in the Tender. **Provisional Registration shall be done for the successful bidder if he is willing to abide by the rules and regulations of Chennai Corporation and on payment of prescribed fees.**

2.3 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices in accordance with sub-clause 31.1.

2.4 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

(a) in case of dispute or mutually agreed separation of the consortium members the lead consortium members can continue to discharge the obligation of contract.

(b) they or their sister concern have controlling shareholders in common; or

(c) they or their sister concern receive or have received any direct or indirect subsidy from any of them; or

(d)they or their sister concern have the same legal representative for purposes of this bid; or

(e) they or their sister concern have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Commissioner regarding this bidding process; or

(f) a Bidder or their sister concern participates in more than one bid for the same package in this bidding process. Participation by a Bidder in more than one Bid for the same package will result in the disqualification of all Bids in which the party is involved. However, this does not limit the inclusion of the same subcontractor in more than one bid; or

(g) a Bidder or their sister concern participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid.

2.5 No one or non of a firm or company is eligible to participate in the tender if any one of his or any one or more of the director's of a firm or company is a blood relative of any one of an employee or a public representative of Corporation of Chennai.

3. Qualification of the Bidder

3.1 All Bidders shall provide in Section 3, a preliminary description of the proposed work method and schedule, as necessary.

3.2 All Bidders shall include the following information and documents with their bids in the prescribed format as per Section 3, unless otherwise stated in the Bid Data sheet:

(a) Copies of original documents defining the constitution or legal status, place of registration, and principal place of business, written power of attorney of the signatory of the Bid to commit the Bidder;

(b) Total monetary value of construction work performed for each of the last five years;

(c) The tenderer in the same name and style as prime contractor have successfully completed contracts (BT or CC Road Works) of not less than 40% of the value of proposed contract in any one year within the last five years (2007-08, 2008-09,2009-10,2010-11 & 2011-12)for Government Department/Board/Government Undertaking enclosed?

(d) Documents for possessing, leasing or hiring of major Equipments & Tools required for laying cement concrete road works to carry out the contract.

<u>Applicable for Cold Milling Work:</u>

Wherever Cold Milling Work is involved, documents for Possessing/ leasing / hiring or an undertaking by the bidder in the prescribed format only for the cold milling machine should be furnished.

(e) Qualifications and experience of key site management and technical personnel proposed for the Contract;

(f) Reports on the financial standing of the Bidder, such as profit and loss statements and auditor's reports for the past five years;

(g) Evidence of adequacy of working capital for this Contract (access to line(s) of credit and availability of other financial resources);

(h) Authority to seek references from the Bidder's bankers;

(i) Information regarding any litigation, current or during the last five years, in which the Bidder is involved, the parties concerned, and disputed amount; and

(j) Proposals for subcontracting components of the works amounting to more than 10 % of the Contract Price.

(k The Bidder should have turnover of 0.40 times the work value put to tender in any one financial year in the preceding five years (2009-10, 2010-11 & 2011-2012).

(l) The lead consortium members has the responsibility to meet the technical qualifications.

3.3 Bids submitted by a Joint venture of two or more firms as partners shall comply with the following requirements, unless otherwise stated in the Bid Data Sheet:

(a) The Bid shall include all the information listed in Sub-Clause 3.2 above for each joint venture partner

(b) If the Bidder is a joint Venture undertaking/Consortium / Group, all the parties need not sign the bid document provided that a Joint Venture/ Consortium / Group agreement, and power of attorney for the person to sign is submitted along with the Bid. The date of signature shall be provided wherever stated

(c) The Bid by a partnership firm shall contain the full names and addresses of all partners. It shall be signed in the name of the partnership firm by one of the members of the partnership authorized for the purpose or by an authorized representative followed by the name and designation of the person signing.

(d) Copy of the constitution of firm/ partnership with the name of partners duly attested by a Notary public and the instrument authorizing the persons to sign on behalf of the firm shall be furnished.

(e) All partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms.

3.4 To qualify for award of the Contract, Bidders shall meet the following minimum qualifying criteria:

(a) 1. Intending Tenderer should be a Class I Registered contractor (monitory limit above Rs.75.00 lakhs) in any of the central/state Government Dept./Govt .undertaking.

2. Whether the tenderer in the same name and style as prime contractor have successfully completed contracts (BT or CC Road Works) of not less than 40% of the value of proposed contract in any one year within the last five years (2007-08,2008-09,2009-10,2010-11&2011-12)forGovernment Department/Board/Government Undertaking enclosed?

3. Whether Proof for having an annual minimum financial turnover of not less than 40% of the value put to tender in any one financial year in the preceding “five” years (2007-08, 2008-09,2009-10,2010-11 & 2011-12) enclosed?**)**

(b) Proposals for the timely acquisition (own or Lease) of the essential equipment listed in the Bid Data sheet.

(c) The Bidder should have the minimum Key Personnel as specified in the Bid Data sheet.

(d) Liquid asset and/or credit facilities, net of other contractual commitments and exclusive of any advance payment which may be made under the contract, of no less than the amount specified in the Bid Data sheet.

4.Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity is more than the total bid value. The available bid capacity will be calculated as under:

Assessed Available Bid capacity = (A x N x 2-B)

Where

A = Maximum value of construction works executed in any one year during the last **five** years (updated to 2012-13 price level) taking into account the completed as well as works in progress.

N = Number of years prescribed for completion of works for which bids are invited.

B = Value, at price 2012-13 level, of existing commitments and on-going works to be completed during the period of completion of the works for which bids are invited.

Note: i) The statements showing the value of existing commitments and on-going works as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer in charge, not below the rank of the an Executive Engineer or equivalent. .

ii) The value of the Financial Turnover of the Previous Years shall be given a *Weightage* of 10% each per year to bring them to the Price Level of 2012-13.

Weightage is as follows for Annual turnover

2011-12 : 1X Annual turnover

2010-11 : 1.10 X Annual turnover

2009-10 : 1.21X Annual turnover

2008-2009: 1.33 X Annual turnover

2007-2008 : 1.46 X Annual turnover

4. One Bid per Bidder

4.1 Each Bidder shall submit only one Bid,. A Bidder who submits or participates in more than one Bid will cause all the proposals with the Bidder's participation to be disqualified.

5. Cost of Bidding

5.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Commissioner will in no case be responsible or liable for those costs.

6. Site Visit

6.1 The Bidder, at the Bidder's own responsibility and risk, is encouraged to visit and examine the site of works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the works. The costs of visiting the site shall be at the Bidder's own expense.

B. Bidding Documents

7. Content of Bidding Documents

7.1 The set of bidding documents comprises the documents listed in the table below and addenda issued in accordance with Clause 9:

Section I	Tender Notice
Section II	Instructions to Bidders (ITB)
Section III	Forms of Bid and Qualification Information
Section IV	Letter of Acceptance
Section V	General Conditions of Contract
Section VI	Contract Data
Section VII	Specifications
Section VIII	Drawings
Section IX	Security Forms
Section X	Technical Specifications

7.2 The number of copies of each section supplied to the prospective Bidder and the number of copies to be completed and returned with the Bid is specified in the Bid Data Sheet.

8. Clarification and Pre-Bid meeting

8.1 In any case any Bidder ask for a clarification to the Bid documents before 4 days of the opening of the Bid, the Bid inviting authority shall ensure that a reply is posted on line to the clarifications sought. It is the responsibility of the Tenderer to note down any changes which is posted on line, the Tender Inviting Authority will not be held responsible in this matter.

8.2 A Pre-Bid meeting will ordinarily be conducted not later than 14 days before the last date of submission of Bid. The purpose of the meeting is to clarify the issues and doubts and to answer the question on any matter that may be raised till that date. The Bidder or his official representative is advised to attend the meeting which will be convened by the Bidding authority as specified in Bid Data sheet. The minutes of the meeting including questions raised and responses given by the Commissioner will be furnished on demand. Any addendum, modifications if required based on the Pre-Bid meeting will be posted on line..

9. Amendment of Bidding Documents

9.1 At any time after the issue of the Bid documents and 5 days before the opening of the Bid, the Bid inviting authority may make any changes, modifications or amendments to the Bid documents and shall send intimation of such change to all those who have purchased the original Bid documents. Prospective bidders shall promptly acknowledge the receipt thereof by telex, cable or fax to the Bidding authority. The Bid shall be furnished taking into account the addendum/amendments, if any, issued as mentioned above and any failure in doing so will lead to consequences including rejection of Bid.

C. Preparation of Bids

10. Language of Bid

10.1 All documents relating to the Bid shall be in the language specified in the General Conditions of Contract.

11. Documents Comprising the Bid

11.1 The Bid submitted by the Bidder shall comprise the following:

(a) The Bid
(b) Bid Security;
(c) Priced Bill of Quantities;
(d) Qualification Information Form and Documents;
(e) Income Tax clearance certificate and Sales Tax clearance certificate for the current year obtained from the appropriate authority;
and any other materials required to be completed and submitted by bidders, as specified in the Bid Data sheet.

11.2 Alternate design

(a) Unless otherwise specified in the design data sheet, alternate design shall not be considered.

(b) Bidders wishing to offer technical alternatives to the requirement of the bidding document must first price the employer's design as described in the bidding document and shall further provide all information necessary for a complete evaluation of the alternative by the Employer including drawings, design, calculations, technical specifications, breakdown of prices and proposed construction methodology and other relevant details. Only technical alternatives if any, of the lowest evaluated bidder confirming to basic technical requirement shall be considered by the employees.

(c) Bidders are permitted to submit alternative technical solutions for specified parts of the projects identified in the bid data sheet.

12. Bid Prices

12.1 The Contract shall be for the whole works based on the priced Bill of Quantities submitted by the Bidder.

12.2 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause shall be included in the rates, prices, and total Bid price submitted by the Bidder.

12.3 The rates and prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract if provided for in the Bid Data sheet and the provisions of the Conditions of Contract. The Bidder shall submit with the Bid all the information required under the Contract Data Sheet and the Conditions of Contract.

12.4 If the contractor offers discount / rebate in a particular item, his bid price will be after deducting the discount from the original quoted price. If the contractor offers discount / rebate in the total value of work, his bid price will be same as original quoted rate, after calculating the total amount the discount / rebate amount is to be deducted.

13. Currency

13.1 The currency for the purpose of the Bid document shall be the Indian Rupee (INR).

14. Bid Validity

14.1 Bids shall remain valid for a period of 90 days unless otherwise specified in the Bid Data sheet.

14.2 In exceptional circumstances, the Commissioner may request that the Bidders to extend the period of validity for a specified additional period. The request and the Bidders' responses shall be made in writing . A Bidder may refuse the request without forfeiting the Bid Security. A Bidder agreeing to the request will not be required or permitted to otherwise modify the Bid, but will be required to extend the validity of Bid Security for the period of the extension, and in compliance with Clause 15 in all respects.

15. Bid Security (Earnest Money Deposit)

15.1 The Bidder shall furnish, as part of the Bid, a Bid Security (Earnest Money Deposit) for an amount equal to 1% of the Work Value. The Earnest Money Deposit shall be either in the form of Demand Draft or a irrevocable bank Guarantee drawn from any Nationalized/Scheduled Bank in favour of the Commissioner, Corporation of Chennai; Banker's cheque,or a chalan by remitting cash into the Corporation Treasury, to the credit of deposits which do not bear interest. The Earnest Money will be refunded to the unsuccessful bidder without interest on application after intimation is sent of the rejection of the tender or at the expiration of Bid validity period. Bids not accompanied by the Bid Security will be rejected. The Bid security of the successful Bidder will be returned as per clause 15.2.

15.2 The Bid Security of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Security.

15.3 The Bid Security will be forfeited:

(a) If a bidder withdraws his Bid during the period of Bid validity.

(b) If a successful Bidder fails to:

- i) Execute the agreement or
- ii) Furnish the necessary performance security within the specified time limit of 30 days from the date of issue of letter of acceptance of his bid.

(c) If the Bidder does not accept the correction of the Bid price, pursuant to Clause 24; or

(d) in the case of a successful Bidder, if the Bidder fails within the specified time limit to

- i) Sign the Agreement; or
- ii) Furnish the required Performance Security.

16. Format and Signing of Bid

16.1 The Bidder shall prepare one original of the documents comprising the Bid as described in Clause 11 of these Instructions to Bidders, bound with the volume containing the Form of Bid, and clearly marked "ORIGINAL." In addition, the Bidder shall submit copies of the Bid, in the number specified in the Bidding Data, and clearly marked as "COPIES." In the event of discrepancy between them, the original shall prevail.

16.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub-Clauses

3.2(a) or 3.3(b), as the case may be. All pages of the Bid where entries or amendments have been made shall be initialed by the person or persons signing the Bid.

16.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initiated by the person or persons signing the Bid.

16.4 The Bid document and Price Bid Documents uploaded in the PDF format should not be changed or converted to any other format while down loading .
The tenderer shall quote their rates only by writing in the indelible ink by manually or by typing after down loading.

D. Submission of Bids

17. Sealing and Marking of Bids

17.1 The Bid shall be submitted in 2 parts simultaneously, addressing the Bid authority and each part shall be in separate sealed covers super scribing cover No, Bid No, Name of work, list of enclosures, name and address of Bidder. The Bidders shall then put the two sealed envelopes into an outer envelope, sealed, addressing the Bid authority, super scribing the name of work, list of enclosures, name and address of the Bidder.

Cover No.1 - Technical Bid
Earnest Money Deposit, Certificates as per clause 11.1 (e) and Prequalification Bid .
This cover should be marked as 'Cover number – 1, Technical Bid', and shall contain, Bid Security and Pre- Qualification documents. Tender document furnished by Corporation of Chennai to be submitted in cover.no.1

Cover No.2 – Price Bid
This cover should be marked as 'Cover number - 2, Price Bid ', and should contain the Price Bid documents .

17.2 The Bidder shall be responsible for properly super scribing and sealing the cover in which the Bid is submitted and Bid inviting authority shall not be responsible for accidental/ misplacement/premature opening of the covers that are not properly super scribed and sealed as mentioned in Clause 17.1 before the time appointed for Bid opening.

17.3 The filled up Bid documents shall be submitted up to the last date of submission as given in Bid Data sheet. Duly filled in Bid documents shall be put in any one of the Tender boxes provided at the Tender Sales Counter , Office of the Public Relation Officer, Office of Vigilance Department and Office of Chief Engineer/General in the Ripon Buildings, Chennai. Tenders can also be submitted by Post or Courier, provided that the Bid inviting authority shall not be responsible for any delay in transit in such cases.

17.4 The Bid inviting authority may extend the last date of receiving tenders after giving adequate notice to all intending bidders in cases where
a) The publication of the IFB has been delayed
b) The communication of changes, in the Bid document to the prospective Bidders under the clause 8 took time.

17.5 The Bidders shall not amend/add/alter any of the Bid conditions, conditions of contract, specifications etc. of his own.

18. Deadline for Submission of Bids

18.1 Bids shall be delivered to any one of the tender boxes provided at the Tender Sales Counter , Office of the Public Relations Officer , Office of the Vigilance Department and Office of the Chief Engineer (GEN) in the Ripon Building, Chennai or by post to the Tender Inviting Authority to the address specified in the Bid Data Sheet not later than the time and date specified in the Bid Data sheet..

18.2 The Tender Inviting Authority may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 9, in which case all rights and obligations of the Employer and the Bidders previously subject to the original deadline will then be subject to the new deadline.

19. **Late Bids**

19.1 Any Bid received by the Tender Inviting Authority after the deadline prescribed in Clause 18.1 will be returned unopened to the Bidder.

E. Bid Opening and Evaluation

20. Bid Opening

20.1 The Pre-Qualification Bid marked as Cover no. 1 will be opened at the time and date outlined in the Bid Data sheet, in the presence of Bidders/Authorized representatives who choose to attend. The Bidders' names, and the presence or absence of Bid Security, and such other details as the Tender Inviting Authority may consider appropriate, will be announced by the Tender Inviting Authority at the opening.

20.2 The Price Bid marked as Cover no. 2 of qualified Bidders will be opened by the Tender Inviting Authority, in the presence of Bidders / authorized representatives who choose to attend. The date of opening of the price bid will be intimated to all the Prequalified Bidders after evaluation of the Prequalification Bids by the Tender Inviting Authority.

20.3 The Bidders' names, the Bid prices, the total amount of each Bid and such other details as the Tender Inviting Authority may consider appropriate, will be announced by the Commissioner at the opening.

20.4 The Employer will prepare minutes of the Prequalification and Price Bid opening, including the information disclosed to those present in accordance with Sub-Clause 20.1 & 20.3.

21. Process to Be Confidential

21.1 Information relating to the examination, clarification, evaluation, and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any effort by a Bidder to influence the Employer's processing of Bids or award decisions may result in the rejection of his Bid.

22. Clarification of Bids and Contacting the Employer

22.1 From the time of Bid opening to the time of contract award, if any Bidder wishes to contact the Employer on any matter related to the Bid, it should do so in writing.

22.2 To assist in the examination, evaluation, and comparison of Bids, the Employer may, at the Employer's discretion, ask any Bidder for clarification of the Bidder's Bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, telex, or facsimile, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause 24.

22.3 Any effort by the Bidder to influence the Tender Inviting Authority in the Employer's Bid evaluation, Bid comparison or contract award decisions may result in the rejection of the Bidders' Bid.

23. Examination of Bids and Determination of Responsiveness

23.1 Prior to the detailed evaluation of Bids, the Employer will determine whether each Bid
(a) Meets the eligibility criteria defined in Clause 2;
(b) Has been properly signed;
(c) Is accompanied by the required securities; and
(d) Is substantially responsive to the requirements of the Bidding documents.

23.2 A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the Bidding documents, without material deviation or reservation. A material deviation or reservation is one
(a) Which affects in any substantial way the scope, quality, or performance of the works;
(b) Which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or
(c) Whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive Bids.

23.3 If a Bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

24. Correction of Errors

24.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

(a) Where there is a discrepancy between the price quoted in figures and in words, the lowest will be taken.

24.2 The amount stated in the Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and, with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid will be rejected, and the Bid Security may be forfeited in accordance with Sub-Clause 15.3(c).

25. Evaluation and Comparison of Bids

25.1 The Employer will evaluate and compare only the bids determined to be substantially responsive in accordance with Clause 23.

25.2 In evaluating the bids, the Employer will determine for each Bid the evaluated Bid price by adjusting the Bid price by making any correction for errors pursuant to Clause 24.

F. Award of Contract

26. Award Criteria

26.1 Subject to Clause 27, the Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid price, provided that such Bidder has been determined to be

(a) Eligible in accordance with the provisions of Clause 2, and

(b) Qualified in accordance with the provisions of Clause 3.

26.2 In determining the lowest evaluated price the following practice will be considered:

i) The quoted price shall be corrected for arithmetical errors

ii) In case of discrepancy between prices quoted in words and in figures, whichever is minimum will be taken.

27. Rates to Include The tendered rates for the items should be inclusive of all items of works required for the proper execution of the items (viz) watering, barricading, lighting, watching, safety arrangements in the interest of traffic, safeguarding the underground services etc, and no claim for extra payment on any score will be entertained. The rates to be tendered should be inclusive of sales tax and other taxes in force. 1-28 Preliminary specification etc, in SSRB/TNBP will form part of the Agreement.

28. Employer's Right to Accept any Bid and to Reject any or all Bids

(1) After negotiation with the tenderer and before passing the order accepting a tender as under sub-section(6) of section 10 of the Tamil Nadu Transparency in Tender Act, 1998 if the Tender Accepting Authority decides that the price quoted by such tenderer is higher by the percentage as may be prescribed over the schedule of rates or prevailing market price, he shall reject the Tender.

(2) The Tender Accepting Authority, before passing the order accepting a tender, may also reject all the tenders for reasons such as changes in the scope of procurement, new technologies or substantial design changes, lack of anticipated financial resources, Court orders, accidents or calamities and other unforeseen circumstances.

29. Notification of Award and Signing of Agreement

29.1 The Bidder whose Bid has been accepted will be notified of the award by the Commissioner prior to expiration of the Bid validity period by cable, telex, or facsimile confirmed by registered letter. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Commissioner will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

29.2 The notification of award will constitute the formation of the Contract, subject to the Bidder furnishing the Performance Security in accordance with Clause 30 and signing the Agreement in accordance with Sub-Clause 29.3.

29.3 The bidder shall have to enter into an agreement with the Commissioner within 30 days from the date of receipt of letter of acceptance. The form of agreement will have to be stamped at the stamp office at the cost of the bidder.

29.4 Upon the furnishing by the successful Bidder of the Performance Security, the Commissioner will promptly notify the other bidders that their bids have been unsuccessful.

30. Performance Security (Security Deposit)

30.1 Within 14 days after receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Commissioner a Performance Security. The Performance Security (Security Deposit) will be 2% of the contract amount in the form of National Savings Certificate/ Small savings instrument/deposits/Accounts pledged in favour of Commissioner, Corporation of Chennai;

irrevocable Bank Guarantee. However it is open to the Commissioner to insist on higher deposit as per rules in force.

30.2 Failure of the successful Bidder to comply with the requirements of Sub-Clause 29.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

30.3 As per the Council Resolution No. 584/86 dated 21.05.86, the percentages of security deposit to be fixed for various percentages of rebates are as following.

Percentage Rebate	Percentage of Security Deposit to be fixed
Up to 10 %	2%
10 to 20 %	3%
20 to 30 %	4%
Above 30%	5%

30.4. As per Council Resolution N. 456/2002, Dt : 28-11-2002 the amount of **Additional Security Deposit** to be paid by the Contractor along with the tender for various percentage of rebate are as follows:

Percentage of rebate	Amount of Additional Security Deposit payable in the form of Demand Draft
5 to less than 15%	2%
15% to 20%	50% of Difference between Office value of work and Tender amount.
above 20%	Same as above

30.5 The Contractors has to pay the Additional Security Deposit in the form of Demand Draft drawn in favour of Commissioner while submitting the tender documents. For more than 1 Lakh bank Guarantee will be accepted.

30.6 If any of the Contractor has not enclosed Additional Security Deposit for the appropriate value in the form of Demand Draft while submitting tender documents, the tenders of such tenderers will be summarily rejected.

30.7 The Demand Draft/Banker's cheque enclosed for the Additional Security Deposit by the unsuccessful Tenders will be returned after obtaining proper acknowledgement and absorbing official procedures..

30.8 If percentage of rebate is above 20% tenderer should furnish the break up details,risk, cost and responsibility analysis and produce documents to prove the previous experience and work on hand with performance certificate showing the satisfactory completion of works entrusted in order to substantiate that the quoted rate is workable for complete execution as detailed in tender..

31.a. Adjudicator :

The Commissioner will propose the person to be appointed as Adjudicator under the Contract and stipulated in the Letter of Acceptance.

31.b. Arbitration
In case of any dispute or difference between the parties to the contract either during progress or after the completion of the work or after the termination , abandonment , or breach of contract or as to any matter or thing arising there under except as to the matters left to the sole discretion of the Superintending Engineer as to the withholding by the Superintending Engineer of payment of any bill to which the contractor may claim to be entitled, then either party shall forthwith give to the other, notice of such dispute or difference shall be referred to the Arbitrator and the award of such Arbitrator shall be Final binding on the parties, progress of work shall not be suspended or delayed on account of the reference of the dispute to arbitration under this clause.

Either party within a period shall be fixed by the arbitration file before the arbitration statement of the case and also shall all documents relating to or having a hearing on the case The Arbitrator shall not be bound to observe the ordinary rules of procedure applicable to trails before judicial Tribunals nor to hear or receive formal evidence , but may pass an award on the documents and statements of the case filed by the parties or personal inspection or on both. The Arbitrator shall have power to view the subject matter of the dispute with or without the parties or their agents to open review and revise any certificate , opinion decision , requisition or notice have in regard to the matters, expressly examined and to determine all matters in dispute which shall be submitted to him and of which notice has been given as aforesaid, in the same manner as if no such certificate, opinion , decision, requisition, or notice been given.

