NATIONAL HIGHWAYS AUTHORITY OF INDIA
(MINISTRY OF ROAD TRANSPORT & HIGHWAYS, GOVT. OF INDIA)

Name of the work: **Road Safety works - Short Term Remedial measures for the Blackspot Locations identified by MoRT&H, rectification of Critical Crash Prone Locations and speed calming measures at pedestrian crossing locations to attain Zero Fatality corridor in NH-83 (old no. NH-209) from Km.123.550 to Km.150.580 of Dindigul – Bangalore Road (Pollachi to Coimbatore Section) in the State of Tamil Nadu**

NHAI/RO CHN/PIU CBE/ Road Safety works/NH-83/2025-26/006

VOLUME – I

Office of the DGM(T) & Project Director
Project Implementation Unit – Coimbatore
National Highways Authority of India
(Ministry of Road, Transport & Highways)
D. No.11/1, Kongu Nagar East, Ramanathapuram,
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SEPTEMBER 2025

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Volume –I

(SECTION-I)
NOTICE INVITING TENDER

(E-TENDERING MODE ONLY)

Notice Inviting Tender
(National Competitive Bidding through e-Tendering mode only)

National Highways Authority of India (NHAI) hereby invites bid through e-tendering from experienced firms/ organizations for **Short Term Remedial measures for the Blackspot Locations identified by MoRT&H, rectification of Critical Crash Prone Locations and speed calming measures at pedestrian crossing locations to attain Zero Fatality corridor in NH-83 (old no. NH-209) from Km.123.550 to Km.150.580 of Dindigul – Bangalore Road (Pollachi to Coimbatore Section) in the State of Tamil Nadu** for the following sections of the National Highways: -

Sl. No.	Section	Length (in km.)	State	Estimated Cost (Rs. in Lakh)
1.	Pollachi to Coimbatore Section (Km 123.550 to Km. 150.580 of NH 209 (New NH 83) in the State of Tamil Nadu	27.030	Tamil Nadu	266.32 Lakhs (Excluding GST)

Cost of Bid Documents (Non-Refundable) : Rs. 50,000/-

E-Tender Processing fee (Non-Refundable) : Nil.

The preliminary requirements (detailed requirements are given in the Bid Document) of bidding firm / contractor for above packages are mentioned as under:

Bid Security (Rs. lakhs)	Average Turn-over during last 3 years (Rs.lakhs)	Work of similar nature during last 7 years (Rs. lakhs)	Time for completion
5,32,630 (in lakhs)	79.89 Lakhs	Single work of Rs. 213.05lakhs OR Two works of Rs. 133.16lakhs OR Three works of Rs. 106.53 lakhs	3 Months (Urgent work)

The Scope of Work includes providing Short Term Remedial measures for the Blackspot Locations at 4 locations and rectification of Critical Crash Prone Locations - 3 locations and speed calming measures at Pedestrian crossing locations - 25 locations to attain Zero Fatality corridor (total 32 locations) as provided in the Section – VI as per the prevailing IRC guidelines and MoRT&H Specification.

It is mandatory for all the bidders to have class-III Digital Signature Certificate (With Both DSC Components, i.e. Signing & Encryption in the name of authorized signatory (who will sign the Bid)) from any of the licensed Certifying Agency (Bidders can see the list of licensed CA's from the link www.cca.gov.in to participate in e-tendering of NHAI.

To participate in the e-bid, it is mandatory for the Applicants to get themselves registered with the NHAI e-Tendering Portal (https://etenders.gov.in) to have a user ID & Password which is free of cost.
The detailed tender document can be viewed /downloaded/purchased from the website (https://etenders.gov.in) from 17/09/2025 to 01/10/2025 (up to 17:00 hrs).

The complete bid documents can be viewed/downloaded from the E-Tender Portal-NIC (https://etenders.gov.in) or www.nhai.gov.in free of cost. To participate for bidding, bidder have to pay a non-refundable fee of tender document i.e. **Rs. 50,000/- through Online Mode Only** on or prior to last date & time of submission of bid documents.
The Payment Should be made to:

Name of the Account	:	National Highways Authority of India
A/C No.	:	61231010004615
IFSC Code	:	CNRB0016123
Bank	:	Canara Bank
Branch	:	R.S. Puram Branch, Coimbatore 641 002

The Bidder must upload Copy of Receipt (Indicating Reference No./Transaction ID) towards payment of cost of Bid document. The amendments /clarifications to the bid document if any will be hosted on the above website.

The bid should be submitted online in the prescribed format given in the website. No other mode of submission is acceptable.

The authorized signatory holding Power of Attorney shall only be the Digital Signatory. In case authorized signatory holding Power of Attorney and Digital Signatory are not the same, the bid shall be considered non-responsive.

The last date submission of Bid in online is 17/09/2025 up to 17:00Hrs. (as mentioned on the e-portal only) ("Bid Due Date"). The technical bids would be opened on 03/10/2025 at 11:00 hrs online at **Office of the DGM(T) & Project Director, Project Implementation Unit – Coimbatore, National Highways Authority of India, (Ministry of Road, Transport & Highways), D.No. 11/1, Kongu Nagar East, Ramanathapuram, Coimbatore – 641 045. The date of opening of the financial bid of successful bidders shall be intimated later.** The representatives of the bidders (maximum of two) who choose to attend, may attend the online opening of the bids at the above office on the date and time as mentioned above. However, such representatives shall be allowed to attend the opening of the bids only if they produce letter of authority on the letter head of the bidder, at the time of opening of bids as mentioned above.

For any clarification, the office of the undersigned may be contacted.
Office of the DGM(T) & Project Director,
Project Implementation Unit - Coimbatore
National Highways Authority of India
(Ministry of Road, Transport & Highways)
D.No.11/1, Kongu Nagar East, Ramanathapuram,
Coimbatore – 641 045.
Phone No: 0422-2324734, 2324735
E mail: nhaicoimbatore@gmail.com, coimb@nhai.org

(SECTION-II)

INSTRUCTIONS TO BIDDERS & APPENDIX TO BID

Section II: Instructions to Bidders

Table of Clauses

Section II
Instructions to Bidders (ITB)
A. General

1. Scope of Bid

1.1 The Employer (i.e. Chairman, National Highways Authority of India) invites bids for "as described in these documents and referred to as "the works". The name and identification number of the works is provided in the Notice Inviting Tender.

1.2 The successful Bidder will be expected to complete the Works by the intended Completion Date specified in the Contract Data (Part I General Conditions of Contract).

1.3 Throughout these bidding documents, the terms "bid" and "tender" and their derivatives (bidder/tenderer, bid/tender, bidding/tendering, etc.) are synonymous.

2. Source of Funds

2.1 The expenditure on this project will be met by National Highways Authority of India.

3. Eligible Bidders

3.1 This Invitation for Bids is open to all bidders meeting the qualification requirements prescribed in this document.

3.2 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices by the Central Government, the State Government or any public undertaking, autonomous body, Authority by whatever name called under the Central or the State Government.

4. Qualification of the Bidder

4.1 Deleted

4.2 All bidders shall furnish the following information and documents with their bids in **Section-3, Qualification Information**.

(a) Scanned copies of original documents defining the constitution or legal status, place of registration, and principal place of business; scanned copy of written power of attorney of the signatory of the Bid to commit the Bidder. (Refer clause 12.2 of ITB).

(b) Scanned copy of total monetary value of Civil Construction works performed for each of the last three years;

(c) Scanned copy of experience certificate in works of a similar nature and size for each of the last seven years with certificates from the concerned officer of the rank of Executive Engineer or equivalent; clearly indicating date of start and date of completion.

(d) Scanned copy of evidence of availability (either owned or leased or rented) of items of construction equipment named in Clause 4.4 B(b)(i).

(e) Scanned copy of the CV of the technical personnel proposed to be employed for the Contract having the qualifications defined in Clause 4.4 B(b)(ii).

(f) Scanned copy of reports on the financial standing of the Bidder, and a certificate from Chartered Accountant as a proof of turnover for the last three years;

(g) Deleted
(h) Deleted
(i) Deleted

(j) Scanned copy of information regarding any litigation or arbitration during the last five years in which the Bidder is involved, the parties concerned, the disputed amount, and the present status;

(k) Deleted
(l) Deleted.

4.3 Bids from joint ventures are not allowed.

4.4 A. To qualify for award of the contract, each bidder in its name should have the following; -

(a) ***achieved an average annual financial turnover (in all classes of civil engineering construction works only) equal to the amount indicated in NIT during last three years ending 31st March of the previous financial year duly certified by Chartered Accountant. (Notwithstanding anything to the contrary contained herein, in the event that the bid due date falls within three months of the closing of the latest financial years, it shall ignore such financial year for the purpose of the bid and furnish annual financial turnover w.r.t. 3 years preceding in last financial year).***

(b) satisfactorily completed (not less than 90% of contract value), as a prime contractor (or as a nominated/approved subcontractor, provided further that all other qualification criteria are satisfied) similar works during last

seven years ending last day of month previous to the one in which bids are invited, either of the following:

i. three similar completed works costing not less than amount equal to each of Rs. 43.52 lakhs.
ii. Two similar completed works costing not less than amount equal to each of Rs. 27.20 lakhs.
iii. one similar completed work costing not less than amount equals to Rs. 21.76 lakhs.

(The similar work constitutes experience in providing Road Safety provisions which includes providing highway lighting, sign boards, road markings and road studs in National Highways).

(Escalation factor as under shall be used to bring the value of such completed works to the level of current financial year i.e., 2023-24) **Escalation factor** (for the cost of works completed during the last 7 years & financial figures required for the calculation of bid capacity) may be taken as follows:

Year before	Multiplying Factor One
	.....1.10
Two	..... 1.21
Three	.....1.33
Four	.....1.46
Five	.....1.61
Six	…….1.77
Seven	.....1.95

(c) Deleted

(d) Deleted

(e) Deleted

4.4 B (a) Each bidder must produce:

(i) An affidavit on a Stamp Paper, duly attested from the Notary Public, that the information furnished with the bid documents is correct in all respects; and

(ii) Such other certificates as defined in Section-III.

(iii) Failure to submit the certificates/documents as specified above at (i) and (ii) may make the bid non-responsive.

(b) Each bidder must demonstrate:

(i) Evidence of availability (either owned or leased or rented) of the key equipment for this work as stated in the Appendix to ITB and as per Form in Section III.

(ii) Availability for this work of personnel with qualification & experience as stated in the Appendix to ITB.

(c) Deleted

(d) Failure to demonstrate the certificates as specified above at (i) and (ii) may make the bid non-responsive.

4.4.C - Deleted

4.5 Sub-Contractors' experience and resources shall not be taken into account in determining the bidder's compliance with the qualifying criteria.

4.6 Bidders who inter alia 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* N* 2.5 - B)

Where

A = Maximum value of civil engineering works in respect of providing Road Safety measures executed in any one year during the last five years (updated to the price level of the year indicated in table below under note) taking into account the completed as well as works in progress. The EPC projects includes turnkey project/item rate contract/Construction works.

N = Number of years prescribed for completion of the works for which bid is invited.

B = Value (updated to the price level of the year indicated in table below under note) of existing commitments, works **for which Appointed Date/Commencement Date has been declared or on-going works** to be completed during the period of completion of the works for which bid is invited. For the Sake of clarification, it is mentioned that works for which LOA has been issued but Appointed Date/Commencement Date not declared as on Bid Due Date shall not be considered while calculating value of B.

Note : The Statement showing the value of all existing commitments, works **for which Appointed Date/Commencement Date has been declared or on-going works** as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Client or its Engineer-in-charge not below the rank of Executive Engineer or equivalent in respect of EPC Projects or Concessionaire/Authorized of SPV in respect of BOT Projects and verified by Statutory Auditor. The factors for updation of the value of civil engineering works to the price level of the year are indicated as under:

Year	Year-1	Year-2	Year-3	Year-4	Year-5
Updation factor	1.00	1.05	1.10	1.15	1.20

4.7 Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

(i) made misleading or false representations in the forms, statements, affidavits and attachments submitted in proof of the qualification requirements; and/or

(ii) record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc. or debarring from NHAI work etc.

(iii) Tampered the bid document in any manner.

5. One Bid per Bidder

5.1 Each Bidder shall submit only one Bid for the work. A Bidder who submits more than one Bid will cause such bids to be disqualified.

6. Cost of Bidding

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

7. Site Visit

7.1 The Bidder, at his own cost, responsibility and risk, is encouraged to visit, examine and familiarize himself with the Site of Works and its surroundings including source of earth, water, road aggregates etc. 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. He may contact the **Office of the Project Director, Project Implementation Unit Coimbatore, National Highways Authority of India, D.No.11/1, Kongu Nagar East, Ramanathapuram, Coimbatore – 641 045 i**n this regard.

B. Bidding Documents (Online)

8. Content of Bidding Documents

8.1 The set of bidding documents comprises the documents listed below and addenda/corrigendum (if any) issued in accordance with Clause 10:

Volume- I:

i. Notice Inviting Tender

ii. Instructions to Bidders & Appendix to Bid

iii. Qualification Information

iv. Forms of Bank Guarantee, Agreement & LOA

v. Conditions of Contract & Contract Data

vi. Scope of work

vii. Technical Specifications

viii. Implementation Manual & Maintenance Intervention Levels

Volume – II:

Bill of Quantities

Bidders will be required to quote a single percentage above/below the overall estimated amount. This percentage would be applicable for all the items of work in the contract for working out the rates for each item of work.

8.2 Deleted

8.3 The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms, terms, specifications, bill of quantities, etc. in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. Pursuant to clause 26 hereof, bids, which are not substantially responsive to the requirements of the Bid Documents, shall be rejected.

9. Clarifications on Bid Documents

9.1 A prospective Bidder requiring any clarification on the bid document may notify the Employer in writing or by e-mail (scanned copy) at the Employer's address indicated in the Notice Inviting Tender. The Employer will respond to any request for clarification received earlier than 10 days prior to the deadline for submission of bids. Copies of the Employer's response will be hosted on website or which are required in the opinion of the Employer including a description of the enquiry, but without identifying its source.

9.2.1 Deleted

9.2.2 Deleted

9.2.3 The bidder is requested to submit any questions in writing or by email so as to reach the Employer not later than one week before the meeting.

9.2.4 Minutes of the meeting, including the text of the questions raised (without identifying the source of the enquiry) and the responses given will be transmitted without delay on website. Any modifications of the bid documents as per clause 10, which may become necessary as a result of the pre-bid meeting or which are required in the opinion of the Employer shall be made by the Employer exclusively through the issue of an Addendum/ corrigendum pursuant to Clause 10 and not through the minutes of the pre-bid meeting.

9.2.5 Deleted

10. Amendment of Bidding Documents

10.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addenda/corrigendum.

10.2 Any addendum thus issued shall be part of the bidding documents and shall be hosted on web site of NHAI e-tendering portal.

10.3 To give prospective bidders reasonable time to take an addendum into account in preparing their bids, the Employer shall extend, as necessary, the deadline for submission of bids, in accordance with Clause20.2.

C. Preparation of Bids

11. Language of Bid

11.1 All documents relating to the Bid shall be in English.

12. Documents Comprising the Bid

12.1 The e-bid submitted by the bidder shall be in two separate parts. Part-I This shall be named Technical Bid and shall comprise of information submitted in section-III. Part-II It shall be named Financial Bid and shall comprise of (i) Priced bill of quantities.

12.2 Documents to be submitted Online.

The scanned copies of following documents are required to be uploaded during submission of e-bid on the e-tendering portal of NHAI, as per clause 12.1 above.

a) Bid Security
b) Proof of submission Bid Document Fee (Online Mode)
c) Written Power of Attorney of the signatory (whose digital signature certificate is used during e-tender submission) of the bidder to commit the bid
d) Affidavit duly notarized
e) Information to be submitted in section-III

12.3 The following documents, which are not submitted with the bid, will be deemed to be part of the bid.

Section	Particulars
1	Notice Inviting Tender
2	Instruction to the bidders
3.	Conditions of Contract
4.	Contract Data
5.	Scope of work
6.	Technical Specifications
7.	Implementation Manual and Maintenance Intervention Level

13. Bid Prices

13.1 The Contract shall be for the whole Works, as described in Clause 1. 1 based on the priced Bill of Quantities submitted by the Bidder.

13.2 The bidder shall quote bid prices on appropriate format enclosed as part of tender document on e-tender portal of NHAI. Bidders will be required to quote a single percentage above/below the overall estimated amount. This percentage would be applicable for all the items of work in the contract for working out the rates for each item of work.

13.3 All duties, taxes (except GST), royalties 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. The GST shall be reimbursed (if applicable) subject to production of proof of such payment by the contractor specific to the subject work.

13.4 The rates and prices quoted by the Bidder are subject to adjustment during the performance of the contract in accordance with the provisions of Clause 43 of the Conditions of Contract (no adjustment on any account will be admissible for contracts up to 12 month period).

14. Currencies of Bid and Payment

14.1 The unit rates given in the BOQ is in Indian Rupees. All payments shall be made in Indian Rupees.

15. Bid Validity

15.1 Bids shall remain valid for a period of **120 days** after the deadline date for bid submission specified in Clause 20. A bid valid for a shorter period shall be rejected by the Employer as non-responsive.

15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' response shall be made in writing or by email. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his bid security for a period of the extension, and in compliance with Clause 16 in all respects.

16. Earnest Money/Bid Security/Forfeiture/Debarment

16.1 The Bidder shall furnish, as part of the Bid, Earnest Money/Bid Security, in the amount as specified in the NIT. The Electronic Bank Guarantee/ Bank Guarantee must be in favour of NHAI, Payable at Chennai. **The bid security will remain in force up to and including the date 45 days beyond the validity of the bid as stated in the Instructions to Bidders**.

16.2 **The Earnest Money shall, at the bidder's option, be in the form of Electronic Bank Guarantee / Bank Guarantee / Online Mode only (the other form will not be acceptable)** of any scheduled commercial bank approved by RBI having a net

worth of not less than Rs. 500 crores as per the latest annual report of the bank must be in the name of employer and operatable at Chennai. In case of foreign bank (issued by a branch in India) the net worth in respect of the Indian operations shall only be taken into account. It shall be valid for 45 days beyond the validity of the bid. **Any bid having bid security for lesser value and shorter validity period shall be treated as non-responsive**.

For submission in BG Form: Upload Copy of Electronic Bank Guarantee/ Bank Guarantee during Online submission of Bid.

For Submission in Online Form: Payment should be made on or prior to last date & time of submission of bid documents. If Electronic Bank Guarantee/ Bank Guarantee is submitted towards Bid Security/EMD, it should be linked in SFMS (Structured Finance Messaging System) with the following NHAI bank account:

Name of the Account	:	National Highways Authority of India
A/C No.	:	61231010004615
IFSC Code	:	CNRB0016123
Bank	:	Canara Bank
Branch	:	R.S. Puram Branch, Coimbatore 641 002

A. Electronic Bank Guarantee/ Bank Guarantee, in the name of the Employer, from following banks would be accepted:-

i. State Bank of India or its subsidiaries,

ii. Any Indian Nationalized Bank,

iii. IDBI/ICICI Bank

iv. A foreign Bank (issued by a branch outside India) with a counter Electronic guarantee from SBI or its subsidiaries or any Indian Nationalized Bank.

v. Any Scheduled Commercial Bank approved by RBI having a net worth of not less than Rs.500 Crores as per the latest Annual Report of the Bank. In the case of a Foreign Bank (issued by a branch in India), the net worth in respect of the Indian operations shall only be taken into account.

