भारत सरकार
लोक निर्माण विभाग
कार्यालय मुख्य अभियंता (दक्षिण)M

NOTICE INVITING TENDER

NIT No.02/CE South(M)/PWD/2019-20

Name of Work: Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.
NIT.NO.16/EE/PWD/SER-1/2019-20
Estimated Cost : Total Rs. 28,80,34,937/-

Civil	**-**	**Rs. 26,61,03,658/-**
Electrical	**-**	**Rs. 1,91,28,278/-**
Horticulture.	-	**Rs. 28,03,381/-**

Earnest Money	**:**	**Rs. 38,80,349/-**
Time Allowed	**:**	**270 Days**
Tender Form	**:**	**7**

NIT No.02/CE South(M)/PWD/2019-20 of Rs. 28,80,34,937/- (Rupees Twenty Eight Crore, Eighty Lac, Thirty Four Thousand, Nine Hundred Thirty Seven Only) having Pages No. 1 to 259 is here by approved.

Assistant Engineer (P)
O/o Chief Engineer South(M)

Executive Engineer (P)
O/o Chief Engineer South (M)

Chief Engineer
South (M), PWD,

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

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CERTIFIED THAT THIS NIT DOCUMENT CONSISTS OF TOTAL 259 PAGES		

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

PRESS NOTICE

PUBLIC WORKS DEPARTMENT
NOTICE INVITING e-TENDER

The Executive Engineer South East Road-I, Kalka More, Ishwar Nagar, New Delhi on behalf of the President of India invites online percentage rate composite tender in two bid system through e-procurement from CPWD enlisted contractors of appropriate class in composite category and those of appropriate list of MES, BSNL, Railway and other State Govt. and firms/ contractors of repute dealing with building/roads fulfilling the eligibility criteria as specified in the bid for " **Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk."**

NIT No.02/CE South(M)/PWD/2019-20

NIT No.16/EE/PWD/SER-1/2019-20

Name of work: Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.

Estimated Cost:-Rs. 28,80,34,937/- (Civil – 26,61,03,658/-+ Electrical - Rs. 1,91,28,278/- + Horticulture Rs.28,03,001/-),

Earnest Money:- Rs. 38,80,349/-

Period of completion: - 270 Days

Last date and time of submission of bid on19.08.2019 upto 15:00 Hours.

Date and time of opening of Techincal Bid on 19.08.2019 at 15:30 Hours.

The Bid forms and other details can be obtained from the website https://govtprocurement.delhi.gov.in

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

** To be filled by EE

Part-A

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

Vol-I (Technical BID)

Name of Work	:	Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.
NIT No.	:	02/CE South(M)/PWD/2019-20
ESTIMATED COST	:	Rs. 28,80,34,937/- (Civil – 26,61,03,658/-+ Electrical - Rs. 1,91,28,278/- + Horticulture Rs.28,03,001/-),
EARNEST MONEY	:	Rs. 38,80,349/-
SECURITY DEPOSIT	:	2.5% of Tendered Cost
PERFORMANCE GUARANTEE	:	5% of Tendered Cost
TIME ALLOWED		270 Days

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR e-TENDERING FORMING PART OF BID DOCUMENT AND TO BE POSTED ON WEBSITE

The Executive Engineer, South East Road-I, Kalka More, Ishwar Nagar, New Delhi on behalf of the President of India invites online percentage rate bids from CPWD enlisted contractors of appropriate class in composite category and those of appropriate list of MES, BSNL, Railway and other State Govt. and firms/ contractors of repute fulfilling the eligibility criteria as specified below, dealing with building/roads in two bid system for the following works.

S. No.	NIT No.	Name of work & Location	Estimated Cost put to bid	Earnest Money	Period of Completion	Date of Pre-Bid meeting	Last date & time of submission of bid, copy of receipt of deposition of original EMD, and other documents as specified in the NIT	Time & date of opening of Technical/Eligibility bid
1	2	3	4	5	6		7	
1	02/CE South(M)/PWD/2019-20	**Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**	**Civil- Rs. 26,61,03,658/- Electrical - Rs. 1,91,28,278/- Horticulture 28,03,001/- Total-28,80,34,937/-/-**	**Rs. 38,80,349/-**	270 Days	**09.08.2019 at 11:00 AM**	**19.08.2019 at 3:00 pm.**	**19.08.2019 on 3:30 pm.**

** To be filled by EE.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

1. Class-II CPWD Contractors and non-CPWD contractors who fulfill the following requirements shall also be eligible to apply. Joint ventures are not accepted.

   (a) Should have satisfactory completed similar work(s) as mentioned below during the last Seven years ending previous day of last date of submission of bids.-

   Three similar works each costing not less than Rs. 11.52 Crores
   or
   Two similar works each costing not less than Rs. 17.28 Crores
   or
   One similar work costing not less than Rs.23.04 Crores

Similar work means works of "**Civil Work pertaining to Building /road work"**. The value of executed work shall be brought to current costing level by enhancing the actual value of works at simple rate of 7% per annum; calculated from the date of completion to previous day of last day of submission of bids.

   (b) Should have Average Annual financial turnover of Rs. **14,40,17,659/-** on construction works during the last three years ending **31st March 2019.(Scanned copy of Certificate from Charted Accountant to be uploaded)**-Form 'A'

   (c) Should not have **incurred any loss** (profit after tax should be positive) in more than two years during the last five years ending **31st March 2019-**Form 'A'

   (d) Should have a **Solvency of Rs. 11,52,14,127/-**(Scanned copy of original solvency to be uploaded), Form 'B'with date of issue not older than one year from the last date of receipt of bid.

2. The intending bidder must read the terms and conditions of **CPWD-6** carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.

3. This information and Instructions for bidders posted on website shall form pay of the bid document.

4. The bid document consisting of plans Specifications, the Schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from **website** https//delhi.govtprocurement.com free of cost.

5. But the bid can only be submitted after deposition of EMD either in the office of Executive Engineer inviting bids or Division office of any Executive Engineer, PWD, NCTD, within the

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

period of bid submission and uploading the mandatory scanned documents such as Demand draft or Pay order or Bankers Cheque or Deposit at call Receipt or Fixed Deposit Receipts and Bank Guarantee of any scheduled Bank towards EMD in favour of Executive Engineer as mentioned in NIT, receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE/AE), PWD, NCTD and other documents as specified.

6. Those Contractors not registered on the website mentioned above, are required to get registered beforehand. If needed they can be imparted training on online bidding process as per details available on the website.

7. The intending bidder must have valid class-III digital signature to submit the bid.

8. On opening date, the Contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.

9. Contractor can upload documents in the form of JPG format and PDF format.

10. **Certificate of Financial Turn over:** At the time of submission of bid Contractor may upload Affidavit/ Certificate from **Chartered Accountant** mentioning Financial Turnover of last 3 years or for the period as specified in the bid document and further details if required may be asked from the Contractor after opening of eligibility bids. There is no need to upload entire voluminous balance sheet.

11. Contractor must ensure to quote percentage rate above or below the estimated cost for civil, electrical and Horticulture component of work separately as per template provided in the NIT. The column meant for quoting rate in figures appears in pink colour and the moment rate is entered, it turns sky blue.

    In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO).

    However, If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section/sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

12. The eligibility (Technical) bid shall be opened first on due date and time as mentioned above. The time and date of opening of financial bid of Contractors qualifying the eligibility bid shall be communicated to them at a later date.

13. **Pre-Bid conference shall be held in the chamber of Chief Engineer, South(M), PWD, New Delhi at 09.08.2019 on 11:00 AM to clear the doubt of intending bidders, if any.**

14. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified Contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.

15. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.

** To be filled in By EE

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

List of Documents to be scanned and uploaded within the period of bid submission:

1	Copy of receipt for deposition of original EMD issued from Division office of any Executive Engineer, PWD, NCTD
2.	Certificate of Registration in appropriate class in composite category (for CPWD Contractors)
3.	Certificate of Financial Turnover and Profit/loss statements from Chartered Accountant (Form 'A')(for class-II contractors of CPWD and non- CPWD contractors.)
4.	Bank Solvency Certificate (Form 'B') (for class-II contractors of CPWD and non-CPWD contractors.)
5.	Certificates of Similar Works Experience & Performance (Form 'C' & 'D')(for class-II contractors of CPWD and non- CPWD contractors.)
6.	Organizational Structure (Form 'E') (for class-II contractors of CPWD and non-CPWD contractors.)
7.	Letter of Transmittal
8.	**GST Registration Certificate of the State in which the work is to be taken up, if already obtained by the bidder**. If the bidder has not obtained GST registration in the State in which the work is to be taken up, **or as required by GST authorities** then in such a case the bidder shall **scan and** upload following undertaking along with **other** bid documents. "If work is awarded to me, I/we shall obtain GST registration Certificate **of the State, in which work is to be taken up** within one month from **the** date of receipt of award letter or before **release of any payment by PWD, NCTD whichever is earlier, failing which I/We shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and /or for any action taken by PWD, NCTD or GST department in this regard.**
9.	Affidavit as per provision of clause 1.2.2 of CPWD-6
10.	Any other document as specified in the NIT

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

CPWD-6 FOR E- TENDERING

1. Percentage rate online bids are invited on behalf of President of India from CPWD enlisted contractors of appropriate class in composite category and those of appropriate list of MES, BSNL, Railway and other state Govt. and firms/ contractors of repute dealing with building/roads in two bid system for the work of:- **Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**
   The enlistment of the contractors should be valid on the last date of submission of bids.
   In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

1.1 The work is estimated to cost **Rs 28,80,34,937/-.** This estimate, however, is given merely as a rough guide.

1.1.1 The authority competent to approve NIT for the combined cost and belonging to the major discipline will consolidate NITs for calling the bids. He will also nominate Division which will deal with all matters relating to the invitation of bids.
   For composite bid, besides indicating the combined estimated cost put to bid, should clearly indicate the estimated cost of each component separately. The eligibility of bidders will correspond to the combined estimated cost of different components put to bid.

1.2 Intending bidders is eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:-
   Criteria of eligibility for submission of bid documents

1.2.1 Criteria of eligibility for non-CPWD contractors,
   For works estimated cost upto tendering limit of class -1 composite category Contractor (However for Horticulture and Furniture discipline, it may be modified as per bidding limit of CPWD class I contractors of respective discipline as the case may be.)

   Three similar works each costing not less than Rs. 11.52 Crores or Two similar works each costing not less than Rs. 17.28 Crores or One similar work costing not less than Rs.23.04 Crores in last 7 years ending pervious day of last date of submission of bids.
   Similar work means works of "**. Civil work pertaining to Building/ road work**".

   The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of bid.

   Note: For works costing above tendering limit of class-II composite category contractors but upto tendering limit of Clause-I composite category Contractor (However, for Horticulture and Furniture discipline, it may be modified as per bidding limit of CPWD class II and CPWD class I contractors respectively of respective discipline as the case

may be) When bids are open to non –CPWD contractors also, then class II contractors of CPWD registered shall also be eligible if they satisfy the eligibility criteria specified in 1.2.1 above.

To become eligible for issue of bid, the bidders shall have to furnish an affidavit as under:-

I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in PWD, NCTD in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee. (Scanned copy to be uploaded at the time of submission of bid)

2. Agreement shall be drawn with the successful bidders on prescribed Form No. **CPWD 7** (or other Standard Form as mentioned) which is available as a Govt. of India Publication and also available on website https://govtprocurement.delhi.gov.in**.** Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

3. The time allowed for carrying out the work will be **270 Days** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.

4. The site for the work is available.

(ii) The preliminary architectural and structural drawing for the work are available. The working drawings shall be made available in phased manner, as per requirement of the same as per approved programme of completion submitted by the contractor after award of work.

5 The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website https://govtprocurement.delhi.gov.in **free of cost.**

6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.

7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

8. When bids are invited in three stage system and if it is desired to submit revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted then the bid submitted earlier shall become invalid.

9. Earnest Money in the form of Treasury Challan or Demand Draft or Pay order or Banker's Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of **Executive Engineer, SER-I, (M-412), New Delhi** shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The original EMD should be deposited either in the

office of Executive Engineer inviting bids or division office of any Executive Engineer, PWD,NCTD within the period of bid submission. The EMD receiving Executive Engineer (including NIT issuing EE/AE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT.

A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any scheduled bank having validity for six months or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

Copy of Enlistment Order and certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in press notice shall have to be submitted by the lowest bidder only along with physical EMD of the scanned copy of EMD uploaded within a week physically in the office of tender opening authority. Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD deposited with any division of PWD,NCTD and other documents scanned and uploaded are found in order.

9A The contractors registered prior to 01.04.2015 on e-tendering portal of CPWD shall have to deposit tender processing fee at existing rates, or they have option to switch over to the new registration system without tender processing fee any time.

The bid submitted shall be opened at 03:30 PM on *..... .

* to be filled by EE,SER-I

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

10. The bid submitted shall become invalid and e-Tender processing fee shall not be refunded if:

(i) The bidder is found ineligible.

(ii) The bidder does not upload scanned copies of all the documents stipulated in the Bid document.

(iii) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of bid opening authority.

(iv) If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

11. The contractor whose bid is accepted will be required to furnish performance guarantee of 5%(Five Percent) of the bid amount within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10000/-) or Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/ Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee**.** The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of aforesaid provisions by the sub contractors, if any engaged by the contractor for the said work within the period specified in Schedule F.

12. **The description of the work is as follows:**

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall

be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by abiders implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.

15. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.

16. The contractor shall not be permitted to bid for works in the PWD Circle (Division in case of contractors of Horticulture/Nursery category) responsible for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Central Public Works Department or PWD, NCTD or in the Ministry of Urban Development. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.

17. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.

18. The bid for the works shall remain open for acceptance for a period of **seventy five (75) days** from the date of opening of eligibility / technical bid. If any bidder withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the bidders shall not be allowed to participate in the rebidding process of the work.

19. This notice inviting Bid shall form a part of the contract document. The successful bidder/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-

(a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

(b) Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as applicable.

20. For Composite Bids

20.1.1 The Executive Engineer in charge of the major component will call bids for the composite work. The cost of bid document and Earnest Money will be fixed with respect to the combined estimated cost put to tender for the composite bid.

20.1.2 The bid document will include following three components:

Part A:-CPWD-6, CPWD-7 including schedule A to F for the major component of the work, Standard General Conditions of Contract for CPWD 2014 as amended/modified up to the date of submission of bid.

Part B:-General / specific conditions, specifications and schedule of quantities Applicable to major component of the work.

Part C:-Schedule A to F for minor component of the work (competent authority under Clause 2 and Clause 5 shall be same authority as mentioned in schedule A to F for major components), General/specific conditions, specifications and schedule of quantities applicable to minor component(s) of the work.

20.1.3 The bidders must associate himself, with agencies as per NIT conditions

20.1.4 The eligible bidders shall quote rates for all items of major component as well as for all items of minor components of work.

20.1.5 After acceptance of the bid by competent authority, the EE in charge of major component of the work shall issue letter of award on behalf of the President of India. After the work is awarded, the main contractor will have to enter into one agreement with EE in charge of major component and has also to sign two or more copies of agreement depending upon number of EE's/DDH incharge of minor components. One such signed set of agreement shall be handed over to EE/DDH incharge of minor component(s).EE of major component will operate **Part A** and **Part B** of the agreement. EE/DDH incharge of minor component(s) shall operate **Part C** alongwith **Part A** of the agreement.

20.1.6 Entire work under the scope of composite bid including major and all minor components shall be executed under one agreement.

20.1.7 Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works.

20.1.8 The main contractor has to associate agencies for specialized component(s) conforming to eligibility criteria as defined in the bid document and has to submit detail of such agency(s) to Engineer-in-charge of relevant component(s).within prescribed time. Name of the agency(s) to be associated shall be approved by Engineer-in-charge of relevant component(s).

20.1.9 In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge of relevant specialized component(s).

The new agency/agencies shall also have to satisfy the laid down eligibility criteria. Incase Engineer-in-charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.

20.1.10 The main contractor has to enter into MoU with agency(s) associated by him. Copy of such MoU shall be submitted to EE (E)/ DDH in charge of each relevant component as well as to EE incharge of major component. In case of change of associate contractor, the main agency(s) has to enter into MoU/agreement with the new contractor associated by him.

20.1.11 Running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor components shall be made by the Engineer- in-charge of the discipline of minor component directly to the main contractor.

20.1.12A. The composite work shall be treated as complete when all the components of the work are complete. The completion certificate of the composite work shall be recorded by Engineer-in-charge of major component after record of completion certificate of all other components.

20.1.12B. Final bill of whole work shall be finalized and paid by the EE of major component. Engineer(s) in charge of minor component(s) will prepare and pass the final bill for their component of work and pass on the same to the EE of major component for including in the final bill for composite contract.

GUIDELINES FOR FIXING ELIGIBILITY CRITERIA FOR TWO BID SYSTEM

1. The eligibility criteria to be inserted under Information and Instructions for Bidders for 2/3 bid system regarding eligibility) shall be decided on the following lines:

   (i) Experience of having successfully completed works during the last 7 years ending previous day of last date of submission of tenders

   Three similar completed works, each costing not less than the amount equal to 40% of estimated cost put to tender,

   Or

   Two similar completed works, each costing not less than the amount equal to 60% of the estimated cost put to tender

   Or

   One similar completed work of aggregate cost not less than the amount equal to 80% of the estimated cost.

   (ii) Turnover: Average annual financial turnover on construction works should be at least 50% of the estimated cost put to tender during the immediate last three consecutive financial years.

   (iii) Profit/loss : The bidder should not have incurred any loss (profit after tax should be positive)in more than two years during available last five consecutive balance sheet, duly audited and certified by the Chartered Accountant.

   (iv) Solvency Certificate: Solvency of the amount equal to 40% of the Estimated Cost put to tender (ECPT).

   (v) Evaluation of performance : Evaluation of the performance of contractors for eligibility shall be done by NIT approving authority or a Committee constituted by him. All the eligible similar works executed and submitted by the bidders may be got inspected by a committee which may consist of client or any other authority as decided by NIT approving authority. The marks for the quality shall be given based on this inspection, if inspection is carried out. Scoring method of evaluation :- The scoring for evaluation mentioned in these columns shall be done as given in Proforma – I . This should be made part of the tender documents.

2. For all works eligibility criteria shall be based on above guidelines. However, the NIT authority may insert experience of particular categories of items like stone work, metal false ceiling, basements, form works etc., as an additional condition.

3. The above criteria shall be applicable for normal Civil & Electrical Works in CPWD

   Note:- In case only technical bids are called, the document may be modified suitably

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

SECTION-I

BRIEF PARTICULARS OF THE WORK

1. Salient details of the work for which bids are invited, are as under:

Sl. No.	Name of work	Estimated cost (Approx.)	Period of completion
1.	**Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**	Rs. 28,80,34,937/-	270 Days

2. The work site is situated **from Moolchand Junction to Ashram Chowk** under the jurisdiction of SER-I, New Delhi for Civil, Electrical and Horticulture works.

3. General features and major components of the work are as under:-

(A) Civil works :-

1. Dismantling of existing footpath, kerb stone, CC RCC, railings and other related road elements as necessary for redesigning the existing road.
2. Construction of footpath with 60mm/80mm thick CC paver blocks of required grade.
3. Construction of Cycle track, service duct, drain.
4. Providing kerb stone M-25 grade CC and 30 cm Wide kerb channel.
5. Providing and laying 40mm thick BC with VG-30 carriageway as wearing course.
6. Providing of bollards, planters etc.
7. Painting and lane making with thermoplastic plaint.
8. Provision of Horticulture work and its irrigation facility.
9. Road signages and safety appurtenances.

(B) Electrical Works:-

The work includes street Lighting, supplying & laying XLPE Insulated and PVC Sheathed Aluminum Armoured conductor cable, cubical feeder pillars, building wiring, submersible pump set etc.

(C) Horticulture Works:-

The work includes land scaping work, plantation of Trees, Shrubs, Ground Cover and creepers

4. Work shall be executed according to the General Conditions of Contract for Central PWD works available separately at Printer's outlets. The bidder may obtain the address of the outlets from the Executive Engineer, SER-I, New Delhi.

SECTION – II

1.0 General :

INFORMATION & INSTRUCTIONS FOR BIDDERS

1.1 Letter of transmittal and forms for deciding eligibility are given in Section III.

1.2 All information called for in the enclosed forms should be furnished against the relevant

Columns in the forms. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a "nil" or "no such case" entry should be made in that column. If any particulars/query is not applicable in case of the bidder, it should be stated as "not applicable". The bidders are cautioned that not giving complete information called for in the application forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing the information may result in the bid being summarily disqualified. Bids made by telegram or telex and those received late will not be entertained.

1.3 References, information and certificates from the respective clients certifying suitability,

technical knowledge or capability of the bidder should be signed by an officer not below

the rank of Executive Engineer or equivalent.

1.4 The bidder may furnish any additional information which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. He is, however, advised not to furnish superfluous information. No information shall be entertained after submission of eligibility criteria document unless it is called for by the Employer.

2.0 Definitions:

2.1 In this document the following words and expressions have the meaning hereby assigned to

them.

2.2 Employer: Means the President of India, acting through the Executive Engineer, M-113(N), PWD, New Delhi.

2.3 Bidder: Means the individual, proprietary firm, firm in partnership, limited company private or public or corporation.

2.4 "Year" means "Financial Year" unless stated otherwise.

3.0 **Method of application:**

3.1 If the bidder is an individual, the application shall be signed by him above his full type written name and current address.

3.2 If the bidder is a proprietary firm, the application shall be signed by the proprietor above his full typewritten name and the full name of his firm with its current address.

3.3 If the bidder is a firm in partnership, the application shall be signed by all the partners of the firm above their full typewritten names and current addresses, or, alternatively, by a partner holding power of attorney for the firm. In the later case a certified copy of the power of attorney should accompany the application. In both cases a certified copy of the partnership deed and current address of all the partners of the firm should accompany the application.

3.4 If the bidder is a limited company or a corporation, the application shall be signed by a duly authorized person holding power of attorney for signing the application accompanied by a copy of the power of attorney. The bidder should also furnish a copy of the Memorandum of Articles of Association duly attested by a Public Notary.

4.0 Final decision making authority.

The employer reserves the right to accept or reject any bid and to annul the process and reject all bids at any time, without assigning any reason or incurring any liability to the bidders.

5.0 Particulars provisional

The particulars of the work given in Section I are provisional. They are liable to change and must be considered only as advance information to assist the bidder.

6.0 Site visit

The bidder is advised to visit the site of work, at his own cost, and examine it and its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment.

7.0 Initial Criteria for eligibility (for class-II contractors of CPWD and non- CPWD contractors.)

7.1 The Bidder should have satisfactorily completed similar works during the last Seven years

ending previous day of last date of submission of tenders as below. For this purpose cost of work shall mean gross value the completed work including cost of material supplied by the

Government/Client but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer/Project Manager or equivalent.

(i) **Three similar works each costing not less than Rs. 11.52 Crores**

or

Two similar works each costing not less than Rs.17.28 Crores

or

One similar work costing not less than Rs.23.04 Crores

Similar work means works of " **Civil work pertaining to Building/road work".**

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7 % per annum; calculated from the date of completion to previous day of last date of submission of tenders

7.2 The bidder should have had Average Annual Financial Turnover of **Rs.14,40,17,659/-** on Civil/Electrical construction work during the last three consecutive years Balance sheets duly audited by Chartered Accountant. Year in which no turnover is shown would also be considered for working out the average.

7.3 The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last five consecutive balance sheets, duly certified and audited by the Chartered Accountant.

7.4 The bidder should have a solvency of **Rs.11,52,14,127/-** certified by his Bankers. (Not applicable for CPWD enlisted contractor of appropriate class in composite category)*

7.5 The bidder should have sufficient number of Technical and Administrative employees for the proper execution of the contract. The bidder shall have to submit a list of these employees stating clearly how these would be involved in this work within 15 days of award of work.

8.0 Evaluation criteria

8.1 The detailed submitted by the bidders will be evaluated in the following manner:

8.1.1 The initial criteria prescribed in para 7.0 above in respect of experience of eligible similar works completed, loss, solvency and financial turn over etc. will first be scrutinized and the bidder's eligibility for the work be determined.

8.1.2 The bidders qualifying the initial criteria as set out in para 7.0 above will be evaluated for following criteria by scoring method on the basis of details furnished by them.

(a)	Financial strength (Form 'A' & 'B')	Maximum 20 marks
(b)	Experience in eligible similar nature of work during last seven years (Form 'C')	Maximum 20 marks
(c)	Performance on works (Form 'D') - Time over run	Maximum 20 marks
(d)	Performance on works (Form D') - Quality	Maximum 40 marks
	Total	**100 marks**

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

To become eligible for short listing the bidder must secure at least fifty percent marks in each (Section a, b, c & d) and sixty percent marks in aggregate.

The department, however, reserves the right to restrict the list of such qualified contractors to any number deemed suitable by it.

Note : The average value of performance of works for time over run and quality shall be taken on the basis of performance report and eligible similar works.

9.0 Financial information

Bidder should furnish the Annual financial statement for the last five year in (Form "A") and Solvency Certificate in (Form "B")

10.0 Experience of similar works

10.1 Bidder should furnish the

List of eligible similar nature of works successfully completed during the last seven years in (Form "C").

11.0 Organization information

Bidder is required to submit the information in respect of his organization in Forms "E"

12.0 Letter of transmittal

The bidder should submit the Letter of Transmittal attached with the document.

13.0 Opening of Price bid

After evaluation of applications, a list of short listed agencies will be prepared. Thereafter the financial bids of only the qualified and technically acceptable bidders shall be opened at the notified time, date and place in the presence of the qualified bidders or their representatives.

14.0 Award Criteria

14.1 The employer reserves the right, without being liable for any damages or obligation to inform the bidder, to:

(a) Amend the scope of work and value of contract.

(b) Reject any or all the applications without assigning any reason.

14.2 Any effort on the part of the bidder or his agent to exercise influence or to pressurize the employer would result in rejection of his bid. Canvassing of any kind is prohibited.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

SECTION III

INFORMATION REGARDING ELIGIBILITY

LETTER OF TRANSMITTAL

From:

To

The Executive Engineer
South East Road-I
Kalka More, Ishwar Nagar, New Delhi.

Subject: Submission of bids for the work of **Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**

Sir,

Having examined the details given in the bid document for the above work, I/we hereby submit the relevant information.

1. I/we hereby certify that all the statement made and information supplied in the enclosed forms A to Hand accompanying statement are true and correct.
2. I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.
3. I/we submit the requisite certified solvency certificate and authorize the Executive Engineer SER-1 to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/we also authorize Executive Engineer SER-1 to approach individuals, employers, firms and corporation to verify our competence and general reputation.
4. I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible similar works:

Name of Work	**Certificate from**

Certificate : It is certified that the information given in the enclosed eligibility bid are correct. It is also certified that I / We shall be liable to be debarred, disqualified / cancellation of enlistment in case any information furnished by me / us is found to be incorrect.

Enclosures: Seal of bidder

Date of submission:

Signature(s) of Bidder(s).

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

FINANCIAL

INFORMATION (FORM 'A')

I. Financial Analysis – Details to be furnished duly supported by figures in balance sheet/ profit & loss account for the last five financial years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (Copies to be attached).

Financials Years				

(i) Gross Annual Turn Over on construction works.

(ii) Profit/Loss.

II. Financial arrangements for carrying out the proposed work.

Signature of Chartered Accountant with Seal

Signature of Bidder(s)

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

FORM "B"

BANKERS' CERTIFICATE FROM A SCHEDULED BANK

This is to certify that to the best of our knowledge and information that M/s./ Sh…….....

..... having marginally noted address, as a Customer of our bank are/is respectable and can be treated as good for any engagement up to a limit of Rs…….(Rupees……..), with date of validity.

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature) For the Bank

NOTE

1. Bankers Certificates should be on letter head of the Bank, addressed to tendering authority.
2. In case of Partnership firm, certificate should include names of all partners as recorded with the Bank.

FORM 'C'

DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING THE LAST SEVENYEARS ENDING PREVIOUS DAY OF LAST DAY OF SUBMISSION OF TENDERS

Sl. No.	Name of work / project and location	Owner or sponsoring organization	Cost of work in Crores of rupees	Date of Commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation/ arbitration cases pending / in progress with	Name and Address (Postal & E-mail) / telephone number of officer to whom	Whether the work was done on back to back basis Yes / No
1	2	3	4	5	6	7	8	9	10

* Indicate gross amount claimed and amount awarded by the Arbitrator.

Signature of Bidder(s)

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

FORM 'D'

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORMS "C"

1. Name of work/project & location

2. Agreement no.

3. Estimated cost

4. Tendered cost

5. Date of start

6. Date of completion

(i) Stipulated date of completion

(ii) Actual date of completion

7. Amount of compensation levied for delayed completion, if any

(a) Whether case of levy of compensation for delay has been decided or not Yes/No

(b) If decided, amount of compensation levied for delayed completion, if any

8. Amount of reduced rate items, if any

9. Performance Report

(1) Quality of work	Outstanding/Very Good/Good/Poor
(2) Financial soundness	Outstanding/Very Good/Good/Poor
(3) Technical Proficiency	Outstanding/Very Good/Good/Poor
(4) Resourcefulness	Outstanding/Very Good/Good/Poor
(5) General Behaviour	Outstanding/Very Good/Good/Poor

Dated: Executive Engineer or Equivalent

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

FORM "E"

STRUCTURE & ORGANISATION

1. Name & address of the bidder

2. Telephone no./Telex no./Fax no.

3. Legal status of the bidder (Scan & upload copies of original document defining the legal status)

(a) An Individual

(b) A proprietary firm

(c) A firm in partnership

(d) A limited Company or Corporation

4. Particulars of registration with various Government Bodies (Scan & upload attested photocopy)

Organisation/Place of registration	**Registration No.**
1.	
2.	
3.	

5. Names and titles of Directors & Officers with designation to be concerned with this work.

6. Designation of individuals authorized to act for the organization

7. Has the bidder, or any constituent partner in case of partnership firm, limited company / Joint Venture, ever been convicted by the court of Law? If so, give details

9. In which field of Civil Engineering construction the bidder has specialization and interest?

10. Any other information considered necessary but not included above.

Signature of Bidder(s)

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

PROFORMA – 1

CRITERIA FOR EVALUATION OF THE PERFORMANCE OF CONTRACTORS

FOR PRE-ELIGIBILITY

(a)	**Attributes**		**Evaluation**			
	Financial strength	**(20 marks)**				
	(i) Average annual Turnover (ii) Solvency Certificate	16 marks 4 marks	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more In between (i) & (ii) - on pro-rata basis			
(b)	Experience in similar class of works	**(20 marks)**	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more In between (i) & (ii) - on pro-rata basis			
(c)	Performance on works (time over run)	**(20 marks)**				
	Parameter Calculation For points		Score			Maximum Marks
	If TOR =		1.00	2.00	3.00 >3.50	20
	(i) Without levy of compensation		20	15	10 10	
	(ii) With levy of compensation		20	5 0	0 -5	
	(iii) Levy of compensation not decided		20	10	0 0	
	TOR = AT/ST, where AT= Actual Time; ST = Stipulated Time in the Agreement plus (+) justified period of Extension of Tim Note:- Marks for value in between the stage indicated above is to be determined by straight line variation basis.					
(d)	**Performance of works (Quality)**		**(40 marks)**			
	(i) Outstanding		**40**			
	(ii) Very Good		**30**			
	(iii) Good		**20**			
	(iv) Poor		**0**			

INSTRUCTIONS TO BIDDERS FOR SUBMISSION OF TENDERS

- PAYMENT OF COST OF TENDER DOCUMENTS:-The collection of Tender documents is dispensed away with as there is no physical supply of tender documents and to have absolute anonymity of the bidders participating in eprocurement solution. The bidders can view / download the tender documents, from the https://govtprocurement.delhi.gov.in.

- SUBMISSION OF BIDS: The bidders who are desirous of participating in 'e' procurement shall submit their price bids in the standard formats prescribed in the Tender documents, displayed at https://govtprocurement.delhi.gov.in. The bidder should upload the scanned copies of all the relevant certificates, documents etc., on the https://govtprocurement.delhi.gov.in. in support of their technical/financial bids. The bidder shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness / authenticity.

- PAYMENT OF BID SECURITY (EARNEST MONEY DEPOSIT) :Earnest Money in the form of Treasury Challan or Demand Draft or Pay order or Banker`s Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of Executive Engineer, South East Road Division-I, PWD, Kalka More, Ishwar Nagar, New Delhi) shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The original EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, PWD, GNCTD within the period of bid submission. The EMD receiving Executive Engineer

  (including NIT issuing EE/AE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT. The receipt shall also be uploaded in the e-tendering website by the intending bidder upto the specified and submission date and time.

- A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any scheduled bank having validity for Six Months are more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

- Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD deposited with any Division Office of PWD, GNCTD and other documents scanned and uploaded are found in order.

- HARD COPY: Original receipt of Earnest Money and attested copies of all other uploaded documents of the lowest bidder should physically reach in the office of Executive Engineer, South East Road, Division-I, PWD, Kalka More, Ishwar Nagar, New Delhi within 7 days of opening of financial bid.

- PRICE BID OPENING: The Price Bids will be opened online by the concerned officer at the specified date & time and the result will be displayed on the website https://govtprocurement.delhi.gov.in which can be seen by all the bidders who has participated in the tenders. The date will be notified by Executive Engineer, Division, South East Road – 1, PWD,(GNCT), Delhi after evaluation of technical bids.

- PROCESSING OF TENDERS: The concerned officer will evaluate and process the Tenders as done in the conventional tenders and will communicate the decision to the bidders online.

- SUBMISSION OF PERFORMANCE GUARANTEE:

- The contractor whose bid is accepted will be required to furnish performance guarantee of 5% (Five Percent)of the bid amount within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10000/-) or Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any Scheduled Bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee.

- The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/registrations of proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code no. (if applicable) and also ensure the compliance of aforesaid provisions by the subcontractors, if any engaged by the contractor for the said work and Programme Chart (Time and Progress) within the period specified in schedule-F

- PARTICIPATION OF BIDDERS AT THE TIME OF OPENING OF BIDS:

Bidders have two options to participate in tendering process at the time of opening of Bids:

- Bidders can come at the place of opening of bids as done in the conventional tender process.

- Bidders can visualise processing online.

- SIGNING OF AGREEMENT:

After the award of the contract, an agreement will be signed by the bidder and the employer both as done in Conventional Tenders.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

- The tenderers should read all the instructions terms & conditions, contract clauses, nomenclature of items, specifications etc. contained in the tender documents very carefully, before quoting the rates. The tenderer should also read the general conditions of contract for CPWD Works Manual-2014 with correction slips issued upto the date of receipt of tender which will form a part of the Agreement with upto date correction slips.

- The contractor shall quote his rates keeping in mind the specifications terms & conditions, additional conditions and special conditions etc. and nothing shall be payable extra whatsoever unless otherwise specified.

- The Eligible contractor shall quote separate rates (item rate in words and figures) for each part of schedule of quantity.

- In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so. Such power of attorney should be produced with the tender and it must be disclosed that the firm is duly registered under the Indian partnership act, 1952.

- GST as applicable shall be paid by the contractor himself. Whereas Statutory Recoveries (eg. Labour Cess and Income Tax etc.) as applicable, shall be deducted by the department from the R/A bills and final bill. The contractor shall quote his rates considering all such Taxes.