The expenses of such reference to Arbitration shall be awarded by the Arbitrator in his discretion subject to the condition that the amount of expenses awarded to either party shall not exceed the limits set forth, irrespective of the actual expenses incurred by either party. The arbitrator may determine the amount of expenses to be awarded or direct the same to be shared as between solicitor and client or as party, and party and shall direct by whom and to whom and what manner the same shall be borne and paid.
The limits referred in this clause are 5 % monitory award which does not exceeds Rs. 10,000/-, 3 % on which next Rs.40,000/- or any part thereof , 2 % on the next Rs.50,000/- or any part there of.

32. Corrupt or fraudulent Practices:
The bidder shall observe highest standard of ethics during bidding process and execution of the project.

If the Contractor has engaged in corrupt or fraudulent practices, in competing for or in executing the Contract, the Employer may, after given 14 days notice to the Contractor, to terminate the Contract.

"corrupt practice" means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract execution.
" Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detrimental to the interest of the Employer, and includes collusive practice among Bidders which is detrimental to the Commissioner and includes collusive practice among the bidders (prior to or after bid submission.) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer .the benefits of free and open competition.

The Commissioner will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question

33. Insolvency : If the Contractor is declared insolvent under any applicable law, the Employer may by notice in writing terminate the contract immediately. The contractor shall then demobilize from the site leaving behind, any contractor's equipment which the employer instructs in the notice is to be used until the completion of work

34. Taking Over: The Employer shall notify the contractor when he considers that the Contractor has completed the works stating the date accordingly. Alternatively the Employer may notify the Contractor that the works, are ready for taking over , stating the date accordingly.

35.Contractor's care of the Works : The contractor shall take full responsibility for the care of the works from the Commencement Date until the date of the Employer's notice under clause 35. Responsibility shall then pass to the Employer. If any loss or damage happens to the Works during the above period, the Contractor shall rectify such loss or damage so that the works confirm with the Contract. Unless the loss or damage happens as a result of an Employer's liability the Contractor shall indemnify the Employer , the Employer's , Contractor's Agents and employees against all loss or damage happening to the Works and against all claims or expenses arising out of the Works caused by a breach of contract , by negligence or by other default of the Contractor, his agents or employees.

36. Compensation Events.

The following are Compensation Events unless they are caused by the Contractor.

(a) The Authority does not give access to a part of the Site mentioned in the current milestone.

(b) The Authority modifies the schedule of other contractors in a way which affects the work of the contractor under the contract.

(c) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of Letter of Acceptance from the information issued to Bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.

(d) The Engineer gives an instruction for dealing with an unforeseen condition, caused by the Authority, or additional work required for safety or other reasons.

(e) Other contractors, public authorities, Utilities or the Authority do not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.

(f) Nil

(g) The effect on the Contractor of any of the Authority's Risks.

(h) Other Compensation Events listed in the Contract Data or mentioned in the Contract if a Compensation Event would prevent the work being completed before the intended completion data, the intended completion date is extended. The Engineer has to decide by how much the intended completion date has to be extended.

As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast. It is to be assessed by the Engineer. If the Contractor's forecast is deemed unreasonable, the decision of the Engineer is final binding on the contractor. The Engineer will assume that the Contractor will react competently and promptly to the event.

The Contractor has to not be entitled to compensation to the extent that the Authority's interests are adversely affected by the contractor not having given early warning or not having cooperated with the Engineer.

G. Bid Data Sheet

Bid data sheet shall be filled in by the Tender Inviting Authority before issuance of the bidding document

<table>
<tr><th>Instructions to Bidders (ITB) Clause Reference</th><th>Bid Data</th></tr>
<tr><td></td><td>A. General</td></tr>
<tr><td>(1.1)</td><td>Tender for Z.O.XV C.NO.B1/ 1047 /2013
Package- 1 - (118 Roads)
Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)</td></tr>
<tr><td>(3.3)</td><td>The qualification data required from bidders in Sub-Clause 3.4 are modified as follows: …..[nil”]…..</td></tr>
<tr><td>(3.4)</td><td>The qualification criteria in Sub-Clause 3 are modified as follows
…… “nil”]…….</td></tr>
<tr><td>3.4 d</td><td>The minimum required annual value of work for the successful Bidder in any of the last five years shall be 40% of package tender value of (ie Rs.102.44 lakhs)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>(3.4 b) & 3.2 d</td><td>The essential equipment to be made available for the Contract by the successful Bidder shall be ……[insert equipment list]……..
<table>
<tr><th>Sl. No.</th><th>Particulars of Equipment</th><th>Capacity</th><th>Number</th></tr>
<tr><td></td><td colspan="2">Cement Concrete works central Mixing Plant One concrete mixer (Non tilting type with weigh batching arrangements) and / or concrete mixer (non Tilting type and separate arrangements) of hopper swing weigh batching (Double bucket) having each bucket capacity of at least 400 litres.</td><td></td></tr>
<tr><td></td><td colspan="2">ordinary mixers</td><td>1 No</td></tr>
<tr><td></td><td colspan="2">Screed vibrators .</td><td>2 Nos</td></tr>
<tr><td></td><td colspan="2">plate vibrators</td><td>2 Nos</td></tr>
<tr><td></td><td colspan="2">needle vibrators (60mm)</td><td>2 Nos</td></tr>
<tr><td></td><td colspan="2">water tanks of 10,000 ltr. capacity each</td><td>2 Nos</td></tr>
<tr><td></td><td colspan="2">Steel battens of channel section of 4” width with proper handles at both the end</td><td>2 Nos</td></tr>
<tr><td></td><td colspan="2">straight edges with scaled wedge</td><td>2 Nos</td></tr>
<tr><td></td><td colspan="2">golchies (edging tools) as per drawing each of 12mm and 25mm curvature</td><td>2 nos</td></tr>
<tr><td></td><td colspan="2">plate vibrators for compaction of trenchless</td><td>2 nos</td></tr>
<tr><td></td><td colspan="2">joint cutting machines with spare blades</td><td>2 nos</td></tr>
<tr><td></td><td colspan="2">M.S. channels minimum 100 RM in length proper shape, line and level</td><td></td></tr>
<tr><td></td><td colspan="2">steel fabricated farma for raising manholes</td><td>1 no</td></tr>
<tr><td></td><td colspan="2">portable air compressor</td><td></td></tr>
</table></td></tr>
</table>

			template for checking camber	
			cube moulds, 150mm x 150mm x 150mm	6 nos
			slump cone with two additional measuring rods	1 No
			Steel fabricated moulds for casting kerbs, water tables etc.,	
			flexural beam moulds of size 700mm x 150mm x 150mm	3 No
			steel wire brooms as specified	2 Nos
			generator – 125 kva	1 no
			dewatering pump 10 HP	1 No
			Vibrating Road Roller	1 No

(3.4c)

Technical Personnel to be deployed by the Contractor for the work.

Name of members of technical staff proposed to be employed	Qualifications
Project Engineer	BE Civil 15 years Experience
Site Engineer	BE Civil 10 years Experience

(3.4d)

The minimum amount liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder shall **be 15% of the package tender work value (ie Rs.128 lakhs)**

RATE OF PROGRESS

The Attention of the tenderers. is directed to the contract requirements as to the time of beginning work, the rate of progress and the dates for the completion of the whole work and its several parts. The following rate of progress and proportionate value of work done from time to time, as will be indicated by the Exe. Engineer certificate of the value of work done, will be required. Date of commencement of these programmes will be the date on which the site (or premises) is handed over to the contractor.

Period after date of commencement (1)	Percentage of work completed (based on contract Lumpsum amount) (2)
90^{th} Day	50 %
180^{th} Day	100 %
	The work should be completed in all respects within the period of …six ……. months.

Note : The period to be entered in column (1) for the purpose of defining the rate of progress may be fixed by the Executive Engineer to suit each case.

	B. Bidding Documents
7.2	The number of copies of the Bid to be completed and returned shall be one copy
	C. Preparation of Bids
(7.2) (16.1)	The number of copies of the Bid to be completed and returned shall be one copy
(12.3)	The Contract *[specify "is" or "is not"]* subject to price adjustment in accordance with Clause 45 of the Conditions of Contract.
(14.1)	The period of Bid validity shall be 90 days after the deadline for Bid submission specified in the Bid Data sheet.
(15.1)	The amount of Bid Security (EMD) shall be Rs 8,66,500/-
	D. Submission of Bids
(18.1)	The address for the purpose of Bid submission is Zonal Officer Ripon Buildings Corporation of Chennai Chennai
(17.3)	The deadline for submission of bids shall be 08.05.2013 3.00 P.M
	E. Bid Opening and Evaluation
(20.1)	**The opening of the Prequalification Bid shall take place 05.07.2013 3.30 PM at** Zonal Officer – Ripon Buildings Corporation of Chennai Chennai
	F. Award of Contract
(30.0)	The Standard Form of Performance Security acceptable to the Commissioner shall be The Performance Security (Security Deposit) will be 2% of the contract amount in the form of National Savings Certificate/ Small savings instrument/deposits/Accounts pledged in favour of Commissioner, Corporation of Chennai; irrevocable Bank Guarantee.

Section III

1. Pre-Qualification Bid Submission Sheet

Date: ……

Invitation for Bid No **Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)**

To:

The ……
Corporation of Chennai,
Chennai.

Sir,

1. **Being duly authorized to represent and act on behalf of …*[…… name of the Bidder……]*…., hereinafter " the Bidder" and having reviewed and fully understand all the bidding information provided, the undersigned hereby applies to be pre-qualified by yourselves as a bidder for the** *"….[Insert Name of the work]……"*

2. The Bid is made in the full understanding of the following and declares:

a) We have examined and have no reservations to the Bidding Document, including Addenda No.(s)…… issued in accordance with ITB Clause 9.

b) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB Sub-Clause 2.4.

c) We, in accordance with GCC Sub-Clause & Appendix to Bid, plan to subcontract the following key activities or parts of the works to the following sub contractors.

Name of Sub Contractor	Address	Key activity	Tentative Amount of the sub activity

(if no part to be sub contracted, indicate "none")

d) We understand that you may accept/ reject any Bidding, cancel the Bidding process at any time and reject all the Bids and that you are not bound either to accept any Bids that you may received without incurring any liability to the Bidders, in accordance with ITB Clause 27.

e) We understand that your Agency will not be liable for any such actions and will be under no obligation to inform the Bidder of the grounds from them.

3. Attached herewith are the following:

i) Income Tax and Sales Tax clearance certificates for the **last three years** issued by the appropriate authority:

ii) Demand Draft ……*(furnish details of the Demand Draft)……* towards cost of Bid documents in case purchased in the counter..

iii) Bid Security for Rs……. in the form of:

a) Demand Draft ……*(furnish details of the Demand Draft)……*
b) Chalan ……*(furnish details of the Chalan)……*
c) Any other Form mentioned in Cl. 15.1 of ITB *(Furnish Details)*

4. Attached to this letter are copies of original documents defining:
i) the Bidder's legal status;
ii) the principal place of business;
iii) the place of incorporation (for Bidders that are corporations) or the place of registration and the nationality of the owner(s) for Bidders that are partnerships or individually owned firms).

5. The Corporation of Chennai and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents and information submitted in connection with this Bid, and to seek clarification from our bankers and clients regarding any financial and technical aspects. This Prequalification Bid Submission Sheet will also serve as authorization to any individual or authorized representative or any institute referred to in the supporting information to provide such information deemed necessary and requested by the Corporation of Chennai to verify statements and information provided in this Bids, or with regard to the resources, experience and competence of the Bidder.

6. The Corporation of Chennai and its authorized representatives may contact the following persons for further information:

Name, Telephone and Fax No. of person

General and Management Information	
Personnel	
Technical Enquiries	
Financial Enquiries	

7. Appended to this Bids, we give details of the participation of each party, including capital contribution and profit/loss agreements, to the joint Venture or associations. We also specify the financial commitment in terms of the percentage of the value of the/each contract, and the responsibilities for execution of the/each contract.

8. We confirm that in the event that we submit bid, that as well as any resulting contract will be:

i) Signed so as to legally bind all partners jointly and severally; and

ii) Submitted with a Joint Venture agreement providing the joint and several liabilities of all partners in the event the contract is awarded to us.

9. The undersigned declare that the statement made and the information provided in the duly completed Bids are complete, true, and correct in every detail.

Name:……

In the Capacity of …….

Signed ……..

Duly authorized to sign the Bids for and on behalf of …….

Date ……

2. DECLARATION BY THE BIDDER / TENDERER

I/We _____ hereby declare that I/We am/are not in any way related to any officer who is in charge of……..

or having control of this work as referred in Clause 2.4 of ITB. I/We agree that if, at any stage, it is found that this declaration is untrue, the bid security/performance security paid by me/us will be forfeited and the contract entered will stand cancelled at the risk and cost of contractor. It is understood that the relationship with the officer referred to herein will be restricted to those referred in Cl.2.4 of ITB.

Signature of the bidder
Place:
Date:

3. QUALIFICATION INFORMATION

3.1 PRE QUALIFICATION BID QUESTIONNAIRE

Sl No	Questions	Answers to be furnished by the bidder
1	Name of Firm	
2	Nationality	
3	Head Office Address Postal Telex No Fax No. E-Mail	
4	Type of Organization Individual Partnership Incorporated company	
5	Year & place of establishment	
6	Give brief description of field/areas in which you have executed work. Please furnish details and particulars of such works in the relevant formats attached.	
7	Are you registered with any other Government/ Department / Public undertaking (if yes, give details)	
8	What are your sources of finance (Please give details of bank reference – certificate from bank endorsing your financial stability and certificate to substantiate other sources)	
9	Give the last five years account with auditor's reports, balance sheet, profit and loss account, and income tax clearance certificate.	

10	How much is your paid up capital How much is your working capital How much is your annual turnover for the last five years (Give separately for each year) How much is your net income for the last five years (Give separately for each year)	
11	Do you intend to associate any other organisation for the works, which you are bidding? If so, give full particulars of that organization separately under each head of questionnaire and forms	
12	Formats (enclosed may filled) Details of Engineers & Managerial Personnel Details of machinery and equipment owned by the Company Present activities in which your firm is engaged as a Main contractor (last five years) Present activities in which your firm is working in Joint Venture (last five years) Material Testing facilities available with the firm	

Note : In the case of Joint venture/consortium/group, the lead bidder shall submit the answers as per the above questionnaire pertaining to each firm in the group.

3.2 LIST OF EQUIPMENTS PROPOSED TO DEPLOY FOR THE WORK

(To be filled by the Bidder)

ANNEXURE 1

Sl No.	Particulars	Capacity	Number	Own/lease for a minimum period of two years

1. Cement Concrete works
One concrete mixer (Non tiltng type with weigh batching arrangements) and / or concrete mixer (non tilting type and separate arrangements) of hopper swing weigh batching (Double bucket) having each bucket capacity of at least 400 litres.

2. One ordinary mixers
3. Screed vibrators 2 Nos. as per drawing i.e., 8 for top layer vibration and 8 for bottom layer vibration.
4. 2 plate vibrators
5. 2 needle vibrators (60mm)
6. 2 water tanks of 10,000 ltr. capacity each
7. 2 Steel battens of channel section of 4” width with proper handles at both the end
8. 2 straight edges with scaled wedge
9. 2 golchies (edging tools) as per drawing each of 12mm and 25mm curvature.
10. 2 plate vibrators for compaction of trenchless
11. 2 joint cutting machines with spare blades
12. M.S. channels minimum 100 RM in length proper shape, line and level
13. 1 steel fabricated farma for raising manhoks
14. 1 portable air compressor
15. 1 template for checking camber
16. 6 cube moulds, 150mm x 150mm x 150mm
17. 1 slump cone with two additional measuring rods
18. Steel fabricated moulds for casting kerbs, water tables etc.,
19. 2 bitumen pouring pot
20. Three flexural beam moulds of size 700mm x 150mm x 150mm

21. Two nos. steel wire brooms as specified
22. 1 no. of generator – 125 kva
23. 1 no. dewatering pump 10 HP
24. 3 Nos. of trunks – 10 T
25. 1 no Vibratory Road Roller
26 1 No mechanical Saw

3.3 LIST OF KEY PERSONNEL PROPOSED TO BE DEPLOY FOR THE WORK

Sl No	Name	Position	Qualification	Years of Experience in the relevant field

3.4 APPLICATION INFORMATION SHEET

Application Information	
Bidder's Legal Name	
In the case of Joint Venture/ Consortium/Group, legal name of each partner	
Bidder's actual or intended year of constitution	
Bidder's legal address in country of constitution	
Bidder's authorized representative (name, address, telephone no., e-mail address)	
Attached are copies of the following original documents 1. In the case of single entity, articles of incorporation or constitution of the legal entity named above. 2. Power of attorney to represent the firm or JV/consortium /group named above. 3. In case of JV, power of attorney for lead member of consortium by other JV partner	

3.5 JOINT VENTURE INFORMATION SHEET

DETAILS OF PARTNER(S) OTHER THAN LEAD PARTNER

Partner	
Partner's legal name	
Partner's year of constitution	
Partner's Legal address in country of Constitution	
Partner's authorized representative (name, address, telephone no; fax and e-mail address)	

3.6 FINANCIAL STATEMENT (DATA FOR PREVIOUS FIVE YEARS - IN INDIAN RUPEES)

a. Information from Balance Sheet

Year			
Total Assets			
Total Liabilities			
Net Worth			
Current Assets			
Current Liabilities			

b. Information from Income Statement

Year			
Total Revenue			
Profit before Tax			
Profit after tax			
Attached are copies of financial statements (balance sheets including schedules and income statements) for the last three years, as indicated above, complying with the following conditions All such documents reflect the financial situation of the bidder Historical financial statements must be audited by a certified chartered accountant Historical financial statements must be complete, including all schedules to the financial statements			

Note : Bidder and Each member of JV/consortium/group must furnish details separately in this form

3.7 TOTAL ANNUAL TURNOVER

(Bidder and/or Each member of Joint Venture/consortium/group must fill in this form)

TOTAL ANNUAL TURNOVER FOR THE LAST FIVE FINANCIAL YEARS	
Year	Indian Rupee
Total	

3.8 PRESENT ACTIVITIES IN WHICH BIDDER FIRM IS ENGAGED AS A LEAD PARTNER

(Each bidder or member of JV/consortium/group must fill in this form)

Sl No	Name & Type of project/work which you are presently executing & its execution	Brief technical description	Name & Address of client	Period of contract (as provided in the agreement)	Construction cost of project (in Rs)	Type & amount of portion sublet by you	Year of Starting	Percentage completed works	Name & Address of consultant if any

3.9 PRESENT ACTIVITIES IN WHICH BIDDER FIRM IS WORKING IN JOINT VENTURE

(Each bidder or member of JV/consortium/group must fill in this form)

Sl No	Name of the project/works and its location (phase of work for which you are responsible)	Brief technical description	Name & Address of client	Period of contract	Construction cost of project (in Rs) (entirely yours)	Year of Starting	Percentage completed works	Name with whom you are in JV	Name & Address of consultant if any

3.10 PRESENT ACTIVITIES IN WHICH BIDDER FIRM IS WORKING AS PARTNER

(INDICATE PLACE OF WORK FOR WHICH FIRM IS RESPONSIBLE)
(Each bidder or member of JV/consortium/group must fill in this form)

Name of the Project /works and its location (phase of work)	Name & Address of client	Construction cost in Rs./ Entire cost of your portion	Name of main contract ors	Period of contract (as provided in agreement)	Year of Starting	Percentage completed works	Name & Address of consultant if any

3.11 COMPLETED WORKS IN WHICH FIRM WAS THE LEAD PARTNER

(DURING LAST 5 YEARS)

(Each bidder or member of JV/consortium/group must fill in this form)

Sl No	Name & Type of project/ works and its location	Brief technical description	Name & Address of client	Period of contract (as provided in the agreement)	Construction cost of project (in Rs)	Type & amount of portion sublet by you	Year of Starting	Percentage Completed works	Name & Address of consultant if any

3.12 COMPLETED WORKS IN WHICH FIRM WAS IN JOINT VENTURE

(DURING LAST 5 YEARS)
(Each bidder or member of JV/consortium/group must fill in this form)

Sl No	Name & Type of project/ works and its location	Brief technical description	Name & Address of client	Construction cost of Project (in Rs)		Period of contract (as provided in the agreement)	Year of Starting	Year of Completion		Reasons for delay if any	Name & Address of consultant if any
				Entire	yours			Scheduled	Actual		

3.13 DETAILS OF SUB CONTRACTOR AND THEIR RESPONSIBILITES

(Applicable in case of subletting)

Sl No	Name & Address of Sub Contractor	Responsibility	Value of work to be sublet.

Definitions & Interpretations

1. **Act** means the Tamil Nadu transparency in Tenders Act, 1998 (Tamil Nadu Act 43 of 1998).

2. **Rules** means The Tamil Nadu Transparency In Tender Rules, 2000

3. **Adjudicator:** The Commissioner will propose the person to be appointed as Adjudicator under the contract in the Letter of Acceptance.

4. **Arbitrator**: If a party is dissatisfied with the decision of the Adjudicator or no decision is given within the time set out the party may give notice of dissatisfaction and a dispute which has been the subject of a notice of dissatisfaction has to be finally settled by Arbitral tribunal. The Arbitrator can revise the decision of the Adjudicator. The Arbitral Tribunal consists of 3 Arbitrators, one each to be appointed by the Authority and the Contractor. The third Arbitrator has to be chosen by the two Arbitrators so appointed by the parties and has to act as presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator has to be appointed by President of the Institution of Engineers (India).

5. **The Authority** (Commissioner) or his authorised representative is the party who Employs the Contractor to carry out the Works

6. **Earnest Money Deposit** means the amount required to be remitted by a bidder along with his bid indicating his willingness to implement the contract.

7. **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.

8. **BIS** means Bureau of Indian Standards.

9. **Compensation Events** are those defined in Clause -36.

10. **The Completion Date** is the date of completion of the Works as certified by the Superintending Engineer / Zonal Executive Engineer,

11. **The Contract** is the Contract between the Authority and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in Clause 11.1

12. **The Contractor** is a person or corporate body whose Bid to carry out the Works has been accepted by the Authority.

13. **Tenderer Or Bidder:** Any person , firm or Corporation submitting a tender for the work contemplated, acting directly or through a duly authorized representative.

14. **The Contractor's Bid** is the completed bidding document submitted by the Contractor to the Authority.

15. **Bid Price** : The prices and discounts quoted by the bidder in the letter of bid and in the bill of quantities.

16. **The Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

17. **Days** are calendar days; months are calendar months.

18. **A Defect** is any part of the Works not completed in accordance with the Contract.

19. **The Defects Liability Certificate** is the certificate issued by Superintending Engineer upon correction of defects by the Contractor.

20. **The Defects Liability Period** is the period named **in the Contract Data and calculated from the** Completion Date.

21. **Drawings** include calculations and other information provided or approved by the Superintending Engineer for the execution of the Contract.

22. **The Authority** (The Commissioner) is the party who employs the Contractor to carry out the Works

23. **The Superintending Engineer** is the person named in the Contract Data (or any other) competent person appointed by the Commissioner and notified to the Contractor, to act in replacement of the Superintending Engineer) who is responsible for supervising the execution of the Works and administering the Contract.

24. **The Executive Engineer** is an Executive Engineer of Corporation of Chennai, who will be in charge of work in Corporation of Chennai.

25. The Lead Bidder shall be designated in the Joint venture/Consortium/Group agreement to be submitted along with the Bid. The Lead Bidder shall have the authority to conduct all business for and to act on behalf of any and all partners of the Joint venture/Consortium/Group, during the bidding process and in the event the contract is awarded.

26. **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

27. **The Initial Contract** Price is the Contract Price listed in the Authority's Letter of Acceptance.

28. **The Intended Completion Date i**s the date on which it is intended that the Contractor has to complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Superintending Engineer by issuing an extension of time.

29. **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.

30. **Plant** is any integral part of the Works that has to have a mechanical, electrical, chemical, or biological function.

31. **The Site** is the area defined as such in the Contract Data.

32. **Site Investigation Reports** are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.

33. **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Superintending Engineer.