B. The acceptance of the electronic guarantees shall also be subject to the following conditions:

i. The capital adequacy of the Bank shall not be less than the norms prescribed by RBI (presently 9, with effect from 31st March 2003).

ii. The Electronic Bank Guarantee/ Bank Guarantee issued by a Cooperative Bank shall not be accepted.

16.3 Any bid not accompanied by an acceptable Earnest Money, shall be rejected by the Employer as non - responsive.

16.4 The Earnest Money of unsuccessful bidders will be returned within 28 days of the end of the Bid validity period specified in Sub-Clause 15.1.

16.5 The Earnest Money of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Security.

16.6 The Bid Security/Earnest Money will be forfeited:

a) if the Bidder withdraws the Bid after its submission during the period of Bid validity ;

b) if the Bidder does not accept the correction of the bid price, pursuant to Clause 27; or

c) in the case of a successful Bidder, if the Bidder fails with in the specified time limit to:

i. Sign the Agreement; and/or

ii. furnish the required Performance Security.

16.7 In case of forfeiture of bid security, the bidder shall also be debarred from participation in NHAI works for a period as decided by NHAI.

17. Alternative Proposals by Bidders

17.1 Bidder shall submit offers that fully comply with the requirement of the bidding documents. Conditional offer or alternate offer will not be considered further in the process of evaluation and the bid will be declared non-responsive.

18. Format and Signing of Bid

18.1 The Bidder shall submit e-bid comprising of the documents as described in Clause 12 of the ITB.

18.2 DELETED.

18.3 DELETED.

D. Submission of Bids

19. Marking of Bids

19.1 The documents to be submitted in Online Mode should be as per clause 12.2 of ITB

19.2 DELETED.

19.3 DELETED.

19.4 DELETED.

19.5 DELETED.

20. Deadline for Submission of Bids

20.1 Complete E-Bid to be uploaded on NHAI e-tender portal before due date & time.

20.2 The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10, 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.

21. DELETED

21.1 DELETED

22. Modification and Withdrawal of Bids

22.1 Bidders may modify or withdraw their e-bids before the deadline prescribed in Clause20.

22.2 DELETED.

22.3 No bid may be modified after the deadline for submission of Bids.

22.4 Withdrawal or modification of a Bid between the deadline for submission of bids and the expiration of the original period of bid validity specified in Clause 15.1 above or as extended pursuant to Clause 15.

22.5 Bidders may modify the prices of their Bids before deadline of submission of bid.

E. Bid Opening and Evaluation

23. Bid Opening

Bid opening shall be carried out in two stages. Firstly, 'Technical Bid' of all the bids received (except those received late) shall be opened on the date and time mentioned. 'Financial Bid' of those bidders whose technical bid has been determined to be substantially responsible shall be opened on a subsequent date through online process of e-tendering, which will be notified to such bidders.

23.1 The Employer will open the "Technical Bid" of all the bids received (except those received late), in the presence of the bidders/bidders' representatives who choose to attend at the time, date and place specified in the **NIT**. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the Bids will be opened at the appointed time and location on the next working day.

23.1.1 DELETED

23.1.2 DELETED

23.2 In all cases, the amount of Earnest Money, forms and validity shall be announced. Thereafter, the Employer at the opening as the Employer may consider appropriate, will announce the bidders' names and such other details.

23.3 The Employer will prepare minutes of the Bid opening, including the information disclosed to those present in accordance with Clause23.1.

23.4 (i) The bids accompanied with valid bid security, bid document fee, Tender processing fee will be taken up for evaluation with respect to the Qualification Information and other information furnished in Part I of the bid pursuant toClause12.1.

(ii) Deleted

(iii) Deleted

(iv) As soon as possible, the Evaluation Committee will finalize the list of responsive bidders whose financial bids are eligible for consideration.

However, to assist in the examination, evaluation of technical bids, the Employer may at his discretion, ask any bidder for clarification of his bid, however, no additional documents in support of clarification will be entertained.

(v) Bidder shall have to submit Originals of all documents as mentioned in Clause 12.2 after declaration of bid evaluation result by Authority.

(vi) Bidder failing to submit the Original Documents as mentioned in Clause 12.2 shall be unconditionally debarred from bidding in NHAI projects for a period of 5 years.

23.5 The Employer shall inform the bidders, whose technical bids are found responsive, of the date, time and place of opening of the financial bids. The bidders so informed, or their representative, may attend the meeting of opening of financial bids.

23.6 At the time of the opening of the 'Financial Bid', the names of the bidders whose bids were found responsive in accordance with clause 23.5 will be announced. The financial bids of only these bidders will be opened. The responsive bidders' names, the Bid prices, the total amount of each bid, pursuant to clause 22 and such other details as the Employer may consider appropriate will be announced by the Employer at the time of bid opening. Any Bid price, which is not read out and recorded, will not be taken into account in Bid Evaluation.

23.7 The Employer shall prepare the minutes of the opening of the Financial Bids.

24. Process to be Confidential

24.1 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 person not officially concerned with such process until the award to the successful Bidder has been announced. Any attempt by a Bidder to influence the Employer's processing of bids or award decisions may result in the rejection of his Bid.

25. Clarification of Bids and Contacting the Employer

25.1. To assist in the examination, evaluation, and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his-Bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, 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 Clause27.

25.2 Subject to sub-clause 25.1, no Bidder shall contact the Employer on any matter relating to his bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Employer, it should do so in writing.

25.3 Any effort by the Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidders' bid.

26. Examination of Bids and Determination of Responsiveness

26.1 During the detailed evaluation of "Technical Bids", the Employer will determine whether each Bid

(a) meets the eligibility criteria defined in Clauses 3 and 4;

(b) the required documents uploaded by the bidder are in order; and

(c) is substantially responsive to the requirements of the bidding documents. During the detailed evaluation of the "Financial Bids", the responsiveness of the bids will be further determined with respect to the remaining bid conditions, i.e., priced bill of quantities, technical specifications and drawings etc.

26.2 DELETED.

26.3 DELETED.

27. Correction of Errors

27.1 Financial 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 rates in figures and in words, the rate in words will govern

27.2 The amount stated in the Financial Bid will be corrected by the Employer in accordance with the above procedure for the correction of errors and 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 shall be forfeited in accordance with Sub-Clause16.6

28. Evaluation and Comparison of Financial Bids

28.1 The Employer will evaluate and compare only the bids determined to be substantially responsive in accordance with Clause26.

28.2 In evaluating the bids, the Employer will determine for each Bid the evaluated Bid price by adjusting the Bid price after making any correction for errors pursuant to Clause27;

28.3 If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer's/Employer's estimate of the cost of work of whole work or cost of one or more items to be performed under the contract, the Employer may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price

analyses, the Employer may require that the amount of the performance security set forth in Clause 33 be increased and an additional performance security may be obtained at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract. The amount of the additional increased performance security as decided by the Employer shall be final, binding and conclusive on the bidder.

28.4 A bid, which contains several items in the Bill of Quantities which are unrealistically priced low and which cannot be substantiated satisfactorily by the bidder, may be rejected as non-responsive.

29. Price Preference

29.1 Deleted

F. Award of Contract

30. Award Criteria

30.1 Subject to Clause 32, the Employer will award the Contract to the Bidder whose Bid has been determined:

i. to be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid price.

ii. Deleted.

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

31.1 Notwithstanding Clause 30, the Employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.

32. Notification of Award and Signing of Agreement

32.1 The bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period by courier/ registered letter. This letter (hereinafter and in the Part I *General Conditions of Contract* called the "Letter of Acceptance") will state the sum that the Employer will pay to the Contractor in consideration of the execution, completion and maintenance of the Works, and of routine maintenance of roads by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

32.2 The notification of award will constitute the formation of the Contract, subject only to the furnishing of a performance security in accordance with the provisions of Clause33.

32.3 The Agreement will incorporate all agreements between the Employer and the successful Bidder. It will be signed by the Employer and the successful Bidder after the performance security is furnished.

32.4 Upon furnishing by the successful Bidder of the Performance Security, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful.

33. Performance Security

33.1 Within 10 (ten) days after receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance Security of Ten percent (10%) of the Contract Price, valid for the period of 28 days after the expiry of defect liability period of whole work in accordance with Clause 28.3 of ITB and sign the contract. The validity shall account for additional 3 months time to account for e-BG/BG verification, signing of contract and start date.

The Selected Bidder, along with the Performance Security, shall also furnish to the Authority an irrevocable and unconditional guarantee from a Bank in the same form given at Appendix-VII towards an Additional Performance Security (the "Additional Performance Security") for an amount calculated as under:

i. Where the bid price is below 10% but not below 20% of the project cost put to bid, the additional performance guarantee/security percentage shall be incremented by 0.1% for every percentage of bid price below 10% of the project cost put to bid starting at 11% with the additional bid performance guarantee being 0.1% and this additional performance guarantee percentage shall be applied on the bid price;

ii. Where the bid price is 20% or more below of the project cost put to bid, the additional performance guarantee percentage shall be incremented by 0.2% for every percentage of bid price below 20% of the project cost put to bid in addition to 1% of the bid price and this additional performance guarantee percentage shall be applied on the bid price;

iii. The additional performance guarantee percentage shall be rounded off to the next lower percentage based on whether the decimal point of the percentage of bid price is below 0.5% or next higher percentage based on whether the decimal point of the percentage of bid price is 0.5% or more.

iv. The additional performance security shall be treated as part of the performance security

33.2 The performance security shall be either in the form of Electronic-Bank Guarantee/Bank Guarantee or fixed deposit Receipts, in the name of the Employer, from a Bank as specified.

33.3 Failure of the successful bidder to comply with the requirement of sub-clause 33.1 shall constitute sufficient ground for cancellation of the award and debarment for

participation in tendering processes for a period of one year from the bid due of this work.

34. Advances

34.1 The Employer will provide Mobilization Advance as provided in Part I General Conditions of Contract.

35. Corrupt or Fraudulent Practices

The Employer 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 and will declare the firm ineligible, either indefinitely or for a stated period of time, to bid for any work with National Highways Authority of India, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for the contract, or in its execution.

For the purpose of this clause, the following terms shall have the meaning hereinafter respectively assigned to them

(a) **" Corrupt practice"** means (i) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the actions of any person connected with the Bidding Process (For avoidance of doubt, offering of employment to, or employing, or engaging in any manner whatsoever, directly or indirectly, any official of the Authority who is or has been associated in any manner, directly or indirectly, with Bidding Process, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Authority, shall be deemed to constitute influencing the actions of a person connected with the Bidding Process);

(b) **"Fraudulent practice"** means a misrepresentation or omission of facts or suppression of facts or disclosure of incomplete facts, in order to influence the Bidding Process;

The Employer requires the bidders/Contractors to strictly observe the laws against fraud and corruption enforced in India, namely, Prevention of Corruption Act, 1988.

Appendix to ITB

(4.4.**B**) (b) (i) The sign boards, Electrical poles, wires, lights, paints and other safety measures with the equipment to be deployed on contract work as should be as per IRC Standards and other relevant guidelines for Civil and Electrical works.

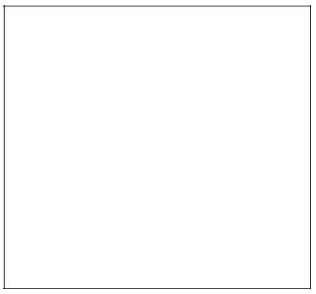
Note: The bidder must produce the documentary evidence in support of the above equipment.

B (b) (ii) The Number of Technical Personnel, Qualifications and Experience will be as follows:

Sl. No.	**Personnel**	**Minimum Qualification and Experience**	**Particular Experience (minimum requirement)**	**No. of Persons**
1.	Project Manager	Graduation in Civil Engineering + 5 Years Exp.	5 years as Project Manager on NH/SH, preferably Road Safety works	1
2.	Electrical Engineer	Graduation in Electrical Engineering + 5 Years Experience	5 Years in execution & Maintenance of Highway lightings	1

Note: The detailed and signed CV's of all the Key Technical Personnel, recently signed (not older than 3 months from the due date of submission of bid) by the key personnel himself, must be furnished **along with the bid as per** Performa given below. Non-compliance of the above or non-furnishing of the CV as above or conditional deployment of any of the above personnel or proposal to employ lesser number of personnel than above may make the bid non responsive and financial bid may not be opened.

Format of Curriculum Vitae (CV) For Proposed Key Staff



1. Proposed Position:_____

2. Name of Staff:_____
_____

3. Date of Birth:_____**(Please furnish proof of age)**

4. Nationality:_____

5. Educational Qualification:
(*Summarize college/university and other specialized education of staff member, giving names of schools, dates attended and degrees obtained).*
(Please furnish proof of qualification)
Contact Address with Phone and mobile numbers:

6. Membership of Professional Societies:_____

7. Publication:
(List of details of major technical reports/papers published in recognized national and international journals)

8. **Employment Record:**

(Starting with present position, list in reversed order, every employment held. List all positions held by staff member since graduation, giving dates, names of employing organization, title of positions held and location of assignments. For experience ***period of specific assignment must be clearly mentioned,*** also give client references, where appropriate).

9. Summary of the CV

(Furnish a summary of the above CV. The information in the summary shall be precise and accurate. The information in the summary will have bearing on the evaluation of the CV).

A) Education:
i) Field of Diploma/Graduation and year
ii) Field of post-graduation and year
iii) Any other specific qualification

B) Experience
i) Total experience in highways:_____Yrs
ii) Responsibilities held:

i) Yrs.
ii) Yrs.

iii) Yrs.

iii) Relevant Experience:_____Yrs.

C) Permanent Employment with the Firm (Yes/No):If yes, how many years:
If no, what is the employment?
Arrangement with the firm?

Certification
:

1 *I am willing to work on the project and I will be available for entire duration of the project assignment and I will not engage myself in any other assignment during the currency of this assignment on the project*

2 I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself my qualification and my experience.

Signature of the Candidate_____

Place:_____
Date:_____

Signature of the Authorized Representative of the firm_____

Place

Date

Note: Each page of the CV shall be signed in ink by both the staff member and the Authorized Representative of the firm.

SECTION III

QUALIFICATION INFORMATION

(To be Filled by Bidder)

SECTION III

QUALIFICATION INFORMATION

The information to be filled in by the Bidder in this section on E-portal & **Scanned Copies of documents to be submitted online** will be used for the purposes of post qualification as provided for in Clause 4 of the Instructions to Bidders.

Qualification Information

1. For Individual Bidders

(a) Year of Constitution

(b) Legal status of Bidder (Proprietorship/Partnership or Pvt. Ltd. firm)

[Upload scanned copy of original]

(c) Place of registration:

_____

(d) Principal place of business:

_____

Power of attorney of signatory of Bid ***[Upload scanned copy & also supply its Original copy in envelop of physical form]]***

1.3. Total value of Civil Engineering construction work performed in the last three years (in Rs. Lakhs) refer ITB Clause 4.4 A (a)
(Upload scanned copies of certificate from Chartered Accountant &also supply original certificate from Chartered Accountant)

2022 - 2023

2023 – 2024

2024 - 2025

Total ----------

Average per year

1.4 (a) Work performed as prime contractor, work performed in the past as a nominated/approved sub- contractor provided further that all other qualification criteria are satisfied (in the same name) of a similar nature during the last seven years as per ITB Clause 4.4A(b).

Project Name	**Name of the Employer ***	**Description of work**	**Contract No.**	**Value**	**Date of issue of work order**	**Stipulated period of Completion**	**Actual date of completion ***	**Remarks explaining reasons for delay & work Completed**

** Upload certificate(s) from the Employer (to be given by an officer at the rank of Executive Engineer or equivalent*

Note: In case of nominated/approved sub-contractor – a certificate from the Executive Engineer or equivalent of the Prime Employer should be obtained from whom an approval for subcontractor has been obtained.

1.4(b) Information on Bid Capacity (works for which bids have been submitted and accepted and works which are yet to be completed) as on the date 7 days before the last date for bid submission (as per Cl 4.6 of the ITB).

(i) Existing commitments and on-going works(B)

Description of works	Place & State	Contract No.	Name& Address of Employer	Value of Contract (Rs Cr)	Stipulated Period of Completion	Value of works* remaining to be completed in the next N years (Rs Cr)	Escalation factor	Anticipated date of completion	Escalated value of remaining work during completion period of work for which bids are invited
1	2	3	4	5	6	7	8	9	10

* Upload certificate (s) from the Engineer(s)-in-Charge of the rank of Executive Engineer or equivalent.

(ii) Details of works for which bid submitted and accepted (i.e. where contract signing is pending)

Description of works	Place & State	Name & Address of Employer	Date of issue of Letter of Acceptance (LOA) *	Value given in LOA	Stipulated period for completion	Value of work during completion period of work for which bids are invited
1	2	3	4	5	6	7

* Upload copy of LOA

(iii) Bid Capacity (Bidder shall calculate, mention his bid capacity and enclose the supporting calculation)

A =Rs..... lakh (enclose the details)

N =0.5years

B =Rs..... lakh (enclose the details)

Assessed Available Bid capacity = (A* N* 2.5 - B)

1.5. ~~Availability of Key Equipment essential for carrying out the Works [Ref. Clause 4.4(B) (b) (i)]. The Bidder should list all the information requested below.~~

~~Item of Equipment~~	~~Requirement~~		~~Availability Proposals~~		~~Page No. of the proof attached.~~
	~~No.~~	~~Capacity~~	~~Owned/Leased rented~~	~~Nos./ Capacity~~	

Note: The bidder must upload the documentary evidence in support of his owning/leased/ rented of the above equipment. In case the bidder proposes to hire or take the above equipment on lease, he should, along with the lease/rent agreement, attach the proof of ownership of this equipment with the company/ entity from whom the equipment is proposed to be hired on lease/ rent.

1.6 Qualification and Experience of Key Personnel required for administration and execution of the Contract [Ref. Clause 4.4 (B) (b) (ii)]. Upload biographical data for technical personnel (Refer also to Cl. 4.2 (e) of Instruction to Bidders).

(Refer also to Sub Clause 9.1 of the Conditions of Contract).

Position	Name	Qualification	Total Professional Experience (Years)	Experience in the proposed position (Years)

Note: The detailed and signed CV's of all the Key Technical Personnel, signed by the key personnel himself, must be uploaded along with the bid as per Performa given in Appendix to ITB. Non-compliance of the above or non-furnishing of the CV as above or conditional deployment of any of the above personnel or proposal to employ lesser number of personnel than above may make the bid non-responsive and financial bid may not be opened.

1.7. Information on litigation history in which the Bidder is involved.

Other Party(ies)	Employer	Cause of Dispute	Amount involved	Remarks showing Present Status

2. Bidders should upload the scanned copy of the following affidavits/ undertakings as per formats enclosed hereinafter & also send original copy of Affidavit:-

(i) Affidavit (it should be on stamp paper attested by Notary Public)

(ii) Undertaking regarding minimum investment of cash towards working capital.

(iii) Undertaking that the Bids shall remain valid for the period specified in Clause 15.1 of the ITB – 120 Days.

(iv) Bid Security shall remain valid for the period specified in Clause 15.1 &16.1 i.e. 120+45=165days

AFFIDAVIT

1. I, the undersigned, do hereby certify that all the statements and documents made in the enclosed attachments are true and correct.

2. The undersigned also hereby certifies that neither our firm M/s_____have abandoned any work on National Highways in India nor any contract awarded to us for such works have been rescinded, during last five years prior to the date of this bid.