- The intending bidders should get registered themselves for getting class-III digital signature from" e-procurement help desk,6th Floor, C- wing, Vikas Bhawan- II, near Metcalf House, Civil Lines, Delhi." for becoming able to participate in the e-tender process.

Vol – II (Financial BID)

Name of Work	:	**Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**
NIT No.	:	02/CE South(M)/PWD/2019-20
ESTIMATED COST	:	Rs. 28,80,34,937/- (Civil – 26,61,03,658/-+ Electrical - Rs. 1,91,28,278/- + Horticulture Rs.28,03,001/-),
EARNEST MONEY	:	Rs. 38,80,349/-
SECURITY DEPOSIT	:	2.5% of Tendered Cost
PERFORMANCE GUARANTEE	:	5% of Tendered Cost
TIME ALLOWED		270 Days

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

CPWD-7

GOVERNMENT OF INDIA
PUBLIC WORKS DEPARTMENT

STATE	***Delhi***	CIRCLE	South East Circle
BRANCH	**B & R**	DIVISION	SER-I
ZONE	**CE(South)M**	SUB-DIVISION	SER-13

Percentage Rate Tender & Contract for Works

Tender for the work of:-

Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.

(i) To be submitted online upto 15:00 Hours on_____** to **Executive Engineer, SER-I, (M-412) New Delhi**
(ii) Eligibility bid to be opened online in presence of tenderers who may be present at 15: 30 Hours on _____** in the office of Executive Engineer, SER-I, New Delhi.

TENDER

I/We have read and examined the notice inviting tender, schedule, part A, B, C, D& E, Specifications applicable, Drawings& Designs, General Rules and Directions, Conditions of Contract, of 2014as amended/modified up to the previous day to last date of submission of Bid, clauses of contract, Special conditions, Schedule of Rate& other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract of 2014as amended/modified up to the previous day to last date of submission of Bid, and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for **Seventy Five (75) days** from the date of opening of Eligibility bid and not to make any modification in its terms and conditions.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

A sum of Rs _____##/-is hereby forwarded in cash/receipt treasury challan / deposit at call receipt of a scheduled bank/fixed deposit receipt of scheduled bank/demand draft of a scheduled bank/bank guarantee issued by a scheduled bank as earnest money.

A copy of earnest money in receipt treasury challan/deposit at call receipt of a scheduled bank/ fix deposit receipt of schedule bank/ demand draft of a scheduled bank/ bank guarantee issued by a scheduled bank is scanned and uploaded **(Strike out as the case may be).** IfI/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, in office shall without prejudice to any other right or remedy,

be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified,I/We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely.The said Performance Guarantee shall be a guarantee to execute

all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

To be filled in By Contractor

** To be filled in By EE

Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another Contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in CPWD in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposited/ Performance Guarantee.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived therefrom to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated: …….. ## ……. Signature of Contractor ##

Witness: ##

Address: ## Postal Address ##

Occupation: ##

To be filled in By Contractor

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the President of India for a sum of Rs. *_ _ _ _ _ _ _ _ _ _ (Rupees *_)

The letters referred to below shall form part of this contract Agreement:-

(a) ----------------------------*

(b) ----------------------------*

(c) ---------------------------*

For & on behalf of the President of India

Signature……………*……………..

Dated ………*……..

Designation………………*…………….

-*- To be filled by EE.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

The Proforma of Schedule is for Civil only.

PROFORMA OF SCHEDULES (A to F)

SCHEDULE 'A'

Schedule of quantities for Civil Parts:- Page No. 216 to 240

SCHEDULE 'B'

Schedule of materials to be issued to the Contractor

Sl. No.	Description of item	Qty.	Rates in figures &words at which the material will be charged to the Contractor	Place of issue
1	2	3	4	5
NIL				

SCHEDULE 'C'

Tools and plants to be hired to the Contractor

Sl. No.	Description	Hire charges per day	Place of Issue
1	2	3	4
NIL			

SCHEDULE 'D'

Extra schedule for specific requirements/document for the work –

Electrical (Page No. 241 to 252) + Horticulture (Page No. 253 to 259)

SCHEDULE 'E'	
Reference to General Conditions of contract	General Conditions of Contract for CPWD works -2014 as amended/modified upto the previous day to last date of submission of Bid including extension, if any.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

Name of work :			**Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**
Estimated cost of work: TOTAL			**Rs. 28,80,34,937/-**
Civil Component			Rs. 26,61,03,658/-
Electrical Component			Rs.1,91,28,278/-
Horticulture Component			Rs. 28,03,001/-
(i) Earnest Money :			Rs.38,80,349/- (to be returned after receiving Performance Guarantee)
(ii) Performance Guarantee			5% of tendered value
(iii) Security Deposit			2.5% of tendered value
SCHEDULE `F': GENERAL RULES & DIRECTIONS:			
Officer Inviting Tender :			Executive Engineer, SER-I, New Delhi
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with clauses 12.2 & 12.3.			As per clause 12 mentioned below
2 (v)	Definitions:		
	Engineer-in-charge	i	Executive Engineer, SER-I, New Delhi
2(viii)	Accepting Authority		Chief Engineer South (M),PWD (After approval from Regional Works Board)
2 (x)	Percentage on cost of material and labour to cover all overheads and profits		15 %

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

2 (xi)	Standard Schedule of Rates	DSR 2016 for Civil works read along with correction slips/ amendments issued upto the last date of submission of tender including extension. If any, plus 15.69% cost index minus 9.5% on all DSR items as per Secretary Finance Govt. of Delhi Order No. F.8/2/2007-AC/Finance/01295543/Infra/1376-1499 dt. 14.05.2018
2 (xii)	Department	PWD,NCTD
9(ii)	Standard CPWD contract form :	GCC 2014, CPWD Form 7 as amended/ modified up to the previous day to last date of submission of bid, including extension, if any.
Clause 1:		
(i)Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance, in days		07 days
(ii) Maximum allowable extension with late fee @0.1% of Performance Guarantee amount per day beyond the period provided in (i) above.		03 days
Clause 2:		
Authority for fixing compensation under clause 2 of bid.		Superintending Engineer, South East (M) Circle
Clause 2A:		
Whether Clause 2A shall be applicable		No

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

Clause 5:	
Number of days from the date of issue of letter of acceptance/ intend for reckoning date of start	10 days

Sl. No.	Physical Progress	Time Allowed (from date of start)	Amount to be with-held in case of non achievement of milestone
1.	15 % (of whole work)	55 days	1% of Tender value
2	30 % (of whole work)	110 days	1% of Tender value
3	50% (of whole work)	165 days	1% of Tender value
4	75% (of whole work)	220 days	1% of Tender value
5	100% (of whole work)	270 days	1% of Tender value

TIME ALLOWED FOR EXECUTION OF WORK— 270 Days

Authority to decide:	
(i) Extension of time	Superintending Engineer, South East (M) Circle
(ii) Rescheduling of mile stones	Superintending Engineer, South East (M) Circle
(iii) Shifting of date of start in case of delay in handing over of site	Superintending Engineer, South East (M) Circle
Clause 5.1	The contractor shall prepare an programme chart in Primavera software for the execution of work, showing clearly all activities from the start of work to the completion, with details of manpower, equipment and machinery required to fulfillment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer – in - charge within ten days of award of the contract.

	It shall indicate the forecast of the dates of commencement band completion of various trades of the section of the work and may be amended as necessary by agreement between the Engineer - in - charge and the contractor within the limitations of the time imposed in the contract documents and further to ensure good progress during the execution of work, the contractor shall in all cases in which the time allowed for any work exceeds one month (same for special jobs for which a separate has been agreed upon) complete the work as per mile stones given in Schedule "F".
Clause 6,6 A	
Clause applicable – (6,or 6A)	**6A (computerized measurement book to be submitted by agency)**
Clause 7: Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment	For Civil work Rs. 250 Lacs
Clause 7-A:- No running Account Bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-Charge.	**Applicable**
Clause 10 A: List of testing equipment to be provided by the Contractor at site lab.	As per annexure 'A'. (Page No.66)
Clause : 10B(ii)	
Whether clause 10B (ii) shall be applicable	No

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

Clause 10 C:- Component of labour expressed as percent of value of work	5%	
Clause 10 CA	Applicable	
Materials Covered under this clause	Nearest material (other than cement, reinforcement bars and structural steel) for which All India Wholesale Price Index is to be followed	Base Price of all the materials covered under Clause10CA.
1. Cement (OPC)	Nil	Rate will be as issued by DG, CPWD for the Month of June 2019.
2. TMT bars	Nil	--do--
3. Structural Steel	Nil	--do--
4.Bitumen of Grade VG 30	Nil	Rate will be from Panipat Refinery for the 2nd Half of June 2019.
* includes Cement component used in RMC brought at site from outside approved RMC plants, if any. ** Base price and its corresponding period of all the materials covered under clause 10 CA is to be mentioned at the time of approval of NIT. In case of recall of tenders, the base price may be modified by adopting latest base price and its corresponding period. *** To be filled by Executive Engineer before uploading NIT.		
Clause 10 CC to be applicable in contracts with stipulated period of completion exceeding the period shown in next column.	Not Applicable	
Schedule of component of other Materials, Labour, POL etc. for price escalation	Not Applicable	

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

Component of material (Except materials covered under clause 10 CA)/ expressed as percent of total value of work. - Xm…..%		Not Applicable	
Component of labour expressed as percent of total value of work.-Y…..%		Not Applicable	
Note:- Xm…..% should be equal to (100%)- (materials covered under clause 10CA i.e cement, Steel & other material specified in clause 10CA + Component of labour + Component of P.O.L)			
Clause 11: Specifications to be followed for execution of Civil work		CPWD Specifications 2009 (Vol-I & II) with modified & corrected upto the last date of receipt of bid and MORTH Specification General Conditions & additional specifications as attached in part 'B' of the NIT.	
Clause 12:			
	Type of work	Original work	
12.2 & 12.3	Deviation limit beyond which clause 12.2 & 12.3 shall apply for building work	30%	
12.5:	(i) Deviation Limit beyond which clauses12.2 & 12.3 shall apply for foundation Work (except earth work)	30%	
(ii) Deviation Limit for items in earth work subhead of DSR or related items		100%	
Clause 16:			
Competent Authority for deciding reduced rates		Superintending Engineer, South East (M) Circle	
Clause 18 List of Mandatory Machinery, tools and plants to be deployed by the Contractor at site.			

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

As per Annexure 'B' (Page…....)	
Clause 19	The contractor shall obtain a valid license under the Contract Labour (R&A) Act, 1970 and the Contract Labour (Regulation and Abolition) Central Rules, 1971 before the commencement of the work, and continue to have valid license until the completion of the work. The contractor shall also comply with provision of the Inter-State \Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.
19L:	The E.S.I & E.P.F. on the part of employer in respect of this contract shall be paid by the contractor. The amount of contribution on the part of the employer to be paid by the contractor shall be reimbursed by the Engineer-in-Charge to the contractor on actual bases. The applicable & eligible amount of E.S.I & E.P.F. shall be reimbursed preferably within 7 days but not less than 30 days of submission of documentary proof of payment provided the same are in order. Next running payment shall not be made till all pending reimbursements regarding eligible E.S.I & E.P.F. etc. have been made to the contractor
Clause25	
Clause 25 :Constitution of Dispute Redressal Committee	Competent Authority to appoint DRC

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

(A) For total Claims more than Rs. 25.00 Lakh. Chairman: CE North(M),. Member: Director of Works, PWD,GNCTD Member : Superintending Engineer South(M), PWD Superintending Engineer South East (M), PWD shall present the case before DRC but shall not have any part in decision making. (B) For total claims upto Rs. 25.00 Lakh. Chairman – Chairman: Director of Works, PWD,GNCTD Member: Executive Engineer SER-II Member: Executive Engineer (P) SE(Circle) Executive Engineer SER-I shall present the case before DRC but shall not have any part in decision making	

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

Requirement of Technical Staff Representative(s) and Recovery Rate for Civil Work

Cost of Work (Rs. In Crore)	Requirement of Technical Staff		Minimum Experience (Years)	Designation Technical Staff	Rate at which recovery shall be made from the contractor in the event of not fulfilling
26.61 Crores	Qualification (Of Major+ Minor Component)	Number			
	Graduate Engineer (Civil)	1	20 (and having experience of one similar nature of work)	Project Manager	Rs.60,000/- per month
	Graduate Engineer	1	12 (and having experience of one similar nature of work)	Deputy Project Manager	Rs.40,000/- per month per person
	Graduate Engineer or Diploma Engineer	1	5 Or 10 Respectively	Project/Site Engineer	Rs. 25,000/- per month per person
	Graduate Engineer or Diploma Holder	1	2 Or 5 Respectively	Project Planning/Quality/billing Engineer	Rs.15000/- per month per person.

"Assistant Engineers retired from Government Services that are holding Diploma will be treated at par with Graduate Engineer". Diploma holder with minimum 10 year relevant experience with a reputed Construction Company can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Note: 1. The recovery shall be applied on pro-rata basis.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

2. At the start of the work, the agency will submit the profiles of Engineers/Technical Representatives and get approved from Engineer-in-charge. The contractor shall submit a certificate of employment of the technical representative(s)/Engineers (in the form of copy of Form-16 or CPF deduction issued to the Engineer employed by him) along with every running account bill/final bill and shall produce evidence if at any times so required by the Engineer-in-Charge. If any Technical Representative is changed during the course of the work, the profile will again be got approved along with all relevant documents.

Clause 42	
(a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2016 modified/corrected upto last date of submission of tender.	
(ii) Variations permissible on theoretical quantities	
a) Cement for works with estimated cost put to tender more than Rs. 5 lakh.	2% plus / minus
b) Bitumen for all work	2.5% plus only & Nil on minus side
c) Steel reinforcement and structural steel sections for each diameter, section and category	2% plus / minus
d) All other materials.	Nil

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

S.No.	Description of Item	Rates in figures and words at which recovery shall be made from the Contractor.	
		Excess beyond permissible variation	Less use beyond the Permissible variation.
1.	Cement	Nil	Not Acceptable
2.	Steel Reinforcement	Nil	Not Acceptable
3.	Structural Steel	Nil	Not Acceptable

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

INTEGRITY PACT CPWD

To

……..,

……..,

……..

Sub: **Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**

Dear Sir,

It is hereby declared that PWD (NCTD), is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the bidding process and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the PWD (NCTD),.

Executive Engineer
South East Road-I,PWD

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

To

Executive Engineer,
South East Road-I,PWD

Sub: Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.

Dear Sir,

I/We acknowledge that PWD (NCTD), is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by PWD (NCTD),. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, PWD (NCTD), shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid is accordance with terms and conditions of the tender/bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

To be signed by the bidder and same signatory competent/authorized to sign the relevant contract on behalf of PWD (NCTD),

INTEGRITY AGREEMENT

This Integrity Agreement is made at ..... on this..... day of 2019

BETWEEN

President of India represented through Executive Engineer South East Road-I, Kalka More, Ishwar Nagar, New Delhi (Hereinafter referred as the 'Principal/Owner', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....(Name and Address of the Individual/firm/Company) ……. through .....(Details of duly authorized signatory)..... (Hereinafter referred to as the "Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender NIT No……(hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for the work **Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.**

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as "Integrity Pact" or "Pact"), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

Article 1: Commitment of the Principal/Owner

1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

(b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner 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/Owner shall endeavor to exclude from the Tender process any person, whose conduct in the past has been of biased nature.

2) If the Principal/ Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/ Contractor(s)

1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
2) The Bidder(s)/Contractor(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) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or 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) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.

c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner 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) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

e) The Bidder(s)/Contractor(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.

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

4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a wilful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.
5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days' notice to the Contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.
2) Forfeiture of EMD/Performance Guarantee/Security Deposit: If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

3) Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises 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 can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Sub-Contractors

1) The Bidder(s)/Contractor(s) undertake(s) to demand from all sub Contractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Sub-Contractors/sub-vendors.

2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.
3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6: Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, PWD (NCTD),

Article 7: Other Provisions

1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal/Owner, who has floated the Tender.
2) Changes and supplements need to be made in writing. Side agreements have not been made.
3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intensions.
5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement/Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/Pact or interpretation thereof shall not be subject to arbitration.

Article 8: Legal and Prior Rights

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....

(For and on behalf of the Principal/Owner)

.....

(For and on behalf of the Bidder)

WITNESSES:

1. .....

(Signature, name and address)

2. ..... Dated :

(Signature, name and address) Place :

Correction- Nil, Insertion-Nil, Overwriting-Nil AE(P) EE(P)

Format of Receipt of deposition of original Bank Guarantee as EMD

Receipt of deposition of original Bank guarantee as EMD (Receipt No……/ date……)
Name of work: **Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.** NIT No. NIT No.02/CE South(M)/PWD/2019-20 Estimated Cost: Rs. 28,80,34,937/- Amount of Earnest Money Deposit: Rs.38,80,349/- Last date of submission of bid 19.08.2019 upto 3.00PM (*To be filled by NIT approving authority/EE at the time of issue of NIT and uploaded alongwith NIT)
Name of Contractor……..# Form of EMD…….# Amount of Earnest Money Deposit …….# Date of submission of EMD……# Signature, Name and Designation of EMD receiving officer (EE/AE(P)/AE/AAO) alongwith Stamp (# to be filled by EMD receiving EE)

Form of Performance Security (Guarantee)/Bank Guarantee Bond

In consideration of the President of India (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between ----------and …… (hereinafter called "the said Contractor(s)") for the work…… (hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs. ……. (Rupees …… only) as a security/guarantee from the Contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

We, ……. (hereinafter referred to as "the Bank") hereby undertake to pay to the Government an amount not exceeding Rs. …….. (Rupees……. Only) on demand by the Government.

We, …….(indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said Contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. …….. (Rupees …….only)

We, the said bank further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.

We, ……. (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

We, ……. (indicate the name of the Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government

against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

We, ……. (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.

This guarantee shall be valid up to ……unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs.

…… (Rupees ……..) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the ……..day of ……for…….(indicate the name of the Bank

Note:- Performance Guarantee shall remain valid for a minimum period of sixty days beyond the date of completion of all contractual obligations.

Form of Earnest Money Deposit (Bank Guarantee Bond)

WHEREAS, Contractor..... (Name of Contractor) (hereinafter called "the Contractor") has submitted his tender dated ..... (date) for the construction of ..... (name of work) (hereinafter called "the Tender")

KNOW ALL PEOPLE by these presents that we (Name of Bank) having our registered office at ..... (hereinafter called "the Bank") are bound unto Executive Engineer South East Road-I, Kalka More, Ishwar Nagar, New Delhi (Hereinafter called "the Engineer-in-charge)in the sum of Rs. ..... (Rs. in words .....) for which payment well and truly to be made to the said Engineer-in-Charge the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this .....day of ..... 20.... THE CONDITIONS of this obligation are:

(1) If after Eligibility Bid opening of tender; the Contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;

(2) If the Contractor having been notified of the acceptance of his tender by the Engineer-in-Charge.

(a) Fails or refuses to execute the Form of Agreement in accordance with the Instructions to Contractor, if required;

OR

(b) Fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and Instructions to Contractor,

OR

(c) Fails or refuses to start the work, in accordance with the provisions of the contract and Instructions to Contractor,

OR

(d) Fails or refuses to submit fresh Bank Guarantee of an equal amount of this Bank Guarantee, against Security Deposit after award of contract.

We undertake to pay to the Engineer-in-Charge either up to the above amount or part thereof upon receipt of his first written demand, without the Engineer-in-Charge having to substantiates his demand, provided that in his demand the Engineer-in-Charge will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

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

DATE ..... SIGNATURE OF THE BANK

WITNESS ..... SEAL

(SIGNATURE, NAME AND ADDRESS)

*Date to be worked out on the basis of validity period of 6 months from last date of receipt of tender

Appendix-A

LIST OF EQUIPMENT FOR FIELD TESTING LABORATORY

A. For Building Work

S.No.	Description of item	Quantity
1.	Balances	
	(i) 7 kg. to 10 kg. capacity, semi-self indicating type - accuracy 10 gm.	1 no
	(ii) 500 gm. capacity, semi-self indicating type - accuracy 1 gm.	1 no
	(iii) Pan balance- 5 kg. capacity - accuracy 10 gms.	1 no
2.	Ovens-electrically operated, thermostatically controlled upto 110°C - sensitivity 1°C.	1 no
3.	Sieves: as per IS 460-1962	
	(i) I.S. sieves - 450mm internal dia, of sizes 100 mm, 80 mm, 63mm, 50 mm, 40 mm, 25 mm, 20 mm, 12.5 mm, 10 mm, 6.3 mm, 4.75mm, complete with lid and pan	1 no
	(ii) I.S. sieves- 200mm internal dia (brass frame) consisting of 2.36mm, 1.18mm, 600 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns, with lid and pan.	1 no
4.	Sieve shaker capable of 200 mm and 300 mm dia sieves, manually operated with timing switch assembly.	1 no
5.	Equipment for slump test- Slump cone, steel plate, tamping rod, steel scale, scoop.	3 no
6.	Dial gauges, 25 mm travel - 0.01 mm/division least count - 2nos.	5 no
7.	100 tonnes compression testing machine, electrical-cum manually operated	
8.	Graduated measuring cylinders 200 ml capacity - 3 Nos.	5 no
9	Enamel trays (for efflorescence test for bricks).	
	(i) 300 mm × 250 mm × 40 mm- 2 nos.	5 no
	(ii) Circular pla tes of 250 mm dia - 4 nos.	5 no
B. For Road Works		
1	Balances	
	(i) 7 kg to 10 kg capacity, semi-self indicating type - accuracy 10 gm.	1 no
	ii) 500 gm capacity, semi-self indicating type, accuracy 1 gm.	1 no
	(iii) Chemical balance, 100 gm capacity - accuracy- 0.1 gm.	1 no
	(iv) Pan balance - 5 kg. capacity - 10 gm accuracy.	1 no
	(v) Platform scale- 300 kg capacity.	1 no
2.	Oven electrically operated, thermostatically controlled.	1 no
	(i) Upto 200°C for determination of loss on heating of bitumen.	1 no

3.	Sieves as per IS 460-1962.	
	(i) I.S. sieves - 450 mm of internal dia of sizes 100 mm, 80mm, 63mm, 50mm, 40mm, 25mm, 20mm, 12.5mm, 10mm, 6.3mm, 1.75mm, complete with lid and pan.	1 no
	(ii) I.S. sieves - 200 mm internal dia (brass frame) consisting of 2.36mm, 1.18mm, 600 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns and 75 microns with lid and pan.	1 no
4.	Sieves shaker capable for shaking 200mm and 300mm dia sieves, electrically operated with timer.	1 no
5.	Dial gauge (i) 25mm travel - 0.01mm/division.	5 no
6.	Load frame-5 tonnes capacity, electrically operated with speed control.	1 no
7.	Aggregate impact test apparatus as per IS 2386-Part IV-1963.	1 no
8.	Compaction apparatus (Proctor) as per IS 2720-Part VII-1974	1 no
9.	Modified ASHO compaction apparatus as per IS 2720-Part-III-1974.	1 no
10.	Sand pouring cylinder with control funnel and tube complete as per IS 2720-Part XXVIII-1974.	1 no
11.	Sampling tins with rods 100mm dia × 50mm ht., 1/2kg capacity, and miscellaneous items like moisture tins etc.	5 no
12.	Constant temperature bath for accommodating bitumen test specimen, electrically operated and thermostatically controlled.	1 no
13.	Penetrometer with automatic time controller and with adjustable weight accessories and needles as per IS 1203-1958.	1 no
14	Oxhlet extraction apparatus complete with extraction thimbles etc.	1 no
15	Laboratory mixer, about 0.02 cu-meter capacity, electrically operated with heating jacket.	1 no
16.	Hubbard field stability test apparatus complete.	1 no
17.	Marshall compaction apparatus as per ASTM 1559-62T, and complete with electrically operated leading unit, compaction pedestal bearing head assembly, dial micrometer, and bracket for flow measurement, load transfer bar, specimen mould (4 inch. dia) with base plate, columns, mould (4 inch, dia) with base plate, collars, specimen extracted. Compaction hammer, 4.53 kg (10lb)/457 mm (18inch) fall	1 no
18.	Distant reading thermometers.	3 no
19.	Graduated cylinder 1000 ml. capacity	5 no
20.	Enamel tray	5 no

FIELD TESTING INSTRUMENTS

1.	Steel tapes - 3 m	10 no
2.	Vernier calipers	2 no
3.	Micrometer screw 25 mm gauge	2 no
4.	A good quality plumb bob	10 no
5.	Spirit level, minimum 30 cms long with 3 bubbles for horizontal vertical	10 no
6.	Wire gauge (circular type) disc	2 no
7.	Foot rule	5 no
8.	Long nylon thread	10 no
9.	Rebound hammer for testing concrete	2 no
10.	Dynamic penetrometer	2 no
11.	Magnifying glass	5 no
12.	Screw driver 30 cms long	10 no
13.	Ball pin hammer, 100 gms	5 no
14	Plastic bags for taking samples	1000 no
15	Moisture meter for timber	2 no
16	Earth resistance tests (for Electrical Divisions)	2 no
17.	Meggar (for Electrical Divisions)	2 no

Appendix – B

As per Clause 18 of Schedule 'A' to 'F'

List of mandatory machinery, tools & plants to be deployed by the contractor at site:-

Sl. No.	Description of Plants & Equipments	Minimum Capacity	Minimum Number/Area
1	Core Cutting Machine		1
2	Welding machines		2
3	Dumpers	5.5 cum	4
4	Excavator	60cum/hr	2
5	JCB		2
6	Grader		1
7	Dewatering pumps	15 & 20 hp each	10
8	Water tanker with sprinkler attachment	10000 Ltr.	2
9	Bar bending and bar cutting machine		2
10	Needle Vibrator (Petrol)		2
11	Needle Vibrator (electric)		
12	Surface Vibrator (Petrol)		2
13	Surface Vibrator (electric)		2
14	Steel shuttering		500 Sqm
15	Hopper Mixers		1
16	Paver Finisher Mechanical fitted with electronic sensor control having capable of paving 3.5 m and above width and upto 250mm lift.		1
17	Mechanical Cleaner using compressed Air		1
18	Vacuum Dewatering Machine		2
19	Emulsion Pressure Distributor		1
20	Steel Barricading		2000 Mtr.
21	Plate Vibrator		2
22	Road Roller (Tandem Road Roller)		1
23	Road Roller (Vibratory Road Roller)		1
24	Road Roller (Static Road Roller)		1
25	Fully/Semi automatic Thermoplastic Paint Applicator Machine.		1

- The above list of plants and equipment is minimum and not exhaustive and the actual requirement may be more. If any other T&P required as per site / work condition, it may be asked to by the Engineer-in-Charge.

PART –'B'

CIVIL WORK

Index for Part-B.

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SALIENT REQUIREMENT FOR THE TENDERER

1. The bidder should read all the instructions, terms & conditions, contract clauses, nomenclature of items, specifications etc., contained in the Tender document very carefully, before quoting the rates. The Tenderer should also read the general conditions of contract.

2. The contractor shall quote his rates keeping in mind the specifications, terms & conditions, additional and special conditions etc. and nothing shall be payable extra whatsoever unless otherwise specified.

3. The contractor(s) shall quote all-inclusive rates against the items in the schedule of quantities and nothing extra shall be payable for any of the conditions and specifications mentioned in the Tender documents unless specifically specified otherwise.

4. Unless otherwise specified in the schedule of quantities the rates for all items shall be considered as inclusive of pumping / bailing out water, if necessary, for which no extra payment shall be made. These conditions shall be considered to include water from any source such as rain, flood, surface and sub-soil water etc. and shall apply to the execution in any season.

5. The contractor has to use specialized agency for specialized items of work such as water proofing treatment pile work, electrical works and horticulture works etc., the Contractor(s) shall submit for the approval of the Engineer-in-charge, the names of such specialized agencies, of reputed along with their technical capability proposed to be engaged by him. Approval of specialized agencies for each specialized work shall be obtained from the Engineer-in-charge with in one month of award of work. The work shall be deemed to be executed by the bidder for all purposes and the responsibility of the quality of items of works executed etc. shall continue to be that of the bidder only.
6. The construction agencies shall make arrangements for a regular monthly or other frequency as directed by Engineer-in-charge for the documentation of the progress colored photographs (5"x7") per month depicting the progress of work at site. Nothing extra shall be paid on this account.

7. The contractor(s) shall inspect the site of work before bidding and acquaint himself with the site conditions and no claim on this account shall be entertained by the department.

8. The contractor(s) shall get himself acquainted with nature and extent of the work satisfy himself about the availability of materials from kiln or approved quarries for Collection and conveyance of materials required for construction.

9. HOUSING, WATER SUPPLY, DRAINAGE AND ELECTRICITY – The contractor shall not be allowed to construct labour huts at the site of work. The contractor has to make his own arrangements for electric connection, housing stores and field offices etc. including drainage arrangements. Contractor should visit the site and see in what manner he is able to arrange the above. Arrangement of water for drinking purpose in addition to the water

required for construction work is also to be made by the contractor. For electric connection, the contractor shall necessary connection as per requirement from NDPL/BSES/NDMC. The department shall provide necessary help for obtaining electric connection. The decision of the Engineer-in-charge shall be final and binding on the contractor.

10. The contractor shall comply with the provision of the Apprentices Act 1961, and the rules and order issued there under from time to time. If he fails to the so, his failure will be breach of the contract and the Superintending Engineer/Executive Engineer may in his discretion. Without prejudice to any other right of remedy available in law, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

11. If any ambiguity is found in any of the items mentioned in the schedule of quantity then the contractor should quote considering complete item including cost of missing components in the schedule of quantity, nothing extra shall be payable on that account to the contractor and complete item shall be determined by the Engineer-in-charge.

GENERAL CONDITIONS

1.1 SITE CONDITIONS

Site conditions given hereunder and elsewhere are given as guidelines and contractor shall satisfy himself regarding all aspects of site conditions and no claim will be entertained on the plea that the information supplied by the department is erroneous or insufficient.

1.2 SITE CONSTRAINTS

There are certain utility services along work site viz.HT Transmission lines of NDPL/ BSES, gas supply lines of IGL, & Water supply line of DJB, Irrigation and Flood Department drain &Sanitary Landfill Site of North MCD etc. Some of them will be required to be shifted for execution of the work.PWD will take necessary steps to relocate these services in consultation with the concerned departments. No claim of payment for any damage/loss on account of such hindrance or due to relocation of services or change in site condition shall be entertained under any circumstances. However, if any delay occurs on this account, PWD will consider the case for suitable extension of time for the actual delay on this account. The decision of the Engineer-in-Charge shall be final and binding on the contractor in this regard. Contractor shall take into account this aspect also while scheduling his work. With these existing underground utilities and developments around this road, diversion of traffic during construction would require careful planning.

No claim shall, however, arise for above or any other site constraints not specifically stated above. Contractor should visit the site and get firsthand knowledge of site constraints and should accordingly quote his rates for work.

On account of Security, safety and noise considerations, there would be some restrictions on the working hours, movement of vehicles for transportation of material and location of labour camp etc. Contractor shall be bound to follow all such restrictions at his own cost and adjust the programme for execution of work accordingly

No Claim for idle establishment of labour, machinery, equipment, tools and plants etc. for any reason whatsoever, shall be admissible during the execution of work as well as after its completion

- **Location : Ring Road from Moolchand Junction to Ashram Chowk**.

The work is to be executed across the ROW of entire stretch of the road. Work has to be executed without disrupting the traffic movement and thus, limited space shall be available for execution of the work. The contractor will have to carefully plan his sequence of operations so that the traffic moves unhindered at all times. The traffic diversion plan evolved by the contractor for execution of the work at all locations will require approval of Delhi Traffic Police and of the Engineer-in charge. Modifications suggested by the Traffic Police and also by the Engineer-in charge shall be implemented by the contractor during execution of the work. All traffic safety arrangement, barricading etc. shall be provided by contractor at this own cost. Nothing extra should be payable on this account. The provisions deemed to be included in the quoted amount by the contractor.

The work has to be executed without disrupting the flow of water in storm water Drains, and nothing extra shall be paid on this account. The agency will also have to follow NGT guidelines (present as well as future guidelines that will be issued by Hon'ble NGT) for working inside drain.

- **Climatic conditions**
  The climate in the region is extreme with three major seasons- winter, summer and rainy. The winter season lasts from October to March, summer season from April to June and rainy season from July to September. This is only for guidance and there may be variations.

- **Housing, water supply, Drainage and Electricity**

  No accommodation for labour is available at the site of work. The contractor has to make his own arrangements for electric connection, housing, stores and field offices, accommodations for his labour and other employees etc. Contractor should visit the site and see in what manner he is able to arrange the above. Arrangement of water for drinking purpose in addition to the water required for construction work is also to be made by the contractor. No other space shall be made available at site of work for temporary site office/ contractor's compound. However onus will be on contractor to arrange the space on its own. No claim whatsoever will be entertained on this account.

- It shall be deemed that the contractor has satisfied himself as to the nature and location of the work, general and local conditions and particularly those pertaining to transport, handling and storage of materials, availability of labour, weather conditions at site and general ground / sub soil conditions and the contractor has to estimate his cost accordingly.

- The employer/PWD will not bear any responsibility for the lack of such knowledge and also the consequence thereof to the contractor. The information's and site data shown in the drawings and mentioned herein and elsewhere in this tender documents are furnished for general information's and guidance only. The Engineer-in-charge in no case shall be held responsible for the accuracy thereof or / and whatsoever, interpretations or conclusions drawn there from/ by the contractor and no claim shall be entertained whatsoever by the Engineer-in-charge. The Engineer-in-charge in no case shall be held responsible If any conditions/information is different or otherwise incorrect as it is presumed that the contractor has satisfied himself for all possible contingencies, situations, bottlenecks and acts of coordination which may be required between the different agencies.

- In case of flooding of site on account of rain or any other cause, or any other damage whatsoever, no claim financially or otherwise shall be entertained, notwithstanding any other provisions elsewhere in the tender documents.

- **DEWATERING**
  Any dewatering required due to flow in drain, heavy rains, water emanating from any other source shall be carried out by the contractor at his own cost and no claim of hindrance/payment on this account will be entertained by employer.

- **GROUND WATER TABLE, SOIL CONDITIONS AND EXTRACT OF SOIL INVESTIGATION REPORT**

- It shall be deemed that the contractor has satisfied himself to the nature and location of the work, general and local conditions, transport, handling, availability and storage of materials, availability of labour, weather conditions at site and general ground/sub soil conditions and the contractor has to quote his rates accordingly. Department will not bear any responsibility for the lack of such knowledge and also the consequences thereof to the contractor. The information and site data shown in the drawings and mentioned in the tender documents are furnished for general information and guidance only. The Engineer-in Charge in no case shall be held responsible for the accuracy thereof or/and deductions, interpretations or conclusions drawn there from by the contractor and no claim shall be entertained whatsoever if the site conditions/ information is different or otherwise incorrect. It will be presumed that the contractor has satisfied himself for all possible contingencies, situations, bottlenecks and acts of coordination which may be required between the different agencies.

- The work shall be carried out in the manner complying in all respects with the requirement of relevant bye-laws of the local bodies under the jurisdiction of which the work is to be executed and nothing extra shall be paid on this account.

- The Contractor or his authorized representative should always be available at the site of work to take instructions from departmental officers, and to ensure proper execution of work. No work should be done in the absence of such authorized representative.

- The structural and other drawings for the work shall at all times, be properly correlated before executing any work and no claim whatsoever shall be entertained in this respect.