34. **The Start Date** is given in the Contract Data. It is the latest date when the Contractor has to commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

35. **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

36. **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

37. **Two-cover system** means a procedure under which the bidders are required to simultaneously submit two separate sealed covers, one containing the Earnest Money (Bid security) and the details of their capability to undertake the tender which will be opened first and the second cover containing the price quotation which will be opened only if the bidder is found qualified to execute the Bid

Section IV

1. Letter of Acceptance

[Letterhead paper of the Employer]

By Cable/Registered Post with acknowledgement due/

From

To

Letter No.---------- Dt……..

Sub: Tender for **Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)**

Package- 1 - (118 Roads)
Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)

This is to notify you that your Bid dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Contract Price of *[amount in numbers and words]*, is hereby accepted by our Agency.

(a) We propose that *[name of the Adjudicator]* be appointed as the Adjudicator.

(b) You are hereby requested to furnish performance security in the form detailed in Cl. 29.1 of ITB for an amount of Rs.--------- within 14 days of the receipt of the Letter of Acceptance. The performance security IN THE FORM OF Bank Guarantee shall be valid up to 2 (Two) years after completion of work certified by the Engineer in Charge. You are requested to sign the Contract within -------- days from the date of receipt of this letter, failing which action as stated in ITB will be taken

(c) You are hereby instructed to proceed with the execution of the said Works in accordance with the Contract documents.

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Agency: _____

Attachment: Agreement

2. Contractor's Bid

Description of Work:

[date]

To: *[name and address of Employer]*

We offer to execute the *[name and identification number of Contract]* in accordance with the Conditions of Contract accompanying this Bid for the Contract Price of *[amount in numbers]*, *[amount in words]*.

We accept the appointment of *[name proposed in Letter of Acceptance]* as the Adjudicator.

[or]

We do not accept the appointment of *[name proposed in Letter of Acceptance]* as the Adjudicator, and propose instead that *[name]* be appointed as Adjudicator, whose daily fees and biographical data are attached.

This Bid and your written acceptance of it shall constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any Bid you receive.

We hereby confirm that this Bid complies with the Bid validity and Bid Security required by the bidding documents and specified in the Bidding Data.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Name and address of agent	Amount	Purpose of Commission or gratuity

(if none, state "none")."

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Bidder: _____

Address: _____

3. AGREEMENT

ARTICLES OF AGREEMENT MADE THIS day of

between the Commissioner, Corporation of Chennai (hereinafter called the "Commissioner" which expression shall where the context so admits include his successors in office and assigns) of the one part * of @

(hereinafter called the Contractor- which expressions shall where the context so admits include his heirs, executors, administrators and legal representatives) of the other part.

WHEREAS the Commissioner is desirous of #

and has caused estimate of probably quantities contained in Schedule A, drawings and specifications describing the work to be done to be prepared.

AND WHEREAS the said Schedule A, drawings numbered serially 1 to…….. inclusive –(Schedule B) – the preliminary Specifications and Schedule C have been signed signed by or on behalf of the parties hereto

. **AND WHEREAS** the contractor has agreed to the retention by the Corporation of the earnest money of Rupees……..paid. by him when he submitted his tender as security for the due fulfillment of the contract to the satisfaction of the S.E…… DEPT.' E.E…….. (zone) Corporation of Chennai (hereinafter referred to as the S.E…….Dept./E.E (Zone……) or in the alternative S.E. ……..

DEPT./EE(Zone……) may direct, to deposit as security for the aforesaid purpose cash or currency notes of the value Rs…….. to perfect Such security.

AND WHEREAS the contractor has deposited with the S.E. ..... DEPT./E.E. (Zone.....) the sum of Rupees ..... cash as additional security for the due fulfillment of this contract to the satisfaction of the S.E…… DEPT. /E.E…….. (zone)

AND WHEREAS the contractor has also signed the copy of the SSRB/TNBP and addenda volume thereto maintained in the ……..' DEPT.' Zone of the Corporation of Chennai acknowledgement of being bound by all the conditions of the clauses of the Standard Preliminary Specification and all the Specifications for items of works described by a Standard Specification Number in Schedule 'A'.

AND WHEREAS the contractor has agreed to execute upon and subject to the conditions set-forth in the General conditions of contract of T .N.B.P, such other conditions as are contained in all the specifications forming part of this contract (hereinafter referred to as "the said condition") the works as shown upon the drawings and described in the said specifications and set forth in Schedule A as the "Probable quantities" and comply with the rate of progress noted at the end of the Articles of Agreement for a sum of Rupees$.

or such other sum as may be arrived at under the clause of the standard preliminary specification relating to "payment on lump sum basis or by final measurement at unit prices." Now it is hereby agreed as follows:

In consideration of the payment of the said sum of Rupees.$.....,. or such other sum as many be arrived at under the clause of the Standard preliminary specification of relating "payment on lump sum basis or by final measurement at unit prices" the Contractor will, upon and subject to the said conditions, execute and complete the works shown upon the said drawings and described in the said specification and to the extent of probable quantities shown in schedule A with such variation, by way of alterations or additions, to or deductions from the said work and method of payment therefore as are provided for in the said conditions.

Now this Agreement witnesses as follows:

1. In this Agreement, words and expressions has to has the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they has to be deemed to form and be read and construed as part of this Agreement.

2. In consideration of the payments to be made by the Authority to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Authority to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

3. The Authority hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects wherein the 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 read and treated as part and parcel of this Agreement, viz.:
   i) Tender Document including the Contractor's Bid Documents and all other documents furnished by the bidder and submitted as part of the Bid;
   ii) Conditions of contract (including Additional Conditions of Contract);
   iii) Specifications;
   iv) Drawings;
   v) Bill of Quantities;
   vi) Letter of Acceptance;
   vii) Work Order (to be issued)

5. Detailed conditions agreed in the tender document form part of the agreement. The services to be performed, timelines to be met with, penalty clauses for non performance, and the other stipulations will be as furnished herein:

i. **Contract Period:** The Contract period is for 180 days from the date of issue of Letter of Acceptance to the successful contractor.

ii. **Payment Schedule:** Part or complete Payment will be made every month by the Zonal Officer, based on the outturn of satisfactory completion of work in the previous month and value of work executed shall be determined, based on the measurements and check measurements by the Engineer in the M.Book.

iii. **Milestones and Liquidated Damages:** The work will have two milestones for Laying of Precast Interlocking concrete Paver blocks of 80mm thick the following milestones have to be met
   a. Minimum 50% of the value of work should be completed by the end of the 90th day, and
   b. Work should be completed in all respects by the end of the 180th day.

   If there is default in meeting either or both these deadlines, Liquidated damages @ 0.1% of the unfinished value of work (in relation to the two milestones) will be levied per day till their completion.

iv. **Machineries:** The bidder should own or lease all machineries required for the work. The detailed list of Machineries as detailed in the Tender document shall be made available at the work site.

v. **Retention Money:** The Corporation of Chennai shall retain a sum equivalent to 5% of the value of the each bill as retention money from each payment due to the Contractor. Out of the 5% of the retention amount, on issue of completion certificate for the work 2.5% will be released to the Contractor, while the balance 2.5% will be retained during defect liability period (ie., 5 years). The retained 2.5% will be released by the Commissioner, Corporation of Chennai, after ensuring no liability in connection with work executed.

vi. **State Quality Monitors:** In order to ensure quality of the work, Third party checks and inspections by the State Quality Monitors will be taken up. Any defects pointed out by the State Quality monitors shall be attended by the Contractor at his own cost and rectified.

vii. **Fraudulent Practices :**If it is found any time during the tender process, award of contract, or during the contract period, that the Contractor has furnished false certificate or if the

Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for, getting the contract or in the executing the Contract, the Contract will be summarily terminated and Criminal Proceedings will be initiated.

viii. **Price Adjustment Clause:** Price Adjustment Clause: Price Adjustment Clause as per G.O. 227 , MAWS, dt. 23.11.2009 is applicable for the tenders of Rs.1.00 crore and above, even if the contract period is less than 1 year.

ix. **Termination of the Contract:** If the work is not completed even 30 days after the contract period (180 Days), the contract is liable for summary cancellation

x. **Defect Liability Period:** The defect liability period is 5 years.

In witness whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

The Common Seal _____
was hereunto affixed in the presence of:

Signed, Sealed and Delivered by the said
_____
_____
_____

in the presence of:

Binding Signature of Employer (Commissioner, Corporation of Chennai) _____

Binding Signature of Contractor _____

The Common Seal of the Corporation of .
Chennai hereunto affixed in presence of :

*** Contractor's name** **# Name and designation**

Section V

1. Conditions of Contract

A.General

Definitions

1. Boldface type is used to identify defined terms.
2. **Act** means the Tamil Nadu transparency in Tenders Act, 1998 (Tamil Nadu Act 43 of 1998).
3. **Rules** means The Tamil Nadu Transparency In Tender Rules, 2000
4. **Adjudicator:** The Commissioner will propose the person to be appointed as Adjudicator under the contract in the Letter of Acceptance.
5. **Arbitrator**: If a party is dissatisfied with the decision of the Adjudicator or no decision is given within the time set out the party may give notice of dissatisfaction and a dispute which has been the subject of a notice of dissatisfaction has to be finally settled by Arbitral tribunal. The Arbitrator can revise the decision of the Adjudicator. The Arbitral Tribunal consists of 3 Arbitrators, one each to be appointed by the Authority and the Contractor. The third Arbitrator has to be chosen by the two Arbitrators so appointed by the parties and has to act as presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator has to be appointed by President of the Institution of Engineers (India).
6. **The Authority** (Commissioner) or his authorised representative is the party who Employs the Contractor to carry out the Works
7. **Earnest Money Deposit** means the amount required to be remitted by a bidder along with his bid indicating his willingness to implement the contract.
8. **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.
9. **BIS** means Bureau of Indian Standards.
10. **Compensation Events** are those defined in Clause - hereunder.
11. **The Completion Date** is the date of completion of the Works as certified by the Authority.
12. **The Contract** is the Contract between the Authority and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in Clause 2.3 below.
13. **The Contractor** is a person or corporate body w4hose Bid to carry out the Works has been accepted by the Authority.

14. **Tenderer Or Bidder:** Any person , firm or Corporation submitting a tender for the work contemplated, acting directly or through a duly authorized representative.

15. **The Contractor's Bid** is the completed bidding document submitted by the Contractor to the Authority.

16. **Bid Price** : The prices and discounts quoted by the bidder in the letter of bid and in the bill of quantities.

17. **The Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

18. **Days** are calendar days; months are calendar months.

19. **A Defect** is any part of the Works not completed in accordance with the Contract.

20. **The Defects Liability Certificate** is the certificate issued by Authority upon correction of defects by the Contractor.

21. **The Defects Liability Period** is the period named **in the Contract Data and calculated from the** Completion Date.

22. **Drawings** include calculations and other information provided or approved by the Authority for the execution of the Contract.

23. **The Authority** (The Commissioner) is the party who employs the Contractor to carry out the Works

24. **The Authority** is the person named in the Contract Data (or any other) competent person appointed by the Commissioner and notified to the Contractor, to act in replacement of the Authority) who is responsible for supervising the execution of the Works and administering the Contract.

25. **The Executive Engineer** is an Executive Engineer of Corporation of Chennai, who will be in charge of work in Corporation of Chennai.

26. **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

27. **The Initial Contract** Price is the Contract Price listed in the Authority's Letter of Acceptance.

28. **The Intended Completion Date i**s the date on which it is intended that the Contractor has to complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Authority by issuing an extension of time.

29. **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.

30. **Plant** is any integral part of the Works that has to have a mechanical, electrical, chemical, or biological function.

31. **The Site** is the area defined as such in the Contract Data.

32. **Site Investigation Reports** are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.

33. **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Authority.

34. **The Start Date** is given in the Contract Data. It is the latest date when the Contractor has to commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

35. **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

36. **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

37. **Two-cover system** means a procedure under which the bidders are required to simultaneously submit two separate sealed covers, one containing the Earnest Money (Bid security) and the details of their capability to undertake the tender which will be opened first and the second cover containing the price quotation which will be opened only if the bidder is found qualified to execute the Bid.

38 Alteration, Additions and Omissions

The Engineer shall make any variation of the form, quality or quantity of the works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following :

(a) Increase or decrease the quantity of any work included in the Contract,

(b) Omit any such work (but not if the omitted work is to be carried out by the Authority or by another contractor).

(c) Change the character or quality or kind of any such work(d) Change the levels, lines, position and dimensions of any part of the works.

(e) Execute additional work of any kind necessary for the completion of the Works, or

(f) Change any specified sequence or timing of construction of any part of the works.

No such variation shall in any way vitiate or invalidate the Contract but the effect if any, of all such variations shall be valued in accordance with Clause 52, provided that where the issue of an instruction to vary the works is necessitated by some default of or breach of contract by the Contractor or for which he is responsible, any additional cost attributable to such default shall be borne by the Contractor.

A **Variation** is an instruction given by the Authority which varies the Works. A variation may an alteration/ alterations, addition / additions and omission / omissions.

Instructions for Variations : The Contractor shall not make any such variation without an instruction of the Engineer, provided that no instruction shall be required for increase or decrease in the quality of any work where such increase or decrease is not the result of an instruction given under this Clause, but is the result of the quantities exceeding or being less than those stated in the Bill of Quantities.

The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Authority, as defined in the Contract Data.

2. Interpretation

2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal

meaning under the language of the Contract unless specifically defined. The Authority will provide instructions clarifying queries about these Conditions of Contract.

2.2 If sectional completion is specified in the Contract Data, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract shall be interpreted in the following order of priority:

(1) Agreement,

(2) Letter of Acceptance,

(3) Contractor's Bid,

(4) Contract Data,

(5) Conditions of Contract,

(6) Specifications,

(7) Drawings,

(8) Bill of Quantities, and

(9) any other document listed in the Contract Data as forming part of the Contract.

3. Language and Law

3.1 The language of the Contract and the law governing the Contract are stated in the Contract Data.

4. Decision of Authority

4.1 Except where otherwise specifically stated, the Authority will decide contractual matters between the Authority and the Contractor in the role representing the Authority.

5. Delegation

5.1 The Authority may delegate any of his duties and responsibilities to his sub-ordinates, except to the Adjudicator, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.

6. Communications

6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Subcontracting

7.1 The Contractor may subcontract with the approval of the Authority, but may not assign the Contract without the approval of the Authority in writing. Subcontracting shall not alter the Contractor's obligations .Any fault identified during the execution of work carried out by the sub-contractor , the contractor will be liable to rectify the defects as per the direction of the Authority

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Authority between the dates given in the Schedule of Other Contractors, as referred to in the Contract Data. The Contractor shall also provide facilities and services for them as described in the Schedule. The Authority may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

9. Personnel

9.1 The Contractor shall employ the key personnel named in the Schedule of Key Personnel, as referred to in the Contract Data, to carry out the functions stated in the Schedule or other personnel approved by the Authority. The Authority will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the Schedule.

9.2 If the Authority asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

10. Contractor's Risks

10.1 The Contractor carries the risks which this Contract states are Contractor's risks.

11. Contractor's Risks

11.1 From the Starting Date until the Defects Correction Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Authority's risks , but are of Contractor's risks.

12. Insurance

12.1 The contractor shall have to provide a minimum insurance of man power and equipments. This insurances cover should start from the date of starting of work and should be valid upto the end of execution period. The responsibility of timely payment of the premium as well as that of lodging claims as and when situation arises, will be that of contractor. All insurances which the contractor requires to enter into under the contract shall be effected with an insurer or insurers and in terms approved by the Authority.

12.2 Accident or Injury to Contractor's Employees

The department shall not be liable for or in respect of any damages or compensation payable by law in respect of or in consequences of any accident or injury to any person in the employment of the contractor (other than accident or injury as may be attributed to the department or its employees) & the contractor shall indemnify the department against all such damages and compensations and against all actins, suits, claims, cost or expenses arising there from. The contractor shall insure against such liabilities and shall continue such insurance during the whole of the time that any persons are employed by him on the works

12.3 Remedy on Contractor's Failure to Insure

If the contractor fail to effect and keep in force the insurances referred to or any other insurance which he may be required to effect under the terms of the contract then and in any such case the department may effect and keep in force any such insurance and pay such premiums as may be necessary for the purpose and from time to time deduct the amount so paid by the department as aforesaid from any moneys due or which may become due to the contractor or recover the same as a debt due from the contractor.

12.4 Policies and certificates for insurance shall be delivered by the Contractor to the Engineer in -Charge for the Engineer in -Charge approval before the Start Date. All such Engineer in-Charge shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

12.5 If the Contractor does not provide any of the policies and certificates required, the Authority may effect the insurance which the Contractor should have provided and recover the premiums the

Authority has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

12.6 Alterations to the terms of an insurance shall not be made without the approval of the Engineer in -Charge.

12.7 Both parties shall comply with any conditions of the insurance policies.

13. Queries about the Contract Data

13.1 The Authority will clarify queries on the Contract Data.

14. Contractor to Construct the Works

14.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.

15. The Works to Be Completed by the Intended Completion Date

15.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Authority, and complete them by the Intended Completion Date.

16. Approval by the Authority

16.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Authority, who is to approve them if they comply with the Specifications and Drawings.

16.2 The Contractor shall be responsible for design of Temporary Works.

16.3 The Authority's approval shall not alter the Contractor's responsibility for design of the Temporary Works**.**

16.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

16.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Authority before this use.

17. Safety

17.1 The Contractor shall be responsible for the safety of all activities on the Site.

18. Discoveries

18.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Authority. The Contractor shall notify the Authority of such discoveries and carry out the Authority's instructions for dealing with them.

19. Possession of the Site

19.1 The Authority shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the Contract Data, the Authority will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event.

20. Access to the Site

20.1 The Contractor shall allow the Authority and any person authorized by the Authority access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

21. Instructions, Inspections and Audits

21.1 The Contractor shall carry out all instructions of the Authority which comply with the applicable laws where the site is located.

21.2 The Contractor shall permit the Corporation to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Corporation, if so required by the Corporation.

22. Disputes

22.1 If the Contractor believes that a decision taken by the Authority was either outside the authority given to the Authority by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Authority's decision.

23.Procedure for Disputes

23.1. The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

23.2 . The Adjudicator shall be paid daily at the rates specified in the contract data together with reimbursable expenses of the type specified in the contract data and cost shall be divided equally between the Authority and the Contractor, whatever the decision is reached by the Adjudicator .Either party may refer a decision of the Adjudicator to an Arbitrator within 30 days of the Adjudicator's written decision. If neither party refers the dispute to the Arbitration within the above 30 days, the Adjudicator's will be final and binding.

23.3 . The Arbitration shall be conducted in accordance with the arbitration published by the Government of Tamil nadu and in the place shown in the conditions of the contract.

24. Replacement of adjudicator.

. Should the Adjudicator resign or die, or should the Authority and the Contractor agree that the Adjudicator is not functioning in Accordance with the provisions of the contract, a new Adjudicator will be jointly appointed by the Authority and the Contractor. In case of disagreement between the Authority and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority , designated in the contract data at the request of either party, within 14 days of receipt of such request.

B. TIME CONTROL

25. Program

25.1 Within the time stated in the Contract Data, the Contractor shall submit to the Authority for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the works.

25.2 .An update of the program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequences of the activities.
25.3. The contractor shall submit to the Authority for approval an updated Program at intervals no longer than the period stated in the contract data. If the Contractor does not submit an updated program within this period, the Authority may withhold the amount stated in the Contract Data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted.

25.4. The Authority's approval of the program shall not alter the Contractors' obligations. The contractor may revise the program and submit it to the Authority again at any time. A revised Program shall show the effect of Variations and Compensation events.

26. Extension of the intended completion date.

26.1 If the delay is due to the failure attributable to the contractor, the Authority l have the powers to decide whether to grant extension or not on the request for extension or time from the contractor. If the extension is granted under such circumstances, the contractor shall not be paid any revised rates or extra rates due to extension of time. The quoted rates in the contract shall prevail during the extension period. The contractor shall have to pay liquidated damages as per contract date for the beyond extended period.

26.2 If the delay is due to the failure attributable to the department or due to force, the Authority shall have the power to decide whether extension of time is to be given or not on request from the contractor of extension of time is given, the contractor shall not be paid extra rate or revised rate due to extension of time. The quoted rates in the contract shall prevail during extension period. The contractor has to pay liquidated damages as per contract data for the beyond extended period.

27. Delays Ordered by the Authority

27.1 The Authority may instruct the Contractor to delay the start or progress of any activity within the Works.

27.2 Damages for Delays and Non Completion

If the contractor fails to complete the works within the period Specified in the Contract Data or within any extended time allowed by the Authority, due to failure attributable to the contractor, the contractor shall pay or allow the Corporation to levy the amount mentioned in the table below as liquidated and ascertained damages for every day beyond the said date or extended time as the case may be during which the works shall remain unfinished. Liquidated and ascertained damages will be levied at the rate of 0.05% (zero point zero five percentage) of the contract value of the work for each day. The total liquidated and ascertained damages will be levied upto a maximum of 5% (five percentage) of the value of the contract and if the contractor fails to complete the work even then, action will be taken to terminate the contract and execute the work at his risk and cost as per provisions of the general conditions of contract of T.N.B.P.

28. Management Meetings

28.1 Either the Authority or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early intimation procedure.

28.2 The Authority shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Authority. The responsibility of the parties for actions to be taken shall be decided by the Authority either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

29. Early Intimation

29.1. The Contractor shall intimate the Authority at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price or delay the execution of the Works. The Authority may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

29.2.The Contractor shall cooperate with the Authority in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Authority

C. Quality Control

30.Identifying Defects

30.1. The Authority shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Authority may instruct the Contractor to search for a Defect and to uncover and test any work that the Authority considers may have a Defect.

30.2.Tests

30.3.. If the Authority instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, or not the contractor shall pay for the test and any samples.

30.4 Correction of Defects

30.5. The Authority shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Contract Data. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

30.6. Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the time framed by the Authority, the defects has to be rectified.

31. Uncorrected Defects

31.1. If the Contractor has not corrected a Defect within the time specified in the Authority notice, the Authority will assess the cost of having the Defect corrected, and the Contractor will have to pay this amount.

D. Cost Control

32.. Bill of Quantities

32.1 The Bill of Quantities shall contain items for the construction, installation, testing, and commissioning work to be done by the Contractor.

33. Changes in the Quantities

33.1. Payment to the contractor will be made for the actual quantities only of the work, performed or materials furnished accordance with the contract, and Tender Accepting Authority shall be ordinarily permitted to vary the quantity finally ordered only to the extent of 25 % either way of requirement indicated in the tender documents. The payment will be made as per originally approved rate.

33.2 If requested by the Authority, the Contractor shall provide the Authority with a detailed cost breakdown of any rate in the Bill of Quantities.

34. Variations

34.1. All Variations shall be included in updated Programs produced by the Contractor.

35. Payments for Variations

35.1.The Contractor shall provide the Authority with a quotation for carrying out the Variation when requested to do so by the Superintending Engineer. The Authority shall assess the quotation, which shall be given within seven days of the request or within any longer period stated by the Authority and before the Variation is ordered.

35.2 If the work in the Variation corresponds with an item description in the Bill of Quantities and if, in the opinion of the Authority, the quantity of work above the limit stated in Sub-Clause 36.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.

35.3 If the Contractor's quotation is unreasonable, the Authority may order the Variation and make a change to the Contract Price, which shall be based on the Authority own forecast of the effects of the Variation on the Contractor's costs.

35.4 If the Authority decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

35..5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early intimation.

36. Cash Flow Forecasts

36.1 When the Program is updated, the Contractor shall provide the Authority with an updated cash flow forecast.

37. Payment Certificates

37.1 The Contractor shall submit to the Authority monthly statements of the estimated value of the work executed less the cumulative amount certified previously.