3. The undersigned hereby authorize(s) and request(s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by NHAI to verify this statement or regarding my (our) competence and general reputation.

4. The undersigned understands and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the NHAI and within the prescribed time.

_____

(Signed by an Authorized Representative of the Firm)

_____
Name of the Representative

_____
Name of Firm

_____
DATE

To be notarized by Notary

UNDERTAKING

I, the undersigned do hereby undertake that our firm M/s. _____ _____Would invest minimum cash up to 25% of the value of the work during implementation of the Contract towards the working capital.

_____

(Signed by an Authorized Representative of the Firm)

_____
Name of the Representative

_____
Name of Firm

_____ DATE

Note: It should not be later than one month before bid due date.

UNDERTAKING

I, the undersigned do hereby undertake that our firm M/s_____ _____agree to abide by this bid for a period of _____days after the date fixed for receiving the same and it shall be binding on us and may be accepted at any time before the expiration of that period.

_____
(Signed by an Authorized Representative of the Firm)

_____
Name of the Representative

_____
Name of Firm

_____
DATE

Note: It should not be later than one month before bid due date.

(On the letter head of the bidder)

Appendix 1.7 [Ref. clause 4.4 B (b) (i)]

Undertaking

I, the undersigned do hereby undertake that our firm M/s…… agree to provide and will deploy required equipment as mentioned in the Appendix to ITB of the work……
……further it is certified that the documents submitted as evidence of availability of the key equipment for this work as stated in the Appendix to ITB, are genuine and correct. If anything, contrary to the details as submitted is found at any stage NHAI would be at liberty to debar/blacklist my firm for an appropriate period as decided by NHAI.

_____
(Signed by an Authorized Representative of the Firm)

_____
Name of the Representative

_____
Name of Firm

(Seal of the company)

_____
Date

Note: It should not be later than one month before bid due date.

(SECTION-IV)

FORMS OF BANK GUARANTEES
LOA & AGREEMENT

FORM OF E-BANK GUARANTEE/BANK GUARANTEE FOR BID SECURITY

WHEREAS_____(Name of Tenderer) (hereinafter called the Tenderer) wishes to submit his tender for providing rectification measures for the Blackspot Locations identified by MoRT&H, rectification of Critical Crash Prone Locations and speed calming measures in Pedestrian crossing locations to attain Zero Fatality corridor in NH-209 (from Km. to km.) in the state/s of herein after called "the Tender" KNOW ALL MEN by these present that we

(hereinafter called the 'Bank') are bound unto the National Highways Authority of India (hereinafter called "the Employer") in the sum of the Rs._____(Rupees_____) *

for which payment can truly be made to the said Employer. The Bank bind themselves, their successors and assigns by this present with the common seal of the Bank this day_____

of_____and undertake to pay the amount of Rs._____To the employer upon receipt of his first written demand without the employer having to substantiate his demand.

The conditions of this obligation are:

(i) If the tenderer withdraws his tender during the period of Tender validity specified in the Form of Tender.

Or

(ii) If the Tenderer having been notified of the acceptance of his Tender by the Employer during the period of tender 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 Instruction to Bidders.

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 any one of the above conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including the date 45days beyond the validity of the bid as stated in the Instructions to Bidders or as it may be extended by the Employer, at any time prior to the closing date for submission of the Tenders Notice of which extension to the Bank is hereby waived. Any demand in respect of this guarantee should be made on the Bank on or before the date of expiry of this guarantee.

This guarantee shall also be operatable at our …….. ….. branch at Chennai, from whom, confirmation regarding the issue of this guarantee or extension/renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation

"The guarantor/bank hereby confirm that it is on the SFMS (Structural Finance Messaging System) Platform & shall invariably send and advice of this E-Bank Guarantee/Bank Guarantee to the designated bank of NHAI after obtaining details thereof from NHAI".

Sl. No.	Particulars	Details
1.	**Name of Beneficiary**	**National Highways Authority of India**
2.	**Name of Bank**	**Canara Bank**
3.	**Account No.**	**61231010004615**
4.	**IFSC Code**	**CNRB0016123**
5.	**Address of Bank Branch**	**R.S. Puram Branch, Coimbatore 641 002**

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs._____(Rs. in words) and the guarantee shall remain valid till. Unless a claim or a demand in writing is served upon us on or before all our liability under this guarantee shall cease.

SIGNATURE OF AUTHORISED REPRESENTATIVE OF THE BANK_____

NAME AND DESIGNATION____

EMPLOYEE CODE NUMBER SEAL OF THE BANK_____

SIGNATURE OF THE WITNESS (IF THIS IS TO BE WITNESSED AS PER BANK'S POLICY)_____

NAME OF THE WITNESS_____

ADDRESS OF THE WITNESS_____

FORM OF BANK GUARANTEE / E-BANK GUARAMTEE FOR PERFORMANCE SECURITY

To

The DGM(T) & Project Director
Project Implementation Unit - Coimbatore
National Highways Authority of India
(Ministry of Road, Transport & Highways)
D.No.11/1, Kongu Nagar East, Ramanathapuram,
Coimbatore – 641 045.
Phone No: 0422-2324734, 2324735
E mail: nhaicoimbatore@gmail.com, coimb@nhai.org

WHEREAS…… (name and address of contractor) hereinafter called "the contractor" has undertaken, in pursuance of Letter of Acceptance No. ……. Dated …….. to execute .....(name of Contract and brief description of Works) (hereinafter called "the contract").

AND WHEREAS it has been stipulated by you in the said contract that the Contractor shall furnish you with a Bank Guarantee for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREOF we hereby affirm that we are the guarantor and responsible to you on behalf of the Contractor, up to a total of Rs…… (amount of guarantee) (Rupees…….(in words), and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of..... (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract or of the works to be performed there under or of any of the contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until 28 days from the date of expiry of the Defects Liability Period.

This guarantee shall also be operatable at our ……. branch at Coimbatore, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this

guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation

"*The guarantor / bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) Platform & shall invariably send and advice of this Bank Guarantee to the designated bank of NHAI after obtaining details thereof from NHAI*".

Sl. No.	Particulars	Details
1.	**Name of Beneficiary**	**National Highways Authority of India**
2.	**Name of Bank**	**Canara Bank**
3.	**Account No.**	**61231010004615**
4.	**IFSC Code**	**CNRB0016123**
5.	**Address of Bank Branch**	**R.S. Puram Branch, Coimbatore 641 002**

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs._____(Rs.___in words) and the guarantee shall remain valid till_____. Unless a claim or a demand in writing is served upon us on or before_____all our liability under this guarantee shall cease.

Signature and seal of the Guarantor with Name, Designation, Employee Code Number & Telephone Number……

Name of the Issuing Bank/Branch.....Name of the Controlling Branch/Bank….

Address & Telephone Number……Address & Telephone Number…….

Date…….

In the presence of (if this is to be witnessed as per bank's policy) ……

1……

(Name, Address & Occupation)

2……
(Name, Address & Occupation)

An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract including additional security for unbalance bids, if any and denominated in Indian Rupees.

FORM OF LETTER OF APPLICATION

To,

The DGM(T) & Project Director
Project Implementation Unit - Coimbatore
National Highways Authority of India
(Ministry of Road, Transport & Highways)
D.No.11/1, Kongu Nagar East, Ramanathapuram,
Coimbatore – 641 045.
Phone No: 0422-2324734, 2324735
E-mail: nhaicoimbatore@gmail.com, coimb@nhai.org

DESCRIPTION OF WORKS:

Dear Sir,

Having examined the Bid Document, Instruction to Bidders Qualification Information, Scope of works, etc. for the subject work. We, hereby submit our bid for the subject work.

It is certified that the information furnished in this document is true and correct. The proposal is unconditional and unqualified. We undersigned accept that NHAI reserves the right to reject any or all application without assigning any reason.

Thanking you,

Yours faithfully,

(Authorized Signatory)
for and on behalf of M/s_____

FORM OF LETTER OF ACCEPTANCE

No……. Dated……..

To

M/s……

Sub.: ……. Name of Work ……

Sir,

Based on your bid submitted on ……. in compliance of bidding document of NHAI for execution of the work of ……. ……., it is hereby notified that your bid for a contract price of **Rs……** (**Rupees in words……)** has been accepted for and on behalf of NHAI

You are hereby requested to furnish Performance Security in the form detailed in para.33.2 of ITB for an amount equivalent to **Rs.....(Rupees in words……)** within 10 days as per provisions of clause 33.1 of ITB of the bid document and sign the contract agreement failing which the actions as stipulated in clause-.33.3 of ITB shall be taken.

Thanking you,

Yours faithfully,

(……..)
DGM(T) & Project Director

FORM OF AGREEMENT

AGREEMENT

This agreement made the _____day of _____ 20_____between the National Highways Authority of India, (hereinafter called "the Employer" of the one part and_____(here in after called "the Contractor") of the other part.

AND WHEREAS the Employer invited bids from eligible bidders for the execution of certain works, viz……

AND WHEREAS pursuant to the bid submitted by the Contractor, vide _____(here in after referred to as the "BID" or "ÖFFER") for the execution of works, the Employer by his letter of acceptance dated_____accepted the offer submitted by the Contractor for the execution and completion of such works and remedying of any defects thereon, on terms and conditions in accordance with the documents listed in para2below.

AND WHEREAS the Contractor by a deed of undertaking dated_____has agreed to abide by all the terms of the bid, including but not limited to the amount quoted for the execution of Contract, as stated in the bid, and also to comply with such terms and conditions as may be required from time to time.

AND WHEREAS the contractor has agreed to undertake such works and has furnished a performance security pursuant to clause 33 of the instructions to bidders (Section-I).

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this agreement words and expressions shall have the same meaning as are respectively assigned to them in the conditions of contract hereinafter referred to;
2. the following documents shall be deemed to form and be read and construed as part of this agreement viz.

    (a) Agreement,
    (b) Letter of Acceptance
    (c) Contractor's Bid including Financial Bid Form,
    (d) Contract Data,
    (e) Conditions of Contract
    (f) Technical Specifications,
    (g) Drawings, if any
    (h) Implementation Manual and Maintenance Intervention Level

(i) Scope of Work
(j) Bill of Quantities, and
(k) Any other document listed in the Contract Data.

3. The foregoing documents shall be construed as complementary and mutually explanatory one with another. Should any ambiguity or discrepancy be noted then the order of precedence of these documents shall be subject to the order as listed above and interpreted in the above order of priority.

4. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the works and remedy any defects therein in conformity in all respects with the provisions of the contract.

5. the employer hereby covenants to pay the contractor in consideration of the execution and completion of the works and remedying of defects therein; 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.

IN WITNESS WHEREOF the parties here to have caused this agreement to be executed the day and year above written. Signed, sealed and delivered by the said Employer through his Authorized Representative and the said Contractor through his Power of Attorney holder.

Binding Signature of Employer_____

For and on behalf of National Highways Authority of India,

Binding Signature of Contractor_____

For and on behalf of M/s._____

In the presence of
1. Name:
   Address:

2. Name:
   Address:

In the Presence of
1. Name:
   Address:

2. Name:
   Address:

(SECTION-V)

CONDITIONS OF CONTRACT

AND CONTRACT DATA

Table of Clauses

Section V

Conditions of Contract

A. General

1. Definitions

1.1 Terms which are defined in the Contract Data are not defined in the Conditions of Contract but keep their defined meanings. Capital initials are used to identify defined terms.

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

Compensation Events are those defined in Clause 41 hereunder.

The Completion Date is the date of completion of the Works as certified by the Engineer, in accordance with Clause 49.1.

The Contract is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in Clause 2.3.

The Contract Data defines the documents and other information, which comprise the Contract.

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

The Contractor's Bid is the completed bidding document submitted by the Contractor to the Employer and includes technical and financial bids.

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

Days are calendar days; months are calendar months.

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

The Defects Liability Certificate is the certificate issued by Engineer, after the Defect Liability Period has ended and upon correction of Defects by the Contractor.

The Defects Liability Period is the period named in contact data and calculated from the Completion Date.

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

The Employer is the party as defined in the Contract Data, who employs the Contractor to carry out the Works. The Employer may delegate any or all of its functions to a person or body nominated by him for specified functions.

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

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

The Initial Contract Price is the Contract Price listed in the Employer's Letter of Acceptance.

The Intended Completion Date is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Engineer by issuing an extension of time after the approval from Employer.

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

Plant is any integral part of the Works that shall have a mechanical, electrical, electronic, chemical, or biological function.

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

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

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

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

A **Sub-Contractor** 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.

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

A **Variation** is an instruction given by the Engineer after the approval from NHAI, which varies the Works.

The **Works** are what the Contract requires the Contractor to construct, install, maintain, and handover to the Employer, 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 Engineer 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.

(a) Agreement,
(b) Letter of Acceptance
(c) Contractor's Bid including Financial Bid Form,
(d) Contract Data,
(e) Conditions of Contract
(f) Technical Specifications,
(g) Drawings, if any
(h) Implementation Manual and Maintenance Intervention Level
(i) Scope of Work
(j) Bill of Quantities, and
(k) Any other document listed in the Contract Data.

3. Language and Law

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

4. Engineer's Decisions

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

5. Delegation

5.1 The Engineer, duly informing the Employer, may delegate any of his duties and responsibilities to other people 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 any portion of work, up to a limit specified in Contract Data, with the prior approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.

7.2 The Contractor shall not be required to obtain any consent from the Employer for:

a. the sub-contracting of any part of the Works for which the Sub-Contractor is named in the Contract;
b. the provision of labour or labour component.
c. the purchase of Materials which are in accordance with the standards specified in the Contract.

7.3 Beyond what has been stated in clauses 7.1 and 7.2, if the Contractor proposes sub-contracting of any part of the work during execution of the Works, because of some unforeseen circumstances to enable him to complete the Works as per terms of the Contract, the Employer will consider the following before according approval:

a) The Contractor shall not sub-contract the Works more than the limit specified in Contract Data.
b) The Contractor shall not sub-contract any part of the Work without prior consent of the Employer. Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any of his sub-Contractor, his agents or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents and workmen.

7.4 The Engineer should satisfy himself before recommending to the Employer whether

a) the circumstances warrant such sub-contracting; and
b) the sub-Contractor so proposed for the Work possess the experience, qualifications and equipment necessary for the job proposed to be entrusted to him in proportion to the quantum of Works to be sub-contracted.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other Contractors, public authorities, utilities, and the Employer 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 Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

8.2 The Contractor should take up the works in convenient reaches as decided by the Engineer to ensure there is least hindrance to the smooth flow of traffic including movement of vehicles and equipment of other Contractors till the completion of the Works.

9. Personnel

9.1 The Contractor shall employ the technical personnel named in the Contract Data. The **RO, NHAI, Chennai** will approve any proposed replacement of technical personnel (except Project Manager) only if their relevant qualifications and experience are substantially equal to or better than those of the personnel stated in the Contract Data. If the personnel stated in the contract data are not deployed on site by the Contractor, a penalty of Rs. 50,000/- per month in case of Project Manager and Rs. 25,000/- in case of other key personnel will be imposed up to a maximum period of 3 months. Thereafter, it will be treated as a breach of contract and action will be taken as per Clause 53. The replacement of Project Manager will be approved by **NHAI, RO- Chennai.**

9.2 If the Engineer 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 Works in the Contract.

10. Employer's and Contractor's Risks

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

11. Employer's Risks

11.1 The Employer is responsible for the excepted risks which are (a) in so far as they directly affect the execution of the Works in the Employer's country, the risks of war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot commotion or disorder (unless restricted to the Contractor's employees), natural calamities and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive, or (b) a cause due solely to the design of the Works, other than the Contractor's design.

12. Contractor's Risks

12.1 All risks of loss of or damage to physical property and of personal injury and death, which arise during and in consequence of the performance of the Contract other than the excepted risks are the responsibility of the Contractor.

13. Insurance

13.1 The Contractor at his cost shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of defect liability period for events (a) to (d), in the amounts and deductibles stated in the Contract Data for the following events which are due to the Contractor's risks:

a) loss of or damage to the Works, Plant and Materials;
b) loss of or damage to Equipment;
c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
d) Personal injury or death.

13.2 Insurance policies and certificates for insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such insurance shall provide for compensation to be payable in Indian Rupees to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be debt due.

13.4 Alterations to the terms of insurance shall not be made without the approval of the Engineer.

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

14. Site Investigation Reports

14.1 The Contractor, in preparing the Bid, may rely on any Site Investigation Reports referred to in the Contract Data, supplemented by any other information available to him, before submitting the bid.

15. Queries about the Contract Data

15.1 The DGM will clarify queries on the Contract Data.

16. Contractor to Construct the Works & do maintenance

16.1 The Contractor shall construct, install and maintain the Works in accordance with the documents forming part of the contract.

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

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

18. Approval by the Engineer

18.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer, who is to approve them if they comply with specifications and drawings.

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

18.3 The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

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

18.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Engineer before their use.

19. Safety

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

20. Discoveries

20.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall

notify the Engineer of such discoveries and carry out the Engineer's instructions for dealing with them.

21. Possession of the Site

21.1 The Employer shall give complete possession of the Site to the Contractor on the date of signing of agreement.

22. Access to the Site

22.1 The Contractor shall allow 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 and to any place where material or plant are being manufactured /fabricated / assembled for the works to the engineer and any person/persons/agency authorized by:

a. The Engineer
b. The Employer

23. Instructions

23.1 The Contractor shall carry out all instructions of the Engineer, which comply with the applicable laws where the Site is located.

23.2 The Contractor shall permit the Employer 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 Employer if so required by the Employer.

24. Deleted

25. ARBITRATION

25.1 in case 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 differences shall be settled as set forth below:

(i) The Dispute shall be finally referred to Society for Affordable Resolution of Disputes (hereinafter called as SAROD), a Society registered under Society's Act, 1860 vide Registration no. S/RS/SW1049/2013 duly represented by Authority and National Highways Builders Federation (NHBF). The dispute shall be dealt with in terms of Rules of SAROD. The detailed procedure for conducting Arbitration shall be governed by the Rules of SAROD and provisions of Arbitration & Conciliation Act, 1996, as amended from time to time.

The Dispute shall be governed by Substantive Law of India

(ii) The appointment of Tribunal, Code of conduct for Arbitrators and fees and expenses of SAROD and Arbitral Tribunal shall also be governed by the Rules of SAROD as amended from time to time. The rules of SAROD are as per Annex-I

(iii) Arbitration may be commenced during or after the Contract Period, provided that the obligations of Authority and the Contractor shall not be altered by reason of the Arbitration being conducted during the Contract Period.

(iv) The seat of Arbitration shall be New Delhi or a place selected by governing body of SAROD and the language for all documents and communications between the parties shall be English.

(v) The expenses incurred by each party in connection with the preparation, presentation, etc., of arbitral proceedings shall be shared by each party itself.

25.2 The arbitrators shall make a reasoned award (the **"Award"**). Any Award made in any arbitration held pursuant to this Clause shall be final and binding on the Parties as from the date it is made, and the Contractor and the Authority agree and undertake to carry out such Award without delay.

25.3 The Contractor and the Authority agree that an Award may be enforced against the Contractor and/or the Authority, as the case may be, and their respective assets wherever situated.

25.4 This Agreement and the rights and obligations of the Parties shall remain in full force and effect, pending the Award in any arbitration proceedings hereunder.