- The contractor shall maintain site of work, all items of the work in good condition, till the completion of entire work allotted to the contractor.

- Royalty at the prevalent rates and all other incidental expenditure shall have to be paid by the contractor on all the metal shingle, earth, sand and stone etc. collected by him for the execution of the work direct to the concerned Revenue Authority of the State or Central Govt. His rates are deemed to include all such expenditure and nothing extra shall be paid on this account.

- All items/material brought at site and left upon the site of work by the contractor or by his order for the purpose of forming part of the work, the same to be considered the property of the President of India and the same shall not to be removed or taken away by the contractor or any other person without consent in writing of the Engineer-in-Charge, but the President of India is not to be in any way responsible for any loss or damage which may happen to or in respect of any such item or material either by the same being lost or damaged by weather or otherwise.

- Unless otherwise provided in the schedule of quantities the rates, quoted by the contractor shall be all-inclusive and shall apply to all heights, depths, leads and lifts.
- The contractor shall construct suitable godown at the contractor's compound for storing the materials safe against damage due to sun, rain dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for the purpose and no extra claim whatsoever shall be entertained on this account.

- Material shall be kept in joint custody of the contractor and the representative of the

Engineer-in- charge. The empty containers shall not be removed from the site of work till the completion relevant item of work and permission obtained from the Engineer-in-Charge.

- The area shall be kept dry when the work is in progress even below water table and nothing extra shall be paid for removal of slush / sludge, bailing out water due to sub-soil condition, rains, spring etc.

- If required the contractor shall have to work during nights also. He shall make the necessary arrangements for lights etc. for nights or even if lights are required due to any other reason. Nothing extra shall be paid on this account. The rates shall include the above elements.

- The contractor shall have to make his own arrangement for housing facilities for staff and labour away from construction site and shall have to transport the labour to and from between construction site and labour camp at his own cost. No labour huts will be allowed to be constructed at the project site except a few temporary sheds for chowkidars and storekeepers. The decision about how many huts can be allowed for chowkidars and storekeepers at project site shall rest with the Engineer-in- Charge and nothing extra shall be paid on this account.

- Labour cess @ 1% (one percent) of the gross value of work done shall be deducted as per Building & other construction workers (RE&CS) Act 1996 (Main Act) and the Building & other construction workers' Welfare Cess Act 1996 (Cess Act) in the National Capital Territory of Delhi.

- The clause 17 of General condition of contract -2014 stands modified for refund of security deposit relating to bituminous works. Clause-35(iii) of the 'General Conditions of Contract for Central PWD Works 2014 shall be read as. The contractor shall be responsible for rectifying defects noticed within defects liability period which is one year from the date of completion of bituminous work or till the final bill has been prepared and passed whichever is later. The security deposit for the bituminous work shall be refunded after the expiry of defect liability period.

- A complete testing lab shall be setup at the site by the contractor at his/her own cost.

- All approved samples shall be kept in a sample room till actual date of completion of work.

- The contractor shall provide a total station Instrument for recording initial and final levels of entire earth work, road work etc. and marking levels for all other related items to ensure proper supervision at his/her own cost & as per direction of Engineer-in-Charge.

- Keeping in view exigency, the work shall be carried out in more than one shift i/c. Sunday & Holiday and nothing extra shall be paid on this account.

- The contractor shall make arrangement to provide adequate watch & ward to prevent dumping of malba at site by outsiders. Any such malba shall be removed & disposed off by the contractor at the approved waste processing facility of MCD and nothing extra shall be paid to the contractor on this account.

- The Successful tenderer shall have to engage specialized agency for each specialize items of work viz. Road Markings with Thermoplastic paint, Retro reflective signage boards, re-carpeting/strengthening of road etc.. The profile of specialized agencies shall be approved by the Engineer-in-charge before engaging them.
- **Maintenance of Registers**

(a) Maintenance of Register of Tests:

- All the registers of tests in respect of tests of material shall be carried out at site of work or in outside laboratories shall be maintained by the contractor which shall be duly issued to the contractor by the Engineer in charge.
- All samples of materials including cement concrete cubes shall be collected jointly with contractor in the presence of representatives of the Department. All necessary assistance shall be provided by the contractor for collecting of samples of materials by the other agencies, if directed by the Engineer in charge. Cost of samples of materials is to be borne by the contractor and he/she shall be responsible for safe custody and transportation of the samples to the laboratory and nothing extra shall be paid to the contractor on this account.
- All the tests in field lab, setup at construction site/yard shall be carried out by the qualified Engineering staff deployed by the contractor in presence of representatives of the Department.
- All the entries in the registers will be made by the designated Engineering Staff of the contractor and same should be produced regularly for reviewing the Engineer- in- charge.
- Contractor shall be responsible for safe custody of all the test registers at site. He shall be liable for all the consequences if any damage or loss occurs to the test register under his possession. Decision of Engineer-in-charge shall be final and binding to the contractor in this regard.
- Submission of copy of all test registers, Material at site register, cement register and hindrance register along with each alternate Running Account Bill shall be mandatory failing which no payment will be made to the contractor.

- **Maintenance of Material at Site (MAS) Registers:-**
  All registers including MAS, Cement Register, Steel Register, Paint Register, Bitumen Register, Bitumen Products Registers etc. shall be maintained by the Contractor which shall be duly issued by Engineer-in-Charge.

- **MODE OF MEASUREMENTS & SUBMISSION OF BILLS FOR PAYMENT**

  Measurements of all items having financial value shall be recorded by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the format of CPWD Works Manual 2014 with upto date correction slips and shall be submitted
  The contractors shall submit his final bill to the Executive Engineer within 15 days of completion of work. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished.

  In case he fails to submit the final bill by this time, the bill shall be accepted by the Executive Engineer only if it is approved by competent authority as per details below depending upon the quantum of delay in submission of final bill –

(1) The measurements of all items having financial value shall be recorded and entered in

computerised format in the first instance by the contractor and compiled in the shape of the Computerised Measurement Book having pages of A-4 size as per the format of CPWD Works Manual 2014 with upto date correction slips and shall be submitted a hard copy to the Engineer- in- charge for verification. All entries shall be made as per CPWD WORKS MANUAL 2014 SECTION 7.

(2) These measurements shall then be 100% checked by the Junior Engineer. If Junior Engineer is not available, the Assistant Engineer shall perform 100% check of the measurements. The contractor shall incorporate all such changes or corrections, as may be done during these checks, to his draft computerised measurements, and submit to the department the corrected computerized measurements in the form of a book, duly hard bound in red colour on the lines of the conventional Measurement Books now in use, and with its pages machine numbered.

(3) The Assistant Engineer and the Executive Engineer shall test check these computerised measurements as per the existing instructions. This book shall be treated as a Computerised Measurement Book.

(4) The Junior Engineer, Assistant Engineer and the Executive Engineer shall record the necessary certificates for their checks and test checks as per the existing procedure in this Computerised Measurement Book.

(6) Measurements shall be got verified from the authorised representative of Department well in advance. Contractor shall made all changes and corrections in measurements, as per the direction of the Engineer -in -charge, and re-submit the same to the Engineer -in -charge in the form of Computerised Measurement Book, duly hard bound with all pages machine numbered.

• (5) The Computerised Measurement Book shall be allotted a serial number as per the Register of Computerised Measurement Books.

• **Cutting or over-writing in the computerised M.B. not allowed:**

(1) The Computerized Measurement Book given by the contractor, duly bound, with its pages machine numbered, shall have no cutting or over-writing.

(2) It is the responsibility of the Junior Engineer or the Assistant Engineer as the case may be to ensure that the checks and test checks done by them in the initial draft measurements are correctly incorporated in the Computerized Measurement Book before they record their certificates.

(3) In case of any error, the Computerised Measurement Book shall be cancelled, and the contractor shall re-submit a fresh Computerized Measurement Book. This should be done before the corresponding computerised bill is submitted to the Division for payment.

(4) The contractor shall submit as many copies of Computerised Measurement Books as may be required, and as are specified in the NIT/contract, for the purpose of reference and record in the various offices of the department.

Computerised Bill to be submitted by the contractor:

(1) The contractor shall submit his running and final bills in a computerised form in the same format as the existing conventional bills, with all the pages machine numbered, and hard bound, and with all the entries made as per the existing procedure.

(2) The contractor shall submit as many copies of the computerized bills as may be required for the purpose of reference and record in the various offices of the department.

(3) The bill shall be carried forward from the previous running account bill as per the existing procedure.

(4) These computerised bills shall be processed by the various offices for payment, as per the existing procedure.

(5) The contractors shall submit his final bill to the Executive Engineer within 15 days of completion of work.

In case he fails to submit the final bill by this time, the bill shall be accepted by the Executive Engineer only if it is approved by competent authority as per details below depending upon the quantum of delay in submission of final bill –

S. No.	Competent Authority to Condone delay in submission of final bill	Time taken in submission of final bill after completion of work that can be condoned by the authority.
1	SE	16-30 days
2	CE	31-45 days
3	Pr CE	46-60 days
4	E-in-C	61-75 days
5	Pr. Secretary PWD	76-90 days

The contractor shall forfeit his claim in case he fails to submit his bill within 90 days after completion of the work.

Terms & condition for releasing payment of final bill after receipt shall be as per clause 9 of the agreement.

- All measurements shall be recorded and entered in Computerised Measurement Book by the contractor, and hard copy shall be submitted to the Engineer -in -charge for verification. All entries shall be made as per procedure and format decided/directed by the Engineer- in -charge.
- Measurements shall be got verified from the authorised representative of Department well in advance. Contractor shall made all changes and corrections in measurements, as per the direction of the Engineer -in -charge, and re-submit the same to the Engineer -in -charge in the form of Computerised Measurement Book, duly hard bound with all pages machine numbered.
- Computerised Measurement Book shall be the property of Department.

- **Safety Precautions and arrangements**

Contractor shall ensure deployment of proper safety arrangements at work site, casting yard and labour camp etc. Contractor shall be liable to sensitise all the workers, supervising staffs and operators about all safety issues at site.

Contractor shall, within two weeks of award of work, submit a list of all measures to be taken at site of work, casting yard and labour camp etc., for maintaining safety of manpower, public, traffic etc. during the period of completion of work to the Engineer-in-Charge for approval. He shall incorporate all additional necessary measures suggested/directed by the Engineer in charge. In any case contractor shall not be absolved of his responsibility from any accident or loss of property or life due to failure of safety arrangements.

- **Scaffolding**

For facia work, double steel scaffolding having two sets of vertical supports shall be used. The supports shall be sound and strong, tied together with horizontal piece over which scaffolding planks shall be fixed.

- **PLANTS AND EQUIPMENTS**

- All constructional tools, plants and machineries provided by the contractor shall when brought on to the site, be deemed to be exclusively intended for the execution and completion of the work and the contractor shall not remove the same or any part thereof from the site of work without the consent in writing of the Engineer-in-charge. All T&P and machinery including formwork mobilised by the contractor for execution of this work shall remain his property and shall be demobilised and taken away from the site after completion of said work. All machinery and equipment's brought for the work shall be in good working condition.

ADDITIONAL CONDITIONS

- A tenderer shall be deemed to have full knowledge of the site whether he /she inspected it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. It shall be deemed that the contractor has satisfied himself as to the nature and location of the work, general and local conditions and particularly those pertaining to probable location of batching plant/casting yard, contractor's offices site, transport, handling and storage of materials, availability of labour, weather conditions at site and general ground / sub soil conditions and the contractor has to estimate his cost accordingly.
- The contractor(s) shall get himself acquainted with nature and extent of the work and satisfy himself about the availability of materials from approved quarries for collection and conveyance of materials required for construction.
- The tenderer shall prior inspect all the approaches and roads to the site. In case any approach from main road is required at site or existing approach is to be improved and maintained for cartage of materials/machine by the contractor, the same shall be provided, improved and maintained by the contractor at his own cost. No payment shall be made on this account.
- On account of security considerations, there would be some restrictions on the working hours, movement of vehicles for transportation of material and location of labour camp. The contractor shall be bound to follow all such restrictions and adjust the programme for execution of work
- Contractor shall be bound to follow all the rules & restrictions imposed on working /movement/stacking of materials by the local authorities at all times. Nothing extra shall be payable on this account.
- Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at his own cost. Any damage caused by the contractor to the existing building/ installations /roads/ boundary walls shall be made good by him (the contractor) at his own cost
- The contractor shall make his own arrangement of water for execution of the work and nothing will be paid on this account. The contractor shall get the water tested with regard to its suitability and conforming to the relevant BIS Code. The contractor shall obtain written approval from the Engineer-in-Charge regarding source of water before he proceeds for using the same for execution of work. The contractor shall arrange Municipal water at his own cost or if he intends to use ground water, he will have to install RO plant of sufficient capacity to treat the water, if required, as the ground water may not be suitable for construction. Nothing extra shall be paid to the contractor on this account. Boring shall not be done by the contractor at site or casting yard to extract ground water without due permission of the Engineer in charge, CGWB and other competent authorities.
- If permission is required from other Government Agencies like Traffic Police, DJB, DMRC, Flood & Irrigation Department, Delhi, Municipal Authorities etc., contractor will apply to the concerned agency directly and make efforts to get the required permissions on time under intimation to the Engineer-in-Charge. The Department will sincerely cooperate and recommend the case to the concerned agencies for early approval. However, no hindrance will be given on account of any delay in issue of such permissions for the execution of work.
- The contractor shall make his own arrangement for obtaining electric connection (s) if required, and make necessary payment directly to the department concerned. The department will however make all reasonable recommendations to the authority concerned in this regard.
- Rates for the items are inclusive of all labour, materials, Transportation, T&P , incidental

charges, contractors profit and overheads etc. unless, otherwise, specified. The contractors shall quote the rates accordingly.

- The contractor shall bear all incidental charges for cartage, storage and safe custody of materials brought to site. The contractor shall be fully responsible for the safe custody of materials brought by him issued to him even though the some materials may be under double lock key system.
- The work shall be executed and measured as per metric dimensions given in the schedule of quantities, drawings etc. (FPS units, wherever indicated are only for guidance).

- **Licenses**

  The contractor shall pay to the municipal, police or other authorities all the fees etc. if required for execution of work, obtain requisite licenses for temporary constructions, enclosures, and pay all fees, taxes and charges as leviable. No extra claim for payment will be entertained on this account. All license fees, royalty charges shall be paid by the contractor directly to the authorities concerned.

- **SETTING OUT OF THE WORKS**

  The Contractor shall establish working Bench Marks tied with the Reference Bench Mark in the area soon after taking possession of the site. The Reference Bench Mark for the area shall be obtained by the Contractor from the Engineer-in-charge. The working Bench Marks shall be set at the rate of four numbers per km and also at the locations directed by the Engineer in charge. The working Bench Marks/levels should be got approved from the Engineer-in-charge. Checks must be made on these Bench Marks once every month and adjustments if any, got agreed with the Engineer-in-charge and recorded. An up-to-date record of all Bench Marks including approved adjustments, if any, shall be maintained by the Contractor and also a copy supplied to the Engineer-in-charge for his record.

  In order to facilitate the setting out of the works the centre line of the structure like embankment, subway, underpass, elevated roads, bridge, flyover, loops and ramps etc. must be accurately established by the Contractor and approved by the Engineer-in-charge. It must then be accurately referenced in a manner satisfactory to the Engineer-in-charge, every 50m intervals in plain and rolling terrains and 20m intervals in hilly terrain and in all curve points as directed by the Engineer-in-charge, with marker pegs and chainage boards set in or near the fence line, and a schedule of reference dimensions shall be prepared and supplied by the Contractor to the Engineer-in-charge. These markers shall be maintained until the works reach finished formation level and are accepted by the Engineer-in-charge.

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

  No reference peg or marker shall be moved or withdrawn without the approval of the Engineer-in-charge and no earthwork or structural work shall be commenced until the centre line has been referenced.

  The Contractor shall be the sole responsible party for safeguarding all monuments, bench marks, beacons, etc. The Engineer-in-charge will provide the Contractor with data necessary for setting out of centre line. All dimensions and levels shown on the drawings or mentioned in documents forming part of or issued under the Contract shall be verified by the Contractor on the site and he shall immediately inform the Engineer-in-charge of any apparent errors or discrepancy in such dimensions or levels. The contractor shall in connection with the setting out of the centre line, survey the terrain along the road and shall submit to the Engineer in Charge for his approval, a profile along the centre line and

cross-sections at intervals as required by the Engineer-in-charge.

After obtaining approval of the Engineer-in-charge, work on earthwork can commence and the profile and cross-sections shall form the basis for measurements and payment. The Contractor shall be responsible for ensuring that all the basic traverse points are in place at the commencement of the contract and if any are missing, or appear to have been disturbed, the Contractor shall make arrangements to re-establish these points. A "Survey File" containing the necessary data will be made available for this purpose. If in the opinion of the Engineer-in-charge, design modifications of the centre line or grade are advisable, the Engineer-in-charge will issue detailed instructions to the Contractor and the Contractor shall perform the modifications in the field, as required, and modify the ground levels on the cross-sections accordingly as many times as required. There will be no separate payment for any survey work performed by the Contractor. The cost of these services shall be considered as being included in the cost of the items of work in the Bill of Quantities.

The work of setting out shall be deemed to be a part of general works preparatory to the execution of work and no separate payment shall be made for the same.

All the survey work except levelling work shall be carried out using total stations with one second accuracy. The levelling work shall be carried out using Auto level. Precision automatic levels, having a standard deviation of + 2 mm per km, and fitted with micrometer attachment shall be used for all double run levelling work. Setting out of road alignment and measurement of angles shall be done by using theodolite with traversing target, having an accuracy of one second. Measurement of distances shall be done by using theodolite with traversing target, having an accuracy of one second. Measurement of distances shall be done preferably using precision instruments like Distomat.

A once yearly instrument calibration by a licensed service centre is required. Calibrations of every piece of survey equipment every three months is also recommended. If the Contractor cannot do 'in-house' periodic calibrations, then external calibration of all instruments twice yearly will be required. All the calibration certificates and 'in-house' reports must be maintained in a filing system by the contractor, and be available for an audit, authorized by the Engineer-in-Charge, at regular intervals.

The stated survey must be carried out by an engineering surveyor with extensive civil and structural survey experience. He will act on the contractor's instructions and at the contractor's expense. The choice of the surveyor is subject to acceptance by the Engineer-in-charge / Design consultant.

The contractor will make overall layout of the entire grade separator / flyover along with verification of existing ground levels as mentioned in general arrangement drawings and get them checked from Engineer-in-charge for the feasibility of same at site. In case of any infringement or any problems in layout and level, the same shall be brought to the notice of the Engineer-in-charge for rectification of the same. The cost of all operations of setting out including construction of bench marks is deemed to be included in the quoted rates. The work shall be done and to be got approved by Engineer in charge prior to starting any construction activity on site.

- **TEMPORARY WORKS**

The Contractor shall ensure that all Temporary Works are properly designed and that the safety of persons and works has been properly considered and also that the effect of the Temporary Works on the Permanent Works has been evaluated. Temporary Works shall not influence the ground conditions in a way that could be harmful to the permanent construction. The design, approval of design, construction/ erection, dismantling of temporary works after completion and clearance of site are deemed to be included in the quoted amount and nothing extra shall be paid on this account.

- **PROTECTION OF WORK**

  All finished Works shall be protected from damage that could arise from other construction activities. Work shall be planned and executed in such a manner that work completed by other agencies is not damaged. The compliance of these provision are deemed to be included in the quoted amount and nothing extra shall be paid on this account.

  The work should be planned in a systematic and coordinated manner with other agencies working at site. The work shall be carried out in such a manner so as not to interfere and disturb other works being executed by other agencies, if any. Nothing extra shall be paid on this account .Any damage done by the contractor to any existing work or work being executed by other agencies shall be made good by him at his own cost

  The contractor shall maintain in good condition all work till the completion of entire work allotted to him. Engineer-in-Charge shall not be held responsible for any claims for injuries to persons/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the contractor or of any other of his authorized representatives in his employment during the execution of the work. The compensation, if any, shall be paid directly to the department/authority/persons concerned, by the contractor at his own cost.

- **DAMAGE AND INTERFERENCE**

  Work shall be Carried out in such a manner that there will be no damage to or interference with:

- archeological monuments, bench marks, beacons etc.
- water courses or drainage systems
- utility services and equipment;
- structures, roads, street furniture, other public and private properties
- public or private vehicular or pedestrian access
- trees and other vegetation

  other than to the extent that it is necessary to construct the Works and that too only with the approval of the appropriate authority and/or the PWD.

  Items, which are damaged or interfered with as a result of the Works and items which are removed to enable the Works to be carried out, shall be reinstated to the satisfaction of the authorities and/or Client and to at least the same condition as that existed before the Works started. The compliance of these provision are deemed to be included in the quoted amount and nothing extra shall be paid on this account.

- **WORKSHOP DRAWINGS AND AS BUILT DRAWINGS**

  The Contractor shall be required to submit and get approved from the Engineer-in-Charge, the workshop drawings for all steel work i/c staging, shuttering etc. and execute under supervision of the experienced professionals only. Shop drawings of staging/shuttering etc. shall be submitted to the Engineer in charge at least one week in advance of their use so that necessary amendments, if required, can be incorporated in time.

  The cost of preparation of workshop drawings, it's modifications / revisions, submittals etc. are deemed to be included in the quoted amount and nothing extra shall be payable on this account.

  "On completion of work, the contractor shall submit at his own cost four prints of "as built" drawings,1 plot on Garware film or equivalent and on CD within one month of completion of the project failing which penalty @ Rs. 1500/- per day with maximum amount limited to Rs. 1,00,000/- shall be levied on the agency. In case the contractor fails to submit the aforesaid drawings to the Engineer-in-Charge, the security deposit shall not be released.

"As Built Drawings" shall have all details incorporating changes/modifications that might have taken place during execution of work. This includes invert levels, street lighting, cabling, other services, levels of road, footpath, drains, elevated road/flyovers/bridges, FOBs etc., details of foundations/substructure, superstructure etc. as executed at site.

- **DRAWINGS TO BE KEPT AT SITE**

  Two complete sets of the drawings as approved by the department shall be kept by the contractor at the site within 14 days of date of start out of which one set shall be lined with cloth and same shall at all reasonable time be available for inspection and use by the Engineer-in-Charge and the representative of the Engineer-in-Charge and any other person authorized by the Engineer-in-Charge in writing.

- **NIGHT WORK**

  For completing the work in time, the contractor might be required to work in two or more shifts (including night period) and no claim whatsoever shall be entertained on this account, notwithstanding the fact that the contractor will have to pay to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and /or extra amounts for any other reason.

- **EXISTING SERVICES**

  Existing drains, pipes, cables, overhead wires, sewer lines, water lines and similar services encountered in the course of the execution of the work shall be protected/ maintained against the damage by the contractor. The contractor shall identify all underground / overhead services and take necessary measures to protect the services before starting any excavation / activity. All temporary supports and other measures required to protect and maintain the services during construction period as per direction of Engineer-in-charge, shall be deemed to be included in the quoted rate / amount of the contractor and nothing extra shall be paid on this account. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services. For any permanent shifting, PWD shall arrange to shift the services as and when required. However in the interest of work, if PWD decides to get it shifted by the contractor, then contractor shall be paid separately at the rates as decided by the Engineer-in-charge based on the actual quantum of the work involved in shifting such utilities/services. The decision of the Engineer-in-Charge in this regard shall be final and binding.

- **DIVERSION OF SERVICES**

  All works pertaining to services including re-routing/diversion of services, routine testing, installation etc., embracing in one or more than one process shall be subject to examination and approval to each stage thereof by the Engineer-in-Charge or concerned department as would be notified by the Engineer-in-Charge or his accredited representative when such stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quantity and extent thereof and the decision of Engineer-in-Charge or his accredited representative in this regard shall be final and binding.

  The contractor will not have any claim in case of any delay by the Engineer-in-Charge in removal of trees or shifting, raising, removing of telegraph, telephone or electric lines (over head or underground), water and sewer lines and other structures etc., if any, which may come in the way of the work. However, suitable extension of time will be granted to cover such delays.

- **DISPOSAL OF THE SPOILS**

  The contractor shall make his own arrangement for the disposal of the spoils from the works to such place where the same shall not cause nuisance and should be acceptable to the authorities concerned without any cost to PWD.

- **PROVISION OF FACILITIES**

  The contractor shall make his own arrangement at his own cost for the provision of telephone and internet facilities at the site of works or at any other place.
  The contractor shall make his own arrangement for obtaining electric and water connections if required and make necessary payment directly to the department concerned. The department shall however make all reasonable recommendations to the authority concerned in this regard.

- **SITE MAINTENANCE**

  The Contractor shall maintain the Site in good order during the whole construction/ execution period. It is strictly prohibited to bury any kind of waste materials, solid or liquid, in the ground. In the event of accidental discharge of polluting materials, the Contractor shall take immediate mitigating action and shall immediately inform the Client and the appropriate authorities.

- **ACCESS TO THE SITE OF BATCHING PLANT/CASTING YARD /OFFICE / STORES ETC.**

  The Contractor shall establish, operate and maintain the means of access and transportation to and from the sites of batching plant / casting yard/office/stores etc. Access and transportation shall be approved by the Engineer- in charge/Delhi Traffic Police or any other appropriate authorities. The contractor shall provide and bear all expense and charges for roads required by him in connections with access to the site and nothing extra shall be paid on this account. He shall alter, adopt or maintain the same as required from time to time or as directed by the Engineer-in-Charge. The Department shall have right of way to this at all times and will not entitle the contractor to claim extra on this account. After completion of the work the contractor shall restore the site as provided to him at his own cost.

- **TENDER DRAWINGS**

  The drawings listed in the tender documents are indicative. The detailed Design and execution drawings will be separately issued to the agency after start of work. The work shall be executed as per the drawings issued 'Good for Construction' and no claim shall be entertained on account of changes in execution drawings.

- **DAY TO DAY MAINTENANCE OF ROADS**

  During the construction activities, the contractor has to maintain roads/footpath/drains etc. in good condition so that there is no inconvenience to the all type of traffic/pedestrians. For the maintenance, following are incidental works and nothing extra shall be paid to the contractor on this account

- Opening of bellmouth
- Cleaning/brooming of roads
- Refixing of disturbed Kerb stones
- Refixing of disturbed paver tile on foothpath However for following items/works, payment shall be made to the contractor:
- Potholes repairs
- Widening of road including construction of Temporary Diversions. (temporary/permanent).
- Refixing of old Kerb stone/Paver blocks in temporary footpath/crossing
- Kerb stone painting
- Replacement of manhole frame and covers damaged due to normal traffic.

In case these roads or part thereof or elsewhere damased due to execution of work or damage done by the contractor, the same shall be repaired by the contractor and nothing extra shall be paid to the contractor on this account.The contractor is bound to do such repairs. In case of failure on the part of contractor, the same shall be got done by the Engineer-in-Charge at contractor's risk and cost.

- **LAND FOR TEMPORARY USE**

The land for labour camps, storage, batching plant, contractor's office etc. shall be arranged by the contractor on its own. The lease / rent charges shall be borne by the contractor. In case of land belonging to any government agency, the Engineer-in-Charge shall extend necessary help and issue necessary recommendations etc. to the concerned department for temporary allotment of land during construction period. If the land belongs to PWD and the same is made available to the contractor, the rent of such land shall be recovered @ Rs. 300,000/- (Rupees Three Lacs Only) per acre per month. The contractor shall vacate the land at the event of completion of work in same condition as was at the time of allotment.

- **SITE OFFICE**
- The contractor shall provide suitable site office accommodations near the site for the supervisory staff of department (PWD). Land for setting up of site office will be provided by the department. Accordingly provision should be made for the following:-
- 1 independent room measuring 4.26 x 4.26 sqm with attached toilet.
- 1 nos independent room for record keeping

- The site office accommodation shall be provided (& maintained) with all necessary furniture, fitted with all electrical items like light, fans, Air conditioners etc. The office setup should be having 1 Nos. Desktop All-in-one Computers (having minimum specification, Intel Core i5 Processor (8th generation), Window 10 (with latest version of MS Office 2016), RAM 6 GB or above, Hard Drive 1 TB or above, Screen Size more than 23 inches) along with Laser Jet printer (Running expenses will be under the scope of Contractor) for day-to-day Working. The above office setup and computer hardware system shall be the property of the contractor after the work is over. No additional payment shall be made to the contractor on this account.The contractor shall arranges to maintain the site office which includes watch and ward, day to day up keeping of the building and surroundings, periodic whitewashing/ colour washing of the building including utilities, payment of bills etc.

- **PROJECT PLANNING AND MANAGEMENT**

The Contractor shall provide One nos. Business Laptop (configuration :- Intel Core i5 8th gen, 15.6 inch Full HD screen 1 TB Hard disk, 8 GB DDR4 Ram, 2GB dedicated graphics Memory, Microsoft windows 10, MS office 2016 along with MS Project)etc. (Running expenses will be under the scope of Contractor) for day-to-day Working. The above hardware system shall be the property of the contractor after the work is over. No additional payment shall be made to the contractor on this account. The Contractor shall also provide one full time computer operator (having good knowledge of Auto Cad, Power point, MS excel etc. with 10 years' experience of government working) till six months after completion of work. All labour laws with respect to payment of wages to the employee shall have to be followed.

- **COMMUTING**

The contractor shall make arrangement for one Nos. (1 Nos.) Inspection vehicles. Model of vehicles shall not be older than 2016), from start to actual completion of entire work, for the field staff of the department to facilitate work inspection, quality control, coordination with multiple agencies and better liasoning. This facility will be provided till the actual date of completion of work. The average mileage of each inspection vehicle shall be approximately 3000 Km/month. The inspection vehicle shall be made available for 12 hours per day on daily basis including holidays as per the direction of Engineer-in-Charge: All expenses of this inspection vehicle including running and maintenance, fuel charges, driver's salary etc. shall be borne by the contractor. In case of non-requirement of vehicle by the department deduction of Rs.1400/- per day per each vehicle and if vehicle not provided by the contractor deduction of Rs.2100/- per day per each vehicle shall be made from running bill of the contractor.

- **HOUSEKEEPING**

i. Housekeeping is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first-line of defense against accidents and injuries.

General Housekeeping shall be carried out by the contractor and ensured at all times at Work Site, Construction Depot, Casting Yard, Fabrication Yard, Workshop, Batching Plant, Labour Camp, Stores, Offices and toilets/urinals etc.

The contractor shall be responsible to provide segregated containers for disposal of debris at required places and regular cleaning of the same.

ii. Full height, barricades etc. shall be erected around the site in order to prevent the surrounding area from excavated soil, rubbish etc, which may cause inconvenience to and endanger the public. The barricade especially those exposed to public shall be aesthetically maintained by regular cleaning and painting as per the direction of Engineer-in-charge. These shall be maintained in one line and level. Provisions deemed to be included in the quoted amount by the contractor. Nothing extra shall be payable on this account.

The structural members, dimensions of the barricade, material and composition, its colour scheme, PWD logo and other details shall be in accordance with the drawing and the direction of Engineer-in-charge.

iii. All stairways, passageways and gangways shall be maintained without any blockages or obstructions. All emergency exits passageways, exits fire doors, break-glass alarm points, firefighting equipment, first aid stations, and other emergency stations shall be kept clean, un-obstructed and in good working order.

iv All surplus earth and debris shall be removed/ disposed off from the working areas immediately. Trucks carrying sand, earth and any pulverised materials etc. shall be covered while moving in order to avoid dust or odour impact. The tyres of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists.

v. No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.

vi. Roads shall be kept clear and materials like: pipes, steel, sand boulders, concrete, chips and brick etc, shall not be allowed on the roads to obstruct free movement of road traffic.

vii. Water logging or bentonite spillage on roads shall not be allowed.

viii. Proper and safe stacking of material are of paramount importance at yards, stores and such locations where material would be unloaded for future use. The storage area shall be well laid out with easy access and material stored / stacked in an orderly and safe manner.

ix. Flammable chemicals, compressed gas cylinders etc. shall be safely stored.
Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas shall be removed to identified locations (s).

All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from the site. Lumber with protruding nails shall be either bent / removed and properly stacked.

x. The contractor shall be penalised at Rs.5000/- per single violation/ non compliance of above mentioned provisions except S.no. (ii) above, which will be covered under relevant clause of Traffic management, compounded to a maximum of Rs.50000/- at any single instance. The decision of Superintending Engineer, regarding violation and the number of instances, shall be final and binding on the contractor. The compliance of above provisions are deemed to be included in the quoted amount of the contractor and no claim / payment whatsoever shall be entertained on this account.

- **Lighting:**
The contractor shall provide sufficient site lighting, of the right type and at the right place for it to be properly effective. Lighting ought not to introduce the risk of electric shock. Therefore, 230 V supplies should be used for those fittings, which are robustly installed, and well out of reach e.g. flood lighting or high-pressure discharge lamps.

The contractor shall ensure that luminaries should always be so placed that no person is required to work in their own shadow and that the local light for one person is not a source of glare for the others. Strongly made clamps should be available for attaching luminaries to poles and other convenient supports.

Luminaries should be robust, resistant to corrosion and rain proof especially at the point of the cable entry.

The correct type of lamp for each luminaries should always be used and when lamps need to be replaced, it shall be in accordance with the supply voltage.

Lamp holders not fitted with a lamp should be capped off.

The contractor shall take every effort to illuminate the work site as per the direction of Engineer-in-charge. The compliance of above provisions are deemed to be included in the quoted amount of the contractor and no claim / payment whatsoever shall be entertained on this account.

Contractor has to make arrangement for Temporary Street lightening on the site/stretch during the course of work so as to keep the stretch lightened adequately for public and traffic.

- **Traffic Management**

- The basic objective of the following guidelines is to lay down procedures to be adopted by contractor to ensure the safe and efficient movement of traffic and also to ensure the safety of workmen at construction sites.

All construction workers should be provided with high visibility jackets with reflective tapes as most of construction activities shall be done within right-of-way of the roads. The conspicuity of workmen at all times shall be increased so as to protect from speeding vehicular traffic.

The guiding principles to be adopted for safety in construction zone are to

- Warn the road user clearly and sufficiently in advance.
- Provide safe and clearly marked lanes for guiding road users.
- Provide safe and clearly marked buffer and work zones.
- Provide adequate measures that control driver behaviour through construction zones.

- **Permission for competent authorities**

- Wherever operations undertaken are likely to interface with public traffic, specific traffic management plans shall be drawn up and implemented by the contractor in consultation with the approval of local traffic police authorities, and /or the concerned metropolitan/civil authorities as the case may be.

- Such traffic management plans shall include provision for traffic diversion and selection of alternative routes. If necessary, the contractor shall carry out road widening before commencement of works to accommodate the extra load. The contractor shall be responsible for getting the "Traffic Management Plan" approved from Traffic Police before taking up any construction activity on the road.

The rates quoted by the contractor shall be deemed to be inclusive of all the related cost except the cost of road widening.

- The primary traffic control devices used in work zones shall include signs, delineators. barricades, cones, pylons, pavement markings and flashing lights, deployment of sufficient number of Marshalls on diversion roads and nothing extra shall be paid to the contractor on this account.

The road construction and maintenance signs which fall into the main three major categories , that are Regulatory Signs. Warning Signs and Direction (or guidelines) Signs shall only be used. The IRC:67 (Code of Practice for Road Signs) provide a list of traffic signs. The size, colours and placement of sign shall confirm to IRC:67. Nothing extra shall be paid on this account

- Regulatory signs

  Regulatory signs impose legal restriction on all traffic. It is essential, therefore, that they are used only after consulting the local police and traffic police authorities and nothing extra shall be paid on this account.