37.2 Payment will be made to the contractor under the certificates to be issued at reasonable frequent intervals by the Authority. Within fourteen days of the submission of each certificate an intermediate payment will be made of a sum equal to 90 percent of the value of the work, as so certified and the balance of 10 percent will be withheld and retained as a security for the due fulfillment of the contract. Under the certificate to be issued by the Authority on completion of the entire works, the contractor will receive the final payment of all the moneys due or payable to him under or by virtue of the contract except security deposit, provided there is no recovery from or forfeiture by the contractor to be made. No certificate of the Authority shall be considered conclusive evidence as to be sufficiency of any work or materials or correctness of measurements to which it relates, nor shall it relieve the contractor from his liabilities to make good defects as provided by the contract. The Contractor when applying for a certificate shall prepare a sufficiency certificate to the satisfaction of the Authority to enable the Authority or the Executive Engineer or the Assistant Executive Engineer to check the claim and issue the certificate.

37.3 The value of work executed shall be determined by the Authority

37.4 The value of work executed shall comprise the value of the quantities of the items in the Bill of Quantities completed.

37.5 The value of work executed shall include the valuation of Variations and Compensation Events.

37.6 The Authority may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

38. Payments

38.1. Payments shall be adjusted for deductions for advance payments, retention and other recoveries in terms of the contract and deduction at source of taxes as applicable under the law.

38.2 If the amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

38.2. Items of the Works for which no rate or price has been entered in will not be paid for by the Authority and shall be deemed covered by other rates and prices in the Contract.

39.**Tax**

39.1.The rates quoted by the contractor shall be deemed to be inclusive of the Sales Tax, Duties and other levies on materials that the contractor will have to pay for the performance of the contract, and the Authority will reform such duties in regard to reduction of taxes at source as per law applicable. Any variation in taxes , duties and levies during the currency of contract shall be borne by the contractor.

40. Currencies

40.1 All payments shall be made in Indian Rupees.

41. Price Adjustment

41.1 Contract price shall be adjusted for increase or decrease in rates and price of labour , materials, fuels and lubricants in accordance with the following principles and procedures.

a) The price adjustment shall apply for the work done from the start date given in the contract . data up to the end of the initial intended completion date or extensions granted by the Engineer and shall not apply to the work carried out beyond the stipulated time for reasons attributable to the contractor.

b) The price adjustment shall be determined during each quarter.

c) Following expressions and meanings are assigned to the work done during each quarter.

R = Total value of work done during the quarter. It would include the value of materials on .which secured advance has been granted , if any , during the quarter , less the valu of materials in respect of which the secured advance has been recovered, if .any . during the quarter. It will exclude value of works executed under variations for which . price adjustment will be worked separately based on the terms mutually agreed.. .

41.2. Adjustment for labour component.

(1) Price adjustment for increase or decrease in the cost due to labour shall be paid in accordance with the following formula.

$$V_L = 0.85 \text{ X } P_1 / 100 \text{ X R X } (L_i - L_o) / L_o$$

V_L = increase or decrease In the cost of work during the quarter under consideration due to changes in rates for local labour.

L_o= the average consumer price index for industrial workers for Chennai centre for the quarter preceding the date of opening of bids as published by labour Bureau, Ministry of Labour, Govt. of india.

L_1= The average consumer price index for industrial workers for Chennai centre for the quarterUnder consideration as published by Labour bureau , Ministry of labour Govt. of .India.

P_1 Percentage of labour component of the work.

41.3..Adjustment for Cement component

(ii) Price adjustment for increase or decrease in the cost of cement procured by the

Contractor shall be paid in accordance with following formula.

$$V_c = 0.85 \text{ X } P_c / 100 \text{ X R X } (C_i - C_o) / C_o$$

V_c = increase or decrease in the cost of work during the quarter under consideration . due to changes in the rates for cement.

C_o = The all india average wholesale price index for cement for the quarter preceding . the date of opening of bids as published by the Ministry of Industrial . . Development , Ministry of Industrial Dev Govt.of India, New-Delhi.

C_i = The All India Average wholesale price index for cement for the quarter under .

42. Retention

42.1 The Authority shall retain from each payment due to the Contractor the proportion stated in the Contract Data until Completion of the whole of the Works.

42.2 On completion of the whole of the Works, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Authority has certified that all Defects notified by the Authority to the Contractor before the end of this period have been corrected.

42.3 On completion of the whole Works, the Contractor may substitute retention money with an "on demand" Bank guarantee

43.. Liquidated Damages

43.1 The Contractor shall pay liquidated damages to the Authority if he fails to execute and complete the work within the period of completion, at the rate per day stated in the Contract Data for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Authority may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

43.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Authority shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in Sub-Clause 41.1.

44. No Advance payment.

44.1 No Mobilization Advance.

5. Securities.

45.1 The Performance Security shall be provided to the Authority not later than the date specified in the Letter of Acceptance and shall be issued in an amount and form specified in Clause 30 of ITB. The Performance Security shall be valid upto 28 days from the date of expiry of defect liability period mentioned in the Contract Data.

Finishing the Contract

47. Completion

47.1 The Contractor shall request the Authority to issue a certificate of Completion of the Works, and the Authority will do so upon deciding that the work is completed.

48. Taking Over

48.1 The Authority shall take over the Site and the Works within seven days of the Authority issuing a certificate of Completion.

49. Final Account

49.1 The Contractor shall supply the Authority with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Authority shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Authority shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Authority shall decide on the amount payable to the Contractor and issue a payment certificate.

50. Operating and Maintenance Manuals

50.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the Contract Data.

50.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the Contract Data, or they do not receive the Authority approval, the Authority shall withhold the amount stated in the Contract Data from payments due to the Contractor.

51. Termination

51.1 The Authority or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

51.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Authority;

(b) the Authority instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days;

(c) the Authority or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(d) a payment certified by the Authority is not paid by the Authority to the Contractor within 84 days of the date of the Authority certificate;

(e) the Authority gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Authority;

(f) the Contractor does not maintain a Security, which is required; and

(g) the Contractor has delayed the completion of the Works by the number of days for which the amount of liquidated damages upto a maximum of 5 % of the value of the Contract unless otherwise specified in the Contract Data.

(h) if the Contractor, in the judgment of the Authority has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

51.3 When either party to the Contract gives notice of a breach of Contract to the Authority for a cause other than those listed under Sub-Clause 57.2 above, the Authority shall decide whether the breach is fundamental or not.

51.4 Notwithstanding the above, the Authority may terminate the Contract for convenience.

51.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

52. Payment upon Termination

52.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Authority shall issue a certificate, for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate less other recoveries due in terms of the contract less taxes to deducted at source as per applicable law and less the percentage to apply to the value of the work not completed, as indicated in the Contract Data. Additional Liquidated Damages shall not apply. If the total amount due to the Authority exceeds any payment due to the Contractor, the difference shall be a debt payable to the Authority.

52.2 If the Contract is terminated for the Authority convenience or because of a fundamental breach of Contract by the Authority, the Authority shall issue a certificate for the value of the work done, Materials ordered, 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.

53. Property

53.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Authority if the Contract is terminated because of the Contractor's default.

54. Release from Performance

54.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Authority or the Contractor, the Authority shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

2. Special Conditions of Contract

1. GENERAL

1.1 The following special conditions of contract shall supplement the conditions of contract. Whenever there is a conflict, the provision herein shall prevail over the conditions of contract and / or those elsewhere.

1.2 The numbers given under each sub head represents the clause No. in conditions of Contract.

1.3 The bidder shall inspect the site and quarries and satisfy himself about the availability of the quality and quantity of materials required for the work.

1.4 The contractor shall make his own arrangements to procure all materials required for the work.

1.5 The Contractor shall make his own arrangements for water supply required for the work, at his own cost.

1.6 The Contractor shall make his own arrangements to obtain electricity for consumption on the work, at his own cost.

2. LABOUR

The Contractor shall unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

The Contractor shall, if required by the Engineer in charge, deliver to the Contractor, a return in detail, in such form and at such intervals as the Engineer in charge may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the site and such information, respecting Contractor's Equipment as the Engineer in charge may require.

3. COMPLIANCE WITH LABOUR REGULATIONS

During continuance of the contract, the Contractor and his subcontractors shall abide at all times by all existing labour enactments and rules made there under regulations, notifications and by laws of the State or Central Government or local authority and any other labour law (including rules), regulations, byelaws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Some of the major laws that are applicable to construction industry are given below. The Contractor shall keep the Employer indemnified in case of any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act of rules made there under, regulations and notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications / byelaws / acts / rules / regulations including amendments, if any, on the part of the Contractor, the Engineer / Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. Employer / Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

The Employees of the Contractor and the subcontractor in no case shall be treated as the employees of the Employer at any point of time.

Some major Labour Laws applicable to Establishments engaged in Construction Work

a. ***Workmen Compensation Act 1923 :***

b. ***Payments of Gratuity Act 1972 :***

c. ***Employees P.F. and Miscellaneous provisions Act 1952 :***

d. ***Maternity Benefit Act 1951 :***

e. ***Minimum Wages Act 1948 :***

f. ***Payment of Wages Act 1936 :***

g. ***Equal Remuneration Act 1979 :***

h. ***Payment of Bonus Act 1989 :***

i. ***Industrial Disputes Act 1974 :***

j. ***Industrial Employment (Standing Orders) Act 1946 :***

k. ***Trade Unions Act 1926 :***

l. ***Child Labour (Prohibition and Regulation) Act 1986 :***

m. ***Inter – State Migrant Workmen's (Regulation of Employment & Conditioning of Service) Act 1979 :***

n. ***The Building and Other Construction Workmen (Regulation of Employment and Condition of Service) Act and the cess Act of 1996 :***

o. ***Factories Act 1940 :***

4. ***ARBITRATION*** (GCC Clause 24.3)

The procedure for arbitration will be as follows:

4.1 If either party is dissatisfied with the decision of the Adjudicator, the party concerned, may within thirty days after receiving the decision of the Adjudicator shall notify to the Commissioner, of his intension to go in for arbitration. Within 30 days of receipt of notice from the Contractor/ Employer of his intention to refer the dispute to arbitration the Commissioner shall send to the Contractor / Employer, a list of five officers of the rank of a Superintending Engineer or of a higher rank who are not connected with the work for selection and appointment of arbitrators.

4.2 In event of dispute or difference arising between the Employer and a contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitration tribunal shall consist of 3 arbitrators, one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the presiding Arbitrator shall be appointed by the Indian Council of Arbitration.

4.3 If one of the portion fails to appoint its arbitrator in pursuance of sub- clauses above within 30 days after arbitrator by the other party, than the presiding Arbitrator shall be nominated by Indian Council of Arbitration shall appoint the arbitrator. A certified copy of the order of the President of the institution of Engineers(India).

4.4 Arbitration proceedings shall be held at Chennai, India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.

4.5 The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, this expenses incurred by each party in connection with the preparation, presentation, etc., of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.

4.6 In the event the value of the contract is up to Rs.5 Crores, the disputes or difference arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties, failing such agreement, the appointing authority is the Indian Council of Arbitration.

4.7 Performance under the contract shall continue during the Arbitration proceedings and payments due to the contractor by the owners shall not be withheld, unless they are the subject matter of the arbitration proceedings such as, but not limited to matters related to quality of work.

4.8 Neither party is entitled to bring claim to arbitration unless the same is made before the expiration of 30 days after defect liability period.

5. *Income Tax*

During the course of contract period deductions of Income Tax shall be made as per the rule in the force of the gross amount of each bill or as directed by the Income Tax department from time to time and such Income Tax amounts shall be remitted to Government of India.

6. *Sales Tax*

Valid Sales Tax Clearance or exemption certificate should be produced before the payment of final bill, otherwise the final payment to the contractor will be withheld.

7. *TESTS ON MATERIALS AND FINISHED ITEM OF WORK*

7.1 Charges for carrying out all the tests specified in specification on materials and finished item of works should be borne by the contractor.

7.2 Charges for carrying out all the tests other than those specified in specification on materials and finished item of work should be borne by the contractor / Employer as below:

a) If the materials / works pass the tests, the charges will be borne by the employer.

b) If the materials / works fail the tests, the charges will borne by the contractor.

7.3 The Contractor should establish a field laboratory at the work site to carryout all tests specified as well as not specified in the specification both for materials and finished items of work in the presence of the Engineer.

8. PAYMENT

8.1 Payment for the work done by the contractor will be based on measurements recorded at various stages of the work by the Engineer or Officer authorized by the Engineer. The Contractor or his authorized agent or representative shall be present at the time of recording of each set of measurements and sign the measurement book or leveling field book in token of their acceptance.

8.2 If for any reason the Contractor or his authorized agent is not available, and the work is suspended by the Engineer to avoid recording of measurements in the absence of the Contractor or his authorized agent, the department shall not entertain any claim from the contractor for any loss incurred by him on this account. If the Contractor or his authorized agent or representative does not remain present at the time of such measurement may be taken in his absence and shall be deemed to be accepted by the Contractor.

8.3 Any amount due to the department from the Contractor arising out of the Contract will be received from the bills of the Contractor. If sufficient amount is not available in the bills the same will be recovered under Revenue Act or from the amount due to the Contractor under any other Contract

9. Extension of Time

Granting extension of time shall be governed as under:

9.1 If the delay is due to the failure attributable to the Contractor, the Engineer shall have powers to decide whether to grant extension or not on the request for attention of time from the Contractor. If the extension is granted under such circumstances, the Contractor shall not be paid any revised rates or extra rate due to extension of time. The quoted rates in the contract shall prevail during the extension period. The Contractor has to pay liquidated damages as per contract data for the extended period.

9.2 For this fixed price contract, if the delay is due to failure attributable to the department, or due to force, the Engineer shall have the power to decide whether extension of time is to be given or not on request from the contractor. If extension of time is given, the contractor shall not be paid extra rate or revised rate due to extension of time. The quoted rates in the contract shall prevail during extension period.

10. Fundamental Breach of Contract:

The Contractor becoming insane or imprisoned shall be deemed as a fundamental Breach or Contract.

11. Extra Item of Works

Extra item of work shall not vitiate the contract. The contractor shall be bound to execute extra items of works as directed by the Engineers.

12. Employment of Project Manager and Other Key Personnel

Other Key Personnel as furnished in the Contract.

13. Contract Period

The contract period is continuous from start date to intended completion date including monsoon and non-monsoon seasons without any break.

14. Inconvenience to Public

The contractor shall not deposit materials at any site which will cause inconvenience to Public. The Engineer may direct the Contractor to remove such materials or may undertake the job at the cost of the Contractor.

15. House and Hutments

The Contractor should arrange to provide accommodation for his staff & Labourers he needs, at his own cost. The Contractor shall make his own arrangements for supply of food-grains and other provisions to his staff and laborers including controlled commodities. If women are employed in more than 50 at a place, the Contractor shall arrange the crèches at his own cost.

16. Water Supply

It is the responsibility of the Contractor to make his own arrangements for water supply and drainage for the work site , in his own cost. The distribution system measures for purification of water, shall be the responsibility of the Contractor and shall be accordance with rules and regulations of the Public Health Department. No compensation will be allowed to the Contractor in this account.

17. Watching and Lighting:

The Contractor shall in connection with the works, provide and maintain at his own cost all lights, guards, fencing and watching when and wherever necessary or required by the Engineer or Engineer's Representative, or by any duly constituted authority for the protection of the works, or for the safety and convenience of the public or others . The Contractor shall make his own arrangements to obtain electricity for consumption on the works at his own cost.

18 Construction Plant

The Contractor shall provide and install at his own cost all necessary construction tools and plant, equipment, machinery and shall use such methods and appliances for the performance of all the operations connected with the work emprised under the contract as will secure a satisfactory quality of work and rate of progress which will ensure the completion of the work within the time specified.

19. Reference Marks and Bench Marks

19.1 The basic central lines, reference points and bench marks will be fixed by the Department.

19.2 The Contractor shall establish at his own cost, at suitable points, additional reference lines and bench marks as may be necessary. The Contractor shall remain responsible for the sufficiency and accuracy and of all his bench marks and reference lines. He shall take precaution to see that the lines, points and bench marks fixed by the Department are not disturbed by his work and shall make good to any such damages.

20. Setting out Works

The Contractor shall be responsible for the correct setting out of all works at his cost. The Contractor shall execute the work true to alignment, grade and levels as shown in the drawings and as directed by the Engineer and shall check these at frequent intervals. The Contractor shall provide all facilities like lobour and instruments, and shall co-operate with the departmental officers to check all alignments, grades, levels and dimensions, such checking shall not absolve the contractor of his own responsibility in maintaining the necessary of the work.

21. Use and Care of Site

The Contractor will be permitted to use without charge, the site and the lands shown for execution of work, labour, staff colonies, site offices, workshops or store and for related activities. The Contractor shall not commence any operation on such lands, except with the approval of the Engineer. If these lands are not adequate, the Contractor may have to make his own arrangements for additional lands at his own cost. The Contractor shall not demolish, remove or alter the structures, trees or other facilities on the site without prior approval of the Engineer.

The rubbish shall be removed from the site as it accumulates. All surface and soil drains shall be kept in a clean, sound and workmen like state. All the means of the Contractor's operations shall be cleared before returning them to the Department. The Contractor shall make good any damage or alteration made to property or land handed over to him before these are returned.

22. Protection of adjoining Premises

The Contractor shall protect adjoining sites against structural, decorative and other damages that could be caused by the execution of these works and make good at his cost any such damages.

23. Local Roads

In addition to the existing public roads, near the site of works and the roads constructed by the Government in the works area, the Contractor may construct and maintain additional roads as required at his own expenses and as per the directions of the Engineer.

24. Work during Night or Sundays and Holidays

No work shall be done on holidays or during nights without the written permission Superintending Engineer /Zonal Executive Engineer and the Contractors shall comply with the provision of the Factories Act, if and so far they are applicable.

The contractor shall give prior information to the Police Department, if necessary, for carrying out the work during night hours. **28**. There shall be a defect liability for **5 years period (60 months**)

25. The contractor shall be liable to maintain the road during the defect liability period, which shall include any repairs, rectification of any part or portion of the project road immediately without waiting for any notice or intimation and shall include:

i. Surface deteriorations shall be rectified as directed

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26 1. The temperature of Pavement Quality concrete shall be maintained as per **IRC:15:2002**. Concrete having temperature at the time of pouring more than 30ºC will not be allowed.

26. 2. Concrete pavement must be in proper cross profile as per camber prescribed by the Engineer.

26.3**.** After the final regulation of the surface of the slab, surface of concrete slab shall be brush - textured in a direction at right angles to the longitudinal axis of the carriageway.

26 4. The brushed surface texture shall be applied evenly across the slab in one direction by the use of a wire brush not less than 450 mm. wide. The brush shall be made of 32-gauge tape wires grouped together in tufts spaced at 10 mm. centres. The tufts shall contain an average of 14 wires and initially be 75 mm. long. The brush shall have three rows of tufts. The rows shall be 20 mm. apart and the tufts in one row shall be opposite the centre of the gap between tufts in the other row. The brush shall be replaced when the shortest tuft wears down to 60 mm. long.

26.5. The texture depth shall be determined by the sand patch test as described in the clause given below**.** The test shall be taken at least once in a week or whenever the Engineer considers it necessary, at times after constructions. 10 individual measurements of the texture depth shall be taken at least 2 Mtr. apart anywhere along the diagonal line across a lane width between points 50 M apart. No measurements shall be taken within 30 mm of the longitudinal edges of the concrete slabs. The texture depth shall not be less than minimum required as per the table below, nor greater than a maximum average of 1.25 mm.

26.6. After the application of the brushed texture, the surface of the slab shall have a uniform appearance.

26.7. It will be the responsibility of the contractor to give the required finish of riding surface by checking with the straight edge and wedge gauge and any deficiency observed, shall be rectified as specified in the general specifications for Road Works.

27. Initial curing shall be done immediately after the surface texturing.Initial curing shall be done covering with hessian cloth and sprinkling with water over the concreted portion as soon as the concrete starts setting and by the application of approved resin based aluminized reflective curing compound which hardens into an impervious film of membrane with the help of mechanical sprayer. Care should be taken not to disturb the brushed surface texture.

Further curing of concrete shall be done as directed, for a minimum period of 14 days from the date of casting of c.c. slab.

A penalty of **Rs.2500**/- per day will be levied for improper curing.

28. The cement concrete slab pavement in M 40 is required to be carried out strictly as per the drawing. As regards thickness no claims on account of additional thickness other than the specified, if provided, will be entertained.

29**.** The regularity of the surface of the slab shall comply with the requirement of following clause.

29.1 Compliance with the requirements of this clause for surface regularity shall be measured using an approved 3 m long straight edge and wedge in such a way as to reveal any and all irregularities. The maximum permitted number of surface irregularity of 5 mm and 7 mm in a length of 300 m shall be 20 numbers and such irregularities shall be properly recorded in the register.

29.2 Longitudinal irregularity shall normally be measured along any line or lines parallel to the edge of the slab.

29.3 Transverse irregularity shall normally be measured along any line with the straight edge placed at right angles to the center line of the road.

30. If deemed necessary by the Engineer, any section of the slab which deviates from the specified levels and tolerance shall be demolished and reconstructed at the Contractor's expense.

31.. Ready mix concrete will be brought to the site from RMC plant only by transit mixers / Leak proof Dumpers / Trucks.

a) Every transit mixer / Leak proof Dumpers / Trucks will carry delivery challan, mentioning the minimum following details -

i) Name of Manufacturer and Depot.

ii) Serial No. of challan.

iii) Date

iv) Truck No.

v) Name of contractor to whom the RMC is being supplied.

vi) Location of contract work.

vii) Grade of concrete.

viii) Specified workability.

ix) Cement content and Grade of cement.

x) Time of loading

xi) Quantity of concrete.

b) A computerized print out showing details of ingredients or ready mix concrete including admixture viz. the actual weight of each ingredients,required weight of each ingredients as per mix design etc. shall invariably be obtained with each transit mixer carrying RMC on site. The computerized sheet shall be signed by the site in charge and contractor's representative and shall be preserved as a record on the site.

Section VI

Contract Data

1. The Employer is Commissioner , Corporation of Chennai The Engineer in Charge is Executive Engineer Zone

The name and identification number of the Contract is

Tender for **Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)**

Package- 1 - (118 Roads)

Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)

The adjudicator appointed jointly by the Employer and Contractor is (Name and Address of the Adjudicator).

The Works consist of Tender for **Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)**

Package- 1 - (118 Roads)

Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)

The Start Date shall be issue of notice to proceed the work

The Intended Completion Date for the whole of the Works shall be **six months** from the commencement of work

MILESTONE DATES

Sl. No.	Description of Work	Milestone I	Milestone II
		50% in 90 days	100 % work should be completed in 180 days

2. The Contractor shall submit a revised Program for the Works within Seven*]* days of delivery of the Letter of Acceptance.

3. The Site Possession Date shall be Zonal Office - Corporation of Chennai

4. The Site is located at *[location]* and is defined in drawings No: Nil *]*

5. The Defects Liability Period is Five years

6. The language of the Contract documents is *[language]*.English

The law that applies to the Contract is the law of *[law]*.

7. Appointing Authority for the Adjudicator: *[name of Authority]*.

8. Arbitration will take place in accordance with *[rules and regulations]*.

9. The Contract *"is"* subject to price adjustment in accordance with Clause 41 of the Conditions of Contract.

10. The liquidated damages for the whole of the Works are *0.1% of contract value* per day till it reaches the maximum value of 5% (five percentage) of the contract value of the work.

11. The Corporation of Chennai shall retain a sum equivalent to 5% of the value of the each bill as retention money from each payment due to the Contractor. Out of the 5% of the retention amount, on issue of completion certificate for the work 2.5% will be released to the Contractor, while the balance 2.5% will be retained during defect liability period (ie., 5 years). The retained 2.5% will be released by the Commissioner, Corporation of Chennai, after ensuring no liability in connection with work executed.

Section VII

General Technical Specifications

1. Earthwork

1.1 General

The excavation shall be carried out to correct lines and levels. This shall also include, where required, proper shoring to maintain excavations and also the furnishing, erecting and maintaining of substantial barricades around excavated areas and warning lamps at night. Rock excavated shall be stacked properly as approved by the Engineer-in-charge.

1.2 Clearing

The area to be excavated / filled shall be cleared of fences, trees, plants, logs, stumps, bush, vegetation, rubbish, slush, etc. and other objectionable matter. If any roots or stumps of trees are encountered during excavation, they shall also be removed. The material so removed shall be disposed off as approved by the Engineer-in-charge.