25.5 Adjudication by Regulatory Commission or Authority

In the event of constitution of a statutory Regulatory Commission or Authority with powers to adjudicate upon disputes between the Contractor and the Authority, all Disputes arising after such constitution shall, instead of reference to arbitration under Clause 25, be adjudicated upon by such Regulatory Commission or Authority in accordance with the Applicable Law and all references to Dispute Resolution Procedure shall be construed accordingly. For the avoidance of doubt, the Parties hereto agree that the adjudication hereunder shall not be final and binding until an appeal against such adjudication has been decided by an appellate tribunal or High Court, as the case may be, or no such appeal has been preferred within the time specified in the Applicable Law.

26 Deleted

B. Time Control

27. Programme

27.1 The Engineer shall issue the indent of work in stages specifying the time limit for the same as and when required. The Contractor shall submit to the Engineer for approval a programme within the time stipulated in the Contract Data showing the general methods, arrangements, order, and timing for all the activities in the Works, along with monthly cash flow forecasts.

27.2 An update of the Programme shall be a programme showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining Works, including any changes to the sequence of the activities.

27.3 The Contractor shall submit to the Engineer for approval an updated Programme at intervals. If the Contractor does not submit an updated Programme within this period, the Engineer 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 Programme has been submitted.

27.4 The Engineer's approval of the Programme shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Engineer again at any time. A revised Programme shall show the effect of Variations and Compensation Events.

28. Extension of the Intended Completion Date

28.1 The Engineer shall extend the Intended Completion Date only after the approval of NHAI if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining Works, which would cause the Contractor to incur additional cost.

28.2 The Engineer shall decide whether and by how much time to extend the Intended Completion Date within 21 days of the Contractor asking the Engineer for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new intended Completion Date.

29. Delays Ordered by the Engineer

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

30. Management Meetings

30.1 Either the Engineer 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 the remaining Works and to deal with matters raised in accordance with the early warning procedure.

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

C. Quality Control

31. Identifying Defects

31.1 The Engineer shall check the Contractor's work and notify the Contractor of any Defects that are noticed. Such checking shall not absolve the contractor from its obligations and its responsibilities. The Engineer may instruct the Contractor to search for a Defect and to uncover and test any work (existing work/work executed by the contractor) that the Engineer considers may have a Defect.

32. Tests

32.1 The contractor shall be solely responsible for:

a. Carrying out the mandatory tests prescribed in the technical specifications forming part of contract.
b. For the correctness of the test results, whether preformed in his laboratory or elsewhere.
c. The Authority may engage third party for testing of executed items. The payment for the same would be made by the Authority.

32.2 If the Engineer instructs the Contractor to carry out a test not specified in the Specification to check whether any work (executed by the contractor) has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no defect, the cost of such tests shall be borne by the Authority otherwise by the Contractor.

32.3 Subject to further condition in contract data

33. Correction of Defects noticed during the Defect Liability Period.

33.1 The Engineer 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.

33.2 Every time notice of a Defect is given; the Contractor shall correct the notified Defect within the reasonable time specified by the Engineer's notice as per good industry practice. If any defect including shrinkage cracks, other faults appear in the work within defect liability period, the Engineer shall give Notice to the Contractor of such defects before end of defect liability period and shall extend the defect liability period as long as defects remain to be corrected.

34. Uncorrected Defects/ Incomplete Works

34.1 If the Contractor has not corrected the Defect, to the satisfaction of the Engineer, within the time specified in the Engineer's notice/indent, the Engineer will assess the cost of having the Defect corrected and get the defects rectified through some other agency and the Contractor will pay 1.2 times of this amount.

34.2 If the Contractor has not completed the work to the satisfaction of the Engineer, within the time specified in the Engineer's notice/indent, in no case exceeding one month, the Engineer will assess the cost of having the work completed and get the work completed through some other agency and the Contractor will pay this amount in addition to the damages specified as per clause45.

D. Cost Control

35. Bill of Quantities

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

35.2 The Bill of Quantities is used to calculate the Contract Price. The Contractor is paid for the quantity of the work done at the rates in the Bill of Quantities for each item for the work executed.

35.3 Changes in the Quantities

Deleted

36. Variations

36.1 All variations shall be included in updated programs produced by the Contractor. The Engineer shall, having regard to the scope of the Works and the sanctioned estimated cost, have power to order +/- 25% of original BOQ quantity of single BOQ item subject to maximum of +/-5% of original Contract value.

37. Payments for Variations

37.1 If rates for Variation items are specified in the Bill of Quantities, the Contractor shall carry out such work at the same rate.

37.2 If the rates for Variation are not specified in the Bill of Quantities, the Engineer shall derive the rate from similar items in the Bill of Quantities and if it cannot be derived from similar item in Bill of Quantities then the rate will be derived as per Clause37.3.

37.3 The Contractor shall, within 14 days of the issue of order of Variation work, inform the Engineer the rate which he proposes to claim, supported by analysis of the rates. The Engineer shall assess the quotation and determine the rate based on prevailing market rates within one month of the submission of the claim by the Contractor and approval from NHAI will be taken. As far as possible, the rate analysis shall be based on the standard data book and the current schedule of rates of the district public works division.

38. Cash Flow Forecasts

38.1 When the Programme is updated, the Contractor shall provide the Engineer with an updated cash flow forecast.

39. Payment Certificates

39.1 The Contractor shall submit to the Engineer monthly statements of the value of the work executed less the cumulative amount certified previously supported with detailed measurement of the items of work executed.

39.2 The Engineer shall check the Contractor's monthly statement within 7 days and certify the amount to be paid to the Contractor after taking into account any credit or debit for the month in question.

39.3 The value of work executed shall be determined, based on measurements by the Engineer.

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

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

39.6 The Engineer 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 to rectify the mistakes with detail justification acceptable to Employer.

39.7 The final bill shall be submitted by the contractor within one month of the actual date of completion of the work; otherwise the Engineers certificate of the

measurement and of the total amount payable for work accordingly shall be final and payment made accordingly within a period of sixty days.

40. Payments

40.1 Payments shall be adjusted for deductions for advance payments, security deposit, other recoveries in terms of the Contract and taxes at source, as applicable under the law. The Employer shall pay the Contractor the amounts Engineer had certified within 7 days of the date of each certificate.

40.2 Deleted

40.3 Deleted.

41. Compensation Events

41.1 The following shall be Compensation Events unless they are caused by the Contractor:

a) The Employer modifies the Schedule of other contractors in a way which affects the work of the contractor under the Contract.
b) The Engineer orders a delay or does not issue drawings, specifications or instructions required for execution of works in reasonable time
c) The Engineer instructs the Contractor to uncover or to carry out additional tests upon work which is then found to have no defects.
d) The Engineer gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.
e) Other contractors, public authorities, utilities or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
f) The effect on the Contractor of any of the Employer's Risks.

41.2 If a Compensation Event would prevent the Works being completed before the Intended Completion Date, the Intended Completion Date shall be extended. The Engineer shall decide whether and by how much the Intended Completion Date shall be extended after the approval of the employer.

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

42. Taxes & Currencies for payments

42.1 The rates quoted by the Contractor shall be deemed to be exclusive of GST and inclusive of other levies, duties, royalties, cess, toll, taxes of Central and State Governments, local bodies and authorities that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source as per applicable law.

42.2 All payments will be made in Indian Rupees.

43. Price Adjustment

43.1 DELETED

43.2 DELETED

44. Security Deposit / Retention Money

44.1 The Employer shall retain security deposit of five percent of the amount from each payment due to the Contractor until Completion of the whole of the Works.

44.2 The security deposit/retention money and the performance security will be released to the Contractor when the Defect Liability period is over, and the Engineer has certified that the Defects, if any, notified by the Engineer to the Contractor before the end of this period have been corrected.

44.3 If the contractor so desires then the Security Deposit/retention money can be released on submission of unconditional Bank Guarantee at the following two stages: -

(a) At a point after the progress of work in financial term (gross value of work done) has reached 50% of the contract amount

(b) After the retention money has been deducted to the full value (5% of the Contract Amount).

45. Liquidated Damages

45.1 The Contractor shall pay liquidated damages to the Employer at the rate or part thereof 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 Employer may deduct liquidated damages from payments due to the Contractor and/ or Performance Bank Guarantee. Payment of liquidated damages shall not affect the Contractor's other liabilities.

45.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any overpayment of liquidated damages by the Contractor by adjusting in the next payment certificate. The contractor shall not be paid interest on the over payment of liquidated damages.

46. Advance Payment

DELETED

47. Securities

47.1 Subject to further condition in contract data, the Performance Security equal to ten percent of the contract price shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in the form given in the Contract Data and by a prescribed bank. The Performance Security shall be valid until a date 28 days after the expiry of Defect Liability Period. The validity shall account for additional 45 days' time to account for BG verification, signing of contract and start date.

48 Cost of Repairs

48.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Liability Period shall be remedied/ rectified by the Contractor at their cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

49. Completion

49.1 When the whole of the works has been completed as per the provision of the Contract, the Contractor shall request the Engineer to issue a certificate of Completion of the Works. The Engineer shall, within 14 days of the date of receipt of such request, either issue to the Contractor, with a copy to the Employer, a completion certificate, stating the date on which, the works were completed in accordance with the contract, or give instructions in writing to the contractor specifying all the work which, in the Engineer's opinion, is required to be done by the Contractor before the issue of such certificate.

50. Taking Over

50.1 The Employer shall take over the Site and the Works within seven days of the Engineer's issuing a certificate of Completion.

51. Final Account

51.1 The Contractor shall supply to the Engineer 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 Engineer 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 Engineer 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 Engineer shall decide on the amount payable to the Contractor and issue a payment certificate within 56 days of receiving the Contractor's revised account.

52. Operating and Maintenance Manual

52.1 DELETED

52.2 DELETED.

53. Termination/Foreclosure

53.1 The Employer may terminate the Contract if the Contractor causes a fundamental breach of the Contract.

53.2 Fundamental breaches of Contract 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 Programme and the stoppage has not been authorized by the Engineer;

b) the Contractor is declared as bankrupt or goes into liquidation other than for approved reconstitution or amalgamation;

c) the Engineer/Employer 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 Engineer;

d) the Contractor does not maintain a Security, which is required;

e) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in clause45;

f) the Contractor fails to provide insurance cover as required under clause13;

g) if the Contractor, in the judgment of the Employer, has engaged in the corrupt or fraudulent practice in competing for or in executing the Contract. For the purpose of this paragraph, **" Corrupt practice"** means (i) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action so fany person connected with the Bidding Process(For avoidance of doubt, offering of employment to, or employing, or engaging in any manner whatsoever, directly or indirectly, any official of the Authority who is or has been associated in any manner, directly or indirectly, with Bidding Process, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Authority, shall be deemed to constitute influencing the actions of a person connected with the Bidding Process);

h) **"Fraudulent practice"** means a misrepresentation or omission of facts or suppression of facts or disclosure of incomplete facts, in order to influence the Bidding Process; if the Contractor has not completed at least thirty percent of the value of Work required to be completed after half of the completion period has elapsed;

i) if the Contractor fails to set up a field laboratory with the prescribed equipment, within the period specified; and

j) any other fundamental breach as specified in the Contract Data.

53.3 Without prejudice to any other right or remedies which the Employer may have under this contract, upon occurrence of a Contractor's fundamental breach of contract, the Employer shall be entitled to terminate this contract by issuing a Termination Notice to the Contractor; provided that before issuing the Termination Notice, the Employer shall by a Notice inform the Contractor of its intention to issue such Termination Notice and grant 15 days to the Contractor to make a representation, and may after the expiry of such 15 days, whether or not it is in receipt of such representation, issue the Termination Notice.

53.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.

53.5 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 but in no case later than 7days.

53.5 **Foreclosure**- NHAI may foreclose the contract before the expiry of the scheduled contract period on account of taking up the stretch for future development such as 4/6-laning or OMT of the highway or any such administrative decision by giving three months Notice.

54. Payment upon Termination /Foreclosure

54.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done less advance payments received up to the date of the issue of the certificate 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 Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer and Employer may recover the same from Performance Bank Guarantee.

In case of foreclosure of contract on account of proposed future development of the highway or otherwise, as specified in Clause 53.6, within a period of 18 months from the date of start of contract, the Engineer shall issue a certificate for the value of work done till foreclosure and balance value of work left out. The agency shall be compensated 10% of the balance value of work left out beyond the Notice period, of the original contract amount, so certified by the Engineer and necessary deductions of income tax and other statutory taxes as applicable at that time will be made and the agency will not have any claim whatsoever on this account". In case, contract is foreclosed after the expiry of 18 months no such compensation will be admissible.

55. Property

55.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer for use for completing balance work if the Contract is terminated because of the Contractor's fundamental breach of contract.

56. Release from Performance

56.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of the Employer or the Contractor, the Engineer 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.

F. Other Conditions of Contract

57. Labour

57.1 The Contractor shall, make arrangements of his own cost and expenses for the engagement of all staff and labour, local or others; for their payment, housing,

feeding and transport; and for compliance with various labour laws/ regulations.

57.2 The Contractor shall, as asked by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer 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 other information as the Engineer may require.

58. COMPLIANCE WITH LABOUR REGULATIONS

58.1 During the currency of the Contract, the Contractor and his sub-Contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be notified already or that may be notified under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to construction industry are given below. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or 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/bye laws/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 from his performance security/ retention money. The 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 Sub-Contractor in no case shall be treated as the employees of the Employer at any point oftime.

58.2 SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK.

a) **Workmen Compensation Act 1923**: - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

b) **Payment of Gratuity Act 1972**: - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed the prescribed minimum years (say, five years) of service or more or on death the rate of prescribed minimum days' (say, 15 days) wages for every completed year of service. The Act is applicable to all establishments employing the prescribed minimum number (say, 10) or more employees.

c) **Employees P.F. and Miscellaneous Provision Act 1952**: The Act Provides for monthly contributions by the Employer plus workers at the rate prescribed (say, 10% or 8.33%). The benefits payable under the Actare:

   i. Pension or family pension on retirement or death as the case maybe.
   ii. Deposit linked insurance on the death in harness of the worker.
   iii. Payment of P.F. accumulation on retirement/death etc.

d) **Maternity Benefit Act 1951**: - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

e) **Contract Labour (Regulation & Abolition) Act 1970**: - The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ prescribed minimum (say 20) or more contract labour.

f) **Minimum Wages Act 1948**:- The Employer is to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads, runways are scheduled employment.

g) **Payment of Wages Act 1936: -** It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

h) **Equal Remuneration Act 1979**: - The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against female employees in the matters of transfers, training and promotions etc.

i) **Payment of Bonus Act 1965**: - The Act is applicable to all establishments employing prescribed minimum (say, 20) or more workmen. The Act provides for payments of annual bonus within the prescribed range of percentage of wages to employees drawing up to the prescribed amount of wages, calculated in the prescribed manner. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. States may have different number of employment size.

j) **Industrial Disputes Act 1947**: - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

k) **Industrial Employment (Standing Orders) Act 1946**: - It is applicable to all establishments employing prescribed minimum (say, 100, or 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get these certified by the designated Authority.

l) **Trade Unions Act 1926**: - The Act lays down the procedure for registration of trade unions of workmen and Employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminalliabilities.

m) **Child Labour (Prohibition & Regulation) Act 1986**: - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulations of employment of children in all other occupations and processes. Employment of child labour is prohibited in building and construction industry.

n) **Inter-State Migrant Workman's (Regulation of Employment & Conditions of Service) Act 1979**: - The Act is applicable to an establishment which employs prescribed minimum (say, five) or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as Housing, Medical-Aid, Traveling expenses from home up to the establishment and back etc.

o) **The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996** and **the Cess Act of 1996**: - All the establishments who carry on any building or other construction work and employs the prescribed minimum (say, 10) or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

p) **Factories Act 1948: -** The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing the prescribed minimum (say, 10) persons or more with aid of power or another prescribed minimum (say, 20) or more persons without the aid of power engaged in manufacturing process.

59. Drawings and Photographs of the Works

59.1 The contractor shall do photography/Videography of the site firstly before the start of the work, secondly mid-way in the execution of different stages of work and lastly after the completion of the work. No separate payment will be made to the contractor for this.

59.2 The Contractor shall not disclose details of Drawings furnished to him and works on which he is engaged without the prior approval of the Engineer in writing. No photograph of the works or any part thereof or plant employed thereon, shall be taken or permitted to be taken by the Contractor or by any of his employees or any employees of his sub-Contractors without the prior

approval of the Employer in writing. No photographs/ Videography shall be published or otherwise circulated without the approval of the Employer in writing.

60. The Apprenticeship Act1961

60.1 The Contractor shall duly comply with the provisions of the Apprenticeship Act 1961 (III of 1961), the rules made there under and the orders that may be issued from time to time under the said Act and the said Rules and on his failure or neglect to do so he shall be subject to all liabilities and penalties provided by the said Act and said Rules.

ANNEX-I

ARBITRATION RULES OF SAROD

Rules

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3. Notice, Calculation of Periods of Time
4. Commencement of Arbitration
5. Response by Respondent
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7. Contents of Case Statements
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PREAMBLE

In order to seek speedy, affordable, just and reasonable Redressal of Dispute/Differences between NHAI and Concessionaire/Contractor arising out of and during the course of execution of various contracts, a Society for Affordable Redressal of Disputes (SAROD) has been formed as a Society under Societies Registration Act, 1860 with registration No. S/RS/SW/l044/2013. It has been formed by National Highways Authority of India (NHAI) and National Highways Builders Federation (NHBF) with founding members as mentioned in the Memorandum of Association of SAROD.

SAROD ARBITRATION

RULES Rule 1 - Scope of Application

1.1 Where any agreement, submission or reference provides for arbitration at the Society for Affordable Redressal of Disputes ("SAROD"), or under the Arbitration Rules of the SAROD and where the case is a domestic arbitration shall be conducted in accordance with the following Rules, or such Rules as amended by the SAROD where the amendments take effect before the commencement of the Arbitration. Parties may adopt following clause for inclusion in the contract: -

"Any dispute or difference whatsoever arising between the parties and of or relating to the construction, interpretation, application, meaning, scope, operation or effect of this contract or the validity or the breach thereof, shall be settled by arbitration in accordance with the rules of arbitration of the "SAROD" and the award made in pursuance thereof shall be final and binding on the parties subject to Provisions of The Arbitration and Conciliation Act,1996".

1.2 These rules shall come into effect from the day of approval by Governing Body of SAROD.

Rule 2 – Definitions

2.1 These Rules shall be referred to as "the SAROD Arbitration Rules".

2.2 In these Rules:

"Act" means the 'Arbitration and Conciliation Act 1996' of India and any statutory modifications or re-enactments thereof.

"SAROD" means the Society for Affordable Redressal of Disputes.

"SAROD Arbitrator Panel" means the list of persons admitted to serve as arbitrators under these Rules.

"NHAI" means National Highways Authority of India.

"NHBF" means the National Highways Builders Federation.

"GOVERNING BODY" means Governing Body of SAROD as defined in Article 9 of Memorandum of Association.

"PRESIDENT" means President of Governing Body of SAROD as defined in Rules & Regulation of SAROD

"**SECRETARY**" means Secretary of SAROD as defined in Rules &Regulation of SAROD.

"TRIBUNAL" means either a Sole Arbitrator or all arbitrators when more than one is appointed.

"PARTY" means a party to an arbitration agreement,

"**E-Arbitration**" means submission of pleadings, defence statement etc by E-mail and holding of proceedings via video conferencing.