- **Warning signs**

  Warning signs in the traffic control zone shall be utilised to warn the drivers of specific hazards that may be encountered.

  The contractor shall place detour signage at strategic locations and install appropriate warning signs. In order to minimise disruption of access to residences and business, the contractor shall maintain at least one entrance to a property where multiple entrance exist.

  A warning sign shall be installed on all secondary roads which merges with the primary road where the construction work is in progress at sufficient distance before it merges with the primary road so as o alert the road users regarding the "Construction Work in Progress".

  Materials hanging over / protruded from the chassis / body of any vehicle especially during material handling shall be indicated by red indicator (red light/flag) to indicate the caution to the road users.

  The compliance of above provisions are deemed to be included in the quoted amount of the contractor and no claim / payment whatsoever shall be entertained on this account

- **Delineators**

  The delineators are the elements of a system of traffic control and have two distinct purposes:

i. To delineate, warn and guide the driver to move along a safe path

ii. As a guide to move traffic from one lane to another.

  These channelising devices such as cones, traffic cylinders, tapes and drums shall be placed in or adjacent to the roadway to control the flow of traffic, These should normally be retro-reflectors complying to IRC:79. Recommended Practice for Road Delineators.

- **Traffic cones and cylinders:**

  Traffic cones of 500mm, 750mm and 1000mm height and 300mm to 500mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro-reflective red and white band shall be used wherever required.

- **Drums**

  Drums about 800mm to 1000mm high and 650 mm in diameter can be used either as channelising or warning devices. These are highly visible, give the appearance of being formidable objects and therefore command the respect of drivers.

- **Barricades**

- The contractor shall make adequate arrangement for temporary barricading as per direction of Engineer-in-Charge to cover the entire site of work including all T&P and materials in order to prevent the working area from the risk of accidents due to speedy vehicular movement and also to protect the road users from any accident which can occur due to construction equipment and other temporary structures. No extra payment shall be made for providing barricading of required size/specification as the cost of barricading is deemed to be included in the quoted rates of different items by the contractor. The structural members, dimensions of the barricade boards, material and composition, its colour scheme, PWD logo and other details shall be in accordance with the drawing attached with the tender document and as per direction of Engineer-in-Charge.

- The requirement of providing and fixing barricading at site shall be decided as per the direction and approval of the Engineer-in-Charge. The barricading shall be provided continuously during the execution of the entire work till completion and shall not be removed at any stage without prior approval of the Engineer-in-Charge. All barricades shall be conspicuously seen in the dark/night time by the road users so that no vehicle hits the barricade. Conspicuity shall be ensured by affixing retro reflective stripes of required size and shape at appropriate angle at the bottom and middle portion of the barricade at a minimum gap of 1000mm. In addition minimum one red light or red light blinker should be placed at the top of each barricade The barricading shall include the following without any extra cost.

- Traffic signals during construction at site for day and night, reflective signs, direction boards, marking, glow lamps, caution tape, traffic signage as per requirement, flags, Traffic Marshals etc. as per direction of Engineer-in-Charge. However traffic police signals shall not be the responsibility of the contractor.
- Cleaning of barricading every fifteen days with water and detergent so as to ensure that there is no dirt of splashes on the barricading. The dust accumulated along the barricades on the carriageway shall be removed every week.
- Installation of temporary warning signs/lamps on all barricades and kept it lit during darkness/night period.
- Shifting and re-fixing in position all incidentals to execute the job repeatedly as per the requirement and as per direction of Engineer-in-Charge.
- Repainting of the barricading at regular interval as per direction of Engineer-in-Charge.
- Proper maintenance of the barricading till completion of the work by repairing/replacing the damaged barricade.
- The barricades shall be maintained in one line and level.
- Non cleaning/repainting/proper maintaining of Barricading boards, as mentioned above and as per direction of Engineer-in-Charge, will attract a levy of compensation @ of Rs. 50/- per meter per week upto maximum of Rs. 400/- per meter after the due date, as to be intimated by the Engineer-in-Charge.
- Penalty for not providing the barricades will be recoverable @ Rs.50/- per mtr per day.
- Contractor will be responsible for any mishappening due to faulty barricading or not providing barricades.

- The barricading provided shall be retained in position at site continuously i/c shifting of barricading from one location to another location as many times as required during the execution of the entire work till its completion and shall not be removed at any stage without prior approval of the Engineer-in-Charge. A barricade register shall be maintained by the contractor.

- The contractor has to provide at least **2000 mtrs**. of barricade boards (of size and specification as per attached drawing) at site immediately after date of start of work. Depending upon site requirement, the Engineer in-Charge may also further direct the contractor to bring more barricading boards within a prescribed time period.

- The contractor shall ensure that all his construction vehicles plying on public roads (like dumpers, trailers, Trucks etc.) have proper license to ply on public roads from the State Transport Authority. Drivers holding proper valid license as per the requirements of Motor Vehicles Act shall drive these vehicles

  The contractor shall not undertake loading and unloading of building material/ Tools & Plants/ Machinery at carriage ways to facilitate safe, smooth and obstruction free movement traffic. Any encroachment on the existing roads by the contractor shall not be allowed.

- **Tow away vehicle**

  The contractor shall make arrangements for keeping toe away van / manpower, at his cost, to tow away any breakdown vehicle in the traffic flow without loosing any time and nothing shall be paid on this account.

- **Cleaning of roads**

  The contractor shall ensure the cleanliness of roads and footpaths by deploying proper manpower for the same. The contractor shall have to ensure proper brooming, cleaning washing of roads and footpaths, at all the time, throughout the entire stretch till the currency of the contract including disposal of sweepage and nothing extra shall be payable on this account.

- The required number of traffic guards /marshals as per direction of Delhi Traffic Police / Engineer-in-charge shall be provided during construction period to ensure safe and smooth movement of traffic and nothing extra shall be paid to the contractor on this account. In case of default, the traffic guards/ marshals shall be deployed by the department and cost thereof shall be recovered from the contractor in addition to recovery for violation of tender provisions.

- In case the contractor fails to adhere to any of the above mentioned provisions, an amount of Rs.5,000/- shall be recovered for single violation and compounded to a maximum of Rs.50,000/- at any single instance. The decision of the Engineer-in-Charge in respect of violation and number of instances shall be final and binding on the contractor.

  The compliance of above mentioned provisions except cost of road widening, if required, are deemed to be included in the quoted amount of the contractor and no claim shall be entertained on this account.

- Batching Plant/Casting Yard
- In case, the quantity of concrete from the RMC Plant does not meet the demand, the contractor may setup its own a batching plant fully automatic at his own cost (min capacity 20 cum/hour). Nothing extra shall be payable/ recoverable from the quoted rates of the contractor.

- The batching plant/casting yard shall be effectively planned for smooth flow of unloading and stacking the aggregates reinforcements and cement, batching plant, transport of concrete etc. As far as possible the conflicts should be avoided.

- The batching plant/casting yard shall be barricaded and made as a compulsory PPE zone.

- If in case of material unloading area is not maintainable as Personal Protective Equipments Zone (PPE zone), the same shall be segregate properly and made as a non-PPE zone with provision of appropriate barricading.

- Electrical system shall also be suitably planned so that location of diesel generator, if any, location of DBs routing of cables and positioning of area lighting poles/masts does not infringe on any other utility and pose danger.

- Drainage shall be effectively provided and waste water shall be disposed off after proper treatment

- The office, canteen, drinking water, toilet and rest place shall be suitably located for the easy access to workers. All the facilities shall be properly cleaned and maintained during the entire period of operation.

- Manual handling of cement shall be avoided to a larger extent. Whenever it is absolutely necessary, the workmen shall be given full body protection, hand protection and respiratory protection as a basic measure of ensuring better health.

- The PPEs provided to cement handling workmen shall conform to international standards.
- Access roads and internal circulation roads shall be well laid and maintained properly at all time.
- The contractor shall provide required PPEs to workmen to protect against safety and/or health hazards. Primarily PPEs are required for the following protection.

    - Head Protection (Safety helmets)
    - Foot Protection (Safety footwear, Gumboot, etc.)
    - Body Protection (High visibility clothing (waistcoat/jacket, Apron, etc.)
    - Personal fall protection (Full body harness, Rope-grab fall arrester, etc.)
    - Eye protection (Goggles, Welders glasses, etc.)
    - Hand protection (Gloves, finger coats, etc.)
    - Respiratory Protection (Nose mask, SCBAs, etc.)
    - Hearing protection (Ear plugs, Ear muffs, etc.)

    The PPEs and safety appliances provided by the contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS). If materials conforming to BIS standards are not available, the contractor shall procure PPE and safety appliances, as approved by the Engineer-in-charge.

- All construction workers should be provided with high visibility jackets with retro-reflective tapes confirming to the requirement specified under BS EN 471: 1994. The conspicuity of workmen at all times shall be increased so as to protect them from speeding vehicular traffic.

The contractor shall provide safety helmet, safety shoe and high visibility clothing for all employee including workmen, traffic marshal and other employees who are engaged for any work under this contract as per the following requirement.

All employees of the contractor including workmen and traffic marshals :

- Hard hat with company Logo
- Safety boots
- Hi- visibility waistcoat covering upper body and meeting the following requirements as per BS EN 471:1994
- Background in florescent orange red in colour.
- Two vertical green strips of 5cm wide on front side covering the torso at least 5cm
- Two diagonal strips of 5 cm wide on back in an 'X' pattern covering at least 5cm
- Horizontal strips not less than 5cm wide running around the bottom of the vertical strip in front and 'X' pattern at back.
- The bottom strip shall be at a distance of 5cm from the bottom of the waist.
- Strips must be retro reflective and fluorescent
- Waistcoat shall have a side adjustable fit and a side and front tear away feature on waists made of nylon.
- Hard hat with
- Safety boots
- Hi-visibility jacket upper body and meeting the following requirements as per BS EN 471:1994:
- Background in fluorescent orange-red in colour.
- Jackets with full-length sleeves with two bands of retro reflective material, which shall be placed at the same height on the garment or those of the torso. The upper band shall encircle the upper part of the sleeves between the elbow and the shoulder: the bottom of the lower band shall not be less than 5 cm from the bottom of the sleeve.
- Two vertical green strips of 5cm wide on front side covering the torso at least 500 cm
- Two diagonal strips of 5cm wide on front side covering the torso at least 500cm
- Horizontal straight not less than 5cm wide running around the bottom of the vertical strip in front and 'X' pattern at back.
- The bottom strip shall be at a distance of 5cm from the bottom of the waist.
- Strips must be retro reflective and florescent
- Colour codes for Helmets.

Safety Helmet colour Code (Every Helmet should have the LOGO affixed/ painted)

Colour	**Person to use**
White	PWD staffs
Grey	All designers, Architect, Consultants, etc.
Violet	Main contractors (Engineers/Supervisors)
Blue	All sub-contractors (Engineers/Supervisors)
Red	Electricians (both Contractor and Sub-contractor)
Green	Safety Professionals (Both Contractor and Sub contractor)
Orange	Security Guards/Traffic marshals
Yellow	All workmen
White (with "VISITOR"	Visitor sticker)

- In addition to the above, any other PPE required for any specific jobs like, welding and cutting, working at height, tunneling etc shall also be provided to all workmen and also ensure that all workmen use the PPEs properly while on the job.

  The contractor shall not pay any cash amount in lieu to PPE to the workers/sub-contractors and expect them to buy and use during work.

  The contractor shall at all time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Engineer-in-charge during he inspections.

  It is the responsibility of the contractor to provide required PPEs for all visitors. Sufficient numbers/quantity of PPEs shall be kept always at the security post.

- Visitors to Site

  No visitor is allowed to enter the site without the permission of the Engineer-in-charge. All authorized visitors should report at the site office and contractor shall provide visitor's helmet (White helmet with visitor sticker) and other PPEs like safety shoe, reflective jacket, respiratory protection etc. as per requirement of the site.

  All visitors shall be accompanied at all times by a responsible member of the site personnel. The contractor shall be fully responsible for all visitors' safety and health within the site. For violation of the any of the above provisions an amount of Rs.200/- shall be recovered for single violation (Single Violation means non compliance by any worker/ individual).

- Submission of copy of all test registers, Material at site register and hindrance register along with each alternate Running Account Bill and Final Bill shall be mandatory. If all the test registers and hindrance register is not submitted along with each alternate R/A Bill & Final Bill, no payment will be released to the contractor.

SPECIAL CONDITIONS OF CONTRACT

- AMENDMENT OF TENDER DOCUMENTS:-At any time prior to the deadline for submission of Tender, PWD may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective Tenderers modify the Tender Document by issuing Corrigendum. In order to afford Tenderers reasonable time to take Corrigendum into account in preparation of their Tenders, PWD may at its discretion, extend the deadline for submission of Tenders.
- VALIDITY OF TENDER:-Tenders shall remain valid and open for acceptance for a period of **75 days** after the date of opening of technical bid. However, in exceptional circumstances, prior to expiry of the original Tender validity period, PWD may request the Tenderers for a specified extension in the period of validity. The request and the responses there to shall be made in writing. A Tenderer may refuse the request without forfeiting his Earnest Money. A Tenderer agreeing to the request will be required to extend the validity of his Earnest Money correspondingly. The provisions regarding discharge and forfeiture of Earnest Money shall continue to apply during the extended period of Tender validity.
- LANGUAGE:-The documents prepared by the Tenderer, and all correspondence and documents relating to the Tender exchanged by the Tenderer and the Engineer-in-charge shall be written in the English language only. Supporting documents and printed literature furnished by the Tenderer may be in another language provided they are accompanied by an appropriate translation in English. For the purpose of interpretation of the Tender, the English language shall prevail.
- DISCREPANCY BETWEEN ANY PROVISION OF THE CONTRACT : - If there are varying or conflicting provisions made in any document forming part of the contract, the Engineer-in-Charge shall be the deciding authority with regard to the intention/interpretation of the tender and his decision shall be final and binding on the contractor.
- DEVIATION FROM THE SPECIFICATIONS, STIPULATION, CONDITIONS :- The contractor will not be allowed to vary or deviate from the specifications, stipulation, conditions of tender documents or instructions are necessary to execute the work or part thereof without authorization by the Engineer-in-Charge in writing. For any extra work involved in consequence of some breach of this contract on the part of the contractor(s), no extra payment shall be admissible to the contractor.
- DEVIATION FROM DRAWINGS :- The drawings are indicative only and may vary as per the site conditions which shall be modified as per the direction of Engineer-in-Charge.
- ENVIRONMENTAL IMPACT :-
- The contractor shall take all precautions for safeguarding the environment during the course of the execution of the work. He shall abide all laws, rules and regulations in force to combating pollution and environment protection.
- The contractor shall carry out the work in such a manner that the soil erosion is fully controlled, sedimentation and pollution into natural water courses, ponds, tanks and reservoirs are avoided.
- Bituminous hot mix plants shall be located sufficiently away from habitation, agriculture operation or industrial establishments. The contractor shall take every precaution to reduce the levels of noise, vibrations, dust and emissions from his plant, machineries and equipment. The contractor shall be fully responsible for any claims for damages caused to the owners of property, fields, and residences in the vicinity and for any fine imposed by the Govt. for violation of prevailing laws.

- The contractor shall not use or generate any material in the work which are hazardous to the health of persons, animals or vegetation. Where it is necessary to use some substances which can cause injury to the health of workers, the Contractor shall provide protective clothing or appliances to his workers.
- The Contractor must take all reasonable steps to minimize dust nuisance during the execution of the work.
- All existing highways and roads used by vehicle of the Contractor or any of his sub-contractors or suppliers of materials or plant, and similarly any new roads which are part of the work and which are being used by traffic, shall be kept clean and clear of all dust/mud or other extraneous materials dropped by the said vehicles. Similarly, all dust/mud or other extraneous materials from the work spreading on these highways and roads shall be immediately cleared by the Contractor.
- Clearance shall be affected immediately by manual/mechanical sweeping and removal of debris and all dust, mud etc. shall be removed entirely from the road surface. Additionally, if so directed by the Engineer-in-charge the road surface shall be cleaned with water using suitable equipment.
- Any structural damage caused to the existing roads/services/property etc. by the Contractor's construction equipment shall be made good without any extra cost.
- Compliance with the foregoing provisions will not relieve the Contractor of any responsibility for complying with the requirements of any statutory Authority. The cost for the above mentioned provisions are deemed to be included in quoted amount and no extra payment shall be made on this account.

7. SECURITY

The Contractor shall be responsible for the security of the site of work for the whole time it is in his possession. The Contractor shall set up and operate a system whereby only those persons entitled to be on the site of work can access. To facilitate the same, Contractor shall provide specific points at which entry can be effected, and shall provide barriers at such points of entry and maintain at such barriers a 24 hours with security guard, and such other security person and patrols elsewhere as may be necessary to maintain security. No extra payment shall be made on this account.

8. RIGHT TO CARRY OUT THE WORK

- The right to carry out the work either in conformity with or in a manner entirely different from the terms of this tender document that may be considered the most suitable before or subsequent to the receipt of tenders due to exigencies of work is reserved with the Engineer-in-Charge.

9. SAFETY OF WORKERS

- In respect of all workmen directly or indirectly employed in the work for the performance of the contractor's part of this agreement, the contractor shall at his expense arrange for the safety provisions as per GCC and shall at his own expense provide for all facilities in connection there with. In case, the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to pay penalty prescribed under relevant clauses of these tender documents for each default and in addition the Engineer-in-charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the cost incurred on that behalf from the contractor, and no claim on this account whatsoever shall be entertained.

- The contractor shall issue identity cards to his labourers and supply the list of names of all labourers engaged at the site along with their home addresses to the local police station. Failure to do so may result in suspension of work by the authority.

10. COMPLIANCE OF LAWS

The contractor shall keep himself fully informed of all acts and laws of the Central and state govt. (i.e. Govt. of National Capital Territory of Delhi) all local bye laws, ordinances, rules and regulations and all orders and decree of bodies or, tribunals having any jurisdiction or authority which in any manner affect those engaged or employed on the work or which in any way affect the conduct of the works. Contractor shall at all times, observe and comply with all such laws, ordinances, rules, regulations, orders and decrees, and shall give all notices and any fee or charges to which he may be liable shall be paid by the contractor and no claim on this account whatsoever shall be entertained. He shall protect and indemnify the Department and its officers and employees against any claim or liability arising out of violations of any such law, ordinances, legislations, order or decree, whether by himself or by his employees & authorised representatives.

11. No claim shall be entertained on account of any damage caused by rain, flood, earthquake or any other natural causes whatsoever during execution of work. The contractor make the damages good and no claim on this account shall be entertained.

12. DRAWINGS TO BE KEPT AT SITE

Two complete sets of the drawings as approved by the department shall be kept at the site of work, out of which one set shall be lined with cloth and same shall at all reasonable time be available for inspection and use by the Engineer-in-Charge and the representative of the Engineer-in-Charge and any other person authorised by the Engineer-in-Charge in writing.

13. FOREIGN EXCHANGE

No foreign exchange shall be made available for the purchase of equipment, plants, machinery or materials of any kind or any other items/purpose required to be carried out in execution of work. Also no foreign exchange required for importing equipments, materials for tools, plants and machinery etc. that may be required in carrying out the work, will be made available by the department. All the payment for work done/Advances shall be made in INR only.

14. WORK DURING NIGHT HOURS

For completing the work in time, the contractor might be required to work in two or more shifts (including night duration) and no claim whatsoever shall be entertained on this account. Notwithstanding the fact that the contractor will have to pay to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and /or extra amounts for any other reason.

15. EXISTING SERVICES

Existing drains, pipes, cables, overhead wires, sewer lines, water lines, underground power lines and similar services encountered in the course of the execution of the work shall be protected/ maintained against the damage by the contractor. The contractor shall identify all under ground / overhead services and take necessary measures to protect the services before starting any excavation / activity. All temporary supports and other measures required to

protect and maintain the services during construction period as per direction of Engineer-in-charge, shall be deemed to be included in the quoted rate / amount of the contractor and nothing extra shall be paid on this account. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services. For any permanent shifting, PWD shall arrange to shift the services as and when required. However in the interest of work, if PWD decides to get it shifted by the contractor, then contractor shall be paid separately at the rates as decided by the Engineer-in-charge based on the actual quantum of the work involved in shifting such utilities/services. The decision of the Engineer-in-Charge in this regard shall be final and binding.

16. DIVERSION OF SERVICES

All works pertaining to services including re-routing/diversion of services, routine testing, installation etc., embracing in one or more than one process shall be subject to examination and approval to each stage thereof by the Engineer-in-charge or concerned department as would be notified by the Engineer-in-charge or his accredited representative when such stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quantity and extent thereof and the decision of Engineer-in-Charge or his accredited representative in this regard shall be final and binding.

17. DISPOSAL OF THE SPOILS

The contractor shall make his own arrangement for the disposal of the spoils from the site of work to such place where the same shall not cause nuisance and should be acceptable to the authorities concerned, and no claim on this account shall be entertained.

18. PROVISION OF FACILITIES

The contractor shall make his own arrangement at his own cost for the provision of telephone and internet facilities at the site of work or at any other place.The contractor shall make his own arrangement for obtaining electric and water connections if required and make necessary payment directly to the department concerned. The department shall however make all reasonable recommendations to the authority concerned in this regard.

19. INSURANCE

Requirements:

Before commencing the execution of the work, it shall be obligatory for the contractor to obtain at his own cost, insurance cover under the following requirements.

- Contractor's all risk and third party cover.
- Liability under the workman's compensation act 1923, Minimum Wages act 1923, Minimum Wages act 1948 and contract labour (Regulation and abolition)Act 1970.
- Accidents to staff, Engineers, Supervisors and others who are not governed by Workman's compensation act of the contractor and department.
- Damage to material, machinery and works due to fire, theft, flood etc.

19.1. Policy in the joint names of Contractor and PWD

The policy referred to under relevant clause shall be obtained in the joint names of the contractor and Engineer- in- charge and shall inter-alia provide coverage against the following, arising out of or in connection with execution of work, their maintenance and performance of contract

- Loss of life or injury involving public, employee of the contractor or that of department, labour etc.
- Loss or damages to the finished works / in progress works.
- Loss or damage to the works or property belonging to public, Government bodies, local authorities, utility organisations, contractors, employers or others

20. Currency of policy

The policies shall remain in force throughout the period of execution of the work and till the expiry of the defects liability period. If the contractor fails to effect or keep in force or provide adequate cover in the insurance policies mentioned under relevant clause above or any other insurance he is required to effect under the contract, then the employer may effect and keep in force any such insurance or further insurance and the cost and the expenses incurred by the department in this regard shall be deductible from the payment due to the contractor or from the contractor's security deposit.

The terms and conditions of the Insurance policies shall be got approved from Engineer-in-charge. Policies and certificates for insurance shall be delivered by the contractor to Engineer-in-charge or his authorised representative before the stipulated date of start of work. All such insurances shall provide for compensation to be payable and the amount required to rectify the loss or damage incurred.

Alterations to the terms and conditions of insurance shall not be made without the approval of the Engineer-in-charge.

21. CONTRACTOR TO INDEMNIFY

The Contractor shall at all times indemnify the department against all claims, damages of compensation under the provisions of payments of Wages Act 1936, Workmen's Compensation Act 1923, Minimum Wages Act 1948, Employment Liability Act 1938, Industrial Disputes Act 1947, Maternity Benefit Act 1961, Interstate Migrant Workmen (Regulation of Employment and Conditions Sewage) Act 1979 or any modifications thereof or any other law relating thereto any rules made there under from time to time or as a consequence of any accident or injury to any workmen or other person in or about the works, whether in the employment of the Contractor or not, save and except where such accident or injury has resulted from any act of the department, their agents or servants and also against all costs, charges and expenses of any suit, action or proceedings arising out of such accident or injury and against all sum or sums which may with the consent of the Contractor be paid to compromise or compound any such claim without limiting his obligation and liabilities as above. The Contractor shall insure against all claims, damages or compensation payable under the Workmen's Compensation Act 1923, or any modifications thereof or any other law relating thereto.

The Contractor shall ensure that similar insurance policies are taken out by his sub-contractor (if any) and shall be responsible for any claims or losses to department resulting from their failure to obtain adequate insurance protection in connection thereof. The contractor shall procure or cause to be produced by his Sub-Contractors (if any) as the case may be relevant policy or policies and premium receipts as and when required by the Engineer-in-charge.

22. SAFETY OF WORKERS

Over and above the provisions made in CPWD Safety Code, the following will also be applicable:

In respect of all workmen directly or indirectly employed in the work for the performance of the contractor's part of the contract, the contractor shall at his expense arrange for the safety provisions as per Indian Standard Safety codes shown below and shall at his own expense provide for all facilities in connection there with. In case, the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to pay penalty prescribed under relevant clauses of the contract for each default and in addition the Engineer- in -charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the cost incurred on that behalf from the contractor, and no claim on this account whatsoever shall be entertained.

IS:3696(part I) Safety code for scaffolds and ladders.
IS:3696(part II) Safety code for scaffolds and ladders Part II ladders.
IS:3764 Safety code for excavation work.
IS:4081 Safety code for blasting and drilling operations.
IS:5121 Safety code for piling and other deep foundations.
IS:5916 Safety codes for construction involving use of hot bituminous materials.
IS:7293 Safety code for working with construction machinery.
IS:7969 Safety code for storage and handling of building materials.
Any other code and/or as per directions of Engineer-in-charge.

The contractor shall issue identity cards to his labourers and supply the list of names of all labourers engaged at the site of work along with their home addresses to the local police station. Failure to do so may result in suspension of work by the authority.

23. INCIDENTAL WORKS SUCH AS BAILING OUT WATER, SHORING ETC.

For execution of any items of work where incidental works such as bailing out water, shoring etc. are actually required but not specifically stated in the scope of item and/ or tender document, it is to be understood that the item rate prices and rates quoted by the contractor shall cover such charges also and nothing extra on account of such incidental charges.

24. COMPLIANCE OF LAWS

The contractor shall keep himself fully informed of all acts and laws of the Central and state govt. (i.e. Govt. of National Capital Territory of Delhi) all local bye laws, ordinances, rules and regulations and all orders and decree of bodies or, tribunals having any jurisdiction or authority which in any manner affect those engaged or employed on the work or which in any way affect the conduct of the works. Contractor shall at all times, observe and comply with all such laws, ordinances, rules, regulations, orders and decrees, and shall give all notices and pay out of his own money any fees or charges to which he may be liable. He shall protect and indemnify the Department and its officers and employees against any claim or liability arising out of violations of any such law, ordinances, legislations, order or decree, whether by himself or by his employees & authorised representatives.

25. PREVENTION OF NUISANCE AND POLLUTION

The contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupiers of adjacent properties and to the public in general and to prevent any damage to such properties and any pollution. He shall make good at his own cost and to the satisfaction of the Engineer-in-charge, any damage to roads, paths, drainage works or public or private property whatsoever caused by the execution of the work or by traffic brought thereon by the contractor. All waste or superfluous materials shall be cleaned away by the contractor without any reservations entirely to the satisfaction of the Engineer-in-charge and no claim on this account whatsoever shall be entertained.

26. NO WAIVING OF LEGAL RIGHTS AND POWERS

The Engineer-in-Charge shall not be precluded or stopped from taking any measurements, and framing of estimates or detaining any certificates made either before or after the completion and acceptance of the work and payment, from showing the true amount and character of the works performed and materials furnished by the contractor and from showing that any such measurements, estimates or certificates untrue or incorrectly made and that Engineer-in-charge shall not be precluded or stopped from recovering from the contractor such damages as it may be sustained by reasons of his failure to comply with the terms and conditions of the contract. Neither the acceptance by the Engineer-in-Charge nor any payment for acceptance of the whole or any part of the work nor any extension of time nor any possession taken by the Engineer-in-Charge shall operate as a waiver of any portion of the contract or any power here in reserved or of any risk to damage. A waiver of any breach of the contract shall not be held to be a waiver of any other or subsequent breach.

27. Royalty at the prevailing rates wherever payable shall have to be paid by the contractor on the boulders, metal, shingle, sand and bajri etc. or any other material collected/brought by him for the work direct to revenue authorities and nothing extra shall be payable on this account.

28. The contractor shall take into account the element of wastage those are likely to be there in all elements of the work and quote his price, taking that into account. Department shall not pay any extra for wastage of materials on any account.

29. Contractor shall provide at his own cost suitable weighing, surveying, levelling and measuring arrangements as necessary at site for checking. All such equipment shall be got calibrated in advance from laboratory, approved by the Engineer-In-Charge. Nothing extra shall be payable on this account.

30. Any cement slurry added over base surface for continuation of concreting for better bond is deemed to have been included in the items and nothing extra shall be payable on this account, also the cement consumed on this account shall not be considered in theoretical consumption.

31. The rate for all items, in which the use of cement is involved, is inclusive of charges for proper curing as per specification.

32. Contractor shall give performance test of entire installation(s) as per standard specifications before work is finally accepted and completion certificate is recorded by the Engineer-in-Charge. Nothing extra whatsoever shall be payable to the contractor on this account.

33. The work shall be carried out in accordance with the Architectural/structural drawings "Good for construction (GFC)" to be issued from time to time, by the Engineer-in-Charge. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work and satisfy himself that the information available therein is complete and unambiguous. The discrepancy if any, shall be brought to the notice of the Engineer-In-Charge before execution of the work.

The contractor alone shall be responsible for any loss or damage occurring due to commencement of work on the basis of any erroneous and/or incomplete information and no claim whatsoever shall be entertained on this account.

34. Any damage done by the contractor to any existing installation or any work being executed by other agencies shall be made good by him at his own cost.
35. Contractor or his authorized technical representatives should always be available at the site of work to take instructions from the departmental officers, and ensure proper implementation of the same. No work should be done in the absence of such authorized representatives.
36. Malba / garbage/building rubbish shall be disposed off from the site of work by the contractor at designated Municipal dumping ground or C&D waste plant or at any authorized dumping ground approved by the Engineer-in-Charge.
37. Contractor shall provide proper testing laboratory at site of work with all necessary appliances of approved and standard quality. The Engineer-in-Charge reserves right to conduct additional field tests other than the specified to ensure that quality of work/material is consistent with the prescribed specifications. If the material or end product is found defective or substandard, it will have to be replaced/rectified by the contractor at his own cost.
38. All approved samples should be kept in the sample room till actual completion of work.
39. The completion drawing/ completion plan with details of all services is to be provided by the contractor before finalizing the bill. A recovery of Rs. 500000/- (Five Lacs only) shall be made on account of non-submission of completion plan.

Site Condition

- Site conditions given here under and as contained in the tender document are given as guidelines by the department but the contractor shall satisfy himself regarding all aspects of site conditions and no claim will be entertained on the plea that the information supplied by the department is insufficient or is at variance with site conditions.

- SITE CONSTRAINTS
- There are certain underground/on ground utility services along work site viz.HT Transmission lines of NDPL/ BSES, gas supply lines of IGL, & Water supply line of DJB, Drainage system of MCD/Irrigation and Flood Department. Some said services may be required to shifted for execution of the work.PWD will take necessary steps to relocate these services in consultation with the concerned departments. No claim on account of any damage/loss due to relocation of services or change in site condition shall be entertained under any circumstances. However, if any delay occurs on this account, PWD will consider the case for justified extension of time for the actual delay on this account. The decision of the Engineer-in-Charge shall be final and binding on the contractor in this regard. Contractor shall take into account this aspect also while scheduling the completion of work, with these existing underground/on ground utilities, development works around said road, diversion of traffic during execution of work.
- No claim shall be entertained on account of above or any other site constraints not specifically stated above. Contractor should visit the site of work and get first hand knowledge of site constraints and quote his rates accordingly.

- On account of Security, safety, traffic and noise considerations, there would be some restrictions on the working hours, movement of vehicles for transportation of material and location of labour camp etc. Contractor shall be bound to follow all such restrictions at his own cost and adjust the programme for execution of work accordingly.
- No claim shall be entertained on account of idle establishment of labour, machinery, equipment, tools and plants etc. for any reason whatsoever, during the execution of work as well as after its completion.
- CLIMATIC CONDITIONS
- The climate in this region is extreme with three major seasons winter, summer and monsoon. The winter season lasts from October to March, summer season from April to June and monsoon season from July to September. This is only for guidance and there may be variations. No claim shall be entertained on account of time/cost.

- HOUSING, WATER SUPPLY AND ELECTRICITY

- No accommodation is available at the site of work and no labour huts shall be allowed within the right of way of road. The contractor has to make his own arrangements for housing, stores and field offices, accommodations for his labour and other employees etc. Contractor should visit the site and see in what manner he is able to arrange the above. He shall submit a site layout plan indicating the locations of various site facilities like Contractor's site office, stores etc. to be created by him at his cost for the execution of work. Arrangement of water for drinking purpose in addition to the water required for construction work is also to be made by the contractor at his own cost. For electric connection, the contractor shall obtain connection, at his own cost and in his name.The contractor shall be authorised to use the same for execution of work. PWD shall provide the necessary assistance like recommendations for obtaining electric connection.

- DEWATERING

  Any dewatering required due to flow in drains, heavy rains, water emanating from any other source shall be carried out by the contractor at his own cost and no claim shall be entertained on this account.

- GROUND WATER TABLE, SOIL CONDITIONS AND EXTRACT OF SOIL INVESTIGATION REPORT

- It shall be deemed that the contractor has satisfied himself to the nature and location of the work, general and local conditions, transport, handling, availability and storage of materials, availability of labour, weather conditions at site and general ground/sub soil conditions and the contractor has to quote his rates accordingly. Department will not bear any responsibility for the lack of such knowledge and also the consequences thereof to the contractor. The information and site data shown in the drawings and mentioned in the tender documents are furnished for general information and guidance only. The Engineer-in-Charge in no case shall be held responsible for the accuracy thereof or/and deductions, interpretations or conclusions drawn there from by the contractor and no claim shall be entertained whatsoever if the site conditions/information is different or otherwise incorrect. It will be presumed that the contractor has satisfied himself for all possible contingencies, situations, bottlenecks and acts of coordination which may be required between the different agencies.
- Contractor shall study the soil investigation report of the site of work, available in the office of the Engineer-in-Charge and satisfy himself about complete characteristics of soil and other parameters at site. However, no claim on the alleged inadequate or incorrect soil data supplied by the department shall be entertained. The contractor, if feels necessary and with the approval of Engineer-in-Charge or if so directed by Engineer-in-Charge, shall be required to carry out necessary confirmatory soil investigation at required location. The subsoil investigation will be got carried out through a reputed firm and approved by Engineer-in-Charge. The cost of soil investigation will be paid to the contractor as per the provision made in the contract. The contractor will also get the confirmatory soil investigation report vetted from the structural/Proof consultant, already appointed by PWD, and nothing extra shall be paid on this account.
- Ground water table at site is variable. It may vary from time to time depending upon the season. No extra payment will be admissible on account of any variations in the water levels including sub-soil level at the site of work from those given in the tender documents.

SPECIFICATIONS

(CIVIL WORK)

A. GENERAL SPECIFICATIONS

1.1. GENERAL:

All the works unless otherwise specified hereinafter or permitted by Engineer-in-Charge shall be done in accordance with the latest editions of IRC codes, with up to date correction slips & relevant BIS Codes as applicable, issued up to the last date of month prior to month of receipt of bid. In case of any inconsistency among different Codes/Specifications, the order of precedence given in Chapter-3 (Special Conditions of Contract) will govern.