1.3 Excavation

Excavation for permanent work shall be taken out to such widths, lengths, depths and profiles as are shown on the approved drawings or such other lines and grades as may be agreed with the Engineer-in-charge Rough excavation shall be carried out to a depth of 150 mm above the final level. The balance shall be excavated with special care. Soft pockets shall be removed below the final level and extra excavation filled up with material as approved by the Engineer-in-charge. Should any excavation be taken below the specified elevations, the Contractor shall fill it up with concrete of the same class as in the foundation resting thereon, up to the required elevation at no cost to the department. Every precaution shall be taken to prevent slips. If slips occur, the slipped material shall be removed and the slope dressed to a modified stable slope.

1.4 Fill, Backfilling and Site Grading

1.4.1 General

All fill material shall be subject to the Engineer-in-charge's approval. If any material is rejected by Engineer-in-charge, the Contractor shall remove the same forthwith from the site. Surplus fill material shall be deposited /disposed off as directed by Engineer-in-charge after the fill work is completed.

No earth-fill shall commence until surface water discharges and streams have been properly intercepted or otherwise dealt with to the approval of the Engineer-in-charge.

1.4.2 Material

To the extent available, selected surplus soil from excavations shall be used as backfill. Backfill material shall be free from lumps, organic or other foreign material. All lumps of earth shall be broken or removed unless otherwise stated. Where excavated material is mostly rock, the boulders shall be broken into pieces not larger than 150 mm size, mixed with properly graded fine material consisting of murrum or earth to fill the voids and the mixture used for filling. If fill material is required to be imported, the Contractor shall make arrangements to bring such material from outside borrow pits. The material and source shall be subject to the prior approval of the Engineer-in-charge. The approved borrow pit areas shall be cleared of all bushes, roots of trees, plants, rubbish, etc. Top soil containing foreign material shall be removed. The materials so removed shall be disposed of as directed by Engineer-in-charge. The Contractor shall provide the necessary access roads to borrow areas and maintain the same if such roads do not exist.

1.4.3 Filling in pits and trenches around foundations of structures, walls, etc.

The spaces around the foundations, structures, pits, trenches, etc., shall be cleared of all debris, and filled with earth in layers not exceeding 15 cm, each layer being watered, rammed and properly consolidated to the satisfaction of Engineer-in-charge. Earth shall be rammed with approved mechanical compaction machines. Usually no manual compaction shall be allowed unless the Engineer-in-Charge is satisfied that in some cases manual compaction by tampers cannot be avoided. The final backfill surface shall be trimmed and leveled to a proper profile to the approval of the Engineer-in-charge.

The filling shall be done after the concrete or masonry is fully set and done in such a manner as not to cause undue thrust on any part of the structure.

1.4.4 Plinth Filling

Plinth filling shall be carried out with approved material such as soil, sand or murum as in layers not exceeding 15 cm watered and compacted with mechanical compaction machines. When filling reaches the finished level, the surface shall be flooded with water, unless otherwise directed, for at least 24 hours, allowed to dry and then the surface again compacted as specified above to avoid settlement at a later stage. The finished level of the filling shall be trimmed to the level/slope specified.

At some locations/ areas, it may not be possible to use rollers because of space restrictions, etc. The Contractor shall then be permitted to use pneumatic tampers, rammers, etc. and he shall ensure proper compaction.

1.4.5 Sand Filling in Plinth and Other Places

Where backfilling is required to be carried out with local sand it shall be clean, medium grained and free from impurities. The filled-in-sand shall be kept flooded with water for 24 hours to ensure maximum consolidation. The surface of the consolidated sand shall be dressed to required level or slope. Construction of floors or other structures on sand fill shall not be started until the Engineer-in-charge has inspected and approved the fill.

1.4.6 General Site Grading

Site grading shall be carried out as indicated in the approved drawings. Excavation shall be carried out as specified in the Department's Requirements. Filling and compaction shall be carried out as specified under relevant Clause and elsewhere unless otherwise indicated below.

If no compaction is called for, the fill may be deposited to the full height in one operation and leveled. If the fill has to be compacted, it shall be placed in layers not exceeding 150 mm and leveled uniformly and compacted as indicated in relevant Clause before the next layer is deposited.

To ensure that the fill has been compacted as specified, field and laboratory tests shall be carried out by the Contractor.

Field compaction tests shall be carried out in each layer of filling until the fill to the entire height has been completed. This shall hold good for embankments as well. The fill will be considered as incomplete if the desired compaction has not been obtained.

The Contractor shall protect the earth fill from being washed away by rain or damaged in any other way. If any slip occurs, the Contractor shall remove the affected material and make good the slip.

1.4.7 Fill Density

Unless otherwise specified the compaction, where so called for, shall comply with minimum 90% compaction by Standard Proctor at moisture content differing not more than 4% from the optimum moisture content. The Contractor shall demonstrate adequately by field and laboratory tests that the specified density has been obtained.

1.4.8 Timber Shoring

The provisions of relevant ISS shall apply.

2 Concrete

2.1 General

The Engineer-in-Charge shall have the right at all times to inspect all operations including the sources of materials, procurement, layout and storage of materials, the concrete batching and mixing equipment and the quality control system. Such an inspection shall be arranged and the *Engineer-in-Charge*'s approval obtained, prior to starting of concrete work. This shall, however, not relieve the Contractor of any of his responsibilities. All materials which do not conform to the Specifications shall be rejected.

Materials complying with codes/standards shall generally be used.

2.2 Materials

2.2.1 Cement

Unless otherwise called for by the Engineer-in-charge, cement shall be ordinary Portland cement conforming to IS: 2697, IS: 8112 or IS: 12269. Super Sulphated cement conforming to IS 6909 or super resistant Portland cement conforming to IS 12330 or Pozzolana Portland Cement conforming to IS 1489..

Sulphate resistant cement conforming to IS 12330 shall be used for all cement concrete works wherever necessary as directed by the Engineer-in-charge.

Only one type of cement shall be used in any one mix. The source of supply, type or brand of cement within the same structure or portion thereof shall not be changed without approval from the Engineer-In-Charge.

Cement which is not used within 90 days from its date of manufacture shall be tested at a laboratory approved by the Engineer-In-Charge and until the results of such tests are found satisfactory, it shall not be used in any work.

2.2.2 Aggregates (General)

It shall comply with requirement of IS 383 and as specified in IS 456-2000. Aggregates shall consist of naturally occurring stones (crushed or uncrushed), gravel and sand. They shall be chemically inert, strong, hard, clean, durable against weathering, of limited porosity, free from dust/slit/organic impurities/deleterious materials such as iron pyrites, cod, mica, slate, clay alkali, soft fragments, sea shells and conform to IS: 383. Aggregates such as slag, crushed over burnt bricks, bloated clay aggregates, sintered fly ash and tiles shall not be used.

Aggregates shall be washed and screened before use where necessary or if directed by the Engineer-in-Charge.

Aggregates containing reactive silica shall not be used.
Graded aggregate shall conform to I.S. specification.

2.2.3 Water

Water used for both mixing and curing shall conform to IS : 456-2000 and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials that may be deleterious to concrete or steel.

2.2.4 Reinforcement

Reinforcement shall be any of the following:

a) Mild Steel and medium tensile bars to IS 432 Part 1.

b) High strength deformed bars and wires to IS 1786.

c) Rolled steel Grade A made from structural steel to IS 2062.

All reinforcement shall be free from loose mill scales, loose rust and coats of paints, oil, mud or other coatings, which may destroy or reduce bond.

2.2.5 Admixtures

Admixtures may be used in concrete as per manufacturer's instructions only with the approval of the Engineer-in-Charge. Accelerating, retarding, water reducing and air entraining admixtures shall conform to IS : 9103 and integral water proofing admixtures to IS : 2645.

2.2.6 Samples and Tests

All materials used for the works shall be tested before use.

Sampling and testing shall be as per IS: 2386 under the supervision of the Engineer-in-Charge.

The Contractor shall furnish manufacturer's test certificates and technical literature for the admixture proposed to be used. If directed, the admixture shall be got tested at an approved laboratory at no extra cost.

2.3 Design Mix Concrete

For Design Mix Concrete, the mix shall be designed according to IS: 10262 and SP 23 to provide the grade of concrete having the required workability and characteristic strength not less than appropriate values given in IS: 456. The minimum cement content for Design Mix Concrete shall be as per IS: 456.

The minimum cement content stipulated above shall be adopted irrespective of whether the Contractor achieves the desired strength with less quantity of cement. It shall be the Contractor's sole responsibility to carry out the mix designs at his own cost. He shall furnish to the Engineer-in-Charge at least 30 days before concreting operations, a statement of proportions proposed to be used for the various concrete mixes and the strength results obtained. The strength requirements of the concrete mixes ascertained on 150 mm cubes as per IS: 516 shall comply with the requirements of IS: 456.

Grades lower than M20 shall not be used for reinforced concrete (general) grading lower than M25 shall not be used for reinforced concrete in liquid retaining structures.

b) Batching & Mixing of Concrete

Proportions of aggregates and cement, as decided by the concrete mix design, shall be by weight. These proportions shall be maintained during subsequent concrete batching by means of weigh batchers capable of controlling the weights within one percent of the desired value.

2.4 Nominal Mix Concrete

Mix Design & Testing

Mix Designing and preliminary tests are not necessary for Nominal Mix Concrete. However works tests shall be carried out as per IS: 456.

Mixing

Concrete shall be mixed in a mechanical mixer conforming to IS 1791. The mixing shall be continued until there is uniform distribution of materials and the mass is uniform in colour and consistency. If there is segregation after unloading, the concrete should be remixed.

2.5 Formwork

Formwork shall be all inclusive and shall consist of but not be limited to shores, bracings, sides of footings, walls, beams and columns, bottom of slabs etc. including ties, anchors, hangers, inserts, false work, wedges etc.

The design and engineering of the formwork as well as its construction shall the responsibility of the contractor; however, if so desired by the Engineer-in-Charge, the drawings and calculations for the design of the formwork shall be submitted to the Engineer-in-Charge for the approval.

Formwork shall be designed to fulfill the following requirements:

a) Sufficiently rigid and tight to prevent loss of grout or mortar from the concrete at all stages and appropriate to the methods of placing and compacting.

b) Made of suitable materials.

c) Capable of providing concrete of the correct shape and surface finish within the specified tolerance limits.

d) Capable of withstanding without deflection the worst combination of self weight, reinforcement and concrete weight, all loads and dynamic effects arising from construction and compacting activities, wind and weather forces.

e) Capable of easy striking out without shock, disturbance or damage to the concrete.

f) Soffit forms capable of imparting a camber if required

g) Soffit forms and supports capable of being left in position if required

h) Capable of being cleaned and/or coated if necessary immediately prior to casting the concrete; design temporary openings where necessary for these purposes and to facilitate and the preparation of construction joints.

The faces of formwork coming in contact with concrete shall be cleaned and two coats of approved mould oil applied before fixing reinforcement. Forms that have deteriorated shall not be used. Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes suitably plugged, joints repaired and warped lumber replaced to the satisfaction of the Engineer-in-Charge.

Wire ties passing through beams, columns and walls shall not be allowed. In their place bolts passing through sleeves shall be used. Formwork spacers left in-situ shall not impair the desired appearance or durability of the structure by causing spalling, rust staining or allowing the passage of moisture.

Formwork showing excessive distortion, during any stage of construction, shall be repositioned and strengthened. Placed concrete affected by faulty formwork, shall be entirely removed and formwork corrected prior to placement of new concrete at Contractor's cost.

2.6 Transporting, Placing and Compacting Concrete

Concrete shall be transported from the mixing plant to the formwork with minimum time lapse by methods that shall maintain the required workability and will prevent segregation, loss of any ingredients or ingress of foreign matter or water.

In all cases concrete shall be deposited as nearly as practicable directly in its final position to avoid re-handling. To avoid segregation, concrete shall not be re-handled or caused to flow. For locations where direct placement is not possible and in narrow forms and Contractor shall provide suitable drops and "Elephant Trunks". Concrete shall not be dropped from a height of more than 1.0 m. Care shall be taken to avoid displacement of reinforcement or formwork.

Concrete shall not be placed in flowing water. Under water, concrete shall be placed in position by tremies or by pipeline from the mixer and shall never be allowed to fall freely through the water.

While placing concrete the Contractor shall proceed as specified below and also ensure the following:

a) Continuously between construction joints and pre-determined abutments.

b) Without disturbance to forms or reinforcement

c) Without disturbance to pipes, ducts, fixings and the like to be cast in; ensure that such items are securely fixed. Ensure that concrete cannot enter open ends of pipes and conduits etc.

d) Without dropping in a manner that could cause segregation or shock.

e) In deep pours only when the concrete and formwork designed for this purpose and by using suitable chutes or pipes.

f) Do not place if the workability is such that full compaction cannot be achieved

g) Without disturbing the unsupported sides of excavations; prevent contamination of concrete with earth. Provide sheeting if necessary in supported excavations, withdraw the linings progressively as concrete is placed.

h) If placed directly onto hardcore or any other porous material, dampen the surface to reduce loss of water from the concrete.

i) Ensure that there is no damage or displacement to sheet membranes.

j) Record the time and location of placing structural concrete.

Concrete shall normally be compacted in its final position within thirty minutes of leaving the mixer. Concrete shall be compacted during placing with approved vibrating equipment without causing segregation until it forms a solid mass free from voids thoroughly worked around reinforcement and embedded fixtures and into all corners of the formwork. When placing concrete in layers advancing horizontally, care shall be taken to ensure adequate vibration, blending and melding of the concrete between successive layers.

2.7 Curing

Curing and protection shall start immediately after the compaction of the concrete to protect it from

1. Premature drying out, particularly by solar radiation and wind;
2. leaching out by rain and flowing water;
3. high internal thermal gradient;
4. vibration and impact which may disrupt the concrete and interfere with its bond to the reinforcement
5. After the concrete has begun to harden i.e. 1 to 2 hr. after laying curing shall be started.
6. All concrete, unless approved otherwise by the Engineer-in-Charge, shall be cured by use of continuous sprays or ponded water or continuously saturated coverings of sacking, canvas, or other absorbent material for the period of complete hydration with a minimum of 7 days. The quality of curing water shall be the same as that used for mixing.
7. Where a curing membrane is approved to be used by the Engineer-in-Charge, the same shall of a non-wax base and shall not impair the concrete finish in any manner. The curing compound to be used shall be approved by the Engineer-in-Charge before use and shall be applied with spraying equipment capable of a smooth, even textured coat.
8. When concrete is used as sub-grade for flooring, the flooring may be commenced before the curing period of sub-grade is over, but curing of sub-grade shall be continued along with the top layer of flooring for a minimum period of 7 days.
9. Curing may also be done by covering the surface with an impermeable material such as polyethylene, which shall be well sealed and fastened.

2.8 Construction Joints and Keys

The position and arrangement of construction joints shall be as indicated by the contractor in his working drawings duly approved by the department. Concrete shall be placed without interruption until completion of work between construction joints. If stopping of concreting becomes unavoidable anywhere, a properly formed construction joint shall be made with the approval of the Engineer-in-Charge.

2.9 Repair and Replacement of Unsatisfactory Concrete

Immediately after the shuttering is removed, all defective areas such as honey-combed surfaces, rough patches, holes left by form bolts etc, shall be inspected by the Engineer-in-Charge who may permit patching of the defective areas or reject the concrete work.

All through holes for shuttering shall be filled for full depth and neatly plugged flush with surface.

Rejected concrete shall be removed and replaced by the Contractor at no additional cost to the Employer.

For patching of defective areas all loose materials shall be removed and the surface shall be prepared as approved by the Engineer-in-Charge.

The decision of the Engineer-in-Charge as to the method of repairs to be adopted shall be final and binding on the Contractor.

2.10 Hot Weather Requirements

Concreting during hot weather shall be carried out as per IS 7861 (Part I).

Adequate provision shall be made to lower concrete temperatures which shall not exceed 40 deg C at time of placement of fresh concrete.

For major and large scale concreting works the temperature of concrete at times of mixing and placing, the thermal conductivity of the formwork and its insulation and stripping period shall be closely monitored.

3 Structural Steel Work

3.1 Fabrication

3.1.1 General

As much fabrication work as is reasonably practicable work shall be completed in shops, where steel work is fabricated.

All workmanship and finish shall be of the best quality and shall conform to the best approved method of fabrication. All materials shall be finished straight and shall be machined/ground smooth true and square where so specified. All holes and edges shall be free of burrs. Shearing and chipping shall be neatly and accurately done and all portions of work exposed to view shall be neatly finished. Tolerances for fabrication of steel structures conform IS 7215. Tolerances for erection of steel structures shall conform to IS 12843.

3.1.2 Welding

Welding shall be in accordance with IS 816, IS 819, IS 1024, IS 1261, IS 1323 and IS 9595 as appropriate.

3.2 Site Erection

3.2.1 Plant and Equipment

The suitability and capacity of all plant and equipment used for erection shall be to the satisfaction of the EIC.

3.2.2 Storing and Handling

All structural steel should be so stored and handled at the site that the members are not subject to excessive stresses and damage.

3.2.3 Setting Out

The positioning and leveling of all steelwork, the plumbing of stanchions and the placing of every part of the structure with accuracy shall be in accordance with approved drawings and to the satisfaction of EIC.

3.2.4 Security during Erection

Safety precaution during erection shall conform to IS 7205:1974. During erection, the steel work shall be securely bolted or otherwise fastened and, when necessary, temporarily braced to provide for all

load to be carried by the structure during erection including those due to erection equipment and its operation.

No riveting, permanent bolting or welding should be done until proper alignment has been obtained.

3.2.5 Field Connections

All field assembly by bolts, rivets and welding shall be executed in accordance with the requirements of shop fabrication excepting such as manifestly apply to shop conditions only. Where the steel has been delivered painted, the paint shall be removed before field welding, for a distance of 50 mm at least on either side of the joint.

3.3 Painting

All fabricated steel material, except those galvanised shall receive protective paint coating as prescribed in IS 1477 Parts 1 & 2.

Parts to be encased on concrete shall not be painted or oiled.

Section VIII

SCHEDULE - A
SCHEDULE OF RATES AND APPROXIMATE QUANTITIES

(a) The quantities given here are those upon which the lump-sum tender cost of the work is based but they are subject to alternations, omissions, deductions or additions as provided for in the conditions of this contract and do not necessarily show the actual quantities of work to be done. The unit rates noted below are those governing payment for extras or deductions or omissions according to the conditions of the contract, as set forth in the Preliminary Specification of the S.S.R.B/T.N.B.P. and other conditions or specifications of the contract.

(b) It is to be expressly understood that the measured work is to be taken net (not withstanding any custom or practice to the contrary) according to the actual quantities when in place and finished according to the drawings or as may be ordered from time to time by the ---------- and the cost calculated by measurement or weight at the respective prices, without any additional charge for any necessary or contingent works connected therewith. The rates quoted are for works IN SITU and complete in every respect.

Item No.	Probable quantity		Description of work	S.S.R.B/ T.N.B.P/ MoSRTH No.	Rate			Unit in words	Amount	
	Figures	Unit			Words	Figures			Figures	
			Separate sheets enclosed			Rs.	P.		Rs.	P.

Date …….. Signature of the Bidder

Note – The Second Sub-division of this column (ie. column 3) is for entering description in words such as number, cubic meter, kg etc.

SCHEDULE - B
LIST OF DRAWINGS

LIST OF DRAWINGS Note – All drawings to be signed by the Contractor as well as the Officer entering into the contract			SUPPLIMENTARY LIST As referred in the specifications (including the Preliminary Specifications of the T.N.B.P / S.S.R.B)			
Sl. No.	Drawing Number	Description	Sl. No.	Drawing Number	Description	Date on which the drawing was supplied

Date ……

Signature of the Bidder

FORM OF BID SECURITY (BANK GUARANTEE)

WHEREAS, …… (Name of Bidder) (hereinafter called "the Bidder") has submitted his bid dated …….. (Date) for the {Name of Work) ……(hereinafter called "the Bid").

KNOW ALL MEN by these presents that We ……. (Name of Bank) of …….. (Name of Country) having our registered office at ……. (hereinafter called "the Bank") are bound unto ……. (Name of Employer) (hereinafter called "the Employer") in the sum of …….. for which payment well and truly to be made to the said Employer the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this …….. day of …..…….. 20…….

THE CONDITIONS of this obligation are :

(1) If the Bidder withdraws his Bid during the period of bid validity specified in the Form of Bid: or

(2) If the Bidder does not accept the correction of arithmetical errors of his bid price in accordance with the instruction to Bidders: or

(3) If the Bidder having been notified of the acceptance of his Bid by the Employer during the period of bid validity :

a. Fails or refuses to execute the Form of Agreement in accordance with the instructions to Bidders, if required : or

b. Fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders; or

c. Fails or refuses to furnish the Domestic Preference Security, where required.

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of all of one or more of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date of 162 days after the deadline for submission of bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE…… SIGNATURE OF THE BANK……

SEAL OF THE BANK……

SIGNATURE OF THE WITNESS……..

Name and address of the witness

Directions to the Tenderers for Cement Concrete Roadworks

1. The Concrete road works are of special nature and are required to be carried out with high degree of supervision quality and construction techniques. the tenderers are therefore required to go through all the tender documents including special conditions / directions before filling of the tender. In the event of any contradiction between these special conditions / directions and general specifications for road works and general conditions of contracts of civil works, these special conditions / directions shall supersede corresponding provisions elsewhere and shall prevail.

2. The contractors / their engineers shall carefully go through the various relevant specifications / tests standards / apparatus standards which are summarized in the accompanying appendix-I for guidance. It will be the responsibility of the contractors to execute the quality work in accordance with a specification of MORTH, IS, IRC, SSRB and issued by the Engineer specifications_ The contractor shall use RMC and all ingredients shall confirm to the relevant IS codes, RMC supplied shall confirm to the standards specified in IS-456-2000 version IS- 4926-1976

3. In addition to the qualities of strength and durability greater attention will need to be devoted to the qualities of the payment surface, which directly affect the user perceptions, comfort and safety_ In this connection, the wear resistance, surface evenness (riding quality) and skid resistance, as well as freedom of the surface from structural or other quality blemishes (example Cracks, Joint and edge spalls, surface pitting / Popouts, scaling / Potholes, etc.,) will need additional attention.

4. Weigh-batching is being introduced on a compulsory basis, for the manufacture of pavement concrete with control on water content, with a objectives of controlling variations in mix proportions and water cement ratio.

5. The contractors will have the full responsibility for quality control and delivering requisitic quality in the field.

6. Contractor shall employ minimum one Senior qualified concrete Engineer on each site in addition to atleast one Junior Engineer, they will additionally employ adequate number of trained supervisors and skilled labours. Contractor's Engineers should be experienced and will be conversant with the concrete mix design procedure and should be thoroughly acquainted with the construction of concrete roads. Contractors not employing such qualified engineers shall not be allowed to commence with the work and the days lost on this account shall be counted as working days. The qualified engineers shall be available on site throughout the period of execution of the work.

7.MATERIALS

Corporation of Chennai will not supply cement to contractors. They shall have to purchase cement from open market that is manufactured by reputed cement companies. It is proposed to use ordinary Portland cement of43-53 grade, confirmingto IS : 269. Cement shall have to be got tested at Municipal Laboratory or at the Highways Research Station (HRS), Guindy or at the Laboratory approved by Engineer at contractor's cost before its, use, for each batch of 1500 bags. In case, the cement test results are not available before its use, the concreting work may be permitted after carrying out compressive, strength test for 3 days at the site laboratory and the C.C. Cube test results for 3 days should comfirm to the proportionate strength, however, cement test results will have to be obtained by the contractors from the laboratories as approved by Engineer before proceeding with the work further.

8. Only ordinary Portland cement of 43 or 53 Grade will be used. Contractor shall provide two independent cement godowns with a capacity of 1500 cement bags each, under' double lock. system with one lock with the contractor and other will a staff of Corporation of Chennai. Cement from locked godowns will be released only after getting satisfactory test results as per clause 7 above. At least one godown must always be full of 1500 cement bags. For a particular slab, same brand cement should be used.