Rule 3 - Notice, Calculation of periods of Time

3.1 For the purposes of these Rules, any notice, including a notification, communication or proposal, is deemed to have been received if it is physically delivered to the addressee or if it is delivered at his habitual residence, place of business or mailing address, or, if none of these can be found after making reasonable inquiry, then at the addressee's last-known residence or place of business. Notice shall be deemed to have been received on the day it is so delivered.

3.2 For the purposes of calculating a period of time under these Rules, such period shall begin to run on the day following the day when a notice, notification, communication or proposal is received. If the last day of such period is an official holiday or a non-business day at the residence or place of business of the addressee, the period is extended until the first business day which follows. Gazetted public holidays or non-business days occurring during the running of the period of time are included in calculating the period.

3.3 Without prejudice to the effectiveness of any other form of written communication, written communication may be made by fax, email or any

other means of electronic transmission effected to a number, address or site of a party.

3.4 The transmission is deemed to have been received on the day of transmission.

Rule 4 - Commencement of Arbitration

4.1 Any party wishing to commence an arbitration under these Rules ("the Claimant") shall file with the Secretary and serve on the other party {"the Respondent"), a written Notice of Arbitration ("the Notice of Arbitration") which shall include the following:

a. a request that the dispute be referred to arbitration;

b. the names, addresses, telephone numbers, fax numbers and email addresses of the parties to the dispute;

c. a reference to the arbitration clause or any separate arbitration agreement that is invoked and provide a copy of the arbitration clause or arbitration agreement;

d. a reference to the contract out of which the dispute arises and provides a copy of the contract where possible;

e. a brief statement describing the nature and circumstances of the dispute;

f. the relief or remedy sought, including the amount of claim if quantifiable at the time the Notice or Arbitration is filed;

g. a proposal as to the number of arbitrators (i.e. one or three), if the parties have not previously agreed on the number; and

h. the name of the Claimant's nominated arbitrator.

4.2 A filing fee of Rs.10,000/- (Ten thousand) or any amount decided by Governing Body from time to time is payable at the time of filing the Notice of arbitration.

4.3 The date of filing of the Notice of Arbitration with the Secretary is the date of commencement of the arbitration for the purpose of these Rules.

Rule 5 – Response by Respondent

5.1 Within 14 days of receipt of the Notice of Arbitration, the Respondent shall file with the Secretary and serve upon on the Claimant, a Response including

a. A confirmation or denial of all or part of the claims;
b. Brief statement of the nature and circumstances of any envisaged counterclaims
C A comment in response to any proposals contained in the Notice of Arbitration; and
d. The name of the respondent's nominated arbitrator.

5.2 A filing fee of Rs. 10,000/- or any amount decided by Governing Body from time to time is payable at the time of filing the Response.

5.3 In case parties have objection to the jurisdiction of Arbitral Tribunal, such objection shall be raised not later than 15 days of the commencement of Arbitration proceedings failing which it will be deemed that parties have waived their right to objection.

Rule 6 – Filing of Case Statements

6.1 Within 30 days after the filing of the Notice of Arbitration, the claimant must file with the Secretary and serve on the Respondent, a Statement of Claimant's Case along with all documents to be relied upon by the Claimant.

6.2 Within 30 days after the service of the statement of Claimant's Case, the Respondent must file with the Secretary and serve on the Claimant, a statement of respondent's defense and counterclaim (if any) along with all documents to be relied upon by the Respondent.

6.3 Within 30 days after the service of the statement of Respondent's defense, if the Claimant intends to challenge anything in the statement of Respondent's defense and/or counterclaim, the Claimant must then file with the Secretary and serve on the Respondent, a statement of claimant's reply and if necessary, defense to counter claim.

6.4 No further case statements may be filed without the leave of the Tribunal or if a Tribunal has not been appointed, the Secretary.

6.5 The Tribunal or if a Tribunal has not been appointed, the Secretary, may upon the written application of a party, extend the time limits provided under this Rule,

6.6 The party required to file a case statement must at the same time deposit with the Secretary for eventual transmission to the Tribunal an additional copy or additional copies of the case statement, according to the number of arbitrators constituting or who will constitute the Tribunal.

Rule 7 – Contents of Case Statements

7.1 The case statements must contain the detailed particulars of the party's claim, defence or counterclaim and must thus contain a comprehensive statement of the facts and contentions of law supporting the party's position.

7.2 It must:

a. Set out all items of relief or other remedies sought together with the amount of all quantifiable claims and detailed calculations.

b. State fully its reasons for denying any allegation or statement of the other party.

c. State fully its own version of events if a party intends to put forward a version of events different from that given by the other party.

7.3 A case statement must be signed by or on behalf of the party making it.

Rule 8 - Default in Filing and Serving Case Statements

8.1 If the Claimant fails within the time specified under these Rules or as may be fixed by the Tribunal or by the Secretary, to submit its Statement of Case, the Tribunal or if a Tribunal has not been appointed, the Governing Body may

issue an order for the termination of the arbitral proceedings or make such other directions as may be appropriate in the circumstances.

8.2 It the Respondent fails to submit a Statement of Respondent's Defense, the Tribunal may nevertheless proceed with the arbitration and make the award.

Rule 9 - Further Written Statements

9.1 The Tribunal will decide which further written statements, in addition to the case statement(s) already filed, are required from the parties and shall fix the periods of time for giving, filing and serving such statements.

9.2 All such further statements must be given to the Tribunal, filed with the Secretary and served on the Claimant or Respondent, whichever inapplicable.

Rule 10 - SAROD to Provide Assistance

10.1 At the request of the Tribunal or either party, the Secretary will render such assistance as is required for the conduct of the arbitration, including arranging for facilities, suitable accommodation for sittings of the Tribunal, secretarial assistance or interpretation of these rules.

10.2 Any additional expenses incurred or to be incurred for any such arrangements shall be borne by the parties.

Rule 11 - Appointment of Tribunal

11.1 The disputes shall be decided by a Sole Arbitrator when the total claim of dispute is Rs. 3 Crores orless.

11.2 In all cases of disputes claimed for more than Rs. 3 Crores, the tribunal shall consist of odd number of Arbitrators to be nominated by the parties. The Presiding Arbitrator shall be appointed by the Arbitrators nominated by the parties from amongst the panel maintained by SAROD. For deciding the Presiding Arbitrator, a draw of lots can be carried out from amongst the names suggested by the Arbitrators nominated by the Parties. The eligibility criteria for empanelment of Arbitrators will be decided by the Governing Body.

11.3 If a Sole Arbitrator is to be appointed, the Governing Body will appoint the Arbitrator within 21 days from the date the Respondent's Statement of Defence and Counterclaim (if any) is filed or falls due, whichever is earlier. The Governing Body will appoint the Arbitrator from the panel of Arbitrators by draw oflots,

11.4 An Arbitrator/Presiding Arbitrator to be appointed under these Rules shall be a person on the SAROD Arbitration Panel as at the date of the appointment,

11.5 In the event of any party failing to appoint Arbitrator within 30 days of receipt of the notice of Arbitration, the Governing Body shall appoint the Arbitrator or Presiding Arbitrator as the case may be by a draw oflots.

Rule 12 - Multiparty appointment of the Tribunal

12.1 If there are more than 2 parties in the arbitration, the parties shall agree on the procedure for appointing the Tribunal within 21 days of the receipt of the Notice of Arbitration.

12.2 If the parties are unable to do so, upon the lapse of the 21-day time period mentioned herein, the Tribunal shall be appointed by the Governing Body as soon as practicable.

Rule 13 - Appointment of Substitute Arbitrator

In the event of the death or resignation of any of the arbitrators, a substitute arbitrator must be appointed by the same procedure as in Rule 11 by which the arbitrator concerned was appointed, failing which, the Governing Body will make the appointment.

Rule 14 - Independence and Impartiality of the Tribunal

14.1 The Tribunal conducting arbitration under these Rules shall be and remain at all times independent and impartial, and shall not act as advocate for any party.

14.2 A prospective arbitrator shall disclose to those who approach him in connection with his possible appointment, any circumstances likely to give rise to justifiable doubts as to his impartiality or independence.

14.3 An arbitrator, once nominated or appointed, shall disclose any such circumstance referred to in Rule 14.2 to the Secretary and/ or to all parties.

Rule 15 **– Code of Ethics for Arbitrators**

An Arbitrator is a fountain of justice and emblem of equity, fairness and good conscience. Therefore he/she is expected to exhibit a noble conduct. The code of conduct prescribed by the Governing Body has to be adopted.

Appointment

15.1 A prospective arbitrator shall accept an appointment only if he is fully satisfied that he is able to discharge his duties without bias, he has an adequate knowledge of the language of the arbitration, and he is able to give to the arbitration the time and attention which the parties are reasonably entitled to expect,

15.2 In this code, the masculine includes the feminine.

Disclosure

15.3 A prospective arbitrator shall disclose all facts or circumstances that may give rise to justifiable doubts as to his impartiality or independence, such duty to continue thorough out the arbitral proceedings with regard to new facts and circumstances.

15.4 A prospective arbitrator shall disclose to the Secretary and any party who approaches him for a possible appointment:

(a) Any past or present close personal relationship or business relationship, whether direct or indirect, with any party to the dispute, or any representative of a party, or any person known to be a potentially important witness in the arbitration;

(b) The extent of any prior knowledge he may have of the dispute.

Bias

15.5 The criteria for assessing questions relating to bias are impartiality and independence. Partiality arises when an arbitrator favours one of the parties or where he is prejudiced in relation to the subject matter of the dispute. Dependence arises from relationships between an arbitrator and one of the parties, or with someone closely connected with one of the parties.

15.6 Any close personal relationship or current direct or in direct business relationship between an arbitrator and a party, or any representative of a party, or with a person who is known to be a potentially important witness, will normally give rise to justifiable doubts as to a prospective arbitrator's impartiality or independence. Past business relationships will only give rise to justifiable doubts if they are of such magnitude or nature as to be likely to affect a prospective arbitrator's judgment. He should decline to accept an appointment in such circumstances unless the parties agree in writing that he may proceed.

Communications

15.7 Before accepting an appointment, an arbitrator may only enquire as to the general nature of the dispute, the names of the parties and the expected time period required for the arbitration.

15.8 No arbitrator shall confer with any of the parties or their Counsel until after the Secretary gives notice of the formation of the Tribunal to the parties.

15.9 Throughout the arbitral proceedings, an arbitrator shall avoid any unilateral communications regarding the case with any party, or its representatives.

Fees

15.10 In accepting an appointment, an arbitrator agrees to the remuneration as prescribed in the rules of SAROD, and he shall make no unilateral arrangements with any of the parties or their Counsel for any additional fees or expenses without the agreement of all the parties and the consent of the Secretary of SAROD.

Conduct

15.11 Once the arbitration proceedings commence, the arbitrator shall acquaint himself with all the facts and arguments presented and all discussions relative to the proceedings so that he may properly understand the dispute.

Confidentiality

15.12 The arbitration proceedings shall remain confidential. An arbitrator is in a relationship of trust to the parties and should not, at any time, use confidential information acquired during the course of the proceedings to gain personal advantage or advantage for others, or to affect adversely the interest of another.

15.13 This Code is not intended to provide grounds for the setting aside of any award.

Rule 16 - Challenge of Arbitrators

16.1 An arbitrator may be challenged if there are circumstances that give rise to justifiable doubts as to his impartially or independence and also if he or she has committed any misconduct.

16.2 An arbitrator may also be challenged if he does not possess the qualifications required by the agreement of the parties,

16.3 A party may challenge an arbitrator appointed on its nomination or with its agreement only for reasons of which it becomes aware after the appointment has been made.

16.4 A party who intends to challenge an arbitrator shall file with the Secretary and serve on the other party or all other parties, whichever is applicable, a Notice of Challenge.

16.5 The Notice of challenge must be filed and served within 14 days from the appointment of the arbitrator or within 14 days after the circumstances mentioned in Rule 15.1 became known to that party.

16.6 The Notice of Challenge must state the reasons for the challenge.

16.7 The arbitration shall be suspended until the challenge is resolved or decided upon.

16.8 When an arbitrator has been challenged by one party, the other party may agree to the challenge. The arbitrator may also, after the challenge, withdraw from his office. However, it is not implied in either case that there has been an acceptance of the validity of the grounds for the challenge. In both cases, the procedure provided in Rule 11 read with Rule 13, shall be used for the appointment of a substitute arbitrator.

Rule 17 - Decision on Challenge

17.1 If the other party does not agree to the challenge and the arbitrator does not withdraw, the decision on the challenge will be made by the Governing Body.

17.2 If the Governing Body sustains the challenge, a substitute arbitrator shall be appointed or chosen pursuant to the procedure applicable to the appointment of an arbitrator as provided in Rule 11 read with Rule 13. If the Governing Body dismisses the challenge, the arbitrator shall continue with the arbitration.

Rule 18 - Removal of the Tribunal

18.1 The Governing Body may on the application of a party remove an arbitrator:

a. Who is physically or mentally incapable of conducting the proceedings or where there are justifiable doubts as to his ability to do so; or

b. Who has refused or failed to use all reasonable dispatch in conducting the arbitration or making an award.

c. Who has continuously absented from attending the proceedings for more than 3 sitting without prior permission of Presiding Arbitrator/ Governing Body of SAROD.

18.2 The arbitrator(s) concerned is entitled to appear and be heard at the hearing of the application to remove him.

18.3 Upon the removal of the arbitrator, a substitute arbitrator shall be appointed in accordance with Rule 11 read with Rule13.

18.3 The Governing Body's decision on the application is final and is not subject to appeal or review.

Rule 19 - Re-hearing in the Event of Replacement of the Tribunal

If the sole or presiding Arbitrator is replaced, there shall be a re-hearing. If any other arbitrator is replaced, such re-hearing may take place at the discretion of the Tribunal.

Rule 20 - Jurisdiction of the Tribunal

20.1 The Tribunal shall have the power to rule on its own jurisdiction, including any objection with respect to the existence, termination or validity of the arbitration agreement. For that purpose, an arbitration agreement which forms part of a contract shall be treated as an agreement independent of the other terms of the contract. A decision by the Tribunal that the contract is null and void shall not entail ipso jure the invalidity of the arbitration agreement.

20.2 The plea that the Tribunal does not have jurisdiction shall be raised not later than in the Statement of Defense. A plea that the Tribunal is exceeding the scope of its authority shall be raised promptly after the Tribunal has indicated its intention to decide on the matter alleged to be beyond the scope of its authority. In either case the Tribunal may nevertheless admit a late plea under this Rule if it considers the delay justified. A party is not precluded from raising such a plea by the fact that he has nominated, or participated in the appointment of an arbitrator.

20.3 The Tribunal must rule on an objection that it lacks jurisdiction as a preliminary question upon the objection being raised. It may rule on an objection that it exceeds the scope of its authority either as a preliminary question or in an award on the merits, as it deems just and convenient.

20.4 In addition to the jurisdiction to exercise the powers defined elsewhere in these Rules, the Tribunal shall have jurisdiction to determine any question of law arising in the arbitration; proceed with the arbitration not with sanding the failure or refusal of any party to comply with these Rules or with the Tribunal's orders or directions, or to attend any meeting or hearing, but only after giving that party written notice that it intends to do so; and to receive and take into account such written or oral evidence as it shall determine to be relevant, whether or not strictly admissible in-law.

Rule 21 – Fees of SAROD and Arbitral Tribunal Fee Schedule

Registration Fee (Non - Refundable): Rs, 10,000/- or any amount fixed by Governing Body from time to time. The Schedule of Fees and allied expenditure shall be decided by Governing Body.

Rule 22- **Transmission of File** to the Tribunal

22.1 The Secretary shall, as soon as practicable transmit to the Tribunal, a file containing the Notice of Arbitration, the Response and all case statements.

22.2 The Tribunal shall as soon as practicable, after consultation with the parties, issue such orders and/or directions as are necessary for the conduct of the arbitration to conclusion, including a timetable for steps to be taken in the arbitration and for the hearing of the arbitration.

Rule 23 - Judicial Seat of Arbitration

23.1 Unless otherwise agreed by the parties, the judicial seat of arbitration shall be New Delhi.

23.2 Notwithstanding Rule 22.1 and 22.2, the Tribunal may, unless otherwise agreed by the parties, hold hearings and meetings anywhere convenient, subject to the provisions of Rule28.2.

Rule 24 - Language of Arbitration

The language of arbitrators shall be English. In case of material existing are in any other language, other than English the same has to be translated to English language.

Rule 25 - Conduct of the Proceedings

The Tribunal shall have the widest discretion allowed by the Act to ensure the just, expeditious, economical and final determination of the dispute. The proceedings shall be conducted from 10.AM to 5PM with a recess of one hour.

Rule 26 - Communication between Parties and the Tribunal

26.1 Where the Tribunal sends any written communication to one party, it shall send a copy to the other party or parties as the case maybe.

26.2 Where a party sends any written communication (including Statements, expert reports or evidentiary documents) to the Tribunal, the same shall be copied to the other party or ail other parties, whichever is applicable, and show to the Tribunal that the same has been so copied.

26.3 The address of the parties for the purpose of all communications during the proceedings shall be those set out in the Notice of Arbitration, or as either party may at any time notify the Tribunal and the other party or parties, whichever is applicable.

26.4 A copy of correspondence between the parties and the Tribunal shall be sent to the Secretary.

Rule 27 - Party Representatives

Any party may be represented by legal practitioners or any other representatives, subject to such proof of authority as the Tribunal may require. The names and addresses of such representatives must be notified to the other party or parties. In case one party is represented by non-legal person, another party will also be represented by non-legal person so as to maintain natural justice.

Rule 28 - Hearings

28.1 Unless the parties have agreed on documents-only arbitration, the tribunal shall hold a hearing for the presentation of evidence by witnesses, including expert witnesses, or for oral submissions.

28.2 The Tribunal shall fix the date, time and place of any meetings and hearings in the arbitrations on the first hearing, and complete time table pertaining to all the activities of the Arbitration e.g. submission of statement of claim, reply, counter claim, reply therein, admission and denial of documents, visit/inspection of site if any. The tribunal shall stick to the time table without any deviations unless there are unavoidable circumstances warranting such deviation which will be with the prior permission of the tribunal.

28.3 Prior to the hearing, the Tribunal may provide the Parties with matters or questions to which it wishes them to give special consideration.

28.4 In the event that a party to the proceedings without sufficient cause, fails to appear at a hearing of which the notice has been given, the Tribunal may proceed with the arbitration and may make the Award after the party present has submitted evidence to prove its case.

28.5 All meetings and hearing shall be in private unless the parties agree otherwise.

Rule 29 - Documents Only Arbitration

29.1 The Disputes may be decided without an oral hearing if it is so agreed by the parties.

29.2.1 Where the parties agree to dispense with oral hearing, the Tribunal must be promptly informed by either of the parties, as soon as is practicable. The Tribunal must also be promptly informed it, at a later stage, the parties or either of them intends to apply for an oral hearing.

29.2.2 Parties may seek discovery of documents if they are not satisfied with existence of documents annexed with statement of claim, reply and counter claim by giving self-contained request to the Tribunal justifying the necessity for such documents. Decision of tribunal shall be final and binding upon the parties.

Rule 30 – Witnesses

30.1 The Tribunal may require each party to give notice of the names and designations of the witnesses it intends to call and reasons for legal necessity of such witness.