Unless otherwise expressly stated to the contrary either in Schedule of Quantities or elsewhere in this Tender, the method of measurements and other guide lines as generally laid down in the CPWD specifications shall equally be applicable for this contract. The work shall be executed and measured as per metric units given in the Schedule of Quantities, drawings etc. (FPS units where indicated are for guidance only). Except where distinguished by BOQ, the rates apply to all heights, depths, sizes, shapes and locations. Absence of terms such as providing, supplying, laying, installing, fixing etc in the descriptions does not even remotely suggest that the Contractor is absolved of such providing, supplying etc. unless an explicit stipulation is made in this contract. The Engineer-in-Charge shall not bear any costs of materials, labour, equipment, duties, taxes, royalties etc.

The Work shall be carried out in accordance with the "Good for Construction" drawings and designs as would be issued to the Contractor by the Engineer-in-Charge duly signed and stamped by him.The Contractor shall not take cognisance of any drawings, designs, specifications, etc. not issued/signed and stamped by Engineer-in-Charge. Similarly the Contractor shall not take cognisance of instructions given by any other Authority except the instructions given by the Engineer-in-Charge or his authorised representatives.

The specifications may have been divided into different sections / sub-heads for convenience only. They do not restrict any cross-references. The Contractor shall take into account inter-relations between various parts of works/trades. No claim shall be entertained on account of compartmental interpretations.

1.2. PROTECTION OF THE ENVIRONMENT

This section of the Specification sets out limitations on the Contractor’s activities specifically intended to protect the environment.

The contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the works and all associated operations on site of work or off-site of work are carried out in conformity with statutory and regulatory environmental requirements including those prescribed elsewhere in this document.

The contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of the Works. This shall wherever possible be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated.

In the event of any spoil, debris, waste or any deleterious substance collected from the site of work being deposited on any adjacent land, the Contractor shall immediately remove all such material and restore the affected area to its original state to the satisfaction of the Engineer-in-Charge. No claim shall be entertained on this account.

- Water Quality

The contractor shall prevent any interference with the supply of water to or abstraction of water from, and prevent any pollution of water resources (including underground percolation of water) as a result of the execution of the Works.

Area where water is regularly or repetitively will be used for dust suppression purposes shall be collected into specially-constructed settlement tanks to permit sedimentation. After settlement of dust particles, the water may be re-use for dust suppression.

All waste water and other liquid waste products arising on the site of work shall be collected and disposed off at a location or on the site in such a manner that shall not cause either nuisance or pollution.
The contractor shall not discharge or deposit any matter arising from the execution of the work into any water body without permission of the Engineer-in-Charge and the regulatory authorities concerned.

The Contractor always will ensure that all existing water stream courses and drains within and adjacent to the site of work kept safe and free from any debris and any materials arising from the Works.
The Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes etc. from pollution as a result of the execution of the Work. No claim shall be entertained on this account.

- Air Quality

The contractor shall devise and arrange methods of working to minimise dust, gaseous or other air-borne emissions and carry out the works in such a manner as to minimise adverse impact on air quality.The Contractor shall be done effective water sprinkling during delivery, production, processing and handing of materials/items to combat dust pollution and to dampen stored materials during dry and windy weather. Stockpiles and friable materials shall be covered with clean tarpaulins including sprinkling of water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement, except where this is contrary to the Specification.

Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards, and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend at least 300 mm over the edges of the side and tail boards.

In the event that the contractor is permitted to use gravel or earth roads for haulage, he shall provide suitable measures to combat dust pollution, if these are, in the opinion of the Engineer-in-Charge, necessary. Such measures may include sprinkling of water on road surface at regular intervals. No claim shall be entertained on this account.

- Noise

The contractor shall consider noise as an environmental constraint in his planning and execution of the Works.

The Contractor shall take all necessary measures so that the operation of all mechanical equipment and construction processes on and off the site of work shall not cause any unnecessary or excessive noise beyond permissible limits in conformity with statutory and regulatory environmental requirements. The Contractor shall take all necessary measures and shall maintain all plant with necessary silencers and necessary noise barriers in good condition to maintain the noise level within the permissible limits during execution of work. No claim shall be entertained on this account.

- Control of Wastes

The contractor shall control the disposal of all kind of waste arising at site of work and by all other associated activities. No uncontrolled deposition or dumping shall be permitted. Waste to be so controlled shall include all forms of fuel, and engine oils, all types of bitumen, cement, surplus aggregates, gravels, bituminous mixtures etc. The Contractor shall make specific provision for the proper disposal of these and any other waste products, conforming to local regulations and acceptable to the Engineer-in-Charge. No claim shall be entertained on this account.

- Emergency Response

The Contractor shall plan and provide for remedial measures to be implemented in the event of occurrence of emergencies such as spillages of oil or bitumen or chemicals.

The Contractor shall provide a statement to the Engineer-in-Charge that the measures he intends to implement in the event of such an emergency including a statement that how he intends to provide personnel adequately trained to implement such measures.

The Contractor shall be deemed to have made allowance for such compliance with these provisions in the preparation of offer and the prices for items of work included in the Bills of Quantities and full compensation for such compliance will be deemed to be covered by them. No claim shall be entertained on this account.

1.3. SITE MAINTENANCE

The contractor shall maintain the site of work in good condition during the whole execution period. It is strictly prohibited to bury any kind of waste material, solid or liquid, into the ground. In the event of accidental discharge of polluting materials, the Contractor shall take immediate mitigating action and shall immediately inform the Engineer- in -charge and the appropriate authorities. The Contractor shall maintain the site of work throughout the period of execution of work. No claim shall be entertained on this account.

Except for the items specified in the Bill of Quantities.

- The contractor shall execute general works such as setting out, site clearance before setting out and on completion of works. All weather approach roads to the site office should also be constructed and maintained in good condition. No claim shall be entertained on this account.

- The contractor shall provide/arrange all labours, materials, plants, equipments and temporary works, Over Head charges as well as general liabilities, obligations, insurance and risks arising out of provisions of tender documents, required for completing and maintaining the works till handing over to the satisfaction of the Engineer-in-Charge. No claim shall be entertained on this account

- The contractor shall provide adequate lighting for execution of works during night period, and also whenever and wherever required by the Engineer-in-Charge. No claim shall be entertained on this account
- The contractor shall provide adequate temporary fences, barricades, signages, guards, lights and protective works necessary for protection of workmen, supervisors, engineers, General public and any other persons permitted access to the site. All fences, barricade shall be painted with colour shades as specified by the Engineer-in-Charge. The barricading should be of adequate height to ensure visual obstruction of work from public view. No claim shall be entertained on this account.

- The contractor shall provide adequate numbers/quality of equipments, instruments, labours and materials required by the Engineer-in-Charge for checking alignment, levels, slopes and evenness of surfaces, measurements and quality etc. No claim shall be entertained on this account.
- The contractor shall submit the Design Mix Reports for design mixed concrete and bituminous concrete and test reports of materials designed/test conducted from stipulated/ approved Institutions/Laboratories as per relevant codes/clauses of specifications giving proportion of ingredients, sources of aggregates and binders along with accompanying trial mixes. Test results to be submitted to the Engineer-in-Charge for approval before adoption for work. All the responsibilities for Design Mixes/testing of materials including collection of samples of materials, transportation/delivery to the stipulated/approved Institutions/Laboratories and deposition of necessary charges and submission of Design Mix Reports/ test reports to the Engineer-in-charge lies with the contractor. Nothing extra on this account shall be paid to the contractor. However testing of materials charges shall be deposited to the stipulated/approved Institutions/Laboratories by the contractor shall be reimbursed to the contractor only if the test reports will be confirmed the quality requirements of the materials as per the relevant codes/and specifications and if test reports will not be confirmed the quality requirements of the materials as per the relevant codes/and specifications then testing of materials charges shall not be reimbursed to the contractor.

- The contractor shall prepare the Quality Assurance Control Programme and submit the same to the Engineer-in-charge for approval and no claim shall be entertained on this account.

- The contractor shall established a materials testing laboratory at site of work with necessary testing apparatus, materials and eligible trained staff required for carrying out tests, as specified elsewhere in the tender document.

1.4. DRAWINGS AND DIMENSIONS

Figured dimensions on drawings shall only be followed and drawings to a large scale shall take precedence over those to a smaller scale. All dimensions shall be checked on site prior to execution.

The levels, dimensions and other informations concerning the existing site as shown on the drawings are believed to be correct, but the contractor should verify the same and also examine the nature of the ground and no claim or allowances whatsoever will be entertained on account of any errors or omissions in the levels or the description of the ground levels or strata turning out different from what was expected or shown on the drawings.

1.5. SETTING OUT OF WORK

Contractor shall set out the work as covered in the scope of contract. The Engineer-in-Charge shall provide datum points and levels for the setting out of the work. Contractor will relate all his construction information and temporary work design to these reference points. The Contractor shall provide suitable stones with flat top and build the same in concrete for temporary bench marks. All the pegs for setting out the Works and fixing the levels required for the execution thereof shall, if desired by the Engineer-in-Charge, likewise be built in masonry at such places and in such a manner as per the direction of Engineer-in-Charge. The contractor will make overall layout of complete work and get it checked from Engineer-in-Charge. The cost of all operations of setting out including construction of bench marks is deemed to be included in the quoted rates as per Bill of Quantities and nothing extra shall be paid to the contractor on this account. All surveying work except levelling work shall be carried out by total station with one second least count. The levelling work shall be carried out by Auto level. The triangulations point given by Engineer-in-Charge before start of work shall be maintained during execution and handed over back to Engineer-in-Charge after completion of work. The Contractor shall satisfy himself that there is no conflict between the data given and shall provide all subsidiary setting out points, monuments, towers and the like which may be necessary for the proper and accurate setting out of the works.

The Contractor shall carefully protect all the surveying reference points, bench marks, setting out points, monuments, towers and the like from any damage and shall maintain them and repair or replace any points damaged from any cause whatsoever. The Contractor shall Calibrate all surveying equipments in every three months.If the Contractor cannot do 'in-house' periodic calibrations, then external calibration of all instruments twice in a year will be done from license holder instruments calibration service centre . All the calibration certificates and 'in-house' reports must be maintained in a filing system by the contractor, and shall be available before audit party and before person authorised by the Engineer-in-Charge at regular intervals.
During conducting the surveying work, the contractor shall demonstrate that the required accuracy is being maintained.
The surveying works shall be be carried out by an Engineering Surveyor with extensive civil and surveying experience. He will act on the contractor's instructions and at the contractor's expense. The choice of the surveyor is subject to acceptance by the Engineer-in-charge / Design consultant.

B. MATERIAL SPECIFICATIONS

1.6. GENERAL :

This Chapter covers the specifications of only the main and important materials to be used in various items of the work. For the materials whose specifications are not covered in this chapter, the contractor shall follow the relevant specifications in the accepted order of preference given under special conditions of the contract. All materials shall be of best available quality and shall be in conformity with the specifications laid down in the contract document.

1.7. SOURCE OF MATERIALS

It shall be the responsibility of the contractor to procure all the materials required for execution and completion of the work. The contractor shall intimate in writing the source of materials well in advance to the Engineer-in-Charge, after the award of the work and before commencing the work. If the material from any source is found to be unacceptable at any time, it shall be rejected by the Engineer-in-Charge and the contractor shall forthwith remove the material immediately from the site as directed by the Engineer-in-Charge.

1.8. QUALITY

All materials shall be used in the work shall be of the best quality of their respective kinds as specified herein, obtained from sources and suppliers approved by the Engineer-in-Charge and shall comply strictly with the tests prescribed hereafter, or where tests are not laid down in the specifications, with the requirements of the latest issues of the relevant Standards/Codes in the accepted order of preference given under special conditions of contract.

- Sampling and Testing: All materials used in the works shall be subjected to inspection and test in addition to test certificates. Samples of all materials proposed to be used in the execution of work shall be submitted to the Engineer-in-Charge in advance for approval before actual materials are brought to the site for construction/execution.

  Samples approved by the Engineer-in-Charge after necessary tests are to be labeled and kept in boxes suitable for storage. Materials or workmanship which will not be corresponding in character and quality with approved samples will be rejected by the Engineer-in-Charge.

  Samples required for approval and testing must be supplied sufficiently in advance to allow for testing and approval, due allowance being made for the fact that if the first samples are rejected further samples may be required. Delay to the works arising from the late submission of samples will not be acceptable as a reason for delay in completion of the works.

  Materials shall be tested before leaving the manufacturer's premises, quarry or resource, wherever possible. Materials shall also be tested on the site and they may be rejected if not found suitable or in accordance with the specification, notwithstanding the results of the tests at the manufacturer's premises or elsewhere or test certificates or any approval given earlier.

The contractor shall supply material required for testing free of charge and make necessary arrangement for transportation of test samples to laboratory. The cost of tests that are required to be tested in the field lab to be set up by the contractor shall be borne by the contractor

The cost for all tests conducted in the field lab set up by the contractor or at Manufacturer's premises or test conducted at the beginning of work or change of source shall be borne by the contractor.

- Dispatch of materials: Materials shall not be dispatched from the manufacturer's premises to the site of work without written permission of the Engineer-in-Charge.

- Test certificates: All manufacturer's certificates of test, proof sheets, etc. showing that the materials have been tested in accordance with the requirement of this specification and of the appropriate Codes/ Standard shall be supplied free of cost to the Engineer-in-Charge.

- Rejection : Any materials which shall not found satisfactry and shall not conform to the specifications/codes/standards shall be rejected forthwith and shall be removed from the site by the Contractor at his own cost within one week or as instructed by the Engineer-in-Charge. The Engineer-in-Charge shall have power to cause the contractor to purchase and use such materials from any particular source, as may in his opinion be necessary for the proper execution of the work.

1.9. STORAGE OF MATERIALS

Materials shall be kept in the joint custody of the contractor & representative of the Engineer-in-charge. Department shall not provide any type of storage. If the place, where material is stored by the contractor, is required by the Engineer-in-Charge for any other purpose, contractor shall forthwith remove the material from that place at his own cost and clear the place for the use of the Employer.

Materials required for the work whether brought by the contractor or supplied by the department shall be stored by the contractor only in standard profiles and in the manner approved by the Engineer-in-Charge. Storage and safe custody of materials shall be the responsibility of the contractor. The contractor shall make sure that the materials shall be brought in, at a time, in adequate quantities to suffice for the whole work or for at least a month's work. The storage of materials shall be in accordance with IS 4082 "Recommendation on stacking and storage or construction materials on site" and as per IS 7969 "Safety code for handling and storage of building materials".

The contractor shall construct suitable godowns at the site of work for safe storage of materials against any damage due to sun, rain, dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for this purpose and no extra claim whatsoever shall be entertained on this account.

The materials which are likely to get deteriorated shall be stored as per recommended condition under covered waterproof sheds constructed on consolidated raised platform with adequate seepage control measures as per direction and satisfaction of Engineer-in-charge. The quoted rates for various items shall be deemed to have included the cost of storage. The storage space shall be open for inspection as and when required by the Engineer-in-charge or his authorised representative.

1.10. EXPLOSIVE AND INFLAMMABLE MATERIALS

If explosives or inflammable materials are to be used for execution of the works, the contractor shall at his expense obtain such licenses as may be required for storing and using explosive and/or inflammable materials. Contractor shall at his own cost locate, construct and maintain magazines if such are required for storage in accordance with the requirements of the appropriate rules in force for their use and safety.

1.11. MATERIALS FOUND AT SITE OF WORK

Materials/minerals/earth/unserviceable materials but have some monetary value obtained from dismantling and excavation from the site of work shall remain the property of the department and shall only be disposed of from site as per direction of Engineer-in-charge only.
All fossils, coins, articles of value or antiquity and structures or other remains or things of geological or archaeological interest discovered on the site of work shall be the absolute property of the department and the contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such articles or valuables and shall immediately upon discovery thereof and before removal, acquaint the Engineer-in-Charge and obtain his/her directions for removal of the same from site of work at the expense of department.

1.12. CEMENT

a) Type of Cement :Cement to be used in the works shall be any of the following as mentioned in nomenclature of items and/ or as approved by Engineer-in-charge.

- Ordinary Portland cement, 43 Grade conforming to IS:8112
- Ordinary Portland cement, 53 Grade conforming to IS:12269
- Portland slag cement conforming to IS:455 and conforming to strength requirement of IS:8112
- Portland Pozzolana Cement conforming to IS: 1489 (Part-I) 1991

b) Batch and MTC : Every batch of cement will be accompanied with a Manufacturer's Test Certificate and subsequent tests will be conducted as per the QAP.

c) Packing: Packed cement shall be delivered to the site in original sealed bags which shall be labeled with the weight, name of manufacturer, brand, type, week of manufacture and ISI mark. Cement received in torn out bags shall not be used. Contractor may obtain cement in bulk and store it in suitable silos of adequate capacity. Each type of cement shall be stored in a separate silo and it shall be ensured, that cement of different quality shall not mixed up.

d) Storage: Cement Godown of adequate capacity conforming to CPWD specifications shall be constructed by the contractor at site of work for which no extra payment shall be made. The contractor shall be responsible for the watch and ward and safety of the cement godown. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-charge or his authorised representative at any time. Cement brought to site shall not be removed from site without written permission of Engineer-in-charge.
Separate godowns shall be provided for different grade/type of cement. Each godown shall display the grade/type of cement stored in it prominently. Testing of cement shall be carried out in advance before use in the work. At least 15 days quantity shall be available at all times during the construction/execution period in the godown.

1.13. COARSE AGGREGATES

Coarse aggregate shall consist of naturally occurring crushed stones, crushed gravel, natural gravel or a suitable combination thereof. Coarse aggregate obtained from crushed or broken stone shall be angular, hard, strong, dense, durable, clean and free from adherent coating, injurious amounts of disintegrated pieces, alkali, vegetable matter, soft, friable, thin plate, elongated or flaky pieces and any deleterious material. The presence of flaky and elongated pieces shall be avoided. Coarse aggregate having positive alkali-silica reaction shall not be used. All coarse aggregates shall conform IS:383 and tests for conformity shall be carried out as per IS:2386, part-I to part- VIII.

The maximum value for flakiness index shall not exceed 35%. The maximum quantity of deleterious material shall not exceed the limit specified in Table I of IS:383.

The nominal maximum size of aggregate to be used in RCC and PCC work shall be 20 mm.

In order to obtain optimum workability, single sized aggregates of nominal size 20mm, 10mm, 4.75mm and 2.36mm will be blended in such a way that the grading curve for all aggregates will be a smooth curve from size 0.15mm to 25mm falling within the established envelop grading curve. Contractor shall establish envelop grading curve for each grade of concrete for given maximum size of aggregates and get it approved by Engineer-in-Charge before finalising the mix design. However, the grading of aggregate shall be controlled by obtaining the coarse aggregate in different sizes and blending them in correct proportions as and when required.

The contractor shall satisfy himself that the material proposed to be used for construction/execution complies with the requirements of IS: 383 and shall submit the entire information indicated in Appendix ‘A’ of IS: 383 for approval of the Engineer-in-charge. In case the aggregate tested do not comply with any requirement of the specifications, the source for the same shall be rejected. No further samples from the rejected source shall normally be considered for approval.

The aggregate shall be stored in such a way as to prevent mixing with foreign materials. Different sizes of coarse aggregate shall be stored in paved area in separate stock piles sufficiently distant from each other in order to prevent intermixing of the materials at the edges of the stock piles.

1.14. FINE AGGREGATE

Fine aggregate shall consist of clean, hard, strong and durable pieces of crushed stone, crushed gravel, or a suitable combination of natural sand, crushed stone or gravel. They shall not contain dust, lumps, soft or flaky, materials, mica or other deleterious materials in such quantities as to reduce the strength and durability of the concrete, or to attack the embedded steel. Motorised sand washing machines should be used to remove impurities from sand. Fine aggregate having positive alkali-silica reaction shall not be used. All fine aggregates shall conform to IS: 383 and tests for conformity shall be carried out as per IS: 2386, (Parts I to VIII). The contractor shall submit the entire information indicated in Appendix A of IS:383 for approval of Engineer-in-charge. In case the aggregate tested do not comply with any requirement of the specifications, the source for the same shall be rejected. No further samples from the rejected source shall normally be considered for approval

The fine aggregate shall conform to Zone II or Zone III of IS: 383 as per requirement of trial mix design (or any combination of the two as approved by Engineer-in-Charge; the decision of Engineer-in-Charge in this respect shall be final). The quality, tests and acceptance criteria for fine aggregates shall be same as per IS:383.The silt content of fine aggregate used for trial mix shall be recorded and silt content in the fine aggregate shall neither exceed 6% nor 1% more than that of the fine aggregate used in the trial mix..

Regarding storage of fine aggregate, provisions as specified for coarse aggregate shall apply.

1.15. WATER

Water to be used for mixing and curing shall be clear and free from injurious impurities like oils, acids, alkalis, salts, sugar, organic material or other substances that may be deleterious to concrete or steel. The maximum permissible limits for physical and chemical impurities shall be as per Quality Control requirements of this tender document.

The PH value of water shall not be less than six. Potable water is generally considered satisfactory for mixing/curing of concrete and other items of work. As a guide, the following concentrations represent the maximum permissible values.

- To neutralize 100 ml sample of water, using phenolphthalein as an indicator, it should not require more than 5 ml of 0.02 normal NaOH. The details of test are given in 8.1 of IS:3025 (Part 22).

- To neutralize 100 ml sample of water, using mixed indicator, it should not require more than 25 ml of 0.02 normal H2S04. The details of test shall be as given in Clause 8 of IS:3025 (Part 23).

- Permissible limit for solids shall be as under.

Sl. No.	Description of solids	Permisible Limits	Relevant Code
1	Organic	200 mg/lit.	IS:3025 (Pt. 18)
2	Inorganic	3000 mg/lit.	IS:3025 (Pt. 18)
3	Sulphates (as SO3)	400 mg/lit.	IS:3025 (Pt. 24)
4	Chlorides (as Cl)	2000 mg/lit.	IS:3025 (Pt. 32)
5	Suspended matter	2000 mg/lit.	IS:3025 (Pt. 17)

Water found satisfactory for mixing is also suitable for curing concrete; however water used for curing shall not produce any objectionable stain or unsightly deposit on the concrete surface. The presence of toxic acid or iron compounds is objectionable.

1.16. ADMIXTURES

The admixtures, if used shall comply with the requirement of IS: 9103- 1999. Admixtures shall not impair durability of concrete nor combine with constituents to form harmful compounds nor risk the corrosion of reinforcement. The contractor shall provide the following details concerning each Admixture proposed to be used, after obtaining the same from the manufacturer, for the prior approval of the Engineer-in-charge along with a copy of the Manufacturer's Test Certificate of not earlier than 6 months.

- Normal dosage and detrimental effects, if any, of under dosage and over dosage.
- The chemical names of the main ingredients in the admixtures.
- The chloride content, if any, expressed as a percentage by the weight of the admixture.
- Values of dry material contents, ash content and relative density of the admixture which can be used for Uniformity Tests.
- Whether or not the admixture leads to the entrainment of air when used as per the manufacturer's recommended dosage, and if so to what extent.
- Where two or more admixtures are proposed to be used in any one mix, confirmation as to their compatibility.
- There would be no increase in risk of corrosion of the reinforcement or other embedment as a result of using the admixture.

The suitability of all admixtures shall be verified by trial mixes of concrete with 0.5% & 1% of admixtures to ascertain compatibility between a particular cement and a particular admixture as per direction of Engineer-in-Charge no extra claim whatsoever shall be entertained on this account.

The workability, compressive strength and slump loss of concrete with and without the use of admixture shall be established during the trial mixes before use of admixture The minimum cement content specified shall not be reduced on account of the use of the Admixtures. Cost of all admixtures shall be borne by the contractor and deemed to have been included in his quoted rates of relative items stipulated in the Schedule of Quantities.

Admixture in addition to conformity to the requirement IS: 9103-1999 shall satisfy the following conditions.

- "Plasticizers" and "Super-Plasticizers" shall meet the requirements indicated for "Water reducing Admixture".

- Except where resistance to freezing and thawing and to disruptive action of deicing salt is necessary, the air content of freshly mixed concrete in accordance with the pressure method given in IS:1199 shall not be more than 2 per cent higher than that of the corresponding control mix and in any case not more than 3 per cent of the test mix.

- The chloride content of the admixture shall not exceed 0.2 per cent when tested in accordance with IS:6925. In addition, the maximum permissible limit of chloride content of all the constituents in concrete expressed as chloride-ion shall not exceed 0.10 percent for PSC and 0.20 percent for RCC by mass of cement used.

- Uniformity tests on the admixtures are essential to compare qualitatively the composition of different samples taken from batch to batch or from the same batch at different times.

The tests that shall be performed along with permissible variations in the same are indicated below:

- Dry Material Content : to be within 3 per cent and 5 per cent of liquid and solid admixtures respectively of the value stated by the manufacturer.
- Ash content: to be within 1 per cent of the value stated by the manufacturer.

Relative Density (for liquid admixtures) to be within 2 per cent of the value stated by the manufacturer.

- All tests relating to the concrete admixtures shall be conducted periodically at an independent laboratory and compared with the data given by the manufacturer.

1.17 STEEL REINFORCEMENT:

(A) Only ISI Marked TMT Bars of various grades shall be procured from Steel manufacturer as per the following guidelines:

1) All the approvals of steel manufacturers issued vide this office shall remain valid up to 31.05.2019 only.
2) The Special Director General of respective region of CPWD (NR, ER, SR, WR & NER) shall approve the steel manufacturers subject to the guidelines for eligibility criteria and other technical perameters given below. SDG (NR) shall approve the steel manufacturers for Delhi Region also.

Credentials for eligibility criteria & other technical parameters for steel manufacturers:
The manufacturer should meet the following eligibility criteria:-

a) The Steel manufacturer should have following documentary evidence:
   i) Certificate of incorporation.
   ii) Memorandum of articles of association.
   iii) Credit rating of the company from CARE/CRISIL/ICRA (the grading should not be C/D grade for minimum last 3 years).
b) The Steel manufacturer must have following licenses and certificates:
   i) ISI certificate for billets (IS 2830 : 2012).
   ii) ISI certificate for TMT Bars (IS 1786:2008 (Amendment-1 November 2012)).
c) The Steel manufacturer should also preferably have the following licenses:-
   i) ISO 9001:2015
   ii) ISO 14001:2015
   iii) OHSAS 18001:2007
d) The Steel manufacturer should be using iron ore as the basic raw material. The entire gamut of iron and steel production is owned by the same company or its subsidiary company (ies) and the iron making capacity is sufficiently matching the steel making capacity, adopting any of the refining technologies for manufacturing steel & TMT Bars as given under are eligible:
   i) BF-BOF Route
   ii) COREX-BOF Route.
   iii) DRI-EAF Route (Each Electric Arc Furnace should be 100 MT or more).
e) Billets produced must be ISI market (IS 2830-2012).
f) The TMT Bars produced must be ISI marked (IS 1786:2008).

g) The steel manufacturer should have the following in house testing facilities (NABL Accredited):
   i. Computerized Universal Testing Machine.
   ii. Spectrometer.
   iii. Bend Re-bend facility as per IS: 1786:2008 (Amendment-1, November 2012).
   iv. Raw material laboratory : Arrangement for testing Carbon, Sulphur & Phosphorous etc.
   v. Other testing facilities as specified in IS: 1786:2008 & IS: 2830:2012.

3) SDGs are also authorized to approve particular steel manufacturer on suo motto in case they are satisfied with the eligibility criteria and other technical parameters of that manufacturer.

(B) The steel reinforcing bars shall be brought to the site in bulk supply of 10 MT or more for each dia. as decided by the Engineer-in-Charge. The contractor shall produce original challan voucher for purchase of steel reinforcement from approved manufacturer as a proof of having purchased steel reinforcement from approved manufacturer.

For checking nominal mass, tensile strength, bend test, re-bend test etc. specimens of sufficient length shall be cut from each size of the bar at random, and at frequency not less than that specified below:

Sl. No.	Size of bar	Consignment	Frequency
1	Under 10 mm dia. bars	For consignment below 100 tonnes For consignment above 100 tonnes	One sample for each 25 tonnes or part thereof One sample for each 40 tonnes or part there of
2	10 mm to 16 mm dia bars	For consignment below 100 tonnes For consignment above 100 tonnes	One sample for each 35 tonnes or part there of One sample for each 45 tonnes or part there of
3	Over 16 mm dia bars	For consignment below 100 tonnes For consignment above 100 tonnes	One sample for each 45 tonnes or part there of One sample for each 50 tonnes or part there of

The contractor shall supply the required samples of reinforcing bars for testing including its transportation to testing laboratories. The cost of tests shall be borne by the contractor.

(C) Storage : The steel reinforcing bars shall be stored by the contractor at site of work about 30 cm above the ground surface in such a way as to prevent distortion and corrosion. Steel reinforcing bars of different sizes and lengths shall be stored separately and properly to facilitate easy counting and checking. The steel reinforcing bars shall be applied cement/inhibitor wash as soon as the reinforcing bars shall reach the site of work and before stacking to prevent scale and rust and nothing extra shall be paid to the contractor on this account.. The procedure for applying cement and inhibitor wash shall be as follows:-

- Cleaning of reinforcing bars by wire brush and sand blasting to remove the rust.
- Any number of reinforcing bars which is declared corroded by the Engineer-in-charge shall be removed from the site.

(D) Bending and Fixing: All reinforcement work shall be executed in conformity with the drawings supplied and instructions given by the Engineer-in-Charge and shall generally be carried out in accordance with the relevant BIS Specifications BIS: 2502- Bending and Fixing of Bars for Concrete Reinforcement. Every reinforcing bar shall be inspected before assembling on the works and any defective, brittle, excessively rusted or burnt bars or bars with crack ends shall be removed. All bars will be carefully and accurately bent by approved means in accordance with BIS: 2502, and relevant drawings. It shall be ensured that depth of crank is correct as per the bar cutting and bending schedule. Bent bars shall not be straightened for use in any manner.

(E) Consumption: Steel reinforcing bars shall be measured in length of different diameters as actually (not more than as specified in the drawings or authorized by engineer-in-charge) used in the work nearest to a centimeter. The actual issue and consumption of steel on work shall be regulated and proper account maintained as provided in clause 10 of "General conditions of contract- 2014" for CPWD works, with up to date corrections/ amendments till the last day of

the month prior to month of submission of tender". The theoretical consumption of steel reinforcing bars shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein. Payment for excess consumption of steel reinforcing bars shall not be allowed. However, for consumption lesser than the permissible theoretical variation recovery shall be made in accordance with conditions of contract without prejudice to action for acceptance of work/item at reduced rate or rejection as the case may be.

The theoretical consumption of steel reinforcing bars shall be worked out for measurement of payment. Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge. The standard sectional weights are as given below.

Sl. No.	Dia. of Bar (mm)	Weight (Kg/m)
1	6	0.222
2	8	0.395
3	10	0.617
4	12	0.888
5	16	1.58
6	18	2.00
7	20	2.47
8	22	2.98
9	25	3.85
10	28	4.83
11	32	6.31
12	36	7.99
13	40	9.85

(i) Records of actual sectional weights shall be kept dia. wise and lot wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as Derived Actual Weight.

- If the Derived Weight as in sub-para (i) above is lesser than the standard weight as in the table above then the derived actual weight shall be taken for payment.

- If the derived actual weight in sub-para (i) above is found more than the standard weight, then the standard weight as given in table above shall be taken for payment. In such case nothing extra shall be paid for the difference between the derived actual weight and the standard weight.

(F) The steel reinforcing bars brought to site and remaining unused shall not be removed from site without written permission of the Engineer-in-charge.

(G) Bar Bending Schedule : Prior to starting bar bending work, the Contractor shall prepare bar bending schedule from the structural drawings supplied to him/her and get approved from the Engineer-in-Charge in conformity with BIS: 2502. Any discrepancies and inaccuracy found by the Contractor in the drawings shall be immediately reported to the Engineer-in-Charge, so that interpretation and decision there to, shall be given. No work shall be commenced without approval the Engineer-in-Charge for bar bending schedule.

(H) Lapping: As far as possible, bars of the maximum length available shall be used. Laps shown on drawings or otherwise specified by the Engineer-in-Charge will be based on the use by the Contractor of bars of maximum length. Payment for reinforcement shall be made only for reinforcement shown in such drawings and approved bar bending schedule. The laps, chairs and spacers shall be measured for payment separately. The contractor shall quote his rate considering the component of wastage, transportation, etc. Use of couplers/grips may be permitted but nothing extra will be paid on this account.

(I) Welding: Welding of steel reinforcing bars shall generally be not accepted. Welding of reinforcing bars (including tack welding for whatever reason), other than that specified elsewhere to make provision for earthing, shall only be carried out when approved by the Engineer in Charge. Wherever specified, all lap and butt welding of bars shall be carried out in accordance with BIS:2571 using the appropriate welding materials and methods and carried out by qualified and experienced welders. The extreme non twisted end portion shall be cut off before welding. Electrodes with rutile coating should be used. Bars shall be free from rust at the joints to be welded. Slag produced in welding after alternative run should be chipped and removed by brush. Electrode should not be lighted by touching the hot bar. The welding procedure shall be approved by the Engineer-in-Charge and tests shall be made to prove the soundness of the welded connection. Some pair bars will be required to be welded with cross bars in diaphragm zone. Cost of the same is deemed to be included in the cost of reinforcement.

(J) Placement and Positioning: All reinforcement shall be placed and maintained in the positions shown on the drawings. The Contractor shall provide approved types of supports for maintaining the bars in position and ensuring required spacing and correct cover of concrete to the reinforcement as specified on the drawings. Cover blocks of required shape and size, M.S. Chairs and spacer bars shall be used to ensure accurate positioning of reinforcement. Cover blocks shall be cast well in advance and shall consist of approved proprietary pre-packaged free flowing mortars (Conbextra HF of Fosroc or equivalent). They shall be circular in shape for side cover and square for bottom cover. Alternatively, plastic cover blocks conforming to approved international codes of practice shall be used. No extra payment shall be made for cover blocks and spacers.18 SWG mild steel annealed wire shall be used for binding reinforcement. The cost of cover block and 18 SWG mild steel annealed wire shall be deemed to have been included in the rates.

(K) Projecting Reinforcement: Reinforcement left projecting from newly placed concrete shall be supported in such a way that there is no sag or risk of damage to the newly placed concrete. The projecting bars, which are likely to be exposed for a long time shall be protected by a coat of cement and inhibitor wash. These shall be thoroughly cleaned and wire brushed before depositing fresh concrete around it. No reinforcement bar shall remain

exposed or projecting out of the finished concrete surface. These shall be removed or treated in a manner as directed by Engineer-in-Charge. The unwanted projected reinforcement bars shall be cut below the finished surface and the cut end painted with cement slurry. Thereafter the surface shall be repaired to match the colour, texture or pattern of adjoining concrete to the satisfaction of Engineer-in-Charge.

(L) Mechanical couplers and anchors: Mechanical couplers or anchors shall be used as per structural drawings. Satisfactory test certificates for soundness of material, bearing capacity and elongation for both static load and fatigue stress shall be provided. For requirements regarding fatigue strength of couplers DS 411 applies. Full traceability of couplers and anchors for all stages of the production process is required. Mechanical couplers will be required for extension of some pair bars in superstructure. No extra payment shall be made for mechanical couplers/ anchors / grips as the same is deemed to be included in the quoted rate of reinforcement.