8.1Admixtures: Admixtures confirming to IS : 6925 and IS 9103 will be used to improve workability of the concrete or extension of setting time on satisfactory evidence that they will not have any adverse effect on the properties of concrete with respect to strength, volume change, durability and have no deleterious effect on steel bars. Satisfactory performance of the admixture shall be proved both on the laboratory concrete trial mixed and in trial paving work.

9 - Water

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

9.2 Water used for mixing and curing of concrete shall be clean and free from injurious amount of oil, salt, acid, vegetable matter and other substances harmful to the concrete. It shall meet the requirements stipulated in I.S.456. The water brought for concreting and curing etc. Shall be got tested from Metro Water testing lab (situated at Kilpauk Water works) or any other laboratories as approved by Engineer such as King Institute, I.I T to verify whether it ts suitable for above purpose, whenever directed. This testing will be done at contractor's cost.

9.3 Contractors will have to make their own arrangement of water for drinking purpose. The contractor has to pay the water bill separately as raised by Metro Water.

10. Sand shall be of approved quality with fineness modulus between 2.4 to 3.5 as per approved mix design The sand will have to be screened and washed to reduce the silt contents below 8% by volume after one hour and to bring it within the permissible range of fineness modulus. Blending of sand of fine and coarse quality may be permitted to achieve the required FM if it is found necessary to give desired results. In case, stone dust is required to be added for mixing with the sand, for bringing the admixture within the desired range of fineness modulus, such stone dust shall be of approved quality with fines passing through 75 micron sieve limited to 15% or less. In case percentage offines in stone dust is found to be more than 15% prescribed under I.S.Code 383 of 1970, the same to be washed and cleaned so as to bring it within the permissible range. The fine aggregates will be tested and retested as directed by the engineer till they satisfy the required norms as per ISI and as specified above.

11. If coarse aggregates are found having white spot the same shall be got tested from approved testing laboratory to eliminate possibility of potential aggregate - alkali reactivity, before accepting or using spotted aggregates.

12.The contractor should make the necessary arrangement to stack the aggregates separately so that they do not get mixed up with each other and / or with the foreign materials, and do not get segregated. the screening of the aggregates shall be done if found necessary, as directed by the engineer

13. The contractors shall have to bring *M.S.I* Tor Steel and structural steel required for this work. M. *S.I* Tor steel and structural steel shal conform to the relevant latest Indian Standard Specifications The Steel brought on site shall be got tested at Municipal or any other approved laboratory at the contractor's cost, before using on site.

TESTING

14. To determine the 'K' value, it is necessary to take a plate load test within the scope of the work. The test will be taken by Highways Research Station (HRS) at Guindy, however, contractor shall arrange

at his cost for excavation loading and refilling. No payment will be made for this word however, if the refilling of the trench is required to be carried out in C.C. as directed by the engineer, then the payment will be made as admissible as per the rates quoted in the tender for the relevant item.

For conversion of K-value to CBR value the values of CBR/K values shall be adopted from *IRC/58* of 1988, as detailed below:

Approximate 'K'Value corresponding to CBR value for homogeneous soil standards									
CBR Value (%)	2	3	4	5	7	10	20	50	100
K-Value (Kg/cm3)	2.08	2.77	3.46	4.16	4.84	5.54	6.92	13.85	2.2

The recommendations of IRC: 15-1981 shall be followed and a K-value of less than 5.5kg/cm3 tested on the subgrade shall not be permitted In case, a large number of tests are required, either in view of low K-value obtained, or in view of heterogeneity / variability of subgrade, additional field soaked CBR tests may be conducted, using the above table for assessing the K-value. The final checking will, however, be based on plate bearing test.

15 Contractors shall set up a laboratory at site before commencement of work at their cost for performing various tests and at least the following machines and equipment's shall be provided therein.

a. Compressive strength testing machine (for cube tests) of 130 tonne capacity

b.Set of sieves required for finding fineness modulus of sand and also for aggregate grading

c Laboratory weighing balance of minimum 1Okg capacity

d Aggregate drying equipment. (Electrical oven or the spirit methods)

e Equipment for testing of silt content in sand

f Thermometers calibrated upto 200 degree C for checking asphalt / bitumen temperature

g Sieve shaker (electrically operated)

h. Cuddappah stone platform of size 2.5 m x 0.9 m approx.

i Electrically operated weighing machines of 60 kg to 150 kg

j V. B. Apparatus for workability

k Other machines as may be directed by engineer of Corporation of Chennai

All the test records shall be meticulously maintained in the site laboratory and made available as and when requjred.

16.1.1. Even though, it is the obligatory duty of the contractors to have an well equipped laboratory at site and carry out the necessary tests in this laboratory, they shall submit atleast, once In two weeks, additional 3 cubes of M40 cement concrete work for testing at the Municipal Laboratory for 28 days strength. The contractors shall send to the municipal laboratory once in a month, 6 flexural beams along with the corresponding 6 c.c. cubes for testing flexural as well as compressive strength The contractors should arrange to send the cubes to the laboratory within four days from the date of casting of the cubes for seven days test, failing which these will be got conveyed by the Engineer in charge and the cost will be recovered from the contractor's bill.

The charges for the testing of cubes and beams shall be as

under Cubes Rs.30/- per cube

Beams *Rs.50/-* per beam

The cubes shall also be tested for 7 days, 14 days and 28 days strength at the contractor's laboratory in the presence of Asst. Exe Engineer incharge of the work. Whenever the material cubes and beams are required to be sent to the Municipal laboratory, the same shall be transported to the Municipal laboratory by the contractors at their cost. However, the contractors shall cast, 9 cement concrete cubes during concreting of each slab to be cast inM 40 and test the cubes at site laboratory in accordance with I.S.516 for 7 days, 14 days and 28days strength. The acceptance criteria for the test results shall be accordance with I. S. 456.

The average compressive and flexural strength of each consecutive group of 6 cubes and 6 beams shall be calculated. The compressive strength of cubes shall not be less than 40 Mpa at 28 days and flexural strength of beams shall not be less tha 5 Mpa at 28 days.

16.2 While designing the mix in the laboratory, correlation between flexural and compressive strengths of concrete shall be established on the basis of tests on samples for any adjustment in design. However, quality control in the field may be exercised on the basis of compressive strength. It may, however, be ensured that in such case, the materials and mix proportions remain unaltered. The water content shall be the minimum required to provide the agreed workability for full compaction of the concrete to the required density. The maximum water cement ratio approved by the Engineer is to be adopted.

16.3 Atleast three cube specimens, one each for 7 days, 14 days and 28 days strength testing shall be cast for every 50 Cu m. or part thereof of concrete placed construction. On each day's work, not less than nine cubes shall be cast and the same shall be tested in presence of the Asst. Exe. Engineer in accordance with the testing procedure.

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

16.5 If during the construction the value of7 days test results falls below the reqUired 7 days strength as per the design mix then the cement content of the concrete shall, without extra payment be increased by 5%. The increased cement content shall be maintained at least until the 28 days strength have been assessed for its conformity with the requirements. Whenever the cement content is increased, the concrete mix shall be readjusted to maintain the required workability.

16.6 Incase the cube test for 28 days period fails, cores shall be taken from the concrete slab and will be tested at contractor's cost. The core will be 100 mm dia, if it fails, action as contemplated under clause no.17. 7 shall be taken.

17.1 The density of the compacted concrete shall be such that the total air voids are not more than 3%. The air voids shall be derived from the difference between the theoretical maximum dry density of the concrete calculated from the specific gravities of the constituents of the mix. The average value of two samples shall be considered of cores of at least 100 mm diameter. If the average of any two consecutive measurements of density of cores is below the minimum required, the extent of defective concrete shall be determined by additional cores or other means approved by the Engineer and the concrete shall be removed and replaced with new materials in accordance with the specification.

17.2 All cores. taken for density measurements shall also be checked for thickness. in case of doubt, additional cores may be ordered by the Engineer and taken at locations decided by him to check the depth or density of concrete slab without any compensation being paid for the same. Thickness of the slab at any point checked as mentioned above shall be within a tolerance of as per specification. Quality concrete test for concrete road specification of MORTH of the specified thickness as per drawing. The cost of core samples to be taken and their testing shall be borne by the contractors. The test samples shall be taken by the agencies approved by Engineer.

17.3 In calculating the density, allowance shall be made for any steel in cores. Cores shall be reinstated with compacted concrete with mix proportions of 1 part of portland cement 2 parts of fine aggregate 2 parts of 10 mm, nominal size single sized coarse aggregate by weight or as directed by the engineer at the contractor cost, in case the cores are taken from the road already opened to traffic, the mix / material adopted for filling shall be such as will develop the requisite strength in a minimum of time.

17.4 At each site of work, minimum 3 cores shall be taken for testing.

17.5 Core density test shall be carried out in accordance with relevant I.S codes. For testing of cores for strength, refer Para 17.6.

17.6 The results of crushing strength tests on these cores shall not be less than 0.8 times the corresponding cube crushing strength requirement, where the height to diameter ratio of the core is two. Where height to diameter ratio is varied then the necessary corrections would be made in calculating the crushing strength of cores in the following manner

The crushing strength of cylinders with height to diameter ratios between 1 and 2 may be corrected to correspond to the standard cylinder of height to diameter ratio of 2 by multiplying with the correction factor obtained from the following equation.

f = 0.11 n + 0.78

Where f = Correction factor and

n = height of diameter ratio

The corrected test results shall be analysed for conformity with the specification requirements for cube samples. Where the core tests are satisfactory, they shall have precedence for assessing concrete quality over the results of moulded specimens. The diameter of cores shall not be less than 10m m.

17 7 If the tests on cores of the concrete is not satisfying the strength requirements, then the payment for the slab shall be withheld upto 5 years. Slab under reference shall be kept under observation during this period and if defects are noted, then further course of action as deemed fit including replacement of the slab will be taken as decided by commissioner and whose decision will be final. In such cases, the decision of the commissioner regarding release of payment, fully or partly, on such slabs, will be binding on the Contractor.

PRE-CONCRETE CONSTRUCTION PHASE

18 Pert / Bar chart shall be furnished while submitting the tender. If it is not done, the tender may be rejected. Contractors should note that the work is carried out in three or more phases depending upon the traffic diversion problems and they should visit the work site to examine the site conditions before tendering.

19 The contractors should make such arrangements that minimum 40 slabs admeasuring about 4.5 m x 4.5 m are cast per month. However, it should be seen that the adjacent slab should not be cast before 48 hours gap. These should be considered while preparing PERT/BAR Chart.

If the contractors excavate certain portion of the road and fail to concrete the same within the stipulated time limit, as per the programme they will be required to reinstate this excavated road portion With bituminous layers as specified and directed by the engineer. No payment will be made for such restoration.

20 The contractors should note that the work be required to be carried out in phase as permitted by the Traffic Police Dept., The contractors will have to obtain permission from the Traffic Police Dept. well in advance for closing down the road or part thereof for the execution of the work. The work will have to be carried out in stages depending upon the permission granted by the Traffic Police for closure of the road or part thereof. The contractors should therefore take this into account while quoting.

21 The contractors should also note they will have to modify if required the detailed programme submitted in the form of BAR Chart or PERT/CPM, Considering the permission obtained from Traffic Police before actual starting of the work at site so as to complete the same in the stipulated contract period.

22 Mix-design to give the specified strength as required in accordance with the relevant IRC/IS specifications shall be prepared. The same shall be obtained from IIT Madras or highways research station, Guindy by the contractors and checked by the Engineer, whenever the contractor brings fresh lot of aggregate at site, the same shalt be got checked. For this purpose, gradation analysis of coarse and fine aggregate shall be performed. The necessary correction shall be made in the mix design accordingly.

23 The mix design shall conform to one of the methods specified in IS 10262 or IRC 44; preferably the mix design should be done as per details given in IRC-44 of 1976. "Tentative guidelines for cement concrete mix design".

24 Before actual starting of M40 concreting work, the sand shall be checked for bulkage and moisture content Accordingly, quantity of water and sand shall be adjusted.

25 Minimum cement content shall be 350 kg / cum and maximum cement content shall be 450 K.G. / CU.m Each cement bag shall contain not less than 50 kg and the cement bags to be used, shall be weighed (not on the standard bag basis) while mixing No claim for excess cement used shall be entertained. If this minimum cement content is not sufficient to produce in the field, the concrete of the strength specified in the drawing / design. it should be increased as necessary without additional compensation under the contract.

26 The water bound macadam base should be adequately watered on the previous day and .also two hours before starting lean concreting work so as to keep it in moist condition before starting the lean concreting work.

27 Double bulkheads for keeping the dowel bars in the proper alignment shall be provided as per drawing, and as directed by the Engineer. Tie bars should be aligned exactly perpendicular to finished concrete surface of the slab by means of suitable device as approved by the Engineer.

28 Dowel bars shall be deformed steel rounds in accordance with details/dimension as indicated in the drawings and free from oil dirt, loose rust or scale. They shall be straight, free of irregularities and the sliding ends sawn or cropped clearly with no protrusions outside the normal diameters of the bar. The dowel bars shall be supported on double bUlkhead or chairs in prefabricated joint assembly position as approved by the Engineer prior to the construction of the 'slabs.

29 Unless shown otherwise on the drawing, dowel bars shall be positioned at the mix depth of the slab within the tolerance of +/- 20mm centered equally about intended lines of the joints within tolerance of +/- 25 mm. They shall be aligned parallel to the finished surface of the slab to the centerline of the carriageway and to each other within the following tolerance.

For the bars supported on bulkhead prior to the laying of the slab.

a All the bars in a joint shall be within +/-45 mm per 300 length of the bar

b 2/3rd of the bars shall be within +/-3 per 300 mm length of the bar

c No bar shall differ in alignment from the adjoining bar by more than 3 mm per 300 mm length of the bar in either horizontal or vertical plane.

d The dowel bars shall be covered by a sheath of high density polythene pipes of approved quality for half the length plus 50 mm for expansion joints. The sheath shat be tough, durable and of an average thickness, not greater than 125 mm. The end portion of the sheath shall be plugged with tin cap fitting properly tight having length of *100* mm.

30 All excavations, trenches obstructions, materials etc. taken kept or deposited in connection with the work should be sufficiently barricaded and lighted at night as directed by the Engineer to prevent against any damage or danger to the traffic. The contractors shall take all precautions to keep all the blinkers working throughout the night for the guidance of the traffic in the following manner. No extra payment will be made for the barricading as well as blinkers the contractors should take this in account while quoting for the tender.

i. All blinkers shall be red in colour

ii. At least two blinkers shall be provided across the direction of the traffic

iii. The contractors to take any other measures as may be directed by the engineer from time to time for the safety of the traffic as well as concreted slab etc.

In the event of contractors not complying with the provisions of this clause, the engineer may without notice to the contractors put up the barricade or improve upon the same or Improve up the lighting or adopt such other measure as he may deem necessary and all the cost of such procedure as may be adopted by the engineering shall be borne by the contractors. In addition, they shall be charged a penalty of Rs.200/- per day till compliance of these requirements.

31. All the trenches will be refilled as specified in the tender.

CONCRETE BATCHING, MIXING, LAYING AND COMPACTION

32. The laying of M 10 concrete in pavement will Have to be carried out with proper form work only. It shall be properly mixed with mechanical mixer compacted with vibrators and shall have smooth surface. It should have proper cross profile. The work will have to be carried out as directed by Engineer on site. Curing shall be done for 7 days or till the lean concrete is covered by M 40 cc slab, whichever is earlier, but not earlier than 48 hours.

33 Weigh batching machine as specified in the list of machinery shall be used for batching, mixing and preparing the mix for every slab in M40. it shall be portable weight mixer of minimum 400 liters capacity and preparation of mix on volume basis will not be permitted unless and otherwise specific written order of Engineer are obtained in special circumstances in advance.

34 For the desired workability the concrete mix of M 40 will have a slump not more than 25mm without any admixture except Ready Mix Concrete (RMC)

35.1 All grades of concrete shall be vibrated suitably as directed and no extra payment will be made for the use of various types of vibrators.

35.2 M 40 cement concrete slab shall be laid in two layers and each layer shall be compacted with needle vibrators, plate vibrator and screed vibrator.

35.3 To achieve the proper consolidation of the concrete slab, the top layer of the concrete shall be compacted by needle vibrator and plate vibrator in addition to screed vibrator If any depressions are observed on the surface of the concrete, fresh concrete is spread on the top, surcharged and got compacted with batten. Screed vibrator is again to be used for compaction as well as levelling.

35.4 The water cement ratio shall be strictly adhered to, as per the approved mix design and should be adjusted according to temperature variation during the day of casting of the slab, if found necessary. Care shall be taken to prevent the over vibration and appearance of water llaitance on top surface other slab. If any excess water is noticed on the surface of the slab, the same shall be removed by moving Hessian cloth on to surface and the concrete mix shall be immediately rectified as directed.

36 Plate vibrators shall be used for compaction of concrete mix in addition to needly and screed vibrator and as such contractors must have two numbers of each machine such as mixer, plate vibrator, needle vibrator, screed vibrator in working condition and an extra one of each as standby, for each site of work in moving condition.

37 The distance as well as time *lag* between bottom concrete layers and top layers during concreting operation shall not exceed 2.5 meters or 20 minutes whichever is lesser.

38 Whenever the needle vibrator is used, the mason must follow with a towel and punch to the portions of concrete from where the needle vibrator is withdrawn to ensure that no hollow portion remains in the stiff mass of concrete. Plate vibrating shall also follow thereafter immediately.

39 Concrete pavement must be in proper cross profile as per camber prescribed by the Engineer

40.1 After the final regulation of the surface of the slab surface of concrete slab shall be brush-textured in a direction at right angles to the longitudinal axis of the carriageway.

40.2 The brushed surface texture shall be applied evenly across the slab in one direction by the use of a wire brush not less than 450 mm wide. The brush shall be made of 32-guage tape wires grouped together in tufts spaced at 10mm. Centers. The tufts shall contain an average of 14 wires and initially be 100 mm long. The brush shall have two rows of tufts. The rows shall be 20 mm, apart and the tufts in one row shall be opposite the centre of the gap between tufts in the other row. The brush shall be replaced when the shortest tufts wears down to 90 mm long.

The texture depth shall be determined by the sand patch test as described in clause 40.4. The test shall be taken at least once in a week or whenever the Engineer considers it necessary, at times after construction. 10 individual measurements of the texture depth shall be taken at least 2 mtr. Apart any where along the diagonal line across a lane width between points 50m apart. No measurements shall be taken within 30 mm of the longitudinal edges of the concrete slabs. The texture depth shall not be less than minimum required as per the table below, nor greater than a maximum average of 1.5 mm.

Sl. No.	Time of tests	Minimum texture depth required
1.	Between 24 hrs and 7 days after the construction of the slab	o 75 mm for an average of 10 measurements with no single measurement less than 0.65 mm
2.	Not later than 6 weeks before the before the road is open to public traffic	0.65 mm for an average of 10 measurements with no singal measurement less than 0.60mm

40.3 After the application of the brushed texture, the surface of the slab shall have a uniform appearance.

40.4 Where the texture depth requirements are found to be deficient, the Contractor shall, make good the texture across the full lane width over length directed by the Engineer, by

RETEXTURING THE HARDENED CONCRETE SURFACE IN AN APPROVED MANNER.

40.6.1 The following apparatus shall be used,

1 A cylinder container of 25 ml internal capacity
2 A flat wooden disc of 64mm diameter with a hard rubber disc, 1,5 mm thick, struck to one face, the revenue face being provided with a handle,
2 Dry natural sand with a rounded particle shape passing a 300-micron IS sieve and retained one a 150 micron IS sieve.

40.6.2 Method - The surface to be measured, shall be dried, any extraneous mortar and loose material removed and the surface swept clear using a wire brush both at right angles and parallel to the carriageway. The cylindrical container shall be filled with the sand tapping the base 3 times on the surface to ensure compaction, and striking off sand level with the top of the cylinder. The sand shall be poured into a heap on the surface to be treated. The sand shall be spread over the surface, working the disc with its face kept flat in a circular motion so that the sand is spread into a circular patch with the surface depressions filled with sand to the level of the peacks

40.6.3 The diameter of the patch shall be measured to the nearest 5mm. The texture depth of concrete surface shall be calculated from 31000/ (D&D) mm where D is the diameter of the patch in mm.

41. It will be the responsibility of the contractor to give the required finish of riding surface, by checking with the straight edge and wedge guage and any deficiency observed, shall be rectified as specified in the general specifications.

42. Curing of concrete shall be done as directed for a minimum period of 14 days from the date of casting cc slab.

43 The vertical sides of concrete are required to be tarred with hot bitumen of *80/100* grade before casting of the adjoining relevant bay.

44 The contractors shall have to cast runner beam, manholes, water tables etc. within 3 days from the date of casing of adjacent slab.

45 The cement concrete slab pavement in M40 is required to b~ carried out strictly as per the drawing, as regards thickness no claims on account of additional thickness other than that specified, if provided, will be entertained.

46. Casting of slab shall be closed at 6.30 PM or sunset whichever is earlier every day unless it is allowed by Engineer under special circumstances with proper adequate lighting arrangement

POST – CONCRETE CONSTRUCTION PHASES

47, The joints shall be cut to the specified depth within 48 hours from the casting of CC slab/bay as directed, failing which these will be got done at the contractor's cost and penalty will be livied as directed by Engineer, including withholding the full payment of entire slab for 5 years. The decision of Engineer shall be final and binding on the contractors.

48 The machine cut joints and expansion Joints must be cleaned first by using Raking tool and then air blown with compressor, so as to remove dust, sand particulars and foreign matter from the joints before filling them with hot 10/20 grade pavement grade bitumen after applying primer with pouring pot.

49 No separate payment for restoring battas before and after cutting of joints or damaged on any account shall be made. Such battas shall be restored immediately by the contractor.

50 The joints cut and cleaned should be got certified from the engineer before filing with 10/20-grade bitumen per as the specifications for sealing of joints in rigid pavements. The filled over bitumen Will be removed immediately The road thereafter shall be opened to traffic.

1.1 The regularity of the surface of the slab shall comply with the requirement of this clause.

1.2 Compliance with the requirements of this clause for surface regularity shall be measured using an approved 3m. Long straight edge and wedge in such a way as to reveal any and all irregularities. The maximum permitted number of surface irregularity of 5mm and *Imm* in a length of 300 m shall be zones.

1.3 Longitudinal regularity shall normally be measured along any lime or lines parallel to the edge of the slab.

1.4 Transverse regularity shall normally be measures along any line With the straight edge places at right angles to the centerline of the road

51 If deemed necessary by the Engineer, any section of the slab, which deViates from the specified levels and tolerance, shall be demolished and reconstructed at the Contractor's expenses.

BITUMINOUS ROAD WORKS

52 The prevailing bituminous roads specifications as per MORTH, IRC, IS, SSRB and circular prepared by Engineer from time to time, shall hold good for the flexible pavement portion of this tender.

53 The contractors shall note that in case of the failure of test samples, on receipt of test reports of the samples sent to the laboratory, the corresponding work to which such substandard results pertain, shall stand rejected provisionally and payment if any, made before shall be recovered from the contractor's bill. Acceptance of such work, with or without rectification, full/part release of the payment, shall be referred to the Engineer whose decision shall be final and binding on the contractors.

MAINTENANCE

54 There shall be a defect liability for 5 years period (60 months) for CC pavement. If during this period concrete road fails due to (1) development of cracks (2) spelling of edges (3) erosion of concrete surface etc. the action as decided by the Engineers shall be taken against the contractors. In case of development of structural cracks/full depth cracks, the panal between the contraction joints shall be replaced. In case of replaced slab, a defect liability of such works The decision of the Engineer will be final and binding on the contractor. The rectification of defects shall be carried out as directed by Engineer. During this period dressing of joints complete in all respect shall have to be done free of cost at lease once in a year, preferably in the month of April or May or as directed by the Engineer, under Municipal supervision.