30.2 No party shall call any expert witness without the leave of the Tribunal.

30.3 Any witness who gives evidence may be questioned by each party or its representative subject to any rulings made by the Tribunal,

30.4 A Witness may be required by the Tribunal to testify under oath or affirmation.

30.5 Subject to such order or direction which the Tribunal may make, the testimony of witness may be presented in written form, either as signed statements or by duly sworn or affirmed affidavits,

30.6 Any party may require a witness to attend an oral examination at a hearing. If the witness fails to attend, the Tribunal may place such weight on the written testimony as it thinks fit, or may exclude it altogether,

30.7 The Tribunal shall determine the admissibility, relevance, materiality and weight of the evidence given by any witness.

Rule 31 - Experts Appointed by the Tribunal

31.1 Unless otherwise agreed by the parties, the Tribunal may:

a. appoint one or more experts to report the Tribunal on specific issues;

b. require a party to give any such expert any relevant information or to produce, or to provide access to, any relevant documents, goods or property for inspection by the expert.

31.2 Unless otherwise agreed by the parties, if a party so requests or if the Tribunal deem it fit, the expert shall, after delivery of his written or oral report, participate in an oral hearing, at which the parties may question him and present expert witnesses in order to testify on the points at issue.

31.3 Rule 30.2 shall not apply to an assessor appointed by agreement of the parties, or to an expert appointed by the Tribunal to advise solely in relation to procedural matters.

Rule 32 - Rules applicable to substance of dispute- (1) Where the place of arbitration is situated in India,

32.1 In an arbitration, the arbitral tribunal shall decide the dispute submitted to arbitration in accordance with the substantive law for the time being in force in India;

Rule 33 - Closure of Hearing

33.1 The Tribunal may inquire of the parties if they have any further proof to offer or witnesses to be heard or submission to make and, if there are none, declare the hearing closed.

33.2 The Tribunal may also, in view of exceptional circumstance, reopen the hearings at any time before the award is made.

Rule 34 - Additional Powers of the Tribunal

34.1 In addition to the powers conferred by the Act, the Tribunal shall also have the power to:-

a. Allow any party, upon such terms (as to costs and otherwise) as it shall determine, to amend claims or counterclaims;

b. Extend or abbreviate any time limits provided by these Rules;

c. Conduct such enquires as may appear to the Tribunal to be necessary or expedient;

d. Order the parties to make any property or thing available for inspection

e. Order any parties to produce to the Tribunal, and to the other parties for inspection, and to supply copies of any documents or classes of documents in their possession, custody or power which the Tribunal determines to be relevant;

f. Make orders or give directions to any party for interrogatories;

g. Make orders or give directions to any party for an interim injunction or any other interim measure;

h. Make such orders or give such directions as it deems fit in so far as they are not inconsistent with the Act or any statutory re-enactment thereof or such law which is applicable or these Rules.

34.2 If the parties so agree, the Tribunal shall also have the power to add other parties (with their consent) to be joined in the arbitration and make a single Final Award determining all disputes between them.

Rule 35 - Deposits to Costs and Expenses

35.1 The Tribunal's fees and SAROD administration fees shall be ascertained in accordance with the Schedule of Fees in Force at the time of commencement of the arbitration.

35.2 The Claimant shall deposit with the SAROD half of the fees payable at the time of filing of the Statement of Case. The Respondent shall deposit with the SAROD one-half of the fees payable at the time of filing the Statement of Respondent's Defence and Counterclaim (if any). The balance of fees payable shall be paid 60 days before the date of the final hearing or on such other date that the Secretary may direct.

35.3 Where the amount of the claim or the counterclaim is not quantifiable at the time payment is due, the Secretary will make a provisional estimate. The fees will be adjusted in the light of such information as may subsequently become available. If the arbitration is settled or disposed of without a hearing, the amount of the Tribunal's fees and SAROD administration fees shall be finally determined by the Secretary who will have regard to all the circumstances of the case, including the stage of proceedings at which the arbitration is settled or otherwise disposed of.

35.4 The Secretary may from time-to-time direct parties to make one or more deposit(s) towards any further expenses incurred or to be incurred on behalf of or for the benefit of the parties.

35.5 All deposit(s) shall be made to and held by the SAROD. Any interest which may accrue on such deposit(s) shall be retained by the SAROD.

35.6 If a party fails to make the payments or deposits required or directed, the Tribunal may refuse to hear the claims or counterclaims, whichever is applicable, by the non-complying party, although it may proceed to determine claims or counterclaims by any party who has complied with orders.

35.7 The parties shall remain jointly and severally liable to the SAROD for payment of all such fees and expenses until they have been paid in full even if the arbitration is abandoned, suspended or concluded, by agreement or otherwise, before the final Award is made.

Rule 36 - Decision Making by the Tribunal

36.1 Where a Tribunal has been appointed, any direction, order, decision or award of the Tribunal must be made by the whole Tribunal or a majority. If an arbitrator refuses or fails to sign the Award, the signatures of the majority

shall be sufficient, provided that the reason for the omitted signature is stated.

36.2 If there is no unanimity, the same shall be made by the majority arbitrators as well as by the dissenting Arbitrator alone as if acting as a sole arbitrator.

36.3 However, in the case of a three-member Tribunal the presiding arbitrator may, after consulting the other arbitrators, make procedural rulingsalone.

Rule 37 - The Award

37.1 It will be mandatory for the parties to submit written synopsis of their arguments respectively which will form part of the arbitral proceedings.

37.2 The Tribunal shall assemble at the assigned place in SAROD and shall exercise utmost secrecy and confidentiality in writing the award,

37.3 Unless the Secretary extends the time or the parties agree otherwise, the Tribunal shall make its Award in writing within 30 days from the date on which the hearings are closed and shall state the reasons upon which its award is based. The award shall contain the date and shall be signed by the arbitrator or arbitrators.

37.4 The Tribunal may make interim awards or separate awards on different issues at different times.

37.5 All Awards must be submitted by the Tribunal to the Secretary and they shall be issued through the Secretary.

37.6 The Tribunal must deliver to the Secretary number of originals of the award sufficient for the parties and for filing with the Secretary.

37.7 The Secretary shall release the award to the parties only upon receipt of sufficient deposits to cover the fees and expenses due to the Tribunal and to the SAROD.

37.8 By agreeing to have arbitration under these Rules, the parties undertake to carry out the award without delay.

37.9 Stamp duty on award shall be payable by the party in whose favor the award has been pronounced.

Rule 38 - Additional Award

38.1 Within 30 days after the receipt of the award, either party, with notice to the Secretary and the other party may request the Tribunal to make an additional award as to claims presented in the arbitral proceedings but omitted from the award.

38.2 If the Tribunal considers the request for an additional award to be justified and considers that the omission can be rectified without any further hearings or evidence, it shall notify all the parties within 7 days of the receipt of the

request, that it will make and additional award, and complete the additional award within 30 days after the receipt of the request.

Rule 39 - Correction of Awards

39.1 Within 30 days of receiving an Award, unless another period of time has been agreed upon by the parties, a party may by notice to the Secretary and the other party request the Tribunal to correct in the Award, any errors in computation, any clerical or typographical errors or any errors of similar nature.

39.2 If the Tribunal considers the request to be justified, it shall make the corrections) within 30 days of receiving the request. Any correction shall be notified in writing to the parties and shall become part of the Award.

39.3 The Tribunal may correct any error of the type referred to in Rule 37.1 on its own imitative within 30 days of the date of the Award.

Rule 40 - Settlement

40.1 If, the parties arrived at amicable settlement of the dispute during the currency proceedings, the parties shall file memo of settlement before the tribunal who shall either issue an order for the termination of the arbitral proceedings or, if requested by both parties and accepted by the Tribunal, record the settlement in the form of an arbitral award on agreed terms. The Tribunal is not obliged to give reasons for such an award,

40.2 The Parties shall:

a. Notify the Tribunal and the Secretary immediately if the arbitration is settled or otherwise terminated:

b. Make provision in any settlement for payment of all the costs of the arbitration and fees and expenses due to the SAROD and the Tribunal.

40.3 If the continuation of the arbitral proceedings becomes unnecessary or impossible for any reason not mentioned in Rule 38.1, before the award is made, the Tribunal shall inform the parties of its intention to issue an order for the termination of the proceedings. The Tribunal shall have the power to issue such an order unless party raises justifiable grounds for objection.

40.4 Copies of the order for termination of the arbitral proceedings or of the arbitral award on. agreed terms, signed by the Tribunal, shall be communicated by the Tribunal to the parties through the Secretary.

Rule 41 - Interest

The Tribunal may award interest on any sum awarded at such rate as applicable in fixed deposits of Sate Bank of India in respect of such periods ending not later than the date of the award as the Tribunal considers just.

Rule 42 – Costs

42.1 The Tribunal shall specify in the final award, the costs of the arbitrations and decide which party shall bear them and in what proportion they shall be borne.

42.2 In this Rule, "costs of the arbitration" shall include:

a. The fees and expenses of the Tribunal and the administration fees of the SAROD as determined by the Secretary in accordance with the Schedule of Fees;

b. The costs of tribunal appointed experts or of other assistance rendered: and

c. All expenses which are reasonably incurred by the SAROD in connection with the arbitration.

42.3 The Tribunal has power to order in its Award, that all or part of the legal or other costs (such as legal fees and expenses, costs incurred in respect of party appointed experts etc) of one party shall be paid by the other party.

Rule 43 - Waiver

A party which is aware of non-compliance with these Rules and yet proceeds with the arbitration without promptly stating its objection in writing to such non-compliance shall be deemed to have waived its right to object.

Rule 44 - Exclusion of Liability

44.1 The Tribunal, the President, the SAROD and any of its officers, employees or agents shall not be liable to any party for any act or omission in connection with any arbitration conducted under these Rules,

44.2 After the Award as been made and the possibilities of corrections and additional Awards have lapsed or been exhausted, neither the Tribunal nor the President shall be under any obligation to make any statement to any person about any matter concerning the arbitration, and no party shall seek to make any arbitrator or the President or the SAROD and any of its officers a witness in any legal proceedings arising out of the arbitration.

Rule 45 - General Provisions

45.1 In all matters not expressly provided for in these Rules, the President, the Secretary and the Tribunal shall act in the spirit of these Rules and shall make every reasonable effort to ensure the just, expeditious and economical conclusion of the arbitration.

45.2 The Secretary may from time-to-time issue Practice Notes on the implementation of these Rules.

Rule 46 - Amendment to Rules

These Rules may from time to time be amended by the Governing Body of SAROD.

Contract Data

Clause Reference

Items marked "N/A" do not apply in this Contract.

1.1

1. **The Employer is** [Cl.1.1]
   Chairman, National Highways Authority of India (NHAI)
   Name of authorized Representative: PD NHAI Coimbatore
2. The Engineer is: (Will be intimated later) Designation:
   Address: [Cl.1.1]
3. The Intended Completion Date for the whole of the Works is 3 months from start date. [Cl.1.1,17&28]
4. The site is located at "Pollachi to Coimbatore Section of NH 83 (Old NH 209) from Km 123.550 to Km 150.400 in the State of Tamil Nadu". [Cl.1.1]
5. The Start Date shall be within 3 days after the date of issue of the Notice to proceed with the work. [Cl.1.1]
6. (a) The name and identification number of the Contract;
   "Short Term Remedial measures for the Blackspot Locations identified by MoRT&H, rectification of Critical Crash Prone Locations and speed calming measures at pedestrian crossing locations to attain Zero Fatality corridor in NH-83 (old no. NH-209) from Km.123.550 to Km.150.580 of Dindigul – Bangalore Road (Pollachi to Coimbatore Section) in the State of Tamil Nadu"

   (b) The Scope of Work includes providing Short Term Remedial measures for the Blackspot Locations at 4 locations and rectification of Critical Crash Prone Locations - 3 locations and speed calming measures at Pedestrian crossing locations - 25 locations to attain Zero Fatality corridor (total 32 locations) as provided in the Section – VI as per the prevailing IRC guidelines and MoRT&H Specification.

   [Cl.1.1]

3.1 (a) The law which applies to the Contract is the law of Union of India. [Cl.3.1]

(b) The language of the Contract documents is English [Cl.3.1]

7.1 The limit of sub-contracting is 50% of initial contract price [Cl.7.1]

8.1 Schedule of Other Contractor –NIL [Cl8.1]

9.1 The Technical Personnel are:
[Cl.9.1]

Sl. No.	Personnel	Minimum Qualification and Experience	Particular Experience (minimum requirement)	No. of Persons
1.	Project Manager	Graduation in Civil Engineering + 5 Years Exp.	5 years as Project Manager on NH/SH, preferably Road Safety works	1
2.	Electrical Engineer	Graduation in Electrical Engineering + 5 Years Experience	5 Years in execution & Maintenance of Highway lightings	1

13.1 Amount for insurance are:
a) Rupees equivalent to Contract price.
b) Rupees equivalent to 5% of Contract price.
c) Rupees equivalent to 5% of contract price
d) Rupees 20 lakhs for multiple incidents.

And deductible as per premium rate.

14.1 Site Investigation Report–NIL [Cl14.1]

27.1 (A) The period for submission of the programme for approval of Engineer shall be 10 days from the issue of Letter of Commencement [Cl.27.1]

(B). DELETED

27.3 Amount to be withheld for delays in submission of updated programme: 1% of value of work corresponding to the updated programme.

32 DELETED

33 The Defect Liability Period will be 36 months from the Date of Completion for the works.

45.1 (a) Amount of liquidated damages for delay in completion of works

For identified work 0.1 percent of the Indented value, Rounded off to the nearest thousand, per day with the minimum of Rs. 10000/- per day

(b) Maximum limit of liquidated damages for delay in completion of work. 10%of the Initial Contract Price rounded off to the nearest thousand

47.1. The standard form of Performance Security acceptable to the Employer shall be an unconditional Bank Guarantee of the type as specified in the Bidding Documents. [Cl.47.1]

53.2 **(j)** Other fundamental breach is that the contractor has failed tocomplete75% of value of indented work in any 3 indents issued by the Engineer. [Cl 53.2 (j)]

54.1. The percentage to apply to the value of work not completed representing the Employer's additional cost for completing the work shall be 20%. [Cl.54.1] 10 per cent of the Initial Contract Price rounded off to the nearest thousand [Cl.45.1]

(SECTION-VI)
SCOPE OF WORK

SCOPE OF WORK

6.1 General

The following safety measures are to be provided in each of **Short Term Remedial measures for the Blackspot Locations at 4 locations and rectification of Critical Crash Prone Locations - 3 locations and speed calming measures at Pedestrian crossing locations - 25 locations to attain Zero Fatality corridor (total 32 locations)** :

Detailed estimate for short term remedial measures at Accident Prone Location at Km 126+200				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W - 210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Km 126+200 at Median	Nos.	8	
	Total Quantity		**8**	
2	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
	At Service Road Approaches 135+450 LHS	Nos.	2.00	
	Total Quantity		**2.00**	

Detailed estimate for short term remedial measures at Blackspot location Identified by MoRT&H from Km 128+300 to 128+850				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and fixing of Reflective Pavement Markers (RRPM), i.e. road studs shall be prismatic retro-reflective type conforming to ASTM D-4280. The Plastic body of RPM/road stud shall be moulded from ASA (Acrylic Styrene Acrylonitrite) or HIPS (HI-Impact Polystyrene) or Acrylonitrile Butadiene Styrene (ABS). The marker height shall not be less than 10mm and shall not exceed 20mm and its width shall not exceed 130mm. The markers shall support a load of 13,635 kg tested in accordance with ASTM ID 4280. The Reflective panels shall consist of number of lenses containing single or dual prismatic cubes capable of providing total Internal reflection of the light entering the lens face. Lenses shall be moulded of methyl methecrylate conforming to ASTM D 788 or equivalent. The optical performance of road studs shall be confirming to clause 804.4 of MoRT&H Specifications.			
a	**Green Colour RPM At Median Openings**			
(i)	Median Opeing at Km 135+760	Nos.	40.00	
b	**For Approaches to Blackspot location before Lighting area (6 m c/c Spacing)**			
(i)	Shoulder side Red	Nos.	168.00	
(ii)	Median Side Yellow	Nos.	168.00	
c	**Red Colour RPMs**			
	On Chevron Rosd marking at Service Road approach	Nos.	12.00	
d	**Yellow colour RPMs**			
	Inbetween each TBM Strips at 1m c/c	Nos.	420.00	
	Total Quantity		**808.00**	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MoRT&H Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	TBM at Median opening Approaches (6 nos 7m strips X 5 Sets X 2 sides X 0.3m wide in 2 layers)	sqm	252.00	
(ii)	Pedestrian Marking	sqm	48.00	

(iii)	a) Increasing thickness of Prohibitory Yellow junction Box Marking	Sqm.	38.65	
	b) Prohibitory Yellow junction Box Marking	Sqm.	12.80	
	Total Quantity		**351.45**	
3	**P**roviding and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
	One set of Single Rip Pattern TBM at Median opening Approaches with cold plastic material (6 nos 7m strips X 1 Sets X 2 sides X 0.3m wide)	Sqm.	25.20	
	Total Quantity		**25.20**	
4	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			

(i)	**All Median Openings & Junctions**			
	On Median opening noise	Nos.	10.00	
	Total Quantity		**10.00**	
5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
	At Service Road Approaches 135+450 LHS	Nos.	2.00	
	Total Quantity		**2.00**	

Detailed estimate for short term remedial measures at Blackspot location Identified by MoRT&H from Km 129+200 to 129+700				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and fixing of Reflective Pavement Markers (RRPM), i.e. road studs shall be prismatic retro-reflective type conforming to ASTM D-4280. The Plastic body of RPM/road stud shall be moulded from ASA (Acrylic Styrene Acrylonitrite) or HIPS (HI-Impact Polystyrene) or Acrylonitrile Butadiene Styrene (ABS). The marker height shall not be less than 10mm and shall not exceed 20mm and its width shall not exceed 130mm. The markers shall support a load of 13,635 kg tested in accordance with ASTM ID 4280. The Reflective panels shall consist of number of lenses containing single or dual prismatic cubes capable of providing total Internal reflection of the light entering the lens face. Lenses shall be moulded of methyl methecrylate conforming to ASTM D 788 or equivalent. The optical performance of road studs shall be confirming to clause 804.4 of MoRT&H Specifications.			
a	**Green Colour RPM At Median Openings**			
(i)	Median Opeing at Km 135+760	Nos.	40.00	

b	**For Approaches to Blackspot location before Lighting area (6 m c/c Spacing)**			
(i)	Shoulder side Red	Nos.	168.00	
(ii)	Median Side Yellow	Nos.	168.00	
c	**Red Colour RPMs**			
	On Chevron Rosd marking at Service Road approach	Nos.	12.00	
d	**Yellow colour RPMs**			
	Inbetween each TBM Strips at 1m c/c	Nos.	420.00	
	Total Quantity		**808.00**	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MoRT&H Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	TBM at Median opening Approaches (6 nos 7m strips X 5 Sets X 2 sides X 0.3m wide in 2 layers)	Sqm.	252.00	
(ii)	Pedestrian Marking	Sqm.	48.00	
(iii)	a) Increasing thickness of Prohibitory Yellow junction Box Marking	Sqm.	38.65	
	b) Prohibitory Yellow junction Box Marking	Sqm.	12.80	
	Total Quantity		**351.45**	