1.18. SPECIFICATION FOR READY MIX CONCRETE AND REINFORCED CEMENT CONCRETE WORKS

(A) General:-

- All items of work involving concrete and reinforced cement concrete shall be carried out using ready mix concrete procured form approved vendor dealing in manufacturing of ready-mixed concrete.
- These specifications shall be read in conjunction with MoRTH/CPWD Specifications and other relevant specifications described in Special Conditions of Contract.

(B) Grade of Concrete

- Only design mix concrete shall be used in the work for structural members. The grades of concrete for various components shall be as given in the respective items in the schedule of quantities and in the approved construction drawings. The contractor shall submit mix design for each grade of concrete and get it approved from the Engineer-in-charge at least one month in advance of commencement of item of work. Concrete mix design shall be carried out by the contractor at his own cost, through one of the following laboratories / Test houses.

- I.I.T. Delhi.
- I.I.T. Roorkee
- Delhi Technological University
- C.R.R.I. Delhi

(C) Design Mix Parameters

- The mix design for various grade of concrete shall be based on BIS 456:2000 and other applicable IS Codes.
  Design Mix proposed for ready –mixed concrete of various grades shall satisfy the following parameters:
- Cement shall be ordinary Portland Cement Conforming to BIS:812/12269 procured from the approved manufacturers,
- Maximum nominal size of aggregate shall be 20mm.
- Exposure conditions for design mix shall be moderate.
- Degree of supervision shall be taken at good.

- Maximum dose of admixture shall be limited to 1%.
- No design mix with fly ash will be allowed for RMC.
- **The Quantity of cement used in excess if any as per the design mix report against the relative agreement item shall not be payable. However quantity of cement less used shall be recoverable.**

(D) Procurement of RMC through approved venders

- The ready mix concrete of specified grade shall be procured from ACC, BIRLA, L&T, Unitech, Ultratech, and other manufacturer of RMC already approved by PWD or as approved by Engineer-in-Charge for execution of work.(The contractor shall submit the list of RMC venders for approval)

Before start of actual procurement of RMC, the following details shall be submitted for the approval of Engineer-in-Charge:

- Design mix indicating proportion of ingredients.
- Grade and brand of cement being used in design mix.
- Type of admixture and its brand name being used in design mix.
- Source of coarse aggregate and fine aggregate being used in the design mix.
- Latest test results of water, cement, admixture, coarse aggregate and fine aggregates.

(E) Sampling,Testing and Acceptance Criteria

(i) **Sampling and Testing:**

Samples from fresh concrete shall be taken as per BIS:1199 and cubes shall be made, cured and tested at 28 days in accordance with BIS:516.

(ii) Sampling Procedure:

A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units. The point and time of sampling shall be at delivery into the construction/execution, unless otherwise agreed to.

(iii) Frequency:

The minimum frequency of sampling of concrete of each grade shall be in accordance with the following Table:

Sl. No.	Quantity of Concrete in cum	Number of samples Required
1	1-5	1
2	6-15	2
3	16-30	3
4	31-50	4
5	51 and above	4 plus one additional sample for each additional 50 cum or part thereof

At least one sample shall be taken from each shift of work. A sample consists of minimum 3 numbers cubes of 150mm x 150mm x 150mm size.

(iv) Test Specimen and Sample Strength:

Additional cubes may be required for various purposes such as to determine the strength of concrete at 7 days or for any other purpose

- The variation in test result of any individual specimen should not be more than 15% of the average.

(F) Acceptance Criteria

(i) Compressive Strength

When both the following conditions are met, the concrete complies with the specified compressive strength:

- The mean strength determined from any group of four consecutive samples should exceed the specified characteristic compressive strength by at least 3 MPa.
- Strength of any sample is not less than the specified characteristic compressive strength minus 3 MPa.

(ii) Workability

The concrete mix proportions chosen shall be such that the concrete is of adequate workability for placing condition of the concrete to ensure proper compaction. Slump at the point of placing the concrete shall be at least 80 to 100mm for all concrete except for pile concrete for which minimum slump between 150mm and 200mm unless a larger slump is required for a particular structural member. Requirement of slump makes it imperative to use water-reducing admixture in order to limit the maximum water-cement ratio.

(G) Transportation, Placing and Compaction of Concrete

Ready Mixed concrete from the automatic RMC / Batching plant shall be transported to the point of placement by transit mixers and placed in position through concrete pumps and/or closed bottom steel buckets capable of carrying minimum 0.6 cum concrete. In case concrete is proposed to be transported by transit mixer, the mixing speed shall not be less than 4 rev/min. of the drum nor greater than a speed resulting in a peripheral velocity of the drum 70 m/minutes at its largest diameter. The agitating speed of the agitator shall be not less than 2 rev/min nor more than 6 rev/min of the drum. The number of revolution of the mixing drum or blades at mixing speed shall be between 70 to 100 revolutions for a uniform mix, after all ingredients, shall be charged into the drum. Unless tempering water is added, all rotation after 100 revolutions shall be at agitating speed of 2 to 6 rev/min and the number of such rotations shall not exceed 250. The general construction of transit mixer and other requirement shall conform to BIS:5892.

In case concrete is to be transported by pumping, the conduit shall be primed by pumping a batch of mortar through the line to lubricate it. Once the pumping is started, it shall not be interrupted (if at all possible) as concrete standing idle in the line is liable to cause a plug. The operator shall ensure that some concrete is always there in the pump receiving hopper during operation. The lines shall always be maintained clean and shall be free of dents.

At all stages, special precaution shall be taken about surrounding temperature during concreting that shall not exceed 30 degree centigrade.

Except where otherwise agreed to by the Engineer-in-Charge, concrete shall be deposited in horizontal layers to a compacted depth of not more than 450 mm. Unless agreed to by the Engineer-in-Charge, concrete shall not be dropped into place from a height exceeding 1.5 mtrs. In order to avoid such situations chutes, tremie pipe or closed bottom buckets shall be used. These shall be kept clean and used in such a way as to avoid segregation. Slope of the chute shall be so adjusted that concrete flows without the use of excessive quantity of water. The delivery end of chute shall be as close as possible to the point of deposit. the chute shall be thoroughly flushed with water before and after each working period and the water used for this purpose shall be discharged outside the formwork.The concrete shall be compacted by using immersion type needle vibrators. When the concrete is being continuously deposited to a uniform depth along a member, vibrator shall not be operated within one meter of free end of the advancing concrete. Every effort shall be made to keep the surface of the previously placed layer of concrete alive so that the succeeding layer can be amalgamated with it by the vibration process. In case the concrete in underlying layer has hardened to such an extent that it cannot be penetrated by the vibrator but is still fresh (that is, just after initial set), un-imposed bond shall be achieved between the top and underlying layer by first scarifying the lower layer before the new concrete is placed by systematically and thoroughly vibrating the new concrete. The points of insertion of vibrator in the concrete shall be so spaced that the range of action overlap to some extent and the freshly filled concrete is sufficiently consolidated at all locations. The spacing between the dipping positions of vibrator shall be maintained uniformly throughout the surface of concrete so that concrete is uniformly vibrated. The vibrating head shall be regularly and uniformly inserted in the concrete so that it penetrates of its own accord and shall be withdrawn slowly whilst running so as to allow redistribution of concrete in its way and allow the concrete to flow back into the hole behind the vibrator. The vibrator head shall be kept in one position till the concrete within its influence is completely consolidated. Vibration shall be continued until the coarse aggregate particle have blended into the surface but have not disappeared. The contractor shall keep at least one additional vibrator in serviceable condition to be used in the event of breakdowns and maintenance problems.

The vibrator head shall not be brought more than 200 mm near to the formwork as this may cause formation of water stagnations. The formwork shall be strong and great care shall be exercised in its assembly. It shall be designed to take up increased pressure of concrete and pressure variations caused in the neighbourhood of vibrating head, which may result in excessive local stress on the formwork. The joints of the formwork shall be made and maintained tight and close enough to prevent the squeezing out slurry or sucking in of air during vibration. The formwork to receive concrete shall be cleaned and made free from standing water, dust, etc. The contractor shall keep provision for screed and shutter vibrators at site.

No concrete shall be placed in any part of the structure until the approval of Engineer-in-Charge has been obtained. If concreting is not started within 24 hours of the approval being given, it shall have to be obtained again from the Engineer-in-Charge. Concreting shall be done continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. When concreting has to be resumed on a surface which

has hardened, it shall be roughened, swept, clean, thoroughly wetted and covered with a 13 mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself. The 13 mm layer of mortar shall be freshly mixed and placed immediately before placing of new concrete.

Where concrete is not fully hardened, all latency shall be removed by scrubbing the wet surface with wire or bristle brushes. Care shall be taken to avoid dislodgement of particles of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. Particular attention shall be given to corners and close spots.

(H) Surface Finish

The exposed surface of concrete of all grades shall be shutter finished except where form liner is used. Concrete with surface defects larger than 1/6th of the cover shall be rejected. Any special surface finish such as form liner finish of outer surface of crash barrier, shall be as per approved drawing or as directed by the Engineer-in-Charge. The quoted rates shall deemed to have included such elements and nothing extra shall be payable on this account.

All members above ground or formation level shall have shutter finished surfaces. The contractor shall ensure that Piers are cast in a single pour without any construction joint. No tie bolt shall be permitted in piers. Cast-in-situ superstructure shall be casted in single pour between the expansion joints. Utmost care shall be taken by the contractor in erection of formwork for components cast in stages if any. Location of construction joints in between such stages shall be pre-decided and all such joints shall be treated in a manner approved by the Engineer-in-charge so as to match with the surrounding concrete without leaving any visual aberration or bad patches and/or bands. The contractor shall be deemed to have included the cost of such operation in his quoted rates and no claim whatsoever shall be entertained at a later date.

The form finished concrete surfaces shall be free from honeycomb, blemishes, holes, surface defects, surface undulation etc. In no case such defects shall exceed 200 mm in any direction for individual spots or the continued area of such defects shall not exceed 0.2% of the entire area of related surface. Any variation beyond this limit shall be considered as a sub standard work and shall be liable for rejection. The Superintending Engineer-in-Charge of the work is the competent authority to accept the sub standard concrete at a reduced rate subjected to it is structurally adequate and due matching of defective patches is done by the contractor to the entire satisfaction of the Engineer-in-Charge.

Special care shall be taken to ensure that no stains are left on the formed concrete either from formwork or exposed reinforcement bars. Such stains shall be removed by the contractor so as to match with adjoining concrete surfaces to the satisfaction of the Engineer-in-Charge and nothing extra shall be paid to the contractor on this account.

(I) Curing of Concrete

Curing of concrete shall be done by continuous replenishment of loss of water from the body of concrete. Water for curing shall be free from harmful amounts of deleterious materials that may attack, stain or discolour the concrete.

Immediately after compaction and completion of concrete surface finishes, the concrete shall be protected from evaporation of moisture by means of polyethylene sheets, wet hessian or other material kept soaked by spraying of water. As soon as the concrete has attained a degree of hardening sufficient to withstand surface damage, moist curing shall be implemented and maintained for a period of at least 14 days after casting.

Method of curing and their duration shall be such that the concrete will have satisfactory durability and strength and members will suffer a minimum distortion, shall be free from excessive efflorescence and will not cause undue cracking in the works by its shrinkage.

The top surface of the slabs and other horizontal surfaces shall be cured by impounding water in cement mortar bunds. Steeply sloping and vertical formed surfaces shall be kept completely and continuously moist prior to and during the striking of formwork by applying water to the top surfaces and allowing it to pass down between the formwork and the concrete. After removal of form, moist curing to be done by wrapping hessian cloth, etc. and keeping it moist by suitable means.

Approved non-wax base curing compounds can be applied on vertical and inclined surfaces, after 7 days of moist curing, where permitted by the Engineer-in-Charge at. However it is required to be proved that using curing compound the concrete shall not have less strength than concrete cured by water curing. It shall not leave any discolouration on the structural concrete. Such approved compounds shall be applied to all exposed surfaces of the concrete and nothing extra shall be paid to the contractor on this account.

Steam curing with approved methodology can be adopted if required, for precast segments. No additional payment will be made for adopting steam curing.

At places which become inaccessible after concreting, curing with application of approved chemical compound may be required. Such curing shall be done only after obtaining the approval of Engineer-in-charge. Nothing extra will be payable on this account.

(J) Concreting of Narrow Members

Wherever the concreting of narrow member as in case of piers/ column (as adjudged by Engineer-in-Charge) is required to be carried out within shutters of considerable depth, temporary openings in the sides of the shutters shall, if so desired by the Engineer-in-charge, be provided to facilitate the pouring and consolidating of concrete. Before any concreting is commenced, shutters and cantering shall be carefully examined and the space to be occupied by the concrete be thoroughly cleaned out.The concrete in such members shall be compacted with suitable surface vibrators.

(K) PROTECTION OF CONCRETE BELOW GROUND LEVEL

Concrete placed below the ground shall be protected from falling earth during and after placing. Concrete placed in ground containing deleterious substances shall be kept free from contact with such ground and with water draining there from during placing and for a period of seven days or as otherwise instructed thereafter. Approved means shall be taken to protect immature concrete from damage by debris, excessive loading, abrasion, vibrations, deleterious ground water, mixing with earth or other materials, and other influences that may impair the strength and durability of the concrete.

(L) CONSTRUCTION JOINTS

Before hardening of concrete surfaces of construction joints, all latency shall be removed by scrubbing the green concrete surfaces with wire or bristle brushes. Care shall be taken to avoid dislodgement of particles of coarse aggregate. Before re-concreting at the construction joints, the surface shall then be thoroughly wetted, all free water removed, apply coat of neat cement grout. Particular attention shall be given to corners and close spots.

Construction joints in all concrete work shall be made as directed by the Engineer-in-Charge. Where vertical joints are required, these shall be shuttered as directed and not allowed to take the natural slope of the concrete. Before fresh concrete is placed against a vertical joint, the old concrete shall be chipped, cleaned and moistened.

When a horizontal construction joint is formed, provision shall be made for interlocking with the succeeding layer by the embedment of saturated wooden blocks or wooden strips beveled on four sides to facilitate their removal. Prior to the next pour the wooden pieces shall be loosened and removed in such a manner as to avoid injury to the concrete. After about 8 to 12 hours of concreting, contact surface shall be hacked to expose the aggregate surface and remove laitance. Immediately thereafter clean the surface using compressed air to remove all the dirt. The surface shall then be compressed cleaned to remove all dirt. Before applying fresh concrete, the contact surface shall be wetted for at least 6 hours. After the surface has dried, coat of approved solvent free epoxy resin such as Nitobond-EP of Fosroc or equivalent shall be brush or spray-applied as per manufacturer's recommendation. Coated substrate shall be left to dry as specified. The fresh concrete shall be placed afterward. Nothing extra shall be payable on this account. The fresh concrete shall be thoroughly vibrated near the construction joint so that the mortar from the new concrete flows between the large aggregate and develop proper bond with old concrete. The construction joint shall ensure proper bond and leak proof joint.

If use of metal, rubber or plastic water stops is specified, this shall be cast into joints. Measures shall be taken by the Contractor to ensure that no displacement or distortion of water stops takes place during placing of concrete. The construction joints shall ensure proper bond and leak proof joint.

(M) DEFECTS IN CONCRETE

(i) CRACKS

If external cracks developed in concrete construction are more than 0.2 mm and in the opinion of the Engineer-in-Charge, these are detrimental to the strength of the construction, the Contractor at his own expense will conduct 'Loading Tests' on the structure in the manner as specified elsewhere in this document. If under such test loads the cracks develop further, the Contractor shall dismantle the construction, carry away the debris, replace the construction and carry out all consequential work thereto.

If any cracks develop in the concrete construction are not more than 0.2 mm or in the opinion of the Engineer-in-Charge, the cracks are not detrimental to the stability of the construction, the Contractor at his own expense shall grout the cracks with neat cement grout or with other composition as directed by Engineer-in-Charge and also at his own expense and risk shall make good to the satisfaction of the Engineer-in-Charge all other works such as plaster, moulding, surface finish, which in the opinion of the Engineer-in-Charge have suffered damage either in appearance or stability owing to such cracks. The Engineer-in-Charge's decision as to the extent of the liability of the Contractor in the above matter shall be final and binding.

(ii) HONEYCOMBING

If any concrete be found honeycombed or in any way defective, such concrete shall be cut out partially or wholly by the Contractor as per the directions of the Engineer-in-charge and made good at his own risk and cost using pressure grouting or any other technique. If Engineer-in-Charge feels that repaired structure will not be having same strength or shape or uniformity with other exposed surface as original desired structure / original structure, the same shall be rejected by Engineer-in-Charge and required to be dismantled and disposed by contractor at his own cost as instructed by Engineer-in-Charge. Decision of the Engineer-in-Charge shall be final binding in this regard.

In no case concrete surfaces shall not be patched or covered up or damaged concrete rectified or replaced until the defective work inspected by the the Engineer-in-Charge or his representative and the written instructions for rectification of defect do not issued. Failure to observe this procedure will render that portion of the work liable to rejection. Contractor shall submit methodology for rectification of defects for approval. Proprietary products for concrete repair shall be used.

1.19 SHUTTERING, FORMWORK ETC. :

- GENERAL

Form work shall include all temporary or permanent forms required for forming required size, shape, line, level, position and surface finish of concrete/ RCC members as shown on drawing or as directed by Engineer-in-charge together with all props, staging, centring, scaffolding and temporary construction required for their support. The design, erection and removal of form work shall conform to IRC:87 2011 :Guidelines for Design and Erection of False work for Road Bridges" and there specifications.

Steel form work or any other internationally accepted "System Form work" shall only be used for concrete work to produce a smooth and uniform finish on all exposed surfaces. The entire responsibility of planning, designing, erection, dismantling, safety and shifting of false work lies with the contractor. Individual steel shuttering plates shall have minimum size 0.90m x 1.50 m (minimum area 1.35 sqm) except in the matching pieces, piers and smaller components. Formwork shall be made out of minimum 5 mm thick M.S. Plates with stiffeners (thickness not less than 5mm) or as per design approved by Engineer-in-charge. Planning and design of formwork shall be got approved from the Engineer-in-charge prior to actual mobilisation and use. All piers shall be cast in one operation and the formwork shall be planned and provided accordingly. All members above ground or

formation level shall have shutter finished surfaces. The outer surface of the crash barriers shall have form liner finish of design and pattern as approved by the Engineer-in-charge. Recklli from liner or equivalent shall be used for form liner finish. Nothing extra shall be paid on account of form liner finish as such finish is deemed to be included in the quoted rate/ amount of the contractor.

(i) DESIGN OF FORMWORK

All temporary works shall be designed/constructed so that the concrete can be properly placed and thoroughly compacted to obtain the required size, shape, line, level, position subject to specified tolerances. All temporary works such as formwork, false work, staging, launching girder scheme etc. shall be designed by the Contractor and submitted to the Engineer-in-charge at least 30 days in advance for approval. Any improvement to shuttering, staging and its supporting system as suggested by Engineer-in-charge shall be binding on the contractor without any extra cost. The approvals by Engineer-in-charge, however, do not absolve the contractor of his full and final responsibility towards the safety and serviceability of the staging and formwork as well as men and equipment working on them during the preliminary works before concreting, during concreting and afterwards. Shutters shall be water tight and fixed in perfect alignment and securely braced so as to be able to withstand, without any displacement, deflection or movement of any kind, the loads due to the pressure of concrete, the movement of construction personnel, materials and plant.

(ii) FORMWORK FOR EXPOSED CONCRETE SURFACES

Exposed concrete surfaces shall be smooth and even, originally as stripped without any finishing or rendering. For the form finish required for the exposed work like pier, outer face of crash barrier, care shall be taken to maintain a single source of the raw material for concreting to achieve a uniform colour. The Contractor shall exercise special care and supervision of formwork and concreting to ensure that the cast members are made true to their sizes, shapes and positions and to produce the surface patterns desired. Contractor shall ensure that no air bubbles are formed on the exposed surface. Concrete pouring sequence, surface vibration methodology etc. shall be planned to avoid air bubbles. A full scale mock-up trial shall be carried out, to ensure feasibility of form liner finish of crash barrier. The cost of such incidental works will be deemed to be included in the quoted rates by the contractor for different items.

All the formwork and launching truss and other selected temporary works shall be tested for the load including factor of safety for which the truss/formwork is designed before use in works. The design of false work should be such as to facilitate easy and safe access to all parts for proper inspection.

Methodology for removal of form should be planned as a part of total form work design.
In case of pre-stressing concrete, careful consideration shall be given to re-distribution of loads due to pre-stressing.

(iii) PRE-ASSEMBLY OF FORMWORK

It shall be obligatory on the part of the contractor to pre assemble the formwork for walls, slabs, diaphragms, crash barrier etc. on ground prior to actual use. The contractor shall

arrange for all material, labour, facilities, etc. to facilitate first hand checking and carry out necessary modifications as required for making the formwork true to line level and shaping at no extra cost. However, the contractor shall be responsible for the correctness of the formwork when erected in position finally. Despite the pre-inspection, the contractor will continue to be wholly responsible for producing the required surface finish. The formwork shall be load tested for the probable anticipated loads before the same is put to actual use, at the direction of Engineer-in-charge. However, load testing of formwork shall not relieve the contractor of his responsibility for safety and serviceability. The cost of all such operations will be deemed to be included in the quoted rates of different items by the contractor.

The following shall apply to all formwork :

- To avoid delay and unnecessary rejection, the Contractor shall obtain the approval of the Engineer-in-Charge for the design of forms and the type of material used before fabricating the forms.

- All shuttering planks and plates shall be adequately backed to the satisfaction of the Engineer-in-Charge by a sufficient number and size of walers or framework to ensure rigidity during concreting. All shutters shall be adequately strutted, braced and propped to the satisfaction of the Engineer-in-Charge to prevent deflection under deadweight of concrete and superimposed live load of workmen, materials and plant, and to withstand vibration.

- Vertical props shall be supported on wedges or other measures shall be taken where the props can be gently lowered vertically during removal of the formwork. Props for an upper level shall be placed directly over those in the level immediately below, and the lowest props shall bear on a sufficiently strong area. Care shall be taken that all formwork is set plumb and true to line and level or camber or better where required and as specified by the Engineer-in-Charge.

- Provision shall be made for adjustment of supporting struts where necessary. When reinforcement passes through the formwork care should be taken to ensure close fitting joints against the steel bars so as to avoid loss of fines during the compaction of concrete.

- If the formwork is held together by bolts, these shall be so fixed that no iron will be exposed on surfaces against which concrete is to be laid. In any case wires shall not be used with exposed concrete formwork. The Engineer-in-Charge may at his discretion allow the Contractor to use tie-bolts running through the concrete and the Contractor shall decide the location and size of such tie-bolts in consultation with the Engineer-in-Charge. Holes left in the concrete by these tie-bolts shall be filled as specified by the Engineer-in-Charge at no extra cost.

- Provision shall be made in the shuttering for beams, columns, and walls for a opening of convenient size so that all extraneous materials that may be collected could be removed just prior to concreting.

- Formwork shall be so arranged as to permit removal of forms without jarring the concrete. Wedges, clamps and bolts shall be used wherever practicable instead of nails.

- The formwork for beams and slabs shall be so erected so that forms on thesides of the beams and the soffit of slabs can be removed without disturbing the beam bottoms or props under beams.

- Surfaces of forms in contact with concrete shall be oiled with a mould oil of approved quality/ form releasing agent. If required by the Engineer-in-Charge the contractor shall execute different parts of the work with different mould oils to enable the Engineer-in-Charge to select the most suitable. The use of oil which results in blemishes of the surface of the concrete shall not be allowed. Oil shall be applied before reinforcement has been placed and care shall be taken that no oil comes in contact with the reinforcement while it is being placed in position. The formwork shall be kept thoroughly wet during concreting and the whole time that is left in place. Nothing extra shall be paid to contractor for oiling.

- Immediately before concreting is commenced, the formwork shall be carefully examined to ensure the following:
- Removal of all dirt, shavings, sawdust and other refuse by brushing and washing.
- The tightness of joints between panels of sheathing and between these and any hardened core.
- The correct location of tie bars, bracing and spacers, and especially connections of bracing.
- That all wedges are secured and firm in position.
- That provision is made for traffic on formwork not to bear directly on reinforcing steel.
- The Contractor shall obtain the approval of the Engineer-in-Charge for dimensional accuracies of the work and for the general arrangement of propping and bracing. All scaffolding and staging shall be either of steel tubes or built up section of rolled steel with adequate bracing at several levels in each perpendicular direction connecting each prop. In addition to this, diagonal bracing should be provided in elevation ideally at 45° or between 30° and 60°. The Contractor shall be entirely responsible for the adequacy of propping, and for keeping the wedges and other locking arrangements undisturbed through the de-centring period.
- Formwork shall be continuously watched during the process of concreting. If during concreting, any weakness develops and formwork shows any distress, the work shall be stopped and remedial action, as directed by the Engineer-in-Charge, shall be taken.

- PERMISSIBLE TOLERANCES

  The formwork shall be so made as to produce a finished concrete, true to shape, lines, levels, plumb and dimensions as shown on the drawings subject to the following tolerance for in-situ casting unless otherwise specified or shown in drawings or directed by the Engineer-in-charge.

• Sectional dimension		± 5mm
• Plumb		+ 1 in 1000 of height
• Levels		3 mm (before any deflection has taken place)
• Overall Length		shall not exceed 10mm or 0.1% of the span length, whichever is lesser
• Permissible surface irregularity	-	5mm when measured with a 3m straight edge or template

The tolerances given above are specified for local aberrations in the finished concrete surface and should not be taken as tolerance for the entire structure taken as a whole or for the setting and alignment of formwork, which should be as accurate as possible to the entire satisfaction of the Engineer in charge. Errors, if noticed, in any lift/tilt of the structure after stripping of forms, shall be corrected in the subsequent work to bring back the surface of the structure to its true alignment provided always that prior approval of the Engineer-in-charge shall be obtained in respect of acceptability of such corrective measures without affecting the component structurally or aesthetically.

Tubular steel props, shores, bracing or similar rigid material approved by the Engineer-in-charge shall be used for shuttering, scaffolding and staging.

- PREPARATION OF FORMWORK BEFORE CONCRETING

The inside surfaces of forms shall, except in the case of permanent formwork or where otherwise agreed to by the Engineer-in-Charge be coated with an approved form release agent to prevent adhesion of concrete to the formwork. Release agents shall be applied strictly in accordance with the manufacturer's instructions and shall not be allowed to come into contact with any reinforcement or pre-stressing tendons and anchorages. Different release agents shall not be used in formwork for concrete which will be visible on the surface of finished works.

Formwork shall be tight enough to prevent any loss of cement slurry during concreting and vibrations. For this purpose, use of silicon putty, foam or any other approved material may be made to ensure the water tightness. Immediately before concreting, all forms shall be thoroughly cleaned.

Contractor shall give due notice to the Engineer-in-charge before placing any concrete in the forms to inspect and accept the formwork as to their strength, alignment and general fitness, but such inspection shall not relieve the contractor of this responsibility for safety of men, machinery, materials and for result obtained.

- REMOVAL OF SHUTTERS

The minimum time period for the removal of formwork shall as per section 1508 of MoRTH Specifications for Road and Bridge Works (5th Revision 2013). The Engineer-in-Charge may vary the periods specified, if he considers it necessary. Immediately after the forms are removed, they shall be cleaned with a jet of water and a soft brush. Where directed by the Engineer-in-Charge, the surface shall be rubbed with carborundum stone immediately on stripping the forms.

The work of form work removal should be planned and a definite scheme of operation worked out. Formwork shall be removed carefully without jarring the concrete, and curing of the concrete shall be commenced immediately. Concrete surfaces shall,be rubbed down with carborundum stone or bush-hammer to obtain a smooth and even finish where required by the Engineer-in-Charge,. Where the concrete requires plastering or other finish later, the concrete surface shall be immediately hacked lightly all over as directed by the Engineer-in-Charge. No extra payment shall be made to the Contractor for such work on concrete surfaces after removal of forms. The consent of the Engineer-in-Charge shall be obtained in writing in all cases before removing any shuttering. The contractor shall

intimate the Engineer-in-Charge well in advance to enable him to inspect the concrete, if he so desires. The contractor shall record in any approved manner, the date on which concrete is placed in each part of the work and the date on which the formwork is removed there from and have this record checked and counter signed by the Engineer-in-charge. The contractor shall be responsible for the safe removal of the formwork and any work showing signs of damage due to premature removal of formwork or loading shall be rejected and entirely reconstructed by the Contractor.Nothing extra shall be paid to the contractor on this account. The Engineer-in-Charge may, however, instruct to delay the removal of formwork if he considers it necessary and no claim whatsoever shall be entertained on this account.

- REUSE OF FORMS

Before reuse, all forms shall be thoroughly scrapped, cleaned, joints and planes examined and when necessary / repaired and inside surface treated as specified herein before. Formwork shall not be used / reused if declared unfit or unserviceable by the Engineer- in-charge. Nothing extra or any claim whatsoever shall be admissible on this account.

The contractor shall make good at his own expenses any injury to the concrete work and any damage caused by, or arising from the removal and striking of shutters and supports. Notwithstanding conditions and requirements mentioned in the foregoing paragraphs the shuttering should be such that all concrete work remains shutter finished as per pattern approved by the Engineer-in-charge.

1.20 ROAD WORK

- Sub-Grade Construction

It shall be ensured prior to actual execution that the borrow area material to be used in the sub-grade satisfies the requirements of design CBR (not less than 5%, under soaked condition). For the purposes of specifications, the top 500mm thick layer of filling in the embankment (just below the sand drainage layer) over the entire formation width and directly supporting the road pavement will be termed as ‘sub-grade’.
Sub-grade shall be compacted and finished to the design strength consistent with other physical requirements. The actual laboratory CBR values of constructed sub-grade shall be determined on re-moulded samples. IRC: 37-2012 shall be referred to for details.

The 500mm thick of the sub-grade shall be compacted to achieve at least 97% of MDD at OMC.

- Granular Sub-Base Course

This work shall consist of laying and compacting well-graded material on prepared sub-grade in accordance with the requirements of these Specifications. The material shall be laid in one or more layers as sub-base or lower sub-base and upper sub-base (termed as sub-base hereinafter) as necessary according to lines, grades and cross- sections shown on the drawings or as directed by the Engineer-in-Charge.

The granular sub-base (GSB) material shall be closed graded of grading as mentioned in BOQ, conforming to the requirements of as per relevant clause of MORTH, Specifications for Road and Bridge Works (5th Revision).

- Wet Mix Macadam Base Course

  The work shall consist of laying and compacting clean, crushed, graded aggregate and granular material premixed with water, to a dense mass on a prepared sub-grade/sub-base/base or existing pavement as the case may be in accordance with the requirements of these specifications. The material shall be laid in one or more layers as necessary to lines, grade and cross section shown on the approved drawings or as directed by the Engineer-in-charge. The laying of WMM layer shall be done using paver only.

  The wet mix macadam base course shall satisfy the requirements as per relevant clause of MORTH, Specifications for Road and Bridge Works, 2013.

- Bituminous Work

  All the bituminous mixes shall be prepared using batch type hot mix plant. The contractor shall have to necessarily deploy self-propelled paver with electronic sensor having suitable hydraulically operated screeds capable of spreading, tamping and finishing the mix true to the specified lines, grades and cross sections of the road. The paver finisher shall have the following essential features:

- Loading hoppers and suitable distributing mechanism.

- All drives having hydrostatic drive/control.

- The machine shall have a hydraulically extendable screed for appropriate width requirement.
- The screed shall have tamping and vibrating arrangement for initial compaction to the layer as it is spread without rutting or otherwise marring the surface. It shall have adjustable amplitude and variable frequency.

- The paver shall be equipped with necessary control mechanism so as to ensure that the finished surface is free from surface blemishes.

- The paver shall be fitted with an electronic sensing device for automatic levelling and profile control within the specified tolerances.

- The screed shall have the internal heating arrangement.

- The paver shall be capable of laying 2.5 to 4.0 m width in service road and 4.0 to 7.0m width on main carriageway as per site requirement.

- The paver shall be so designed as to eliminate skidding/slippage of the tyres during operation.

- The contractor shall have to necessarily deploy the road rollers, for BM, DBM & BC for their compaction as per relevant clause of MORT&H specifications.

Mix shall be prepared in a computerised hot mix plant of adequate capacity and capable of yielding a mix of proper and uniform quality with thoroughly coated aggregate. Hot Mix Plant shall be preferably of batch mix type with electronic load sensor device. The requirement as per relevant clause of MORTH specifications shall be strictly adhered to.

(i) Prime Coat

The work shall consist of the application of a single coat of low viscosity liquid bituminous material to a porous granular surface preparatory to the superimposition of bituminous mix material. The work shall execute in accordance as per relevant clause of MORTH specifications for Road & Bridge works 2013.

The emulsified bitumen for prime coat shall be medium setting conforming to IS: 8887-2004. The bitumen emulsion shall be brought at site in one lot in sealed drums and shall be got verified and checked by the representative of Engineer-in-Charge before its use. After priming coat the road can be opened to the traffic as directed by the engineer in charge.

(ii) Tack Coat

The work shall consist of application of single coat of low viscosity liquid bituminous material to an existing road surface preparatory to another bituminous construction over it. The binder used for tack coat shall be bitumen of suitable grade as specified in nomenclature of item.

- The emulsified bitumen for tack coat on road shall be medium setting bitumen emulsion) type conforming to IS: 8887.The bitumen emulsion shall be brought at site in one lot in sealed drums and shall be got verified and checked by the representative of Engineer-in-Charge before its use. The work shall be done strictly in accordance as per relevant clause of MORTH specifications for Roads & Bridges work (Fifth Revision), 2013.

- Cleaning and Preparation of the Surface: The surface on which the tack coat is to be applied shall be clean and free from dust, dirt and any extraneous material and be otherwise prepared in accordance with the requirements of clauses 501.8 and 902 as appropriate. Immediately before the application or the tack coat, the surface shall be swept clean with a mechanical broom and high pressure jet or by other means as directed by the Engineer-in-Charge.

(iii) Bituminous Macadam

The work shall consists of constructing a single layer of specified compacted thickness of bituminous macadam having crushed stone aggregate premixed with bituminous binder on a previously prepared base to the requirement as per relevant clause of MORTH specifications for Road & Bridge works (Fifth Revision) 2013 and as directed by the Engineer-in-Charge.

- Material

- Bitumen
  Bitumen shall confirm to grade and quantity as specified in nomenclature of item.

- Aggregate
  Aggregate shall consists of crushed stone aggregate as laid down as per relevant clause of MORTH specifications for Road & Bridge works (5th revision). The grading shall conform to grading 2 of Table 500-7.

- Rate
  The contract unit rate for the Bituminous Macadam shall be payment in full for carrying out all the required operations as specified, and shall include, but not necessarily limited to all component listed as per relevant clause of MORTH specifications for Road & Bridges (Fifth revision) 2013. The rate shall include the provision of bitumen of grade VG 30@ 3.5% by weight of total mix with provision that variation of quantity on minus side is not acceptable. However, no extra payment would be admissible for use of bitumen if the variation is on higher side i.e. beyond 3.5% of weight of total mix.