GENERAL

55 The tenders shall submit a list of equipment, machinery possessed by them, which are required for execution of the works

56 The contractor when called upon will take up the additional work in the vicinity of this work and complete the same at the rates, terms and conditions of this tender without claiming any compensation and work shall be completed within the time period allotted to this tender.

57 The labour huts for the CC road works may be permitted on work site in consultation with the respective Zonal Officers and subject to the following conditions.

a. The labourers hutments will be completely isolated from the public by providing a tin sheet fencing around them.

b. They will be specifically identified by Corporation of Chennai staff by numbering them suitably

c. Adequate toilet and bathing facilities will be provided for them inside this fencing.

d The contractors will strictly observe that labourerers will use these toilets and bathing facilities and no ' un hygienic conditions are created at site.

e In case, any of the above conditions is violated Such hutments will be removed by the division AE/JE without giving any notice to the contractor in consultation with the Executive Engineer in-charge of the work.

f. Such hutments will be removed by the contractors with in seven days of the completion of the work

58 The tender shall submit PERT /CPM chart monthly progress reports

59 The contractor shall obtain and maintain an electric connection at their cost at the site for lighting as well as for operating machineries.

60 The contractor shall obtain and maintain the telephone at site at their cost

61 The tender shall submit PERT /CPM chart monthly progress reports

63 The Contractor shall obtain and maintain an electric connection at their cost at the site for lighting as well as for operating machineries.

64 After completion of the work, the Contractors shall submit two sets of completion drawing showing therein the details of work executed including the details of SWD and their diameter, Water mains laid, locations of duct manhole and water entrances etc., as directed by Engineer such plans shall be mounted on canvas cloth.

APPENDIX I

TABLE 1

INDIAN STANDARDS (IS AND IRC) FOR CONCRETE PAVEMENT CONSTRUCTION AND QUALITY CONTROL

1. MATERIALS

Items	**Specifications**	Method of test	Sampling
Cement	IS 8112 (Gr.43)	IS 4031 (Pt 1 to 14)	IS 4879
	IS 12269 (Gr.53)	IS 4032	
Aggregate coarse &Fine	IS 383	IS 2386 (Pt. 1 to 8)	IS 2340
Water	IS 456		
Admixture for concrete	IS 9103		
Performed fillers for expansion joints	IS 1838 (Pt. 1 &2)	IS 10566	
Hot applied sealing compound for joints	IS 1834		
Poly sulphide base joint sealant One Part grade	IS 11433 (Pt.1)	IS 11433 (Pt.2)	
Two parts grade	IS 12118 (Pt.1)	IS 2118 (Pt.2)	
Standard sand for testing of cement	IS 650	IS 8142	
Test sieving			
Concrete mix design	IS 10262		
	IRC 44		
	IRC 59		
Concrete Strength			IS 516
Splitting tensile strength of concrete cylinders			IS 5816
Concrete sampling and analysis			IS 1199
Setting time			IS 8142
Permeability			IS 3085
Abrasion resistance accelerated			IS 9284
Strength testing			IS 9013
			IRC 85
Ready-mixed concrete	IS 4926		
1. MATERIALS			
Precase concrete kerbs	IS 5758		
Precast concrete cable cover	IS 5820		
Concrete porous pipe for under drainage	IS 4350		
II TEST AOOARATUS AND EQUIPTMENT			
Flow table for cement tests		IS 5512	
Vicat apparatus		IS 5513	
Lea Chatelier Apparatus		IS 5514	
Air permeability apparatus plain type		IS 5516	
Lea and hurse type		IS 5536	
Jointing apparatus for testing cement		IS 10078	
Vibrating machine for casting standard cement mortar cubes		IS 10080	
Planetary mixer user in tests of cement and puzzolana		IS 10890	
Moulds for use in tests of cement and concrete		IS 1008	
Test sieves		IS 460 (Pt.1 &2)	IS 430 (Pt.3)

APPENDIX 1
TABLE 2

MINIMUM TEST FREQUENCIES FOR QUALITY CONTROL OF CONCRETE ROAD CONSTRUCTION

Item	Test	Control criterion	Frequency
APPROVAL OF SOURCE OF SUPPLY OF MATERIALS			
Cement	Physical and Chemical Test	IS 8112	Once for each source supply for approval of the source and subsequently when warranted by change in quality in case of doubt
Coarse &fine aggregates	-Do- (including soundness and alkali reactivity)	IS 383	-Do-
Water	Chemical Test	IS 456	-Do-
Expansion Joint Filler board		IS 1838	-Do-
Joint Sealing Compound		IS 1834	Do-
DURING CONSTRUCTION MATERIAL			
Cement Received	Strength	IS 8112	For each lot of cement
Coarse and fine aggregate	Gradation	IS 383	For each lot of aggregate received
	Moisture Content	IS 383	Regularly as required subject to minimum of 2 tests per day
Coarse aggregates	Los Angeles abrasion value /aggregate impact value	IS 383	Once on every change of source
Flakiness Index		IS 383	Do-
Elongation Index		IS 383	Do-
CONCRETE			
Workability Concrete strength		Three tests per day. Cube samples, as specified for each age of 7 days, and 28 days for every 50 Cu. M and Flexural strength to be carried out as per IRC Specification.	
Checking surface evenness with 3 mt. Straight edge and wedge edge		Three longitudinal lines along the slap length one in the middle third and the two edge – third stripes, along the lines of maximum unevenness.	
DOWEL BARS			
Alignment (Being in a plane parallel to the surface of the base course, and being also parallel to the center line of the slab		Each dowel bar, after fixing in position.	
TIE BARS			
Mid-height positioning		Each tie bar.	

Signature of the Tenderer.

APPENDIX 1		
TABLE 3		
ADDITIONAL QUALITY CONTROL CRITERIA AND TOLERANCES		
	Criteria	**Tolerance**
Sub grade / Sub base under Lean concrete base	Ful Compaction K Value 5.5 kg/m3	No minus tolerance
Lean concrete base	Grade M 10	Tolerance level for characteristic strength assessment 1 in 15
	Surfacing unevenness under 3m straight edge Curing 7 days or till laying concrete slab is laid earlier	Not more than 10mm
Cement Concrete pavement	Quality concrete Grade M-40	Tolerance level for characteristic strength assessment in 15
	Workability25mm (slump) maximum	No tolerance
	Curing 14 days curing by pending with water and wethessain cloth curing for the day of casing (prior to starting curing by ponding)	14 days curing by ponding with water.
Dowel Bar	Length and dia Placement with equal length vis-a-vis centerline of the joint	Should not be smaller then stipulated value = 4.5 m
	Horizontal &Vertical alignment including that of dowel cap	As specified in relevant item

APPENDIX 1		
TABLE 4		
MINIMUM TEST FREQUENCIES FOR QUALITY ASSURANCE / ACCEPTANCE OF CONCRETE ROAD CONSTRUCTION		
	Lean Concrete Base	**Cement Concrete Pavement**
Strength recovering cores		Six 100mm dia cores per site as specified in relevant clauses
Surface evenness	3 longitudinal lines (as for quality control)	3 longitudinal lines (as for quality control) as specified in relevant clauses.
Surface defects / defects reflected on the surface	Full surface	Full surface

TABLE 5		
ACCEPTANCE CRITERIA		
Parameter	**On completion, before/within two months of opening to traffic**	**At the end of defect liability period of 5 years**
Strength	Characteristic strength (28 days) of the test specimens analysed for the complete work to exceed the specified strength	Before the end of the defect liability period, the site will be jointly inspected as per Clauses No.55 of Special Conditions / Directions to the Tenderer for CC Road Works, along with the contractor's representative / Engineer &defects observed will be listed and the necessary rectification will be carried out as directed by Engineer in accordance with the relevant specifications and clauses mentioned in Special Directions / Conditions to the Tenderers.
	Individual core strength test results. Corrected forage, ratio and shape (cylinder to cube) upto the specified strength. The characteristic strength (28 days) to be not less than the specified strength (for a tolerance level of 1 in 15)	-
Thickness	At no point should the layer thickness be less than the specified thickness as checked from the levels	-

SPECIFICATIONS FOR INTERLOCKING CONCRETE BLOCK PAVEMENT

1.0 The interlocking concrete blocks for the pavement shall be procured of the approved shape, size and colour from the reputed manufacturers having facilities of production of design mix concrete, vibro-compacting machine of required specification and well established laboratory for conducting the required tests. The approval shall be obtained from the engineer-in-charge in writing well before the procurement action by the agency.

2.0 The engineer-in-charge reserves the right to inspect the manufacturing plant, manufacturing process and to collect the samples at factory or work site and get it tested in the Laboratory of his choice to his entire satisfaction. The testing charges payable if any shall be borne by the contractor.

3.0 Unless otherwise specified in the nomenclature of items or in the drawing the concrete paving block, shall conform to the grade(s) as specified in **Table 1** hereunder for various uses.

4.0 All paver block, shall be sound and free of cracks or other visual defects which will interfere with the proper paving of the unit or impair the strength or performance of the pavement constructed with the paver blocks. Minor defects in the form of chippings, resulting from the customary methods of handling during delivery, not larger than 10 mm in not more than 5% of consignment shall not be deemed grounds for rejection.

5.0 Sampling for Testing:

5.1 The paver blocks required for carrying out the tests laid down in this standard shall be taken by one of the methods given in 5.2 and 5.3 In either case, a sample of 20 blocks shall be taken from every consignment of 4000 blocks or part thereof of the same size, shape and thickness, and the same batch of manufacture. From these samples, the blocks shall be taken at random for conducting the tests.

5.2 The required number of paver blocks shall be taken at regular intervals during the loading of the vehicle or the unloading of the vehicle depending on whether sample is to be taken before delivery or after delivery. When this is not practicable, the sample shall be taken from the stack, in which case the required number of blocks shall be taken at random from across the top of the stacks, the sides accessible and from the interior of the stacks by opening trenches from the top.

5.3 Each designated section or part thereof in a consignment of blocks shall be divided into ten real or imaginary, approximately equal, group. Two blocks from each group shall be randomly selected for testing.

5.4 The sample paver blocks shall be marked for future identification of the consignment it represents. The blocks shall be kept under cover and protected from extreme conditions of temperature, relative humidity and wind till they are required for test. The test shall be undertaken as soon as practicable after the sample has been taken.

5.5 All the 20 paver blocks shall be inspected for visual defects. Out of the 20 blocks, 10 blocks shall be subjected to the test for measurement of dimensions, chamfer, aspect ratio, plan area, wearing surface area and deviation from squareness and, in the case of two layer blocks, for measurement of the thickness of the wearing layer. Out of these 10 blocks, 5 blocks shall be subjected to tests for water absorption, block density and compressive strength, in that order. The remaining 5 blocks in this group of 10 shall be subjected to flexural strength test, and remaining if the blocks are used for road pavement carrying vehicular traffic.

6.0 Acceptance Criteria

The lot shall be considered as conforming to the requirements of the specification if the following conditions are satisfied:-

6.1 Dimensions & tolerances:

The recommended dimensions and tolerances for Type A, B and C paver blocks, measure as per "**Annexure B"** are given in **Table 2**. Among the sampled 20 blocks the number of blocks with visual defects outside the tolerance limit shall not be more than three.

6.2 Water absorption:

Water absorption, being average of the five units, when determined in the manner described in "**Annexure C"** shall not be more than 5% by mass.

6.3 Block density:

The block density of concrete pavers, being average of five units, determined in the manner described in "**Annexure.D"**, shall not be less than 2200 Kg/m3.

6.4 Compressive strength:

The concrete block when tested for compressive strength as per method specified in "**Annexure.E"** shall conform to the requirement and tolerances for different grades as given in **Table 3.**

6.5 Flexural strength:

The flexural strength the block, shall not be less than 4.0 Mpa when tested as per method specified in **"Annexure F"**

6.6 Abrasion Resistance:

The abrasion index of the paver blocks sample determined by method specified in **"Appendix G"** shall conform to the values given in **Table 4.**

7.0 Marking:

Concrete paver blocks manufactured in accordance with laid down specification shall be marked permanently with the following information:

a) the identification mark of manufacturer ;
b) The grade of concrete used for manufacturing of paver blocks.

8.0 For detailed guidelines for the use of interlocking concrete block pavement IRC: SP: 63-2004 may be referred to.

9.0 Technical specifications for laying concrete paving blocks are available in **Annexure "A"**.

10.0 Payment

The finished area shall be measured nearest to 0.01 sqm. for the purpose of payment. The payment for edge restraint shall be made separately which shall be measured on per cum. basis.

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Table 1 Recommended Grades of Paver Blocks for Different Traffic Categories

(Clauses 5 and 9.1.4)

Sl No.	Grade Designation of Paver Blocks	Specified Compressive Strength of Paver Blocks at 28 Days	Traffic Category	Recommended Minimum Paver Block Thickness	Traffic Examples of Application
(1)	(2)	(3)	(4)	(5)	(6)
i)	M-30	30	Non-traffic	50	Building premises, monument premises, landscapes, public gardens / parks, domestic drivers, paths and patios, embankment slopes, sand stabilization area, etc
ii)	M-35	35	Light-traffic	60	Pedestrian plazas, shopping complexes ramps, car parks, office driveways, housing colonies, office complexes, rural roads with low volume traffic, farm houses, beach sites, tourist resorts local authority footways, residential roads, etc
iii)	M-40	40	Medium – traffic	80	City streets, small and medium market roads, utility cuts on arterial roads, etc.
iv)	M-50	50	Heavy – traffic	100	Bus terminals, industrial complexes, mandi houses, roads on expansive soils, factory floor, service stations, industrial pavements, etc
v)	M-55	55	Very heavy – traffic	120	Container terminals, ports, docks yards, mine access roads, bulk cargo handling areas, airport pavements, etc.

NOTES

1. Non-traffic areas are defined as areas where no vehicular traffic occurs.

2. Light-traffic is defined as a daily traffic up to 150 commercial vehicles exceeding 30 KN laden weight , or an equivalent up to 0.5 million standard axles (MSA) for a design life of 20 years (A standard axle is defined as a single axle load of 81.6 KN.)

3. Medium traffic is defined as daily traffic of 150-450 commercial vehicles exceeding 30 KN laden weight, or an equivalent of 0.5 to 2.0 MSA for a design life of 20 years.

4. Heavy traffic is defined as a daily traffic of 450 – 1500 commercial vehicles exceeding 30 KN laden weight, or an equivalent of 2.0 to 5.0 MSA for a design life of 20 years.

5. Very heavy – traffic is defined as a daily traffic of more than 1500 commercial vehicles exceeding 30 KN laden weight, or an equivalent

Table 2: Recommended dimensions and tolerances for type A, B and C paver blocks.

S.No.	Dimension	Measurement Method	Recommended Values	Tolerance Limit
1.	Width, W	As per Annex B	80 to 115 mm	± 2 mm
2	Length, L	As per Annex B	(1.5 to 2.3) X W	± 2 mm
3	Thickness, T	As per Annex B	60 to 120 mm	± 3 mm
4	Aspect Ratio (L/T)	As per Annex B	Maximum: 4.4	+ 0.275
5	Chamfer	As per Annex B	Maximum: 5mm	+ 1 mm
6	Thickness of Wearing Layer	As per Annex B	Minimum:15mm	- 2mm
7	Plan Area, Asp.	As per Annex B	Maximum:0.03m2	+0.001m2
8	Wearing Surface Area, A_{sw}	As per Annex B	75% of plan Area	± 1%
9	Squareness	As per Annex B	Nil	± 2mm

Table 3 Compressive strength requirements of concrete paver blocks.

S.No.	Grade of Concrete	28-day Compressive Strength (MPa) of Chamfered Paver Blocks of Thickness			
		60mm	80mm	100mm	120mm
1	M-25	26.5	29.5	31.0	32.5
2.	M-30	31.8	35.4	37.2	39.0
3	M-35	37.1	41.3	43.4	45.5
4	M-40	42.4	47.2	49.6	52.0
5	M-45	47.7	53.1	55.8	58.5
6	M-50	53.0	59.0	62.0	65.0
7	M-55	58.3	64.9	68.2	71.5
8	M-60	63.6	70.8	74.4	78.0

Note: A 10 percent lower tolerance limit in compressive strength shall be allowed.

Annexure "A"

1. TECHNICAL SPECIFICATIONS FOR LAYING CONCRETE PAVING BLOCKS

1.1. Base

1.1.1. The Finished surface of the concrete base shall match the design profile of the concrete blocks within ±10 mm.

1.1.2. Compaction shall be done with vibratory roller. In restricted areas where normal rollers cannot operate, hand-held or plate vibrators should be employed.

1.2. Bedding Sand Layer

1.2.1. The bedding sand layer shall be from either a single source or blended to achieve the following grading.

IS Sieve Size	*Per cent Passing*
9.52 mm	100
4.75 mm	95-100
2.36 mm	80-100
1.18 mm	50-95
600 micron	25-60
300 micron	10-30
150 micron	0-15
75 micron	0-10

Single sized, gap-graded sands or those containing an excessive amount of fines will not be used. The sand particles should preferably be angular type.

The joint-filling sand should pass a 2.35 mm sieve and be well graded. The following grading is recommended:

Sieve Size	*Per cent Passing*
2.36 mm	100
1.18 mm	90-100
600 micron	60-90
300 micron	30-60
150 micron	15-30
75 micron	0-10

The use of cement in the joint-filling sand is not recommended as a general practice as the cemented sand is likely to crack into segments which are easily dislodged.

1.2.2. Average thickness of this laying course shall be 20 to 40 mm.

1.2.3. The sand should be slightly moist, and the moisture content shall be about 4 per cent by weight.

1.2.4. It should contain not more than 3 per cent by weight of clay and silt and the materials shall be free from deleterious salts or contaminates.

1.2.5. The finished surface of the bedding layer shall match exactly the design profile as indicated on the drawings.

1.2.6. Before placing the bedding layers, the surface of concrete should be cleared by sweeping.

1.2.7. Walking or driving on the finished surface of the bedding layer shall not be permitted.

1.3. **Concrete Paving Blocks**

1.3.1. Laying of the blocks shall be done, precisely at the indicated level and profile and in a way that a good surface draining to the gulley chambers is assured.

1.3.2. Around gulley chambers and inspection pits the pavement shall have a level of 5 mm higher than the above mentioned elements.

1.3.3. The blocks shall be laid to the pattern directed by the Engineer or the pattern recommended by the designer. The blocks shall be laid as tight as possible to each other. The maximum joint width shall be limited to 4 mm.

1.3.4. Laying of broken blocks is not allowed except along connections or edges. The maximum length of a purpose broken block is 100 mm. Breaking of the blocks shall be done with a "block splitter" or a mechanical saw.

1.3.5. Fine angular sand as per specification shall be brushed into the joints, and thereafter compaction shall be done with a vibrating plate compactor on a clean surface. After compaction, again fine angular sand shall be brushed into the joints.

1.4. **Surface Tolerances**

1.4.1. Surface tolerance for finished surface shall be ±10 mm from the design level.

1.4.2. The surface tolerance for base course shall be in the range of 0 to +10 mm from nominated level and 10 mm deviation from a 3 m straight edge.

1.4.3. The surface tolerance for sub-base shall be within 0 to –20 mm of nominated level.

2. FIELD/LABORATORY TESTS

(a) Necessary field/laboratory tests shall be carried out by the contractor while executing the work at his own cost.

(b) The field/laboratory tests may be conducted in an Engineering College/ approved technical institution as directed by the Engineer.

"ANNEX B"

METHOD FOR DETERMINATION OF DIMENSIONS, ASPECT RATIO, PLAN AREA, WEARING SURFACE AREA AND DEVIATION FROM SQUARENESS.

B-1 DETERMINATION OF LENGTH, WIDTH, THICKNESS AND ASPECT RATIO

B-1.1 Apparatus

The apparatus shall comprise:

a) Steel calipers;
b) A steel rule capable of measuring up to 300 mm to an accuracy of 0.5 mm

B-1.2 Specimens

Ten paver block specimens, randomly selected from the group of blocks of specified shape, size and thickness, as per the sampling procedure in 5, shall be tested.

B-1.3 Procedure

B-1.3.1 Length and Width: The length and width of a paver block (Fig.3) shall be measured across two opposite faces by using the steel calipers or steel rule. Two representative positions shall be used for measurement of length and three for measurement of width. The mean values of length and width for the block shall be noted to the nearest 1 mm.

B-1.3.2 Thickness: The thickness of a paver block (Fig. 3) shall be measured at four sensibly different representative positions. The mean value of the thickness of the block shall be noted to the nearest 1 mm.

B-1.3.3 Aspect Ratio: The Aspect Ratio of the specified block shall be calculated by dividing the mean length by the mean depth as determined by the procedures in B-1.3.1 and B-1.3.2 and shall be noted to the nearest 0.1

B-2 CHAMFER

B-2.1 Apparatus

The apparatus shall comprise of steel calipers.

B-2.2 Specimens

The ten paver block specimens, tested for dimensions as per B-1, shall be tested.

B-2.3 Procedure

The depth and width of chamfer of the paver block (Fig.3) shall be measured across two opposite faces, to the nearest 0.1 mm, by using the steel calipers. Four representative positions shall be used for measurement of depth and width. The mean values of depth and width of chamfer for the block shall be noted to the nearest 0.1 mm

B-3 PLAN AREA AND WEARING SURFACE AREA

B-3.1 Apparatus

The apparatus shall comprise:

(a) Balance capable of weighing 100 g to an accuracy of 0.01 g;
(b) Sheets of thin cardboard of uniform thickness:
(c) Sharp pencil;
(d) Odd-leg marking gauge (Fig.4);
(e) Sharp scissors;
(f) Steel rule marked with graduations of 0.5 mm.

B-3.2 Specimens

The ten specimens, tested for dimensions as per B-1, shall be used for the tests.

B-3.3 Procedure

B-3.3.1 Plan Area (Asp): The block shall be placed, wearing surface facing up, on the card board and its perimeter traced with the pencil. The shape shall be cut out accurately with the scissors and weighed to the nearest 0.01 g, and the result recorded as mass $\mathbf{m_{sp}}$. A rectangle measuring 200 mm X 100 mm, accurately cut out from the same cardboard, shall also be weighted to the nearest 0.01 g, and the result recorded as mass $\mathbf{m_{std}}$. The plan area for the block shall be calculated from the formula:

$$A_{sp} = \frac{20{,}000\ \mathbf{m_{sp}}}{\mathbf{m_{std}}}, \text{ mm}^2$$

Alternatively, where possible, the plan area may also be calculated by multiplying the length by the width, as determined by the procedure in B-1.3.1

B-3.3.2 Wearing Surface Area (A_{sw}): The width of the chamfer of the block shall be measured at four sensibly different locations and their mean value determined. A ball-point pen refill shall be fixed to the odd-leg marking gauge and the gauge shall be set to the measured mean value of chamfer width. The gauge so set shall be used to draw a line, indicating the width of the chamfer, along the periphery of the cardboard shape of the plan area of the block with mass **m_{sp}** , as obtained in B-3.3.1. The marked chamfer width on the cardboard shall be neatly cut away with the scissors, and the cardboard shall be weighed to the nearest 0.01 g and the result recorded as mass **m_{sw}**. The wearing surface area for the block shall be calculated from the formula:

$$A_{sw} = \frac{20{,}000\ m_{sw}}{m_{std}}, \text{ mm}^2$$

B-4 DEVIATION FROM SQUARENESS

B-4.1 Apparatus

The apparatus shall comprise:

(a) Engineer's square or a profiled template
(b) Feeler gauges

B-4.2 Specimens

The ten specimens, tested for dimensions as per B.1, shall be used for the tests.

B-4.3 Procedure

With the stock of the square of profiled template in contact with the top or bottoms surface of the block, the blade shall be brought into contact with the vertical face of block. The clearance, if any, between the square of profiled template and the vertical face of the block shall be measured to the nearest 0.1 mm with the feeler gauge at points 10 mm inside each top and bottom edge of the block. This measurement shall be repeated at six sensibly different locations around the block, and the average of the feeler gauge measurement noted as the deviation from squareness for the block, which shall be noted to the nearest 0.1 mm.