3	**P**roviding and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
	One set of Single Rip Pattern TBM at Median opening Approaches with cold plastic material (6 nos 7m strips X 1 Sets X 2 sides X 0.3m wide)	Sqm.	25.20	
	Total Quantity		**25.20**	
4	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	**All Median Openings & Junctions**			
	On Median opening noise	Nos.	10.00	
	Total Quantity		**10.00**	

5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
	At Service Road Approaches 135+450 LHS	Nos.	2.00	
	Total Quantity		**2.00**	

Detailed estimate for short term remedial measures at Blackspot location Identified by MoRT&H from Km 132+300 to 32+800				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and fixing of Reflective Pavement Markers (RRPM), i.e. road studs shall be prismatic retro-reflective type conforming to ASTM D-4280. The Plastic body of RPM/road stud shall be moulded from ASA (Acrylic Styrene Acrylonitrite) or HIPS (HI-Impact Polystyrene) or Acrylonitrile Butadiene Styrene (ABS). The marker height shall not be less than 10mm and shall not exceed 20mm and its width shall not exceed 130mm. The markers shall support a load of 13,635 kg tested in accordance with ASTM ID 4280. The Reflective panels shall consist of number of lenses containing single or dual prismatic cubes capable of providing total Internal reflection of the light entering the lens face. Lenses shall be moulded of methyl methecrylate conforming to ASTM D 788 or equivalent. The optical performance of road studs shall be confirming to clause 804.4 of MoRT&H Specifications.			
a	**Green Colour RPM At Median Openings**			
(i)	Median Opeing at Km 135+760	Nos.	40.00	
b	**For Approaches to Blackspot location before Lighting area (6 m c/c Spacing)**			
(i)	Shoulder side Red	Nos.	168.00	

(ii)	Median Side Yellow	Nos.	168.00	
c	**Red Colour RPMs**			
	On Chevron Rosd marking at Service road approach	Nos.	12.00	
d	**Yellow colour RPMs**			
	Inbetween each TBM Strips at 1m c/c	Nos.	420.00	
	Total Quantity		**808.00**	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MoRT&H Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	TBM at Median opening Approaches (6 nos 7m strips X 5 Sets X 2 sides X 0.3m wide in 2 layers)	Sqm.	252.00	
(ii)	Pedestrian Marking	Sqm.	48.00	
(iii)	a) Increasing thickness of Prohibitory Yellow junction Box Marking	Sqm.	38.65	
	b) Prohibitory Yellow junction Box Marking	Sqm.	12.80	
	Total Quantity		**351.45**	

3	**P**roviding and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
	One set of Single Rip Pattern TBM at Median opening Approaches with cold plastic material (6 nos 7m strips X 1 Sets X 2 sides X 0.3m wide)	Sqm.	25.20	
	Total Quantity		**25.20**	
4	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	**All Median Openings & Junctions**			
	On Median opening noise	Nos.	10.00	

	Total Quantity		**10.00**	
5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
	At Service Road Approaches 135+450 LHS	Nos.	2.00	
	Total Quantity		**2.00**	
5	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W - 210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Extension of Street lights from Km 132+450 to 132+900 at Median	Nos.	16.00	
	Total Quantity		**16.00**	

Detailed estimate for short term remedial measures at Blackspot location Identified by MoRT&H from Km 135+350 to 135+850				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and fixing of Reflective Pavement Markers (RRPM), i.e. road studs shall be prismatic retro-reflective type conforming to ASTM D-4280. The Plastic body of RPM/road stud shall be moulded from ASA (Acrylic Styrene Acrylonitrite) or HIPS (HI-Impact Polystyrene) or Acrylonitrile Butadiene Styrene (ABS). The marker height shall not be less than 10mm and shall not exceed 20mm and its width shall not exceed 130mm. The markers shall support a load of 13,635 kg tested in accordance with ASTM ID 4280. The Reflective panels shall consist of number of lenses containing single or dual prismatic cubes capable of providing total Internal reflection of the light entering the lens face. Lenses shall be moulded of methyl methecrylate conforming to ASTM D 788 or equivalent. The optical performance of road studs shall be confirming to clause 804.4 of MoRT&H Specifications.			
a	**Green Colour RPM At Median Openings**			
(i)	Median Opeing at Km 135+760	Nos.	40.00	
b	**For Approaches to Blackspot location before Lighting area (6 m c/c Spacing)**			
(i)	Shoulder side Red	Nos.	168.00	
(ii)	Median Side Yellow	Nos.	168.00	
c	**Red Colour RPMs**			
	On Chevron Rosd marking at Service Road approach	Nos.	12.00	
d	**Yellow colour RPMs**			
	Inbetween each TBM Strips at 1m c/c	Nos.	420.00	
	Total Quantity		**808.00**	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MoRT&H Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	TBM at Median opening Approaches (6 nos 7m strips X 5 Sets X 2 sides X 0.3m wide in 2 layers)	Sqm	252.00	

(ii)	Pedestrian Marking	Sqm	48.00	
(iii)	a) Increasing thickness of Prohibitory Yellow junction Box Marking	Sqm.	38.65	
	b) Prohibitory Yellow junction Box Marking	Sqm.	12.80	
	Total Quantity		**351.45**	
3	**P**roviding and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
	One set of Single Rip Pattern TBM at Median opening Approaches with cold plastic material (6 nos 7m strips X 1 Sets X 2 sides X 0.3m wide)	Sqm.	25.20	
	Total Quantity		**25.20**	
4	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling			

	holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	**All Median Openings & Junctions**			
	On Median opening noise	Nos.	10.00	
	Total Quantity		**10.00**	
5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
	At Service Road Approaches 135+450 LHS	Nos.	2.00	
	Total Quantity		**2.00**	

Detailed estimate for short term measures at Km 136+700 RHS (Identified by Save life foundation)				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and fixing of Reflective Pavement Markers (RRPM), i.e. road studs shall be prismatic retro-reflective type conforming to ASTM D-4280. The Plastic body of RPM/road stud shall be moulded from ASA (Acrylic Styrene Acrylonitrite) or HIPS (HI-Impact Polystyrene) or Acrylonitrile Butadiene Styrene (ABS). The marker height shall not be less than 10mm and shall not exceed 20mm and its width shall not exceed 130mm. The markers shall support a load of 13,635 kg tested in accordance with ASTM ID 4280. The Reflective panels shall consist of number of lenses containing single or dual prismatic cubes capable of providing total Internal reflection of the light entering the lens face. Lenses shall be moulded of methyl methecrylate conforming to ASTM D 788 or equivalent. The optical performance of road studs shall be confirming to clause 804.4 of MoRT&H Specifications.			

(i)	**Yellow colour RPMs**	Nos.	45.00	
	Total Quantity		45.00	
3	**P**roviding and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
(i)	**Providing 1 set of Single Rid Pattern TBM with 10mm Thickness using cold plastic material**			
	On 9.0m MCW			
	ii) 1 Set (6 nos. of strip for 9.0m width MCW)	Sqm	16.20	
	Total Quantity		**16.20**	

Detailed estimate for short term remedial measures at Km 148+900 LHS (Identified by Save life foundation)				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
	From Km 148+700 to 148+800 on Median	Nos.	4.00	
	Total Quantity		**4.00**	

2	Providing and Erecting of Retro - Reflectorised Two-way Hazard Marker Traffic Sign made out of High Intensity Prismatic Grade Sheeting confirming to Type-IV standards of IRC-67: 2022 and ASTM D 4956 –09, specification and fixed over 2mm thick Aluminium sheet fixed over a back supporting frame of 25mmx25mmx3mm Mild Steel angle and supported on a mild steel angle post 75X75X6mm and 0.60m below ground level. The sign post should be painted as per IRC 67-2022 and firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45cmX45cmX60cm size including cost and conveyance of all materials, equipment, Machinery and labour with all leads and lifts, loading charges necessary for satisfactory completion of the work as directed by the engineer-in-charge. High intensity Retro - Reflectro sheet shall consist of minimum coefficient of Retro-reflection as per Table 6.6 of IRC 67-2022. The retro- reflective sheeting shall be covered under 7year warranty issued for field performance and a certified copy of three years outdoor exposure report shall be obtained as per IRC 67:2022. (as per MoRT&H Specification No.801) 45cm x 90cm rectangular			
	Two-way Hazard Marker	Nos	1.00	
	Total Quantity		**1.00**	
3	Providing and fixing of Reflective Pavement Markers (RRPM), i.e. road studs shall be prismatic retro-reflective type conforming to ASTM D-4280. The Plastic body of RPM/road stud shall be moulded from ASA (Acrylic Styrene Acrylonitrite) or HIPS (HI-Impact Polystyrene) or Acrylonitrile Butadiene Styrene (ABS). The marker height shall not be less than 10mm and shall not exceed 20mm and its width shall not exceed 130mm. The markers shall support a load of 13,635 kg tested in accordance with ASTM ID 4280. The Reflective panels shall consist of number of lenses containing single or dual prismatic cubes capable of providing total Internal reflection of the light entering the lens face. Lenses shall be moulded of methyl methecrylate conforming to ASTM D 788 or equivalent. The optical performance of road studs shall be confirming to clause 804.4 of MoRT&H Specifications.			
a	**Yellow colour RPMs**			
	Inbetween each TBM Strips at 1m c/c	Nos.	30.00	
b	**Red Colour RPMs**			
	On Chevron Rosd marking	Nos.	12.00	
	Total Quantity		**42.00**	

4	**P**roviding and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
a	**Providing one set of Single Rib pattern TBM of thickness 5 mm using cold plastic material**			
	On 5.5m width Service road (6 nos. of Strips x 5.5m width)			
	i) 1st Set	Sqm	9.90	
	Total Quantity		**9.90**	
5	**P**roviding and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
a	**Providing one set of Single Rib pattern TBM of thickness 10 mm using cold plastic material**			
	On 5.5m width Service road (6 nos. of Strips x 5.5m width)			
	ii) 2nd Set	Sqm	49.50	
	Total Quantity		**9.90**	
6	**P**roviding and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm.			

	Type 1 beads (Refer MoRT&H Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MoRT&H Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRT&H Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
a	**Providing one set of Single Rib pattern TBM of thickness 15 mm using cold plastic material**			
	On 5.5m width Service road (6 nos. of Strips x 5.5m width)			
	iii) 3rd Set	Sqm	9.90	
	Total Quantity		**9.90**	
7	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
a	For Service Road Approaches	Nos.	1.00	
	Total Quantity		**1.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 123+960 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
2	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		**15.00**	

3	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
4	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		**2.00**	
6	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50			

	mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

7	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 124+260 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 125+240 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	

2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	

4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts			

	which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	
8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 126+350 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
2	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		**15.00**	

3	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
4	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		**2.00**	
6	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50			

	mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

7	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 126+960 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 127+640 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 128+270 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 128+920 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
2	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		**15.00**	

3	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
4	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		**2.00**	
6	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50			

	mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

7	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 129+300 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	

2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	

4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts			

	which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	
8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 132+800 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
2	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		**15.00**	

3	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
4	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		**2.00**	
6	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50			

	mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	
7	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	

	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 133+200 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
2	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		**15.00**	

3	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
4	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		**2.00**	
6	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts			

	which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	
7	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 133+450 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 133+935 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 134+370 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 139+160 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 139+760 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 140+360 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 140+530 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 141+070 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 141+375 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 141+755 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 142+805 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 143+420 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		15.00	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		2.00	
7	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro			

	Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	

8	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 144+250 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1.	Providing and erecting of 10m hot-dip Galvanized Octagonal Pole with BSEN-10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole spaced at 30mtrs with overhang 1.5 - 1.8 m (double arm) fitted with 180W -210 W (2 fixtures per pole) confirming to IS Specification and as directed by Engineer. Using foundation in median. Spacing 30 m c/c			
(i)	Street lights at Median	Nos.	4	
	Total Quantity		4	
2	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		**61.20**	

3	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		**15.00**	
4	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
6	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night			

	time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	
7	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

Detailed estimate for short term remedial measures at Pedestrian Crossing Locations at Km 149+040 in Pollachi to Coimbatore Road Stretch section of NH-83 (Old NH-209)				
DETAILED ESTIMATE				
Sl. No.	**Description of the Item**	**Unit**	**Quantity**	**Remarks**
1	Providing and Laying hot applied thermoplastic road marking strip on Concrete Surface of specified shade/ colour of 2.5 mm thick including Type 1 beads (Refer MoRTH Specification Clause803.4.2) which are a constituent of the basic thermoplastic compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MoRTH Specification). The glass beads shall have a minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. The thermoplastic road marking material thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be level, uniform, and free from streaks and holes complete as per direction of Engineer-incharge and in accordance with applicable specifications. (Refer MORTH Clause 803 for technical Specification and Performance for IRC 35:2015). Recommended Use of specialized Road Marking Primer, based on surface conditions.			
(i)	One Set of TBM for each location on either side	sqm	61.20	
	Total Quantity		61.20	
2	Providing and Laying of 5mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	For Speed Limit Markings	Sqm	15.00	
	Total Quantity		**15.00**	

3	Providing and Laying of 10mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surfacing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	
4	Providing and Laying of 15mm high Single Rib Pattern Transverse Bar Markings with 2 component cold plastic with specialised cold plastic Primer coating rolled on surf cing material solvent free, high build two pack seamless, tough, skid resistant, for material to reduce speed. Cold Plastic road marking material shall be applied in single monolithic application to create rumble strip raised section of 10 mm high, 300 mm wide confirming to clause 3.7 of IRC 99, across the entire carriageway. Each rumble marking shall be made complete with specialised high refractive index glass beads of minimum reflectivity index of 1.5. The glass bead shall be @ 250gm/sqm. Type 1 beads (Refer MORTH Specification Clause803.4.2) which are a constituent of the basic cold plastics compound vide Table 800-9 (MORTH Specification) and Type 2 beads are those which are to be sprayed on the surface vide Clause 803.6.4 (MORTH Specification). Pavement Marking Performance such as Day/Night visibility, Dry/Wet visibility and skid resistance shall be confirming to clause 15.5 of IRC 35. The finished surface to be levelled, uniform and free from streaks and holes, to be applied on the edge lines, including surface cleaning and cost of all materials etc. complete.			
i)	One Set for each location on either side	Sqm	30.60	
	Total Quantity		**30.60**	

5	Supplying and erecting red /yellow unbreakable polycarbonate body Solar Blinker 300mm dia. LED lamp confirming to IRC:93 and IS:7537. It shall have Light Emitting Diode (LED) - Hi Bright technology (Compliant to EN12368 or equivalent BIS standard). The Signal Switching shall be Solid State, with Opto-isolation. The Automatic operation mode shall have functional flashing rate available at 50% Duty Cycle 50 or 60 Flashes/minutes. The Electrical Power Supply shall be solar based 12 VDC operating at Ambient Temperature 0° to 55°C. The solar power system shall have in-built charge Controller - Low/High cut out, Solar SPV Module -60 Watts, Maintenance Free Battery (60AH) (having back up for operating blinker for 72 Hrs in absence of Sun or during rainy or foggy days. The Solar System shall be housed in a weatherproof pole mounting cabinet with clamp and mounting accessories. The Solar Blinker shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239, 3m above the Finish Road level. Gl circular pipe shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawing. Alternate white and yellow bands (Minimum four bands) of Type XI retro-reflective sheeting shall be pasted @ 0.5m c/c starting from a height of 0.5 m above the finish road level.			
i)	Solar Blinkers @ at Opening	Nos	2.00	
	Total Quantity		**2.00**	
6	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per clause 801 of MoRTH Specifications for Roads & Bridge Works and IRC: 67 (2022) made of class -C Micro Prismatic Grade Sheeting of Type XI retro reflective sheeting. The retro reflective sheeting shall have manufacturer logo, watermark and lot number on the sheet. A QR (Bar) code shall also be placed on the backside of the sign board with an indelible ink. For signs above 600mm size, retro reflective sheet shall be fixed over 2 mm thick aluminium sheeting vide or 4mm thick Aluminium composite material sheet vide clause 801 of MoRTH Specifications for Roads & Brdige Works. For signs above 600mm sizes, sign shall be fixed over back support frame of minimum 35 x 35x 3 mm angle Frame. For signs above 600mm size, Signs shall be supported on Gl circular pipe 80 NB, 3.2 mm thickness confirming to IS 1239. Retro-Reflective sheet shall be fixed on Substrate with Pressure Sensitive Adhesive. The Substrate shall be firmly riveted on Angle Frame @ 200mm spacing with Aluminium Pop rivets using Pneumatic Guns. The Angle frame shall be firmly fixed with high strength bolts, washers nuts conforming to IS1364 and IS 1367 on Sign Support Pole. Sign Supports shall be firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60, 60 cm below ground level as per approved drawling. All Components of signs and supports including Angle Frame, Bolts, Nuts, Washers, etc. other than the reflective portion shall be galvanized by hot dip process (Zinc coated, 0.55 kg/sqm; minimum single spot) unless otherwise specified. All galvanizing shall be done after fabrication. Alternate white and yellow bands measuring 50 mm long retro-reflective			

	sheeting shall be pasted around Gl posts which help in ensuring the visibility/Presence of poles during night time even if the sign boards are stolen or totally vandalized. Minimum four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the finish road level. The messages (legends, letters, numerals, etc.) and borders as per clause 6.8 of RC 67 shall be digitally printed. Finished Signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the signs supplied by reflective sheet manufacturer. The agency shall submit 10 years warranty for satisfactory field performance for type XI retro reflective sheeting from the retro-reflective sheet manufacturer confirming to clause 6.7 & 6.9 of IRC 67. Agency shall submit a certified copy of test reports from an Government laboratory/ Institute conforming to clause 6.7 6.9 of IRC 67 including 3 years accelerated outdoor weathering for the retro reflective sheeting. The Agency shall submit the sign convertor (manufacturer) name with details of essential equipment available with convertor in his fabrication shop such as digital, printer, cutter, plotter, laminator, Galvanizing plant, etc. The Agency shall submit road sign installation drawing in Kmz' file for approval before installation and after installation submit geo-tagging of all road signs with its installation photos and date of installation and other details as mentioned in IRC 67 annexure VII, complete in all respects. The sign supports and its foundation details are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.			
i)	90 cm equilateral triangle	No.	2.00	
	Total Quantity		**2.00**	
7	Solar Powered Road marker (Solar Stud): Supplying and installation of Solar Raised Pavement Markers made of polycarbonate moulded body with circular shape, solar powered, LED self-illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280. Its water resistance shall meet the requirements of IP 65 in accordance with IS: 12063:1987 Category 2 for protection against water ingress. Colour of lighting could be provided in red or yellow (amber) or green or blue or combination as per requirement. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to +55°C. Its life shall be not less than 3 years. The full charge should provide for a minimum autonomy of 50 hours operation. The height, width and length of the marker shall not be less than 10mm x 100mm x 100mm. Also the surface diameter of the marker shall not be less than 100mm respectively. The weight of marker shall not exceed 0.5 kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the Engineer			
(i)	All Median Openings & Junctions			
	On Median opening nose	Nos.	12.00	
	Total Quantity		**12.00**	

(SECTION-VII)

TECHNICAL

SPECIFICATIONS

TECHNICAL SPECIFICATIONS

7.1 PREAMBLE:

The Technical Specifications contained herein shall be read in conjunction with the other Bidding Documents as specified.

7.2 GENERAL REQUIREMENTS

The Technical Specifications in accordance with which the entire work described hereinafter shall be executed and completed by the Contractor shall comprise of the following:

PART – I – GENERAL TECHNICAL SPECIFICATIONS

The General Technical Specifications shall be the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS" (FIFTH REVISION, 2013) issued by the Ministry of Road Transport & Highways, Government of India and published by the Indian Roads Congress, hereinafter referred to as MORT&H Specifications.