(iv) Dense Bituminous Macadam

The work shall consists of constructing dense bituminous macadam in one/two layers of specified compacted thickness having crushed stone aggregate premixed with bituminous binder on a previously prepared base to the requirement as per relevant clause of MORTH specifications for Road & Bridge works (Fifth Revision) 2013 and as directed by the Engineer-in-Charge.

- Material

- Bitumen
  Bitumen shall confirm to grade and quantity as specified in nomenclature of item.

- Aggregate
  Aggregate shall consists of crushed stone aggregate as laid down as per relevant clause of MORTH specifications for Road & Bridge works . The grading shall conform to grading of Table 500-10

- Filler
  Filler shall consist of hydrated lime of grade & specification conforming as per relevant clause of MORTH specifications for Roads & Bridges.

- Rate
  The contract unit rate for the Dense Bituminous Macadam shall be payment in full for carrying out all the required operations as specified, and shall include, but not necessarily limited to all component listed as per relevant clause of MORTH specifications for Road & Bridges (Fifth revision) 2013. The rate shall include the provision of bitumen of grade VG 30 @ 5.0% by weight of total mix with provision that variation of quantity on minus side is not acceptable. However, no extra payment would be admissible for use of bitumen if the variation is on higher side i.e. beyond 5% of weight of total

(v) BITUMINOUS CONCRETE
The work shall consists of constructing wearing surface with single layer of bituminous concrete of specified compacted thickness having crushed stone aggregate premixed with bituminous binder on a previously prepared base to the requirement laid as per relevant clause of MORTH specifications for Road & Bridge work (5th Revision) complete in all respects and as per directions of Engineer-in-Charge.

- Material

- Bitumen
  Bitumen shall confirm to grade and quantity as specified in nomenclature of item.

- Aggregate
  Aggregate shall consists of crushed stone aggregate as laid down as per relevant clause of MORTH specifications for Road & Bridge works . The grading shall conform to grading of Table 500-10 and Table 500-35.

- Filler
  Filler shall consist of hydrated lime/Stone dust of grade & specification conforming as per relevant clause of MORTH specifications for Roads & Bridges.

- Rate
  The contract unit rate for the bituminous concrete shall be paid in full for carrying out all the required operations as specified, and shall include, but not necessarily limited to all component listed as per relevant clause of MORTH specifications for Road & Bridges (Fifth revision) 2013. The rate shall include the provision of VG 40 Bitumen @ 5.50% by weight of total mix with provision that variation of quantity on minus side is not acceptable. However, no extra payment would be admissible for use of bitumen if the variation is on higher side i.e. beyond 5.50% of weight of total mix.

(v) STONE MATRIX ASPHALT (SMA)

The work shall consists of constructing wearing surface with single layer of fibre stabilised Stone Matrix Asphalt (SMA) of specified compacted thickness having crushed stone aggregate premixed with bituminous binder on a previously prepared base to the requirement laid as per relevant clause of MORTH specifications for Road & Bridge work (5th Revision) complete in all respects and as per directions of Engineer-in-Charge.

- Material

- Bitumen
  Bitumen shall confirm to grade and quantity as specified in nomenclature of item.

- Aggregate
  Aggregate shall consists of crushed stone aggregate as laid down as per relevant clause of MORTH specifications for Road & Bridge works . The grading shall conform to grading of Table 500-10 and Table 500-35.

- Filler
  Filler shall consist of hydrated lime/Stone dust of grade & specification conforming as per relevant clause of MORTH specifications for Roads & Bridges.

- Stabilizer Additive
  Stabilizer additive shall consist of pelletized cellulose fibres. Grade, specification, dosage etc should conform as per relevant clause of MORTH specifications for Roads & Bridges.

- Rate

  The contract unit rate for the Stone Matrix Asphalt shall be payment in full for carrying out all the required operations as specified, and shall include, but not necessarily limited to all component listed as per relevant clause of MORTH specifications for Road & Bridges (Fifth revision) 2013. The rate shall include the provision of VG 30 Bitumen @ 6.00% by weight of total mix with provision that variation of quantity on minus side is not acceptable. However, no extra payment would be admissible for use of bitumen if the variation is on higher side i.e. beyond 6.00% of weight of total mix.

1.21 Road Marking Work with Thermoplastic paint

The road marking work shall be carried out as per relevant clause of MORTH specifications for Road and Bridge Works (Fifth Revision) 2013 with upto date correction slip.

1.22 OVERHEAD SIGNS

- The work shall be carried out as per agreement item, as per clause 801 (but using sheet for the road signages of un-metalized micro prismatic retro reflective element material (Type-XI of ASTM : D4956-11a), as per relevant clause of MORTH specifications for Road and Bridge Works (Fifth Revision) 2013 with up to date correction slip and as per direction of Engineer-in-Charge.

TESTING OF RETRO REFLECTIVE SHEET IN LOCAL LABORATORY

Every lot of the sheets to be used in the work shall be got tested for following tests from CRRI or any approved independent test house and the entire cost on account of cost of sample, it's packing and carriage to laboratory & other incidental charges etc., shall be borne by the contractor. Testing charges, if any, shall be borne by the department provided that if the test results are satisfactory otherwise the same shall also be borne by the contractor. Results of such tests shall be binding upon the contractor.

- Coefficient of Retro Reflection.
- Dry time colour& luminous.
- Removability of liner.
- Specular Gloss.
- Flexibility.
- Shrinkage.
- Impact Resistance.
- Resistant to accelerated weathering.
- Colour fastness
- Appearance.
- Reflective Intensity.
- Adhesion.
- Reflective intensity during rainfall after accelerated weathering.
- Adhesion.

One sample of each type of sign boards material shall be got tested from CRRI or some approved independent test house as approved by competent authority after completion of second, third and seventh year of installation of the sign boards at site to observe the performance of high intensity Retro Reflective Sheeting, Transparent film, screen printed or cut out letters/legends etc. The results shall be compared with the provisions of ASTM-D-

4956-07. Necessary facility/means including carriage to the test house, cost of the samples, other incidental charges, if any, making arrangement for lowering down, etc. shall be provided by the contractor at his own cost. Testing charges, if any, shall be borne by the department provided the material passes the test, otherwise the same shall be borne by the contractor. Result of such tests shall be binding upon the contractor.

Fabrication of Signages

- The signages shall be fabricated in the manner as specified in the description of respective item of work in the schedule of quantity.
- The M.S. angle iron/Tubular frame work for the signages shall be fabricated in accordance with CPWD Specification-2009.
- The surface of the ACP substrate to receive the retro reflective sheeting shall be thoroughly cleaned, descaled, dusted and degreased before the sheeting is laid over the same.
- To the extent possible, there shall be no joints in the retro reflective sheet laid for signages. However, in unavoidable circumstances, joints can be allowed with prior approval of Engineer-in-Charge. Over lapping in such cases shall not be less than 5mm.

1.23 FOUNDATIONS:

Mainly the following type of foundations shall be adopted.

- Open Foundations with normal excavation

- OPEN FOUNDATIONS WITH NORMAL EXCAVATION

The quoted amount of the contractor also includes ripping and breaking open of road or pavement or any other obstruction met with and all operations and incidental charges, etc. complete. The balling out of all sorts of water including rain water, seepage water, sewage/sludge mixed water etc. or dewatering for lowering the ground water table required for construction is included in the scope. No separate payment for dewatering shall be payable.

The contractor shall follow the specifications as given below in addition to contract provisions/MORTH Specifications.

- The contractor shall ensure all benchmarks and reference points likely to be disturbed during excavation are protected or transferred appropriately to enable their subsequent use. The excavations shall be done with safer slopping sides as approved by the Engineer-in-charge.

- The initial depth of excavation shall be done manually, if presence of underground utilities is suspected. Machine excavation can be resorted to for the remaining depth only with the permission of the Engineer-in-charge. The excavation shall proceed from the middle of the cut towards the walling so that the unsupported period to which the walling is exposed is the minimum. The last 0.5m of excavation shall be taken up only after full arrangements for laying the base concrete have been made. After the excavation is completed to the final level, the base shall be prepared by dressing; ramming consolidating and then base concrete shall be laid and compacted. It shall be ensured that at no time, the bottom of the cut is left exposed in the final level for long duration.

- During excavation, if water percolation takes place through the joints in the trench walling, the contractor shall take remedial measures either by grouting or by caulking or plastering as approved by the Engineer-in-charge. The contractor shall take remedial measures to stop such percolation. The idea is to keep the trench in as dry condition as possible and to avoid loss of soil due to such percolation. The water through the walling should be completely eliminated. If despite the precautions taken, there is water percolation and water is required to be pumped out, the contractor shall make arrangements to lead the water by appropriate

  surface drain to a convenient sump from where the same could be pumped out. The quoted rate includes all the expenses incurred in stopping water percolation and also includes the cost of arrangement for provision of sumps in the cut and collection of seepage and all sorts of other water such as rain waters, flood water, sewage or sludge mixed waters etc. towards the sumps.

- The Contractor shall be required to maintain the water table over the entire area and in the vicinity of the foundation at 300mm or more below the bottom level of the foundation at the lowest point of the same so that the dry working surface is available until the foundation is completed. Thereafter, the water table can be allowed to rise to its natural level. The Contractor shall also ensure that there is no danger to nearby properties and installations on account of such lowering of the water table. If needed, suitable measures shall be taken by the Contractor at no extra cost. The quoted amount of the contractor shall be deemed to be inclusive of such incidental works. In trenches where surface water is likely to get into cut during monsoon a ring bund of puddle clay shall be formed outside to the required height and maintained at no cost to the department. The contractor shall also take steps to prevent back inflow of pumped water.

- The contractor shall arrange to stack separately at locations or at dumping areas indicated by the Engineer-in-charge, the excavated materials which are fit for use for back filling at no extra cost being paid for such stacking. Spoils from excavation shall be disposed off in the nearby authorized dumping yard of local body as per the directions of the Engineer-in-charge.

- Any special treatment for improving the soil qualities to stabilize bottom against heaving conditions by way of any chemical or quick lime treatment in advance excavation if ordered by the Engineer-in-charge shall be paid for separately. Similarly any grouting of soil-mass, if considered to prevent subsidence, will be paid for separately.

- For open foundation resting on rock, if the sound rock is located at very shallow depth, the contractor is required to cut the rock (of all type or strength) to a depth so that open foundation with a minimum earth cushion of 500mm can be accommodated. However, in some cases cutting in rock will also be required to have required flexibility of piers as directed by Engineer-in-charge. Excavation of rock may be carried out by chiseling, jack hammers, crow bars, wedging and using cutting machine or by any other method approved by the Engineer-in-Charge. Use of non-explosive demolition compounds shall also be permitted.

- Excavation for all works and of materials required for filling shall be to the exact width, length and depth shown on the drawings or as directed by the Engineer-in-Charge. Where the nature of soil or the depth of the trench and season of the year, do not permit vertical sides, the contractor at his own expense shall put up the necessary shoring, strutting and planking with due regard to the safety of personnel and works and to the satisfaction of the Engineer-in-Charge. If required, driving of rolled section / sheet pile of suitable size to be done into the soil to retain earth as directed by Engineer-in-Charge at his own expense.

- If excavation is carried out to greater depth than required beyond the level specified, for any reason whatsoever, such volume shall be made good by filling with PCC M15 having coarse aggregates 40 mm and downgraded and brought to level to receive the levelling course below foundations. If excavation is carried out to greater width and length, such extra width and length shall be filled in by well consolidated earth / sand or if the Engineer-in-Charge thinks it is necessary for the stability of the work, by masonry or concrete as he may direct. Nothing extra shall be payable on this account.

  Propping shall be undertaken when any foundation or stressed zone from an adjoining structure is within a line of 1 vertical to 2 horizontal from the bottom of the excavation. No extra payment shall be made on this account.

- The Contractor shall, at the contract rates make provision for all shoring, dewatering, dredging, bailing out or draining water whether subsoil or rain or other water and the excavation shall be kept free of water while the masonry work or concrete work is in progress and until the Engineer-in- Charge considers the work well set (Refer IS:3764 Safety Code for Excavation Work). Dewatering shall be carried out by suitable means with adequate stand-by arrangements as may be approved by the Engineer-in-Charge. The level of ground water shall be maintained at least 300mm below the lowest level of excavation during the laying of foundations. The Contractor shall be deemed to have satisfied himself with regard to feasibility of all aspects of dewatering including site constraints due to existing structures. Though the method of dewatering is left to the contractor, he shall be required to submit method statement of dewatering scheme including requisite justifications to the Engineer-in-Charge and seek his prior written approval. Approval of the Engineer-in-Charge, however shall not relieve the contractor of the responsibility of adequacy and appropriateness of dewatering and protection arrangements for the quality and safety of the work. The contractor shall satisfy the Engineer-in-Charge as to the capacity of the drains or disposal site to take the required quantity and flow of water to be pumped out at various stages of excavation. The Contractor shall obtain necessary approvals of local bodies for discharging the pumped out water. All the dewatering pumps shall therefore also have dedicated D.G. Power supply which shall come on automatically in case of failure of electrical supply from the mains. Monitoring of water table shall be done using electronic probes located at least one each of the four corner of excavation.

- The Contractor shall erect and maintain during progress of works temporary barricading with all safety measures around dangerous excavations at contractor's cost. The contractor shall take all adequate protective measures to see that excavation operations do not affect or damage adjoining structures.

- The Contractor shall intimate to the Engineer-in-Charge when the excavation is completed and no base or Concrete shall be laid until the Engineer-in-Charge has inspected and approved of the soil conditions obtained for each individual footing or the full raft area.

- In case any underground structures that need to be protected (like underground sewer lines etc.) are encountered, the Contractor shall bring the same to the notice of the Engineer-in-Charge immediately and shall take all such steps as the Engineer-in-Charge may instruct for protection of such structures. Such protective measures shall be done at the Contractor's cost. If any damage occur to such items which were required to be protected during excavation, the same shall be made good by contractor at his own cost otherwise Engineer-in-Charge will arrange to make it good at the risk and cost of contractor.

- The Contractor is free, within the framework of rules and regulations of the local authorities, to deal with the surplus earth in any manner suitable to him. The Contractor may dispose off the surplus earth from the project site to a place/ places as may be permitted by the Engineer-in- Charge/ appropriate authority/ body. The transportation of the surplus earth shall be done by mechanical means only. The Contractor shall at his own cost obtain necessary clearances/permissions statutory or otherwise needed for the purpose. Dumpers may be used for transporting slushy, material excavated from pile boring / pile cap / Open Foundation with precautions for non-spillage of muck.

- In case earth or sand is used for backfilling in foundation, it shall be got approved from the Engineer-in-Charge. In the foundation the backfilling shall be done in layers not more than 200mm thick and shall be thoroughly watered and consolidated by approved method. The rate for backfilling in foundation using earth is deemed to have been included in the excavation rate.

1.24 STRUCTURAL STEEL WORK - QUALITY CONTROL & TESTING REQUIREMENTS

- General Scope of Specification
  The scope of work of these specifications is to establish the norms for ensuring the required Quality Control through established testing norms of the welded structural steelwork by Engineer-in-charge.

- Codes / Standards Tests and Standards of Acceptance:
- The materials shall be tested in accordance with relevant IS specifications and necessary test certificates shall be furnished. Additional tests if required shall be got carried out by the Contractor at his own cost from the approved testing laboratory.
  The fabrication, furnishing, erecting and painting of structural steel work shall be in accordance with these specifications and shall be checked and accepted by the Engineer in charge.

- Submittals

  The Contractor shall submit the following:
- Proposed overall schedule for documentation of shop drawings, plan procedures and records, procurement of materials from approved suppliers, submission of procedure of fabrication and erection.

- The contractor shall himself inspect all materials and shop work to satisfy the specified tolerance limits and Quality norms before the same are inspected by Engineer-in-charge or his authorized representative.

- Field Inspection

  General

  All materials, equipment and work of erection shall be subject to the inspection of the Engineer in charge who shall be provided with all facilities including labour and tools required at all reasonable times. Any work found defective is liable to be rejected.

- No protective treatment shall be applied to the work until the appropriate inspection and testing has been carried out. The stage inspection shall be carried out for all operations so as to ensure the correctness of fabrication and good quality. Plate Girder dimensions and camber, if any, shall not be finally checked until all welding and heating operations are completed and the member has cooled to a uniform temperature.

- Testing of material

  Structural steel shall be tested for mechanical and chemical properties as per various IS codes as may be applicable and shall conform to requirements specified in IS:226, IS:2062, IS:11587, IS:1977, IS:8500 and IS:961 etc. Rivets, bolts, nuts, washers, welding consumables, steel forging, casting and stainless steel shall be tested for mechanical and chemical properties in the appropriate IS Code. Rolling and cutting tolerance shall be as per IS: 1852. The thickness check measurements for the plate and rolled sections shall be taken at not less than 15 mm from edge. For plates thicker than 25mm, Check for laminations in plates shall be carried out by ultra-sonic testing or any other specified methods. Steelwork shall be inspected for surface defects and exposed edge laminations during fabrication and blast cleaning. Significant edge laminations found shall be reported to the Engineer in charge for his decision. Chipping, grinding, machining or ultrasonic testing shall be used to determine depth of imperfection.

- Bolted connections:

  Bolts and bolted connection joints with high strength friction grip bolts shall be inspected and tested according to IS:4000. The alignment of plates at all bolted splice joints and welded butt joints shall be checked for compliance with codal requirements.

- Welding and welding consumables :

  Welding procedure, welded connection and testing shall be in compliance with codal requirements. All facilities necessary for stage inspection during welding and on completion shall be provided to the Engineer in Charge or his authorized representatives.

  Adequate means of identification either by identification mark or other record shall be provided to enable each weld to be traced to the welder(s) by whom it was carried out.

- Execution Tolerances:
  The contractor shall through appropriate planning and continuous measurements in the workshop and the erection at site, ensure that the tolerance specified below are strictly adhered to.

  Tolerances in dimensions of components of fabricated structural steel work shall be specified on the drawings and shall be subject to the approval of the Engineer before fabrication. Unless specified, all parts of an assembly shall fit together accurately within tolerances specified in Table 1900-2 of MORT&H specifications.
  A machined bearing surface, where specified by the Engineer, shall be machined within a deviation of 0.25 mm for surfaces that can be inscribed within a square of side 0.5 m.

  Dimensional & Weight Tolerance

  The dimensional and weight tolerance for rolled shapes shall be in accordance with IS: 1852, 808 etc. The acceptable limits of straightness for rolled or fabricated members as per IS: 7215

- Quality Control
  The steel shall comply in all respects with the requirements of approved drawings and relevant codes and specifications and shall be procured from approved manufacturers only. It may be noted that quality of raw steel used for fabrication shall be essence of the contract & shall be strictly conforming to specified standard. Steel sections to be supplied by the manufacturers shall be tested as per codal provisions at the manufacturer's premises before dispatch. The contractor on receipt of supply in his fabrication shop shall carry out necessary control tests including ultrasonic testing as per codal requirements and verify them with the list received from manufacturers. The rejected lot shall not be used and rejected lot shall be immediately removed from fabrication shop. Only steel passed in all tests shall be used for fabrication.

  The contractor shall supply information in the technical package regarding source / manufacturers from where procurement of steel is proposed.

  The contractor shall conduct visual examination and measurement of the external dimensions of the weld for all joints. Before examining the welded joints, areas close to it on both sides of the weld for a width not less than 20 mm shall be cleaned of slag and other impurities. Examination shall be done by a magnifying glass which has a magnification power of ten (10) and measuring instrument which has an accuracy of + 0.1 mm or by weld gauges. Welded joints shall be examined from both sides. The contractor shall examine the following during the visual checks.

- Correctness and shape of the welded joints
- Incomplete penetration of weld metal.
- Influx
- Burns
- Un-welded craters
- Undercuts
- Cracks in welded spots and heat affected zones
- Porosity in welds and spot welds
- Compression in welded joints as a result of electrode impact while carrying out contact

welding

- Displacement of welded element
- The contractor shall, document all data as per sound practices.
- Mechanical Test

The Contractor shall carry out various mechanical tests to determine weldability, metal alloy-ability, nature of break, correct size and type of electrodes, degree of pre-heat and post-heat treatment. The type, scope and sample of various mechanical tests shall be determined in agreement with the purchaser. The number of tests conducted shall depend on the result obtained to satisfy the Engineer-in-charge that the correct type and size of electrode, degree of pre-heating and post-heating and weldability of metal are being followed.

- Dye Penetration Test

All welds shall be tested by "Dye Penetration test" as per current practices.

- Radiography Test

Radiography test shall be conducted by the contractor to determine gas inclusion (blow holes, hollows) slag inclusion, shallow welds and cracks for 25% lengths all butt joints.

Before conducting the examination the welded joints shall be cleaned of slag and scales and visually examined. The welds shall be marked into separate portions depending on the length of photograph. The length of photograph shall be such as to ensure that there are no distortions and shall reveal the defect correctly. The length shall not be more than 0.75 of the focal distance and the width of the photograph would depend on the width of the welded joint plus 20 mm on either side of the weld. The cassette with film shall be protected by sheet of lead or equivalent of proper thickness against incidental, diffused and secondary radiation.

The direction of the ray with relation to the film shall be as specified hereunder.

Welds of butt joints without edge slopes with edge processing shall be examined by central ray directed at right angles to the weld.

In special cases examination of welds with inclined rays directed along edge slopes may be permitted by the Engineer-in-charge.

Lap joints shall be examined by directing rays at 45 degree to the bottom plate. Welds in T-joints without any edge preparation shall be examined by rays directed at 45 degree to the weld. Angle welds in lap and tee-joints shall be examiner by the rays in opposite direction i.e. the film will be on the side of the weld. Weld in angle joints shall be checked by directing ray along the bisector of the angle between the welded elements. Opposite direction of the ray and location of the film may also be permitted by the Employer.

- Ultrasonic Test

  Ultrasonic test shall be conducted by the contractor to detect gas inclusion (pores), slag inclusion, shallow welds, cracks, lamination and friability etc. Prior to starting of ultrasonic test the welded joint shall be thoroughly cleaned of slag and other material. Surface of the basic metal adjacent to welded joint on both sides shall be mechanically cleaned by the grinder or a metal brush to provide the contact of the whole ultrasonic probe surface with surface of basic metal. The width of the clean surface shall be as directed by the Engineer-in-charge. The welded joint then shall be covered with a thin coat of transformer oil, turbine or machine oil to ensure acoustic contact. The joints so treated shall be marked and the marks shall be entered into the documentation, subsequent to this, ultrasonic test shall be carried out as directed by the Engineer-in-charge. At least 50% of weld shall be tested by ultrasonic testing.

1.25 Erection of Steel Structures

- General Scope of Specification

  The scope of work of these specifications is to establish the norms for ensuring the required safety procedures methods etc. for erection of steel structures.

- Submittals

  The methodology shall be submitted by contractor for approval by Engineer-in-charge well before the arrival of material for erection.

- Erection

  General

  The Contractor shall erect the structural steel, remove the temporary construction, and do all the work required to complete the, construction included in the contract in accordance with the drawings and the specifications and to the entire satisfaction of the Engineer.

- Organization and Equipment

  The Contractor shall submit erection plans prepared by the fabricator, showing a method and procedure of erection, compatible with the details of fabrication.

  A detailed scheme must be prepared showing stage-wise activities, with complete drawings and working phase-wise instructions. This should be based on detailed stage-wise calculation and take into account specifications and capacity of erection equipment machinery, tools, tackles to be used and temporary working loads as per Codal provisions.

  The scheme should be based on site conditions e.g. hydrology, rainfall intensity, soil and sub-soil conditions, temperature and climatic conditions and available working space, etc.

  The scheme should indicate precisely the type of temporary fasteners to be used as also the minimum percentage of permanent fasteners to be fitted during the stage erection. The working drawings should give clearly the temporary jigs, fixtures, clamps, spacer supports, etc.

The contractor shall supply and erect all necessary false work and staging and shall supply all labour, tools, erection plant and other materials necessary to carry out the work complete in all respects.

The Contractor shall supply all bolts, nuts, washers, etc. required to complete erection at site with an allowance for wastage, etc., of 10% or a minimum of five number of each item.

Prior to actual commencement of erection all equipment, machinery, tools, tackles, ropes, etc. need to be tested to ensure their efficient working. Frequent visual inspection is essential in vulnerable areas to detect displacements, distress, drainages, etc.

Deflection and vibratory tests shall be conducted in respect of supporting structures, launching truss, cranes etc. as also the structure under erection and unusual observations reviewed, looseness of fittings are to be noted.

For welded structures, welders' qualifications and skill are to be checked as per standard norms. Non-destructive tests of joints as per designer's directives are to be carried out.

Precision non-destructive testing instruments available in the market should be used for noting various important parameters of the structures frequently and systematic record is to be kept.

Safety requirements should conform to IS:7205, IS:7273 and IS:7269 as applicable and should be a consideration of safety, economy and rapidity.

Erection work should start with complete resources mobilised as per latest approved drawings and after a thorough survey of foundations and other related structural work. In case of work of magnitude, maximum mechanisation is to be adopted.

The structure should be divided into erectable modules as per the scheme. This should be pre-assembled in a suitable yard/platform and its matching with members of the adjacent module checked by trial assembly before erection.

The structure shall be set out to the required lines and levels. The stocks and masses are to be carefully preserved. The steelwork should be erected, adjusted and completed in the required position to the specified line and levels with sufficient drifts and bolts. Packing materials are to be available to maintain this condition. Organised “Quality Surveillance” checks need to be exercised frequently.

Before starting work, the Contractor shall obtain necessary approval of the Engineer as to the method adopted for erection, the number and character of tools and plants. The approval of the Engineer shall not relieve the Contractor of his responsibility for the safety of his method or equipment or from carrying out the work fully in accordance with the drawings and specifications.

During the progress of work, the Contractor shall have a competent Engineer or foreman in charge of the work, who shall be adequately experienced in steel erection and acceptable to the Engineer in Charge.

- Handling and Storing of Materials

  Suitable area for storage of structures and components shall be located near the site of work. The access road should be free from water logging during the working period and the storage area should be on levelled and firm ground.

  The store should be provided with adequate handling equipments e.g. road mobile crane, gantries, derricks, chain pulley blocks, winch of capacity as required. Stacking area should be planned and have racks, stands sleeper, access tracks, etc., and properly lighted.

  Storage should be planned to suit erection work sequence and avoid damage or distortion. Excessively rusted, bent of damaged steel shall be rejected. Methods of storage and handling steel, whether fabricated or not shall be subject to the approval of the Engineer in charge.

  Fabricated materials are to be stored with erection marks visible, such as not to come into contact with earth surface or water and should be accessible to handling equipment.

  Small fitting hand tools are to be kept in containers in covered stores.

  All materials, consumables, including raw steel or fabricated material shall be stored specification-wise and size-wise above the ground upon platforms, skids or other supports. It shall be kept free from dirt and other foreign matter and shall be protected as far as possible from corrosion and distortion. The electrodes shall be stored specification-wise and shall be kept in dry warm condition in properly designed racks. The bolts, nuts, washers and other fasteners shall be stored on racks above the ground with protective oil coating in gunny bags. The paint shall be stored under cover in air-tight containers.

  IS:7293 and IS:7969 dealing with handling of materials and equipments for safe working should be followed. Safety nuts and bolts as directed are to be used while working. The Contractor shall be held responsible for loss or damage to any material provided by the Department while in his care or for any damage to such material resulting from his work.

- Formwork

  The formwork shall be properly designed, substantially built and maintained for all anticipated loads. The Contractor, if required, shall submit plans for approval to the Engineer in Charge. Approval of the plans, however, shall not relieve the Contractor of his responsibility.

- Straightening Bent Material

  The straightening of plates, angles and other shapes shall be done by methods not likely to produce fracture or any injury. The metal shall not be heated unless permitted by the Engineer for special cases, when the heating shall not be to a temperature higher than that producing a dark “cherry red” colour, followed by as slow cooling as possible. Following the straightening of a bend or buckle the surface shall be carefully investigated for evidence of fracture. Sharp kinks and bends may be the cause for rejection of material.

- Assembling Steel

  The parts shall be accurately assembled as shown on the drawings and match marks shall be followed. The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged.

  Hammering which will injure or distort the members shall not be done. Bearing surface or surfaces to be in permanent contact shall be cleaned, before the members are assembled. The truss spans shall be erected on blocking, so placed as to give the proper camber. The blocking shall be left in place until the tendon chord splices are fully riveted and all other truss connections pinned and bolted. Bolts in splices of butt joints of compression members and bolts in railings shall not be driven until the span has been swung.

  All joint surface for bolted connections including bolts, nuts, washers shall be free from scale, dirt, burrs, other foreign materials and defects that would prevent solid seating of parts. The slope of surface of bolted parts in contact with bolt head and nut shall not exceed 1 in 20, plane normal to bolt axis, otherwise suitable tapered washer shall be used.

  All fasteners shall have a washer under nut or bolt head whichever is turned in tightening.

  Any connection to be bolted shall be secured in close contact with service bolts or with a sufficient number of permanent bolts before the rivets are driven or before the connections are finally bolted. Joints shall normally be made by filling not less than 50 percent of holes with service bolts and barrel drifts in the ratio 4:1. The service bolts are to be fully tightened up as soon as the joint is assembled. Connections to be made by close tolerance bolts shall be completed as soon as practicable after assembly.

- Transportation & Handling

- Before the shop assembling is dismantled, all members and sections shall be appropriately marked with paint or grooved with their identification numbers as detailed in shop drawings.

- The Contractor shall transport the fabricated structural steel materials to work site, with all necessary field connection materials, in such sequence as will permit the most efficient and economical performance of the erection work. As per scheduled programme, the Engineer-in-charge may, at his discretion prescribe or control the sequence of delivery of materials.

- Fabricated parts shall be handled in such a way-that no damage is caused to the components. Measures shall be taken to minimise damage to the protective treatment on the steelwork. All work shall be protected from damage in transit. Particular care shall be taken to stiffen free ends, prevent permanent distortion and adequately protect all machined surfaces. All bolts, nuts, washers, screws, small plates and articles generally shall be suitably packed and identified.

Field Bolts

- Field bolts nuts and washers shall be furnished by the Contractor in excess of the nominal numbers required. He shall supply the full number of bolts, nuts and washers and other necessary fittings required completing the work, together with the additional bolts, nuts and washers totalling to 10% of the requirement subject to minimum of 10 Nos. Only HSFG bolts of class 8.8 or higher shall be used.

- At the time of assembly, the surfaces in contact shall be free of paint or any other applied finish, oil, dirt, loose rust, loose scale, burrs and other defects which would prevent solid seating of the parts or would interfere with the development of friction between them.

- If any other surface condition, including a machined surface, is specified, it shall be the responsibility of the Contractor to work within the slip factor specified for the particular case.

- Each bolt and nut shall be assembled with washers of appropriate shape, quality and number in cases where plane parallel surfaces are involved. Such washers shall be placed under the bolt head or the nut, whichever is to be rotated during the tightening operation. The rotated nut or bolt head shall be tightened against a surface normal to the bolt axis, and the appropriate tapered washer shall be, used when the surfaces are not parallel. The angle between the bolt axis and the surface under the non-rotating component (i.e. the bolt head or the nut) shall be 90 + 3 degree. For angles outside these limits, a tapered washer shall be placed under the non-rotating component. Tapered washers shall be correctly positioned.

- No gasket or other flexible material shall be placed between the holes. The holes in parts to be joined shall be sufficiently well aligned to permit bolts to be freely placed in position. Driving of bolts is not permitted. The nuts shall be placed so that the identification marks are clearly visible after tightening. Nut and bolts shall always be tightened in a staggered pattern and where there are more than four bolts in any one joint, they shall be tightened from the centre of the joint outwards.

- If, after final tightening, a nut or bolt is slackened off for any reason, the bolt, nut and washer or washers shall be discarded and not used again.
- Tightening of bolts

  Bolted connection joints with high strength friction grip bolts shall be inspected for compliance of codal requirements.

  The Engineer shall observe the installation and tightening of bolts to ensure that correct tightening procedure is used and shall determine that all bolts are tightened. Regardless of tightening method used, tightening of bolts in a joint should commence at the most rigidly fixed or stiffest point and progress towards the free edges, both in initial snugging and in final tightening.
  The tightness of bolts in connection shall be checked by inspection wrench, which can be torque wrench, power wrench or calibrated wrench. Tightness of 10 per cent bolts, but not less than two bolts, selected at random in each connection shall be checked by applying inspection torque. If no nut or bolt head is turned by this application, connection can be accepted as properly tightened, but if any nut or head has turned all bolts shall be checked and, if necessary, re-tightened.

- Painting at Site

  Surfaces which will be inaccessible after site assembly shall receive the full specified protective treatment before assembly. Surfaces which will be in contact after site assembly shall receive a coat of paint (in addition to any shop primer) and shall be brought together while the paint is still wet. Damaged or deteriorated paint surfaces shall be first made good with the same type of coat as the shop coat. Where steel has received a metal coating in the shop, this coating shall be completed on site so as to be continuous over any welds, bolts and site rivets. Specified protective final painting treatment shall be completed after erection.

- Rate

  The unit rate shall include following :-

(i) Preparation and getting approval of complete detailed fabrication drawings based on the design drawings, required for all permanent structures including incorporating the connection details of temporary structure. Preparation of details for alternative sections/ any modifications in design drawings. Furnishing required numbers of sets of drawings as an advance (for approval) and final execution drawings.

(ii) Procurement of all raw steel materials including plates & other sections, HSFG bolts nuts, washer, shear connector , electrodes / wires /flux including its testing, allowance for all types of wastage, temporary works, shuttering, staging, temporary bolts etc. and all incidentals required to complete the job as per drawings and specifications and as per instructions of Engineer-in-Charge. All rolling tolerances shall be within the specified limits as per codal provisions. Any material with lesser than specified weight will not be acceptable. No payment will be made for overweight materials.

(iii) Complete fabrication and its testing including shop assembling.

(iv) Surface preparation for application of primers and procurement and application of all coats of shop primers and internal and external paints as specified.

(v) Loading, transportation and unloading of fabricated parts and field connection materials etc. to site storage yard or erection site.

(vi) Erection and installation in final position including all site splicing, bolting, final painting etc. including all tools, machinery, equipments required to complete the job.

- Measurements for Payment

  The payment for the steel work will be made for the weight of the steelwork (excluding HSFG bolts nuts, washers) which will be actually erected and used as permanent works, i.e. plates, shear connectors, splice plates, gusset plates, stiffeners, rolled sections, bracing etc. The payment for steel work shall be made on the basis of actual weight or standard weight of the steel members and lower weight between both shall be considered for payment.

  Dimensions of the steelwork will be taken from the approved shop drawings as prepared by the contractor based on design drawings. For structural sections the weight will be calculated on lengths actually used with no deduction for splay cut or mitred end. Gusset plates shall be calculated for nearest rectangle or square section weight. Full weight of the HSFG bolts, compatible nuts & washers will be paid separately in numbers and their weight being as per Indian Standard Codes. No deduction shall be made for bolt holes. The weight of sheet steel, plate, strips and rolled sections shall be taken from relevant Indian Standards. The length measurements shall be made using steel tapes or other device properly calibrated with measurement upto 1mm.

The measurements of this item shall be in tonnes based on the net weight of metal in the fabricated structure and used as permanent work, computed on the basis of nominal weight of materials and as per Bill of Material in the approved shop drawings.