B-5 REPORT

The individual and average values of measured dimensions, chamfer, aspect, ratio, plan area, wearing surface area and deviation from squareness of specimens tested as per B-1, B-2, B-3 and B-4 shall be reported.

"ANNEX C"

METHOD FOR DETERMINATION OF WATER ABSORPTION

C-1 APPARATUS

The balance used shall be sensitive to within 0.5 percent of the mass of the smallest specimen tested.

C-2 SPECIMENS

Five out of the ten test specimens selected for test as per Annex B shall be used for the tests.

C-3 PROCEDURE

C-3.1 Saturation: The test specimens shall be completely immersed in water at room temperature for 24± 2 hours. The specimens shall then be weighed, while suspended by a metal wire, and completely submerged in water, and the weight shall be recorded in kg to the nearest 0.001kg.(Wa). They shall be removed from the water and allowed to drain for one minute by placing them on a 10mm or coarser wire mesh. Visible water on the specimens shall be removed with a damp cloth. The specimen shall then be immediately weighed and the weight for each specimen noted in kg to the nearest 0.001 kg. (Ww).

C-3.2 Drying : Subsequent to saturation, the specimens shall be dried in a ventilated oven at (107± 7)^{0}C for not less than 24 h. and until two successive weighing at intervals of 2 hours show an increment of loss not greater than 0.2 percent of the previously determined mass of the specimen. The dry weight of each specimen (Wd) shall be recorded in kg to the nearest 0.001kg.

C-4 CALCULATION

C-4.1 Absolute Water Absorption (Wab): The absolute water absorption shall be calculated as follows:

$$Wab = \frac{Ww - Wd}{Ww - Wa}, \quad Mg/m^3$$

C-4.2 Percent Water Absorption (W %): The percent water absorption shall be calculated as follows:

$$W\% = \frac{Ww - Wd}{Wd} \times 100$$

C-5 REPORT

The individual and average values of measured water absorption of specimens tested as per C-1 to C-4 shall be reported.

" ANNEX D"

METHOD FOR DETERMINATION OF DENSITY

D-1 APPARATUS

(a) Electric oven
(b) Weights and Balance of adequate capacity and accuracy

D-2 SPECIMENS

Five specimens tested as per Annex C shall be used for the tests.

D-3 PROCEDURE

D-3.1 The five specimens shall be dried to constant mass in a suitable oven, heated to $(110 \pm 5)^0$ C. The blocks shall then be taken out and allowed to cool to room temperature. Their dimensions shall be measured in accordance with Annex B and the overall volume completed in m^3, nearest to 0.001 m^3. The blocks shall then be weighed in kg to the nearest 0.001 kg.

D-3.2 Alternatively, the volume of the specimens shall be calculated by making use of the data generated during the determination of water absorption (Annex C), as follows:

Volume = $(Ww - Wa)\ 10^{3}$, m^{3}

D-4 CALCULATION

The density of each block shall be calculated as follows:

$$\text{Density} = \frac{\text{Mass of block in kg}}{\text{Volume of block in } m^3} \times 10^{-3} \ (Mg/m^3)$$

D-5 REPORT

The individual and average values of measured density of specimens tested as per D-1 to D-4 shall be reported.

"ANNEX E"

METHOD FOR DETERMINATION OF COMPRESSIVE STRENGTH

E-1 APPARATUS

E-1.1 Testing Machine: The apparatus shall comprise a compression testing machine which shall be equipped with two steel bearing blocks for holding the specimen. It is desirable that the blocks have a minimum hardness of 60 (HRC) and a minimum thickness of 25 mm. The block on top through which load is transmitted to the specimen shall be spherically seated. The block below on which the specimen is placed shall be rigidly fitted. When the bearing area of the steel blocks is not sufficient to cover the bearing area of the paver block specimen, two steel bearing plates meeting the requirements of E-1.2 shall be placed between the steel platens fitted on the machine and the specimen.

E-1.2 Steel Bearing Block and Plates : The surfaces of the steel bearing blocks and plates shall not depart from the plane by more than 0.025 mm in any 15 mm dimension. The centre of the sphere of the spherically seated upper bearing block shall coincide with the centre of the bearing surface. If a bearing plate is used, the centre of the sphere of the upper bearing block shall be on a line passing vertically through the centroid of the specimen bearing face. The spherically seated block shall be held closely in its seat, but shall be free turn in any direction. The diameter of the face of the bearing blocks shall be at least 150 mm. When steel plates are employed between the steel bearing blocks and the specimen, the plates shall have a thickness equal to at least one-third the distance from the edge of the bearing block to the most distant corner of the specimen. In no case shall the plate thickness be less than 12mm.

E-2 SPECIMENS

The five specimens tested as per Annexes C and D shall be used for the tests.

E-3 CAPPING OF SPECIMENS

E-3.1 The bearing surfaces of the specimens shall be capped by one of the methods described in Clauses C-3.1 and C-3.2 of Appendix C of IS: 2185 (Part1)-1979,

E-3.2 Alternatively, 4 mm thick plywood sheets of size larger than the specimens by a margin of at least 5 mm from all edges of the specimen shall be used for capping the specimens.

E-3.3 When blocks with surface relief features have to be tested; their surfaces shall be ground to plainness before capping and testing.

" ANNEX D"

METHOD FOR DETERMINATION OF DENSITY

D-1 APPARATUS

(a) Electric oven
(b) Weights and Balance of adequate capacity and accuracy

D-2 SPECIMENS

Five specimens tested as per Annex C shall be used for the tests.

D-3 PROCEDURE

D-3.1 The five specimens shall be dried to constant mass in a suitable oven, heated to $(110 \pm 5)^0$ C. The blocks shall then be taken out and allowed to cool to room temperature. Their dimensions shall be measured in accordance with Annex B and the overall volume completed in m^3, nearest to 0.001 m^3. The blocks shall then be weighed in kg to the nearest 0.001 kg.

D-3.2 Alternatively, the volume of the specimens shall be calculated by making use of the data generated during the determination of water absorption (Annex C), as follows:

Volume = $(Ww - Wa)\ 10^3$, m^3

D-4 CALCULATION

The density of each block shall be calculated as follows:

$$\text{Density} = \frac{\text{Mass of block in kg}}{\text{Volume of block in } m^3} \times 10^{-3} \ (Mg/m^3)$$

D-5 REPORT

The individual and average values of measured density of specimens tested as per D-1 to D-4 shall be reported.

E-4 PROCEDURE

E-4.1 The dimensions and plan areas of the blocks shall be determined as described in Annex B. The blocks shall be stored for 24 ± 4 hours in water maintained at a temperature of (20 ± 5)°C. The bearing plates of the testing machine shall be wiped clean. The specimen shall be clamped between the plates in such a way that the axes of the specimen are aligned with those of the bearing plates.

E-4.2 The load shall be applied without shock and increased continuously at a rate of 15±3N/mm^2 / minute until no greater load can be sustained by the specimen or delamination occurs. The maximum load applied to the specimen shall be noted
in N.

E-5 CALCULATION

The apparent compressive strength of individual specimen shall be calculated by dividing the maximum load (in N) by the plan area (in mm^2). The corrected compressive strength shall be calculated by multiplying the apparent compressive strength by the appropriate correction factor from Table below. The strength shall be expressed to the nearest 0.1 N/mm^2.

Correction factors for thickness and chamfer of paver block for calculation of compressive strength

(Clause E-5)

Paver Block Thickness (mm)	Correction factor for	
	Plain Block	Chamfered Block
60	1.00	1.06
80	1.12	1.18
100	1.18	1.24
120	1.24	1.30

For other thickness of paver blocks between 60 mm and 120 mm, linear extrapolation of correction factor shall be made.

E-6 REPORT

The individual and average compressive strength of the specimens tested as per E-1 to E-5 shall be reported.

METHOD FOR DETERMINATION OF FLEXURAL STRENGTH

F-1 APPARATUS

The apparatus used for test shall be the same as in Clause 8 of IS 516 with the following modifications:

(a) The distance from centre to centre of the two rollers on which the specimen is supported shall be 160 mm.

(b) The load shall be applied through a single roller mounted on top of the specimen at the centre of the supporting span, i.e., the horizontal distance from the loading point to the centre of each of the supporting rollers shall be 80mm.

F-2 SPECIMENS

This test method can be applied for type A, B and C blocks having minimum length of 180 mm. Five paver block specimens, randomly selected from the group of blocks of specified shape, size and thickness, as per the sampling procedure in 5.0, shall be tested.

F-3 CAPPING OF SPECIMENS

F-3.1 The test specimens shall be capped by one of the methods described in E-3 of Annex E.

F-3.2 Specimens with false joints and surface relief features which are likely to interfere with the test results shall have their surface grounded to plainness before capping and testing.

F-4 PROCEDURE

The test procedure shall be the same as in Clause 8 of IS 516, with the following modifications:

(a) The load shall be applied along the vertical centre line of the supporting span

(b) The load shall be applied without shock and increased continuously at a rate such that the extreme fiber stress increases at approximately 7 kg/cm^2/min.

(c) The load shall be increased until the specimen fails, and maximum load applied shall be recorded.

F-5 CALCULATION

Flexural strength of the specimen shall be calculated as follows:

$$fb = \frac{24\ p}{bd^2}$$

Where

fb = Flexural strength (N/mm^2)
p = Maximum load (N)
b = Width of the block (mm)
d = Thickness of the block (mm)

F-6 REPORT

The individual and average flexural strength of block specimens tested as per F-1 to F-4 shall be reported.

"ANNEX G"

METHOD FOR DETERMINATION OF ABRASION RESITANCE

G-1 APPARATUS

The following apparatus is required :

(a) Electric drill (1000 watts minimum, ' WOLF 3814` or equivalent),
(b) Drill bracket, guide bar and guide-bar bracket (`WOLF 0421` or equivalent),
(d) Drill stand and paving-unit clamp welded to base plate,
(d) Drill stand shaft,
(e) Dial gauge (calibrated one full revolution = 1mm),
(f) Chuck and ball race ,
(g) Chuck casing with water hose connection , and
(h) Revolution counter (photoelectric or electronic) to measure total revolutions or rpm of ball-race.

The output of the shaft of the drill shall be set at a speed of between 1000 and 1050 revolutions per minute. When the test drill is rigged, the total sliding mass of the drill and attachments shall be 14.5 kg. with a tolerance of $\pm$0.25 kg. The test rig shall be maintained in this condition. Before testing, the rig shall be checked to ensure that there are no external factors affecting the sliding mass. The drill-stand shaft and guide bare shall be lubricated to ensure free sliding at all Times.

G-2 SPECIMENS

Five paver block specimens, randomly selected from the group of blocks of specified shape, size and thickness, as per the sampling procedure in 5.0, shall be tested.

G-3 PROCEDURE

G-3.1 The mass of drill and fittings shall be checked for free slide on the drill stand shaft without any obstruction. The dry specimen shall be clamped on the drill-stand base plate. The ball-race shall be placed on the specimen and the chuck shall be lowered on the ball-race. The drill shall be left unclamped on the shaft. A constant rate of water supply to the test surface of the specimen shall be started and maintained to clear the debris formed during abrasion.

G-3.2 The drill shall be run for approximately 3 seconds to seat the ball-race. The dial gauge plunger shall be lowered on the bearing surface of the drill bracket and chuck shall be rotated by hand through one revolution in each direction. The dial gauge shall be set Zero to the mean of the needle reading.

G-3.3 The drill shall be run, stopping it at approximately every 1000 revolutions to measure the penetration. The test shall be continued until the ball-race has completed 5000 revolutions or until the dial gauge has indicated an indentation greater than 1.5mm, whichever occurs first. The indentation shall be measured by rotating the chuck by hand through one revolution in each direction and noting the

mean dial gauge reading. The number of revolutions of the ball-race shall be noted.

Note: If the drill and drill stand appear to wander from side to side causing the ball race to alter its path to the paver block surface, then either the drill has been set at the wrong speed or the guide mechanism is worn and needs replacement. Results from the test are valid only if a clearly defined circular impression has been made on the paver block surface upon completion of the test.

G-4 CALCULATION

The abrasion index of the specimen shall be calculated using the following formula:

$$Ia = \frac{\sqrt{r}}{di}$$

Where:
Ia = Abrasion Index (calculated when the ball-race revolutions equal 5000 or the penetration equals 1.5mm, whichever occurs first)

r = ball-race revolutions in thousands
di = depth of indentation in mm

G-5 REPORT

The minimum value of abrasion index obtained from the five specimens shall be reported as the abrasion index (Ia-min) of the sample.

G-6 GUIDE FOR CHOICE OF ABRASION INDEX

The Abrasion Index is defined in such a manner that it increases/decreases with the increase/decrease in abrasion resistance. When the purchaser wants to specify values for Abrasion Index, the values given in Table 4 may be taken as interim guide.

Table 4 Suggested values of Abrasion Index
(Clause G-6)

S.No	Traffic (Ref. Table 1)	Minimum 28 Days Abrasion Index
1	Non-Traffic	1.0
2	Light Traffic	1.2
3	Medium Traffic	1.3
4	Heavy Traffic	1.5
5	Very Heavy Traffic	2.0

CERTIFICATE FOR OWNING/POSSESSION OF EQUIPMENTS

BY THE TENDERER

(TO BE ISSUED BY A GAZETTED OFFICER OF THE GOVERNMENT OR AND OFFICER OF THE CORPORATION OF CHENNAI NOT BELOW THE RANK OF A CLASS-II OFFICER)

I .....hereby certify that M/s. Thiru / Tmt..... is owning / in possession of the under mentioned machineries.

1. Cement Concrete works
One concrete mixer (Non tilting type with weigh batching arrangements) and / or concrete mixer (non Tilting type and separate arrangements) of hopper swing weigh batching (Double bucket) having each bucket capacity of at least 400 liters.

2. One ordinary mixers
3. Screed vibrators 2 Nos. as per drawing i.e., 8 for top layer vibration and 8 for bottom layer vibration.
4. 2 plate vibrators
5. 2 needle vibrators (60mm)
6. 2 water tanks of 10,000 ltr. capacity each
7. 2 Steel battens of channel section of 4" width with proper handles at both the end
8. 2 straight edges with scaled wedge
9. 2 golchies (edging tools) as per drawing each of 12mm and 25mm curvature.
10. 2 plate vibrators for compaction of trenchless
11. 2 joint cutting machines with spare blades
12. M.S. channels minimum 100 RM in length proper shape, line and level
13. 1 steel fabricated farma for raising manholes
14. 1 portable air compressor
15. 1 template for checking camber
16. 6 cube moulds, 150mm x 150mm x 150mm
17. 1 slump cone with two additional measuring rods
18. Steel fabricated moulds for casting kerbs, water tables etc.,
19. 2 bitumen pouring pot
20. Three flexural beam moulds of size 700mm x 150mm x 150mm
21. Two nos. steel wire brooms as specified
22. 1 no. of generator – 125 kva
23. 1 no. dewatering pump 10 HP
24. 3 Nos. of trunks – 10 T
25. Vibratory Road Roller
26 Mechanical Saw

NB: The Certifying Officer shall personally verify before issuing the certificate and he should take responsibility for any discrepancy, mis-statement or untruth in the certificate.

The tenderer should also enclose attested copy (Notarized) of documentry evidence for owning of above machineries

Corporation of Chennai

Z.O.XV.C.No.B1/1047/ 13

Package I (118 Roads)
Integrated road work at vaiors roads in Dn.192. Zone XV under Chennai Megacity Development Mission I Savings fund (Two cover system)

List of Roads

Sl.No.	Dn.No.	Name of the Roads	No. of Roads	Length in M
1	192	Workers Estate 1 to 3rd Main Road, 1 to 5 Cross Streets & Vinayagar Koil Street	9	650
2	192	Saraswathy Nagar (North), 1st Main Road, 2,3,4,5 Street, ECC School Street,	6	850
3	192	Arignar Anna 2nd Street	1	1000
4	192	Sandeep Nagar (East) 1st and 2nd Street	2	1000
5	192	Ellaiamman Koil Street	1	400
6	192	Anbalagan Street, Anna Street, Kamaraj Street, Pillaiyar Koil Street, Gandhi Nagar 1,2 Cross Street, Philip Street and Sulthan Ahamed Street	8	600
7	192	Sandeep Nagar Main Road	1	1000
8	192	Sandeep Nagar Link Road, Kovil Manai Salai and Cross Street	3	650
9	192	Gandhi Nagar Main Road, Gengaiamman Koil Street 1 to 4 Cross Street	5	1000
10	192	Singaravelar Main Road	1	1000
11	192	Chinna Neelankarai Kuppam South, Centre, North Street	3	600
12	192	CLRI Nagar 1 to 3rd Main Road and 1 to 17th Street	20	1000
13	192	Sivan Koil Street, Cross Streets, Ellaiamman Koil 1 to 4 Cross Streets, Habeeba Street and Quaithemillath Street	6	600
14	192	Periya Neelankarai Kuppam 1st and 2nd Street and Community Hall Street	3	800
15	192	Kumaraguru Avenue Main Road and 1 to 11 Cross Streets	11	1000

16	192	Thiruvalluvar Nagar 1 to 4 Cross Streets, Surya Garden Main Road, 1st and 2nd Cross Streets, Pandian Salai Cross Street, Ruby Complex Street	9	650
17	192	Arignar Anna Nagar 3,4,5th Streets	3	1000
18	192	Saraswathy Nqgar (South) 1 to 3 2nd Main Road, 1,2,3 and 4 Cross Streets	8	850
19	192	Barathy Nagar 1 to 17 Street	17	1000
20	192	Pandian Salai	1	1000
		Total	**118**	**16650**

It is informed that the contract labourers should wear proper uniform during the maintenance period.

Sl.No.	*Name of Equipment*
1	*Face Mask*
2	*Shock proof hand gloves*
3	*Disposable hand gloves*
4	*Gum boot / Safety shoes*
5	*First Aid box*
6	*Emergency light*
7	*Helmet / hard hat*
8	*Safety cones*
9	*Traffic barriers*
10	*Warning lights*
11	*Red flags*
12	*Caution boards*

Z.O.XV C.NO.B1/ 1047 /2013 (RT-1)

Package- 1 - (118 Roads)

Integrated Road work at Various roads in Dn-192, Zone-XV Under Chennai Megacity Development Mission 1 Savings Fund (Two Cover System) Zone-XV (118 roads) (Package –I)

AS IN TENDER BOOK

Section II
RATE OF PROGRESS

The Attention of the tenderers. is directed to the contract requirements as to the time of beginning work, the rate of progress and the dates for the completion of the whole work and its several parts. The following rate of progress and proportionate value of work done from time to time, as will be indicated by the Exe. Engineer certificate of the value of work done, will be required. Date of commencement of these programmes will be the date on which the site (or premises) is handed over to the contractor.

Period after date of commencement (1)	Percentage of work completed (based on contract Lumpsum amount) (2)
90th Day	50 %
180th Day	100 %
	The work should be completed in all respects within the period of …six ……. months.

MODIFICATIONS

Section II
RATE OF PROGRESS

The Attention of the tenderers. is directed to the contract requirements as to the time of beginning work, the rate of progress and the dates for the completion of the whole work and its several parts. The following rate of progress and proportionate value of work done from time to time, as will be indicated by the Exe. Engineer certificate of the value of work done, will be required. Date of commencement of these programmes will be the date on which the site (or premises) is handed over to the contractor.

Period after date of commencement (1)	Percentage of work completed (based on contract Lumpsum amount) (2)
1st Month	40 %
2nd Month	80 %
3rd Month	100%
	The work should be completed in all respects within the period of …three……. months.

PRICE BID DOCUMENTS

SCHEDULE – A

Note : The Bid document and Price Bid Documents uploaded in the PDF format should not be changed or converted to any other format while down loading . The tenderer shall quote their rates only by writing in the indelible ink by manually or by typing after down loading

SCHEDULE- A

Z.O.XV.C.No.B1/1047/ 13 (RT-1)							
Package I (118 Roads) **Integrated road work at vaiors roads in Dn.192. Zone XV under Chennai Megacity Development Mission I Savings fund (Two cover system)**							
ROAD WORKS						**SOUTH**	
SL NO	**PROBABLE QTY**	**DESCRIPTION OF WORK**	**SCH NO**	**Rate**			
				Figure	**Words**	Unsit	AMOUNT RS P

1	11680	CUM	Providing and laying Granular Sub-Base (GSB) layer of 200 m.m. compacted thickness on the prepared Sub-Grade with approved coarse Graded material ;of; minimum CBR Value 30 grading confirming to Table 400-1/400-2 Grading 1 of MORTH-Revision-IV, including screening, spreading in uniform ;layer with motor; grader, watering and premixing at ;optimum moisture content, compacting with power and vibratory roller of 80 to 100 KN static weight to not less than 98pct. of the maximum laboratory dry density as per IS:2720 (Part 8) and fine dressing to required grade and cross slope as shown on the drawing or as directed by the Engineer including obtaining and transporting all materials from approved Quarry Site to Work site with all lifts and lead by Mechanical Transport head load or any other mode of transportation including labour, tools, equipment, safety measures testing and incidentals necessary to complete the work as per MORTH specification clause 401 and as; directed by Engineer..	GSB			CUM	

2	11680	CUM	Providing laying, Spreading and compacting Graded Stone aggregate to Wet Mix macadam specification including premixing the material (0.396 Cu.m of 45-22.4mm Metal, 0.528 Cu.m of 22.4-2.36mm Metal, 0.396 Cu.m of 2.36 mm Size & below) with water at OMC in Mechanical Mix Plant Carriage and transporting the mixed material by tipper to site, laying in uniform layers with pavers in sub base/base course on well prepared surface and compacting with vibratory roller to achieve the desired density, Complete as per clause 406 of MoRT & H Specifications.(COMPACTION BY VIBRO MAX ROLLER IS A MUST)	WMM			CUM	
3	92200	SQM	Providing Prime Coat 6Kg/10 m2 with Bitumen Emulsion (slow setting) including cost of bitumen at the site, including labour charges for preparing the surface and applying required quantity of bitumen emulsion as Prime Coat using bitumen sprayer etc., over wet Mix Macadam as per clause 502 of MORT & H specifications.	TC6			10 SQM	
4	92200	SQM	Providing Tack Coat 2.5 kg/10 m2 with Bitumen Emulsion (Rapid Setting - 1) including cost of bitumen at the site, including labour charges for preparing the surface and applying required quantity of bitumen emulsion as Tack Coat using bitumen sprayer etc., over primed surface as per clause 503 of MoRT & H Specifications.	TC7			10 SQM	

5	92200	SQM	Providing and laying bituminous macadam 50mm thick using 0.283 Cu.m of 25-10mm metal, 0.283 Cu.m of 10-5mm Metal,0.1415 Cu.m of 5mm and below Metal of specified grading aggregates premixed in CMP with bituminous binder (60/70 grade bitumen) 36.219 kg, per 10Sq.m, transported to site, laid over a previously prepared surface with paver finisher to the required grade level and alignment, rolled, etc., Complete as per clause 504, 501.6 and 501.7 of MoRT & H Specifications to achieve the desired compaction.	BMCM2			10 SQM	
6	92200	SQM	Providing and laying Semi Dense Bituminous Concrete 40mm thick using 0.1175 Cu.m of 13.2-10mm Metal, 0.2223 Cu.m of 10-5mm Metal, 0.2351 Cu.m of 5mm Size and below of specified grading aggregates and 0.0118 Cu.m of Quarry Dust premixed in CMP with bituminous binder (60/70 grade bitumen) 41.5 kg, per 10Sq.m transported to site, laid over a previously prepared surface with paver finisher to the required grade level and alignment, rolled, etc., Complete as per clause 508 of MoRT & H Specifications to achieve the desired compaction	SDBCP2			10 SQM	
7	37500	KGS	Conveyance charges for plastic waste to a lead 20 - 30 km including loading and unloading charges (for CMP Work)	GONPL 3			10 KGS	
8	92200	SQM	Additional labour charges for loading plastic waste in CMP for Bituminous Concrete 40mm thick	ALBCCMP			10 SQM	

TOTAL VALUE OF WORK IN FIGURES
TOTAL VALUE OF WORK IN WORDS
Signature of the Bidder Address of the bidder in Block Letters (with seal)