PART – II – SUPPLEMENTARY TECHNICAL SPECIFICATIONS

When an Amended/Modified/Added Clause supersedes a Clause or part thereof in the said Specifications, then any reference to the superseded clause shall be deemed to refer to the Amended/Modified/Added Clause or part thereof.

In so far Amended/Modified/Added Clause may come in conflict or be inconsistent with any of the provisions of the MOST Specifications under reference, the Amended/Modified/Added clause and the additional specifications shall always prevail.

In the absence of any definite provisions on any particular issue in the aforesaid Specifications, reference may be made to the latest codes and specifications of IRC and BIS in that order, Where even these are silent, the construction and completion of the works shall conform to sound engineering practice as approved by the Engineer and, in case of any dispute arising out of the interpretation of the above, the decision of the Engineer shall be final and binding on the Contractor.

The Authority/Client shall get the 3rd party quality audit of Road Furniture and Highway lights from any nearest reputed government technical institute for its gradation, bitumen content and thickness for every km. and construction agency shall bear the cost of these tests.

Conditions for Retro Reflective Road Signs

1. The contractor shall obtain from the sheeting manufacturer of Retro Reflective Sheeting a Pre- Qualification Warranty certificate in original for Ten years satisfactory field Performance including stipulated retro reflectance of the retro reflective sheeting to be used and submit the same during Bid Submission.

2. Product Conformance Certificate in original from the manufacturer of retro reflective sheeting stating that the material offered for this tender, conforms to the standards / specifications of retro reflective sheeting as given in this tender and is part of the original warranty shall be submitted.

3. A certificate of having tested the sheeting for following properties and its having passed these tests shall be obtained from a reputed test laboratory from International/Government Laboratory/Institute by the manufacturer of the sheeting and in case the certificate is obtained from international agency, it should also be obtained from Indian agency within 3years from the date of launching the product in India, by the manufacturer of the sheeting as per IRC 67-2022

4. The sheeting manufacturer shall also provide test data showing that has met the Requirements for 36 months of accelerated outdoor weathering. The test data shall be gathered in accordance with ASTM D 4956 and shall be performed by an independent agency. The above test certificate shall be uploaded during the bid submission.

5. The Retro reflective surface after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro reflection as given in Table I determined in accordance to ASTM D 4956 Type XI Sheeting and should be within the allowable limits mentioned in Section 6 of IRC 67-2022.

6. Contractor should emboss date of installation & contractor firm details on the back side of the sign board at the time of supply.

7. The bidder is responsible for appropriate traffic management and all other temporary safety protection during construction no additional payment will be admissible for traffic diversion and management.

Conditions for Raised Pavement Marker (Twin Molded Shanks):

1. A certificate of having tested the lens as per ASTM D 4280 & MoRT&H Clause no.804 for the following tests and its having passed these tests shall be obtained from an independent laboratory of repute by the manufacturer and enclosed along with the bid at the time of bid opening.
   i. Construction-Height & width of marker
   ii. Coefficient of Luminous Intensity at 0.2,0.3- & 0.5-degree Observation angle

iii. Initial Abrasive Resistance
iv. Color
v. Temperature Cycling
vi. Area of Retro reflecting surface
vii. Slope of reflecting surface

2. A third-party test report (not less than 3 months old) conforming that the product passes following test conforming to MoRT&H circular and ASTM D 4280
   i. Compressive Strength
   ii. Flexural Strength
   iii. Lens Impact Strength

3. The contractor shall obtain Pre-Qualification Warranty certificate in original for two years satisfactory field performance from the Manufacturer and submit the same during Bid Submission.

4. A sample of the stud with Twin Molded shanks confirming to the specifications mentioned above shall be submitted by the contractor.

5. The tenderer should submit all the documents mentioned above during the bid Submission, failing which their Bid would be disqualified.

6. The bidder is responsible for appropriate traffic management and all other temporary safety protection during construction no additional payment will be admissible for traffic diversion and management.

Conditions for Road Markings

1. The contractor shall submit a warranty period for the pavement markings for atleast two years. During the warranty period, all the performance parameters must remain higher than the minimum threshold level for the values mentioned in Section 15 of IRC 35-2015.

2. Product Conformance Certificate in original from the manufacturer of pavement markings stating that the material offered for this tender, conforms to the standards / specifications of pavement markings as given in this tender and is part of the original warranty shall be submitted.

3. The contractor shall submit the test reports of Performance Assessment as per Section 15 of IRC 35-2015 and characteristics of the pavement markings as per Section 16 of IRC 35-2015.

4. All the conditions mentioned in MoRT&H Clause no.803 and IRC 35-2015 are to be followed without any deviations.

5. The bidder is responsible for appropriate traffic management and all other temporary safety protection during construction no additional payment will be admissible for traffic diversion and management.

Conditions for Highway Lighting:

1. Providing and erecting of 10m hot-dip galvanized Octagonal Pole with BSEN -10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, suitable to with stand the wind speed of 180 KMPH for 10 mtrs height Pole having dimensions Bottom Ø175 mm, Top Ø70 mm with 3mm thick, base plate 300 x 300 x 16mm confirming to IS Specification and as directed by Engineer In charge & pole drawing. The pole shall be supplied and erected with 2 mtrs with 0-to-15-degree tilt double arm bracket completes with all accessories with MS galvanized (as per IS 4759:1996 / IS 2629:1985) 55/60mm dia Pipe with 2/3mm thick. The pole shall be fitted with 210W LED street light with prescribed lumens of illumination with LM 6 Pressure Die cast aluminium housing. The luminaire shall be with dedicated street lighting unique peanut optic lens to ensure a minimum lux level of 40 LUX with uniformity as per IS1944 high spacing from pole to pole and cut-off type. The driver shall be of electronic type suitable for on/off. Driver sould have inbuilt surge protection of Min 4KV and external SPD of 20KV/10KA. THD <10%, power factor >0.95.

2. Bidder to submit the BIS certificate, LM79, LM80 & Type test certificate from NABL laboratory to ensure the compliance.

3. As per IS 15885 (Part 2/ Sec 13): 2012, the luminaire shall be used with high power LEDs delivering system lumen output more than 24300/28300 lumens with CCT of 5700K. The efficacy of the luminaire shall not be less than 135 lm/W. A design report to be submitted along with the bid for the following parameters using dialux / calculux software confirming to Minimum 40 Lux as per IRC: SP: 84-2019 as per the directed by the Engineer in charge.

4. Obtain of power supply from TNEB in the name of client as suggest by the authority for adequate for power consumption duly comply of all the applicable formats duly filled and singed by the Authority as directed by the engineer.

5. Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.), PCC/RCC in foundation, supply, fitting and placing un-coated HYSD bar reinforcement in foundation, supply and drilling, fixing of wall mounted clamps are to be carried out as directed by the Engineer.

6. The bidder is responsible for appropriate traffic management and all other temporary safety protection during construction no additional payment will be admissible for traffic diversion and management.

(SECTION-VIII)

IMPLEMENTATION MANUAL AND

MAINTENANCE INTERVENTION LEVELS

SECTION – VIII
IMPLEMENTATION MANUAL AND MAINTENANCE INTERVENTION LEVEL

8.1 Introduction

8.1.1 DELETED

8.1.2 DELETED

8.2 Maintenance Procedures

8.2.1 DELETED

8.3 Maintenance Programme Planning

8.3.1 DELETED

8.4 Resource Estimation

8.4.1 DELETED.

8.5 Identification of Priorities

8.5.1 DELETED.

8.5.2 DELETED

8.5.3 DELETED.

8.5.4 DELETED.

8.6 Work Scheduling

8.6.1 The Contractor shall in prior provide the work schedule and shall abide to it.

8.6.2 DELETED.

8.6.3 DELETED.

8.6.4 DELETED.

8.6.5 DELETED.

8.7 Work Management

8.7.1 The success of Contract maintenance system lies with good work management. The Contractor shall draw activities which shall be

accomplished by in house crew and portion of the work to be accomplished with Sub-Contractors.

8.7.2 DELETED

8.7.3 DELETED.

8.7.4 DELETED.

8.8 Work Control & Quality Assurance

8.8.1 The Engineer shall adopt random sampling procedures to ensure quality control. Engineer shall carry out in- process inspections and end product inspections to collect samples and shall carry out testing in order to determine the degree of adherence to the maintenance standards of delivered or constructed material. Any testing / checking of works by Engineer shall not absolve the contractor from his responsibility to execute works strictly in accordance of MoRT&H/IRC/IS specifications or laid down standards in bid document.

8.8.2 A quality control laboratory equipped with all instruments required to perform tests as indicated in MoRT&H / IRC / IS specifications at frequency mentioned therein shall have to be provided by the contractor. Contractor shall ensure that testing of all material delivered or constructed is regularly carried out by his filed staff as per standard norms and results of these tests are recorded in specified manner and made available to Engineer whenever required by him. The contractor shall provide the QC laboratory, as incidental to work and no separate payment shall be made for this item. The QC lab shall also be made available to Engineer for conducting tests of his own.

8.8.3 In- process inspections shall be carried out by the Engineer to witness and/or to verify the quality / quantity of work, when activity is in process with aim to judge justification of payment. Engineer shall carry out end product inspections after completion of the activity to provide satisfactory evidence about acceptability of the Contractor's work.

8.8.4 The results of in process inspections, end product inspections and quality control tests shall form basis of acceptance of completed works and issuance of Non-Conformance Report (NCR). Items of Works or unit of material or the end product do not meet the specifications / standards shall be identified by "Non- Conformance-Report" and can become basis of rejection of work on establishing the authorized disposition.

8.8.5 Non-Conformance Report: Defective or uncompleted work shall not be paid. Such work shall also be notified to the Contractor within 10 days of submission of bill through non-conformance report (NCR). The NCR shall clearly identify the item of work that is non – conforming either to specification or to a specific requirement in the contract document. Once

NCR is identified, it shall be evaluated and of the dispositions would be established.

a. "Do" Identifies the work which has not been done at all at site within specified time limit. An NCR issued with "Do" disposition for the work should immediately be undertaken by Contractor.

b. "Re-Do" Identified the work, that is non conforming of all quality aspects. Such works be totally removed & redone.

c. "Re-work" Requires part of particular item identified in this category be reworked to bring it to the quality required.

d. "Use-as-is" Applied where Engineer accepts work "as-is" notwithstanding the fact that it does not exactly conform to the contract requirements. This work shall be accepted only for agreed reduced rates with respect to unit rates quoted in financial bid by the Contractor otherwise shall be re-classified under disposition "Do" or "Re-Do".

8.9 Payment Procedures

8.9.1 The Contractor shall submit to the Engineer after the completion of work bill in two copies, each signed by authorized Contractor's representative in standard format, showing the amounts to which the Contractor considered himself to be entitled after the completion of work. These bills should be prepared each indent wise.

8.9.1.1 The Engineer after scrutiny of the bills shall certify and recommend the payments for completed accepted works within 14 days of presentation of bill to him to the employer subject to deductions as per bid documents.

8.9.1.2 The employer shall pay the amount due to the Contractor under certificate and recommendations by the Engineer within 28 days after it has been delivered to the Employer.

8.10 Records & Documentation

8.10.1 The results of all inspections shall be documented. The test results containing documentary evidence of activities and data relevant to the quality of work and performance of the Contractor shall also be documented. The field daily to be filled by Site Engineer of Contractor shall be a basic form of documentation. The activities to be entered in daily dairy are

- The description of day's activities, number and type of crew on job, equipment on job weather and temperature

- Any measurement made to determine pay quantities
- Daily summary of material issued in the job
- A record of significant conversations with and direction given to the Contractor
- A record of bottlenecks with the progress or execution of the work
- A record of material testing in lab
- Details of visit by officials

8.10.2 The Contractor shall carryout Retro Reflector test for sign boards, road markings and studs and Lux meter test for lightings as directed by Engineer for the entire stretch at the end of the pavement maintenance and shall submit the complete record to NHAI. There shall not be any separate payment on account of this. The payment pertaining to this shall be deemed to be included in the items of works.

8.11 MAINTENANCE INTERVENTION LEVELS

DELETED

ANNEXURE - I

DRAFT INTEGRITY PACT

(To be executed on plain paper and submitted along with Technical Bid/Tender documents for tenders having a value between Rs.5 Cr and Rs.100 Cr. To be signed by the bidder and same signatory competent/ authorized to sign the relevant contract on behalf of the NHAI)

This integrity Pact is made at_____on this_____ Day of_____20.

Between

National Highways Authority of India (NHAI), a statutory body constituted under the National Highways Authority of India Act, 1988, which has been entrusted with the responsibility of development, maintenance and management of National Highways, having its office at G-5 & G- 6, Sector-10, Dwarka, New Delhi, hereinafter referred to as **"The Principal",** which expression shall unless repugnant to the meaning or contract thereof include its successors and permitted assigns.

and

_____herein after referred to as **"The Bidder / Contractor / Concessionaire / Consultant"** and which expression shall unless repugnant to be meaning or context thereof include its successors and permitted assigns.

Preamble

Whereas, the Principal intends to award, under laid down organizational procedures, contract/s for **"The Scope of Work includes providing Short Term Remedial measures for the Blackspot Locations at 4 locations and rectification of Critical Crash Prone Locations - 3 locations and speed calming measures at Pedestrian crossing locations - 25 locations to attain Zero Fatality corridor (total 32 locations) as provided in the Section – VI as per the prevailing IRC guidelines and MoRT&H Specification. ----------".**

"_____
_____". The Principal values full compliance with all relevant laws of the land, rules of land, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and/ or Contractor(s)/Concessionaire(s)/Consultant(s).

And whereas to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact (hereafter referred to as Integrity Pact) the terms and conditions of which shall also be read as integral part and parcel of the Tender documents and contract between the parties. Now, therefore, in consideration of mutual covenants

stipulated in this pact, the parties hereby agree as follows and this pact witnesseth as under:-

Article 1 Commitments of the Principal

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

(a) No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self, or third person, any material of immaterial benefit which the person is not legally entitled to.

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

(c) The Principal will exclude all known prejudiced persons from the process, whose conduct in the past has been of biased nature.

1. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act or any other Statutory Acts or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions as per its internal laid down Rules/Regulations.

Article 2 Commitments of the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s).

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

(a) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal" s employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

(b) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or

non-submission or bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not commit any offence under the relevant IPC/PC Act and other Statutory Acts; further the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not use improperly, for purposes of completion or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

(d) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) of foreign-origin shall disclose the name and address of the Agents/ Representatives in India, if any. Similarly the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) of Indian Nationality shall furnish the name and address of the foreign principle, if any.

(e) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract. He shall also disclose the details of services agreed upon for such payments.

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

(g) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not bring any outside influence through any Govt. bodies/quarters directly or indirectly on the bidding process in furtherance of his bid.

Article 3 Disqualification from tender process and exclusion from future contracts.

1. If the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s), before award or during execution has committed a transgression through a violation of any provision of Article-2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) from the tender process.

2. If the Bidder / Contractor / Concessionaire / Consultant has committed a transgression through a violation of Article-2 such as to put his reliability or credibility into question, the Principal shall be entitled to exclude including blacklist and put on holiday the Bidder/Contractor/Concessionaire/Consultant for any future tenders/ contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Principal

taking into consideration the full facts and circumstances of each case particularly taking into account the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder / Contractor / Concessionaire / Consultant and the amount of the damage. The exclusion will be imposed for a minimum of 1year.

3. A transgression is considered to have occurred if the Principal after due consideration of the available evidence concludes that "On the basis of facts available there are no material doubts".

4. The Bidder / Contractor / Concessionaire / Consultant with its free consent and without any influence agrees and undertakes to respect and uphold the Principal" s absolute rights to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

5. The decision of the Principal to the effect that a breach of the provisions of this Integrity Pact has been committed by the Bidder / Contractor / Concessionaire / Consultant shall be final and binding on the Bidder / Contractor / Concessionaire / Consultant.

6. On occurrence of any sanctions / disqualification etc arising out from violation of integrity pact, the Bidder / Contractor / Concessionaire / Consultant shall not be entitled for any compensation on this account.

7. Subject to full satisfaction of the Principal, the exclusion of the Bidder / Contractor / Concessionaire / Consultant could be revoked by the Principal if the Bidder / Contractor / Concessionaire / Consultant can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption prevention system in his organization.

Article 4 Compensation for Damages.

1. If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Arcticle-3, the Principal shall be entitled to forfeit the Earnest Money Deposit / Bid Security or demand and recover the damages equivalent to Earnest Money Deposit / Bid Security apart from any other legal right that may have accrued to the Principal.

2. In addition to 1 above, the Principal shall be entitled to take recourse to the relevant provisions of the contract related to Termination of Contract due to Contractor / Concessionaire / Consultant" s Default. In such case, the Principal shall be entitled to forfeit the Performance Bank Guarantee of the Contractor / Concessionaire / Consultant and / or demand and recover liquidated and all damages as per the provisions of the contract/concession agreement against Termination.

Article 5 Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last 3 years immediately before signing of this Integrity Pact with any other Company in any country conforming to the anti corruption / Transparency International (TI) approach or with any other Public Sector Enterprise / Undertaking in India or any Government Department in India that could justify his exclusion from the tender process.

2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action for his exclusion can be taken as mentioned under Article-3 above for transgressions of Article-2 and shall be liable for compensation for damages as per Article-4above.

Article 6 Equal treatments of all Bidders / Contractors / Concessionaires / Consultants / Subcontractors.

1. The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) undertake(s) to demand from all Sub-Contractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

2. The Principal will enter into agreements with identical conditions as this one with all Bidders / Contractors / Concessionaires / Consultants and Subcontractors.

3. The Principal will disqualify from the tender process all Bidders who do not sign this Pact or violate its provisions.

Article 7 Criminal charges against violating Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) / Sub-contractor(s).

If the Principal obtains knowledge of conduct of a Bidder / Contractor / Concessionaire / Consultant or Sub-Contractor, or of an employee or a representative or an associate of a Bidder / Contractor / Concessionaire / Consultant or Sub-Contractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Article 8 Pact Duration

This Pact begins when both parties have legally signed it. (In case of EPC i.e. for projects funded by Principal and consultancy services). It expires for the Contractor / Consultant 12 months after his Defect Liability period is over or 12 months after his last payment under the contract whichever is later and for all other unsuccessful Bidders 6 months after this Contract has been awarded. (In case of BOT / DBFOT Projects) It expires for the concessionaire 24 months after his concession period is over and for all other unsuccessful Bidders 6 months after this Contract has been awarded. If any claim is made / lodged during this time, the same shall be binding

and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by Chairman of NHAI.

Article 9 Other Provisions.

1. This pact is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi.

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

3. If the Bidder / Contractor / Concessionaire / Consultant is a partnership or a consortium, this pact must be signed by all partners or consortium members.

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

5. Any disputes / differences arising between the parties with regard to term of this pact, any action taken by the Principal in accordance with this Pact or interpretation thereof shall not be subject to any Arbitration.

6. The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

In witness whereof the parties have signed and executed this Pact at the place and date first done mentioned in the presence of following witness:-

_____ _____

(For & On behalf of the Principal) (For & On behalf of the Bidder / Contractor / Concessionaire / Consultant)

(Office Seal)

Place:_____

Date:_____

Witness 1: (Name &Address):_____

Witness 2: (Name & Address):