The weight of steel plates and other sections shall be determined from the dimensions shown on the drawings on the following basis:
- Steel Plates: 7.84 x 103 kg/cum
- Rolled Sections: As per IS:808-1989
- SHS/RHS sections : As per IS:4923
- Tubes : IS1161-1979

Weight of structural sections shall be nominal weight as per IS:Codes. Weight of weld fillets and the weight of protective coatings shall not be included.

1.26 PRECAST CEMENT CONCRETE KERB STONES

Procurement
Pre-cast cement concrete kerb stones conforming to specified grade shall be of different size and shape to be provided at different locations and shall be procured only from reputed manufacturer approved by Engineer-in-Charge or pre casted at casting yard using proper moulds using Hydraulic compressor and vibratory compaction methodology, as per the direction of Engineer-in-Charge. The joints of kerb stones shall be kept to minimum (not more than 5mm) and shall be finished smoothly using necessary pigment in the cement mortar (1 cement : 3 coarse sand). Nothing extra shall be paid on the account.

1.27 Other Materials

All other materials not specifically mentioned but are to be used on work shall be of best quality and shall conform to relevant IRC / BIS codes/ BS codes/ MORTH/ CPWD specifications. Wherever no specific code of practice of IRC/BIS is applicable, the decision of the Engineer-in-charge shall be final and binding regarding specification to be adopted for any particular material.

1.28 PRECAST CONCRETE PAVER BLOCKS

Material : Precast chamfered edge CC Paver Block of required strength , thickness, size/ shape, as approved by Engineer-in-Charge, made by table vibratory method using PU mould, shall be obtained from approved manufacturer or manufactured at casting yard, if agreed by Engineer-in-Charge.

Wherever paver blocks are required to be cut, the same shall be cut using specified machine and no manual cutting shall be allowed. Paver blocks shall be thoroughly compacted on bedding layer using plate vibrator so as to give a smooth finish surface. The maximum tolerance in surface unevenness in longitudinal and cross profiles when checked with a three meter long straight edge shall be +5 mm. The joints between the paver block shall not be more than 2 mm and will be properly filled with River sand.

QUALITY ASSURANCE
QUALITY ASSURANCE SYSTEM OF PROJECT:

The Quality Assurance Activity, in order to be truly effective has to ensure a progressively improved and uniform quality of the finished work. Maintenance of quality has to be imbibed in the minds of contractor as well as the officials of the department. The Quality Assurance shall be achieved as per CPWD specifications. In addition department/contractor shall get the quality assurance tests and if required, inspections done from independent/external agency/agencies. Immediately after award of work, the successful tenderer shall submit his detailed Quality Assurance Plan(QAP) / Quality Assurance Manual(QAM) with detailed method statements/detailed pro forma commensurating with the specifications of the work, and get it approved by the department within a month of award of the work. The quoted price of the tenderer shall include all these aspects of extra high level quality assurance system."

- QUALITY ASSURANCE MANUAL

The tables given in Annexure - QA shows the tentative Quality Assurance Plan for testing some typical materials to be used in this work. QAP is given in 4 columns indicating the name of the test, frequency of testing, check level, Referred codes. The levels shown under the check level are defined as below.

a. Level 1 indicates the Manufacturer's Test Certificate (MTC) or the tests performed by the contractor at his own level before requesting the department for accepting the material for its approval.

b. Level 2 (2A or 2B) indicates the tests to be conducted in order to ensure the suitability of the material being used. Level 2 is classified in two categories i.e. Level 2A for the tests conducted at site laboratory and level 2B for the tests conducted outside the site laboratory as necessary facilities cannot be made available at site.

c. Level 3 indicates the testing of the sensitive material from an independent source equipped with proper controls like temperature, humidity etc. essential for the specific material testing and also equipped with well-qualified staff, from whom an expert opinion can be obtained.

Before actual date of start of work, the contractor shall establish a fully equipped site testing laboratory including all relevant Indian and International codes and standards.The quoted rates shall include cost of all test material and their tests to be conducted at field laboratory for the purpose of quality assurance. Similarly, for the tests to be carried out by the external laboratories, the contractor shall supply all the materials required for testing free of cost and the testing charges including collection of samples, transportation of samples to the laboratories etc. shall be borne by the contractor. However fee of laboratories on account of testing charges shall be reimbursed to the contractor, if test results will be satisfactory as per relevant codes/specifications and if test results will not be satisfactory as per relevant codes/specifications then testing charges shall be borne by the contractor. All the testing machines and equipment shall be calibrated prior to first use and recalibrated periodically as determined by the Engineer-in-charge to detect errors. The calibration certificates/ charts (from an approved laboratory) shall be submitted to the Engineer-in-charge well in advance of execution of work. The moulds for cubes shall be checked at regular interval as decided by Engineer-in-Charge and made to conform to specifications contained in IS-516.

The contractor or his authorised representative shall associate in collection, preparation forwarding and testing of such samples. In case he or his authorised representative is not present or does not associate himself, the Engineer-in-charge shall do the needful for getting the samples collected and tested, the results of such tests and consequences thereof shall be binding on the contractor.

The contractor shall give not less than 7 days' notice for all tests in order that the Engineer-in-charge may be present. Two copies of all test certificates shall be supplied by the contractor to the Engineer-in-charge for approval immediately after the completion of the tests. Test certificates shall invariably be supplied to the Engineer-in-charge well in advance before the materials or components are used in the works, unless the Engineer-in-charge directs otherwise.

The Engineer-in-Charge shall be free to carry out such additional tests as may be decided by him at his sole discretion, from time to time, in addition to those specified in this document. The Contractor shall provide the samples and labour for collecting the samples. Nothing extra shall be payable to the Contractor for samples or for the collection of the samples. The results of such additional tests and third party inspection shall be binding on the contractor

The test under Level 2 shall be conducted at the Site laboratory that shall be established by the Contractor or at any other Standard External Laboratory selected by the Engineer-in-Charge. The Contractor shall transport the samples to the laboratory for which nothing extra shall be payable. In the event of the Contractor failing to arrange transportation of the samples in proper time, the Engineer-in-Charge shall have them transported and recover two times the actual cost from the Contractor's bills. All sampling and testing shall be performed in the presence of Engineer-in-Charge or his authorised representative. Testing may be witnessed by the Contractor or his authorised representative if permitted by the Standard External Laboratory. Whether witnessed by the Contractor or not, the test results shall be binding on the Contractor.

The Engineer-in-Charge shall have the right at all times to inspect all operations including the sources of materials, procurement, layout and storage of materials, all equipment including the concrete batching and mixing equipment, and the quality control system. Such an inspection shall be arranged and the Engineer-in-Charge's approval obtained prior to starting of the particular item of work. This shall however, not relieve the Contractor of his responsibilities. All materials which do not conform to these specifications shall be rejected and shall be removed from the site immediately. The Engineer-in-Charge shall have the powers to cause the Contractors to purchase and use materials from any particular source, as may in the Engineer-in-Charge's opinion be necessary for the proper execution of work.

- THIRD PARTY QUALITY CONTROL

In order to achieve a high standard of quality, it shall be required to go for Third Party Quality Control. For this purpose, a separate agency may be appointed by the owner who will carry out independent testing of materials and checking and ensuring overall quality procedures. The contractor shall be required to fully cooperate with agency and facilitate them in taking samples, transportation and examination of various activities including documentation and nothing extra shall be paid to the contractor on this account. In case of any adverse findings by the agency, the contractor shall do the needful rectifications within reasonable time and nothing extra shall be paid to the contractor on this account. The Engineer-in-charge shall be at liberty for getting quality assurance of work done through agencies like CRRI, IIT Roorkee, Delhi College of Engineering (DTU), IIT Delhi, NCCBM Ballabhgarh, EIL, RITES etc. (any one agency as approved by Engineer-in-charge) at its own cost. The successful tenderer shall include the provisions mentioned in this chapter while framing the proposed methodology for tests.

- FIELD LABORATORY

All the materials to be used in the work and tested in the laboratory shall comply with the requirements of relevant specification or particular specifications as applicable or such recognised specifications as acceptable to Engineer-in-Charge in terms of this tender.

The testing machines shall be recalibrated periodically as per QAP/QAM and approved by Engineer-in-Charge. The calibration shall be got done from authorized laboratory approved by Engineer-in-Charge. The site laboratory shall be equipped with the minimum of the items given as per relevant clause of MORTH Specification (Fifth Revision) 2013.

- **Maintenance of Registers**

(a) Maintenance of Register of Tests:

- All the registers of tests in respect of tests of material shall be carried out at site of work or in outside laboratories shall be maintained by the contractor which shall be duly issued to the contractor by the Engineer in charge.

- All samples of materials including cement concrete cubes shall be collected jointly with contractor in the presence of representatives of the Department. All necessary assistance shall be provided by the contractor for collecting of samples of materials by the other agencies, if directed by the Engineer in charge. Cost of samples of materials is to be borne by the contractor and he/she shall be responsible for safe custody and transportation of the samples to the laboratory and nothing extra shall be paid to the contractor on this account.

- All the tests in field lab, setup at construction site/yard shall be carried out by the qualified Engineering staff deployed by the contractor in presence of representatives of the Department.

- All the entries in the registers will be made by the designated Engineering Staff of the contractor and same should be produced regularly for reviewing the Engineer- in- charge.

- Contractor shall be responsible for safe custody of all the test registers at site. He shall be liable for all the consequences if any damage or loss occurs to the test register under his possession. Decision of Engineer-in-charge shall be final and binding to the contractor in this regard.

- Submission of copy of all test registers, Material at site register, cement register and hindrance register along with each alternate Running Account Bill shall be mandatory failing which no payment will be made to the contractor.

- **Maintenance of Material at Site (MAS) Register:-**

All the MAS Registers including Cement Register, Steel Register, Paint Register, Bitumen Register, Bitumen Products Registers etc. shall be maintained by the Contractor which shall be duly issued by Engineer-in-Charge.

LIST OF IS CODES FOR SITE LABORATORY

APPENDIX – A

A. CONCRETE WORKS

1. COARSE AGGREGATES

Sl. No.	Test		Frequency	Ref. Codes
1.	**Particle size and Shape** Sieve Analysis Flakiness Index and Elongation Index	1. 2.	At the beginning for approval of each source and change of source Once in week	IS::383-1970 IS: 2386 (part – I) - 1963
2.	**Deleterious Materials**	1. 2.	At the beginning for approval of each source and change of source One in 3 months	IS : 383-1970 IS : 2386 (part – II) – 1963
3.	**Specific Gravity and Density**	1. 2.	At the beginning for approval of each source and change of source Once in a Fortnight	IS : 383-1970 IS : 2386 (part – III) – 1963
4.	**Mechanical Properties** Aggregate Crushing Value Impact Value 10 percent fines Abrasion Value	1. 2	At the beginning for approval of each source and change of source Once in week	IS : 383-1970 IS : 2386 (part – IV) – 1963
5.	**Soundness**	1. 2.	At the beginning for approval of each source and change of source One in 3 months	IS : 383-1970 IS : 2386 (part – V) – 1963
6.	**Surface moisture content**	1. 2. 3.	At the beginning for approval of each source and change of source At every change of mix design Every time making the concrete	IS : 383-1970 IS : 2386 (part – III) – 1963
7.	**Alkali Reactivity**	1. 2.	At the beginning for approval of each source and change of source One in 3 months	IS : 383-1970 IS : 2386 (part – VII) – 1963
8.	**Petrographic Examination** Trade Group Petrological name	1.	At the beginning for approval of each source and change of source	IS : 383-1970 IS : 2386 (part – VIII) – 1963

	and Description Description of Bulk Particle shape Surface texture	2.	One in 3 months	

2. FINE AGGREGATES

Sl. No.	Test		Frequency	Ref. Codes
1.	**Particle size**	1. 2.	At the beginning for approval of each source and change of source Once in a month	IS::383-1970 IS: 2386 (part – I) – 1963
2.	**Deleterious Materials**	1. 2.	At the beginning for approval of each source and change of source Once in a month	IS::383-1970 IS: 2386 (part – II) – 1963
3.	**Silt Content**	1.	At the beginning for approval of each source and change of source	
		2.	Once Daily	
4.	**Specific Gravity and Density**	1. 2.	At the beginning for approval of each source and change of source Once in 3 months	IS::383-1970 IS: 2386 (part – III) – 1963
5.	**Water absorption**	1. 2.	At the beginning for approval of each source and change of source. Daily	IS::383-1970 IS: 2386 (part – III) – 1963
6.	**Soundness**	1. 2.	At the beginning for approval of each source and change of source. Once in 3 months	IS::383-1970 IS: 2386 (part – U) – 1963

3. WATER

Sl. No.	Test		Frequency	Ref. Codes
1.	**Chemical Analysis**	1.	Once at beginning for approval of each source and change of source	IS : 456:2000
a)	pH value	2.	Once in a months	
b)	Chlorides (as Cl)	3.	Chemical Tests daily in the site Laboratory with testing kits	IS:3025 (Part 24)
c)	Sulphates (as SO_3)			IS:3025 (Part 32)
d)	Neuterlisation with NaOH (with phenolphathalein as indicator)			IS:3025 (Part 22)
e)	Neuterlisation with H_2SO_4			IS:3025 (Part 23)

2.	**Physical Analysis**			
a)	Suspended matter	1.	Once at beginning for approval of each source and change of source	IS:3025 (Part 17)
b)	Organic matter	2.	Once in 3 months	IS:3025 (Part 18)
c)	Inorganic matter			IS:3025 (Part 18)

B. ROADS WORK

A. CONCRETE WORKS

1. COARSE AGGREGATES

Sl. No.	Test		Frequency	Ref. Codes
1.	**Particle size and Shape** Sieve Analysis Flakiness Index and Elongation Index	1. 2	At the beginning for approval of each source and change of source Once in week	IS::383-1970 IS: 2386 (part – I) - 1963
2.	**Deleterious Materials**	1. 2.	At the beginning for approval of each source and change of source One in 3 months	IS : 383-1970 IS : 2386 (part – II) – 1963
3.	**Specific Gravity and Density**	1. 2.	At the beginning for approval of each source and change of source Once in a Fortnight	IS : 383-1970 IS : 2386 (part – III) – 1963

4.	**Mechanical Properties** Aggregate Crushing Value Impact Value 10 percent fines Abrasion Value	1. 2	At the beginning for approval of each source and change of source Once in week	IS : 383-1970 IS : 2386 (part – IV) – 1963
5.	**Soundness**	1. 2.	At the beginning for approval of each source and change of source One in 3 months	IS : 383-1970 IS : 2386 (part – V) – 1963
6.	**Surface moisture content**	1. 2. 3.	At the beginning for approval of each source and change of source At every change of mix design Every time making the concrete	IS : 383-1970 IS : 2386 (part – III) – 1963
7.	**Alkali Reactivity**	1. 2.	At the beginning for approval of each source and change of source One in 3 months	IS : 383-1970 IS : 2386 (part – VII) – 1963
8.	**Petrographic Examination** Trade Group Petrological name and Description Description of Bulk Particle shape Surface texture	1. 2.	At the beginning for approval of each source and change of source One in 3 months	IS : 383-1970 IS : 2386 (part – VIII) – 1963

2. FINE AGGREGATES

Sl. No.	**Test**		**Frequency**	**Ref. Codes**
1.	**Particle size**	1. 2.	At the beginning for approval of each source and change of source Once in a month	IS::383-1970 IS: 2386 (part – I) – 1963
2.	**Deleterious Materials**	1. 2.	At the beginning for approval of each source and change of source Once in a month	IS::383-1970 IS: 2386 (part – II) – 1963

3.	**Silt Content**	1.	At the beginning for approval of each source and change of source	
		2.	Once Daily	
4.	**Specific Gravity and Density**	1. 2.	At the beginning for approval of each source and change of source Once in 3 months	IS::383-1970 IS: 2386 (part – III) – 1963
5.	**Water absorption**	1. 2.	At the beginning for approval of each source and change of source. Daily	IS::383-1970 IS: 2386 (part – III) – 1963
6.	**Soundness**	1. 2.	At the beginning for approval of each source and change of source. Once in 3 months	IS::383-1970 IS: 2386 (part – U) – 1963

3. WATER

Sl. No.	**Test**		**Frequency**	**Ref. Codes**
1.	**Chemical Analysis**	1.	Once at beginning for approval of each source and change of source	IS : 456:2000
a)	pH value	2.	Once in a months	
b)	Chlorides (as Cl)	3.	Chemical Tests daily in the site Laboratory with testing kits	IS:3025 (Part 24)
c)	Sulphates (as SO_3)			IS:3025 (Part 32)
d)	Neuterlisation with NaOH (with phenolphathalein as indicator)			IS:3025 (Part 22)
e)	Neuterlisation with H_2SO_4			IS:3025 (Part 23)

2.	**Physical Analysis**			
a)	Suspended matter	1.	Once at beginning for approval of each source and change of source	IS:3025 (Part 17)
b)	Organic matter	2.	Once in 3 months	IS:3025 (Part 18)
c)	Inorganic matter			IS:3025 (Part 18)

4. LIME

Sl. No.	Test		Frequency	Ref. Codes
1.	**$CaCo_3$ Content**	1.	At the beginning for approval of each source and change of source	IS:1195-1978
2.	**Sieve Analysis**	2.	One test for every 5MT of lime consumption	

5. CEMENT

• ORDINARY PORTLAND CEMENT (43/53 GRADE)

Sl. No.	Test	Frequency	Ref. Codes
1	**Chemical Tests** • Total Chloride content • Ratio of Alumina to that of Iron Oxide • Magnesia % by mass • Total sulphate content • Loss on Ignition • Insoluble Residue • Lime saturation factor.	1. At the beginning for approval of each source and change of source 2. Once for every lot 3. Once in 3 months	IS:12269 – 1987 (for 53 Grade) & IS: 8112-1989 (for 43 Grade)
2	**Physical tests** (a) Setting Time • Initial • Final (b) Soundness (c) Compressive Strength (i) At 3 days (ii) At 7 days (iii) At 28 days (d) Fineness	1. At the beginning for approval of each source and change of source 2. Once for every lot 3. Once in 3 months	IS:12269 – 1987 (for 53 Grade) & IS: 8112-1989 (for 43 Grade)

REINFORCING BARS (TMT)

Sl. No	Test	Frequency	Ref. Codes
1	**(i) Chemical Tests** • Carbon • Sulphur • Phosphorus • Sulphur + Phosphorus	1. At the beginning for approval of each source and change of source 2. Once for every lot* 3. Once in 3 months for at least one lot	IS: 1786-1985

	(ii)Physical Test (a) Ultimate Tensile Strength. • 0.2% Proof stress • Percentage Elongation • Bend and Rebend Test • Mass per meter run(Kg)	1. At the beginning for approval of each source and change of source 2. Once for every lot** 3. Once in 3 months for at least one lot	

The lot shall be defined as under from each source for each dia.

(a) For consignment below 100 MT.

(i) Under 10mm – One sample for each 25MT or part thereof.
(ii) 10mm to 16mm dia – One sample for each 35MT or part thereof..
(iii). Over 16mm dia – One sample for each 45MT or part thereof.

(b) For consignment below 100 MT.

(i) Under 10mm – One sample for each 40MT or part thereof.
(ii) 10mm to 16mm dia – One sample for each 45MT or part thereof.
(iii) Over 16mm dia – One sample for each 50MT or part thereof.

MILD STEEL AND STRUCTURAL STEEL

Sl. No.	Test	Frequency	Ref. Codes
1	• Chemical Composition • Physical Test • Tensile Test • Bend Test • Impact Test • Y- Groove crackability test	Each lot of different heat	IS:2062-1999

*** NOTE :- The Engineer-in-Charge may carry out any other tests required at the site other than listed above.**

LIST OF APPROVED MAKES FOR CIVIL WORKS

1	TMT	AS PER SPECIAL CONDITIONS OF STEEL
2	Admixture for concrete	Cico, Sika, Pidilite, Asian
3	Epoxy Paint	Nerolac or equivalent
4	Terrazo tiles (precast)	NITCO, GEM, MODERN, HINDUSTAN
5	Chequrered tiles	NITCO, GEM, MODERN, HINDUSTAN
6	Sanitary wares	Parryware, Hindustan Sanitary ware, CERA, Neycer, Seabird, Johnson CERA.
7	GI Pipes/ M.S. Pipes	Tata, GST, Jindal Hissar, Prakash
8	GI Fittings	Unik, , UK, Prakash
9	Stoneware pipes & Gully trap	Perfect, Burn, Parry
10	C.I. Manholes	R.I.F., NECO
11	Water Tank	Sintex, Unitank, Sheetal, Star, Lotus
12	PTMT Fittings	Prayage, Wilson
13	Ceramic floor tiles	Kajaria, Johnson, Somany.
14	Bathroom Fittings	Jaguar, Kohlar, Marc , Hindware
15	STRUCTURAL STEEL SECTIONS	TATA, JINDAL, SAIL, TICO
16	PRECAST DRAIN COVER/KERB CHANNEL	S&S, HPL, KK, NITCO, KERAKROME, TERRAFIRMA & SUSHMA INDUSTRIES./ ASHOKAA TILES
17	CEMENT – OPC/PPC	ACC, ULTRA TECH, J.P. CEMENT, VIKRAM, SHREE CEMENT, BIRLA UTTAM
18	HDPE Pipes	Reliance, Duraline, Times, Jain.
19	READY MIXED CEMENT CONCRETE	(ACC, LAFARGE, ULTRATECH, NDCON constructions, RMC READYMIX (India), M/s. V.K. Ready Mix Concrete Pvt. Ltd., M/s Raj Ready Concrete Pvt. Ltd., M/s Shri Ram Ready Mix concrete Pvt. Ltd.
20	WHITE CEMENT	BIRLA WHITE , J.K. WHITE
21	GLAZED CERAMIC TILES/ Vitrified Tiles	SOMANY, KAJARIA, NITCO, ORIENT
22	BITUMEN	IOCL, BPCL, HPCL
23	POLYMERISED MODIFIED BITUMEN	USHA LUBES, OOMS POLYMER, TIKI BAR, STP Ltd.
24	VITRIFIED TILES	KAJARIA, SOMANY, JOHNSON, ORIENT
25	WATER-PROOF CEMENT PAINT	SNOWCEM, ASIAN, BERGER, STP Ltd.
26	SYNTHETIC ENAMEL PAINT	BERGER, NEROLAC, ASIAN

27	PLASTIC EMULSION PAINT	ASIAN, BERGER, NEROLAC, ICI DULUX, JENSEN.
28	ACRYLIC DISTEMPER	ASIAN, BERGER, NEROLAC, ICI DULUX
29	STEEL PRIMER	ICI, NEROLAC, BERGER, ASIAN PAINTS
30	WOOD PRIMER	ICI, NEROLAC, BERGER, ASIAN PAINTS
31	WOOD FINISH (MELAMINE & PU POLISH)	JIVANJOR , JIVANJOR (PU) , ASIAN
32	PLY BOARD, PLYWOOD (PINE BOARD)	MERINO, GREEN, DURO, KIT PLY
33	LAMINATE	MERINO, GREEN NEW MIKA, FORMICA, GREEN LAM, DONEAR
34	VENEER PLY	MERINO, GREEN PLY, KITPLY INDUSTRIES, DURO DOORS
35	LOCKS, LATCH	GODREJ, HARRISON, PLAZA, GOLDEN, YALE, LINK
36	PRELAMINATED PARTICLE BOARD	CENTURY PLY, NOVOPAN, KITLAM, ECOBOARD, MERINO
37	ANODISED ALUMINIUM FITTINGS FOR DOOR & WINDOWS	NU-LITE ,ARGENT , CLASSIC (HEAVY DUTY) OR EQUIVALENT
38	STEEL WINDOWS, PRESSED STEEL FRAMES	SAN HARVIC, STEELMAN INDUSTRIES, PD INDUSTRIES, METAL WINDOWS, CHANDNI INDUSTRIES, GANPATI UDYOG (RAJPURA)
39	WIRE MESH	STERLING ENTERPRISES, TRIMURTY WELDED MESH
40	TILE ADHESIVE	UNITILE , BAL ENDURA , PIDILITE , FAIRMATE , BASF , SOMANY, STP Ltd.
41	GROUTING COMPOUND	BAL ENDURA , PIDILITE , LATICRETE, FAIRMATE , BASF , SOMANY, STP Ltd.
42	DASH,ANCHORING FASTENERS	HILTI, FISCHER, EXCEL, CANON
43	NUTS,BOLTS & SCREWS	GKW, KUNDAN, PRIYA, ATUL
44	ALUMINIUM SECTIONS FOR DOORS & WINDOWS ETC.	JINDAL , HINDALCO,INDAL
45	ALUMINIUM COMPOSITE PANEL	ALUCOBOND , REYNOBOND , ALUDECOR
46	SPECIALISED AGENCIES FOR ALUMINIUM GLAZING, STRUCTURAL GLAZING, ALUMINIUM DOOR & WINDOWS, ACP WORK.	S.P. FABRICATORS (BOMBAY, DELHI), ALCOHNS (GURGAON), WINDORZ INDIA PVT. LTD. (DELHI), ALKARMA, BHARAT ARCHIMETAL, GV ALUMINIUM (P) LTD, ATERNIA
47	SILICON SEALANT	GE , DOW CORNING , PIDILITE , FAIRMATE, STP Ltd.

48	SOLVENT BASED SILICONE REPELLENT COATING	DR. FIXIT, PIDILITE WR OR D.C. - 6689 SOLVENT BASED WATER REPELLENT, BASF, STP Ltd.
49	FLUSH DOOR	GREEN PLY, DURIAN, CENTURAY PRIME, MERINO
50	Stainless Steel Wash-basin & WCs	Jayra, Neelkhant, Prayag or equivalent
51	TEXTURED PAINT	UNITILE PRODUCTS , HERITAGE (BAKELITE HYLAM LTD) , SPECTRUM
52	S.S. STAIRCASE RAILING	JINDAL STAINLESS STEEL LTD., KICH INDUSTRIES, ESSAL
53	WALL PUTTY	JK , BIRLA, STP Ltd.
54	FLOOR HARDENER	PIDITOP 333 (NON – METALLIC) MANUFACTURED BY M/S PIDILITE INDUSTRIES LTD. BOMBAY , NITOTOP OF FOSROC , SIKA , FAIRMATE , BASF, STP Ltd.
55	POLYSULPHIDE SEALANT	ORDINARY PIDISEAL BY M/S PIDILITE INDUSTRIES LTD. BOMBAY, TUFFESEAL BY M/S HINDUSTAN BROTHERS 225 RUE FRANCUIS MARTIN, PONDICHERRY – 605001 , FAIRMATE , MASTERFLEX 700I OF BASF, STP Ltd.
56	SPECIALISED AGENCY FOR EXPANSION JOINT TREATMENT	BASF, M/S TECHNOCRATS, M/S TUFF WATERPROOFING CO., STP Ltd.
57	WATERPROOFING COMPOUND	FOSROC, DR. FIXIT, FAIRMATE, BASF, STP Ltd.
58	ADMIXTURES	FOSROC, SIKA, DR. FIXIT, FAIRMATE, BASF, STP Ltd.
59	VITREOUS CHINA SANITARYWARE	HINDWARE, CERA, PARRYWARE, NEYCER, KOHLER, JAQUAR
60	STAINLESS STEEL SINKS	NILKANTH, NIRALI, CORBA, KINGSTON
61	C.P. BRASS FITTINGS	JAQUAR (CONTINENTAL), PARKO (ECO), MARC (ORIENTAL), CERA
62	SOIL, WASTE & VENT PIPES & FITTINGS A) CENTRIFUGAL CASTIRON	NECO , HEPCO (BINAY UDYOG),SKF
63	CENTRIFUGALLY CAST (SPUN) IRON PIPES (CLASS LA)	RIF (RAJ IRON FOUNDRY), NECO, SKF
64	HCI PIPES	RIF (RAJ IRON FOUNDARY), SKF
65	CPVC PIPES	ASTRAL, ASHIRWAD, PRAKASH, FLOGUARD
66	UPVC WINDOW/ DOORS	PRIZMA, FANIESTA, DOROWIN
67	G. I. PIPES	TATA, JINDAL HISAR (AS PER CLASS SPECIFIED IN THE BOQ)

68	UPVC PIPES	SUPREME, PRINCE, FINOLEX
69	GUNMETAL VALVES	LEADER, SANT, ZOLOTO
70	BALL VALVES	ZOLOTO, IBP, ARCO
71	C.I. DOUBLE FLANGED SLUICE VALVES	KIRLOSKAR, IVC, BURN
72	COPPER FITTINGS	YORKSHINE, IBP, BCONEX
73	C.P. BATHROOM ACCESSORIES LIKE ROBE HOOK, TOWEL RING, TOWEL RAIL, SOAP DISH, TUMBLER HOLDER, TOILET PAPER HOLDER, TOWEL RACK ETC.	CAMRY , GEM , PARKO , SIEKO , ESS ESS, CERA, JAQUAR
74	SPREADER, WASTE COUPLING	GEM , ESS ESS , CAMRY
75	MECHANICAL COUPERS	USHA MARTIN, DEXTRA, ASCON, HERRISAN, G-TECH SPLICING
76	FLOAT GLASS	MODI GLASS , SAINT GOBAIN GLASS
77	FIRE CHECK DOOR	NAVAIR, GODREJ, ABACUS, PROMAT,KUTTY DOOR, DORMA
78	ANCHOR PLUG SOIL/ ROCK ANCHOR	BBR, VSL, FREYSSINET
79	PAVING TILES/ PAVER BLOCK	NITCO,PREFAB, ULTRATECH, ASHOKAA TILES, KK, DALAL, SUSHMA, JMD TILES, M/s Kiriti Spun Pipes M/s S.S & Co., CECO TILES
80	THERMO PLASTIC PAINT	BURGER, ASIAN, CBM, CMS, RELIANCE THERMOPLAST, SUNRISE
81	PRECAST CC KERB STONES	ASHOKAA TILES, KK, S&S, HPL, NITCO, KERAKROME, TERRAFIRMA, SUSHMA, DALAL, M/s Kiriti Spun Pipes
82	RCC PIPE	ASHOKAA TILES, LAKSHMI, SOOD & SOOD, JAIN & CO., DIWAN SPUN PIPES, M/s Kiriti Spun Pipes
83	DI PIPE	TATA, ELECTRO STEEL, JINDAL, RASHMI
84	ÁNTICARONATION PAINT& PRIMER	SUNANDA, FOSROC, CHOWGULE, ICI LTD, NEROLAC, BERGER, ASIAN, STP LTD.
85	Release Agent	FOSROC, MBT, DURA BUILD CARE, CICO
86	Non- shrink grout	Fosroc Chemicals, Sika, Dura Buildcare
87	Mild Steel Tubes	Tata, LLyods, NSL
88	Welding Electrodes	ESAB, Advani-orlikon, weld Alloy.
89	Bar Couplers	Dextra, Moment

90	Reinforced soil wall system	AIMIL, VSL, SARGAON, GARWARE WALL ROPES, EARTHCON SYSTEMS, Z-TECHINDIA,
91	Anti Carbonation paints	CICO, MBT, FOSROC.
92	PVC WATER STOPS	FIXOPAN \, MARUTI RUBBER
93	Pressurising System	FPCC, BBR, VSL
94	Approved workshop for fabrication	Any work shop who fabricated similar work and approved by Superintending Engineer.
95	HSFG BOLTS	UNBARKO PRECISION, PANCHSHEEL FASTENERS, LAXMI PRECISION FASTENER.
96	Bevelled edge mirror with PVC	Atul, Jolly, Modi Guard, Saint Gobain
97	Brass /CP Brass fittings	Kingston, Gem, Parko, Marc, Jaquar
98	Stainless Steel sink	AMC, Neelkanth, Kingston, made of salem stainless steel
99	Automatic Flushing Cistern	Utech – Toshi
100	Surgeon Mixers	Vijay, Jaquar, Parko
101	Plastic WC seat cover	Commander, Diplomat, Bestolite, Century.
102	Flush Valves	Jaquar, , Kohlar, MARC, Hindware
103	C.P. Accessories	ESS ESS, Dripless Delta, Lotis, AKOI
104	Gunmetal Valves (Fullway Check and Globe Valves)	Leader, Sant, Zoloto,
105	Stoneware pipes & Gully trap	Perfect, Burn, Parry
106	C.I. Double flanged sluice valves	Kirloskar, IVC, Burn
107	C.I. Doubled flanged non return valves	Kirloskar
108	Deck Wood Flooring	Pergo, Vista
109	Butterfly Valve	AUDCO
110	Water pumps	Kirloskar, KSB, Harrison
111	Float Volves	IVC, leader or equivalent
112	Centrifugal cast iron pipes 150mm/ 100mm dia and its accessories/ fittings	NECO, RIF, HIF, HEPCO.

PART 'C' ELECTRICAL WORK.

Index for Part-C.

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SCHEDULES

SCHEDULE 'A'

Schedule of Quantities :- - As per separate sheets attached from **Page No. 241 to 252**

SCHEDULE 'B'

Schedule of materials to be issued to the contractor.

Sl. No.	Description of Item	Quantity	Rates in figures & words at which the material will be charged to the contractor	Place of Issue
1	2	3	4	5
Nil				

SCHEDULE 'C'

Tools and Plants to be hired to the contractor

S.No	***Description***	Hire charges per day	Place of issue
1	**2**	3	4
Nil			

SCHEDULE 'D'

Extra schedule for specific requirements/documents for the work, if any. NIL

SCHEDULE 'E'
Reference to General conditions of contract :-

i)	Estimate cost of Work	:
ii)	Earnest Money	:
iii)	**Performance Guarantee**	**:**
iv)	**Security Deposit**	**:**

SCHEDULE 'F'

GENERAL RULES AND DIRECTIONS:
Officer Inviting Tender — As per Schedule A to F for **Civil works Page No.42**

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3.

Definitions:

2 (i)	Engineer-in-Charge	**Executive Engineer (E) PWD Elect. Div. South-East Tyagraj Stadium, Tyagraj Nagar, New Delhi - 110003**
2(ii)	Accepting Authority	As per Schedule A to F for Civil Works Page No. 42 to 43
2(iii)	Percentage on cost of materials and labour to cover all overheads and profits.	
2(iv)	Standard Schedule of Rates	
2(v)	Department	
9(vi)	Standard CPWD contract Form	

Clause 1

i) Time allowed for submission of Performance Guarantee from the date of issue of tender of acceptance, in days

ii) Maximum allowable extension **with late fee @ 0.1% per day of Performance Guarantee amount** beyond the period provided in (i) above

Clause 2

Authority for fixing compensation under clause 2.

Clause 2A

Whether Clause 2A shall be applicable

As per Schedule A to F for Civil Works Page No.42 to 44

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start

Clause 5.1

Table of Mile Stone (s)

SN	Description of Milestone (Physical)	Time Allowed in days (from date of start)	Amount to be with-held in case of non achievement of milestone
As per Schedule A to F for Civil Works Page No.44			

Time allowed for execution of work :	As per Schedule A to F For Civil works Page No.44
Authority to decide :	
(i.) Extension of time	
(ii) Rescheduling of mile stones	
(iii.) Shifting of date of start in case of delay in handing over of site	
Clause 6, 6A	
Clause applicable – (6 or 6A)	
Clause 7 Gross work to be done together with net payment/adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment.	Rs. 20.00 lacs
Clause 7A	Applicable
Clause 10A List of testing equipment to be provided by the contractor at site lab.	As per Schedule A to F **for Civil works at Page 45**
Clause 10B(ii) Whether Clause 10 B (ii) shall be applicable	
Clause 10C Component of labour expressed as percent of value of work	

Clause 10CA

S.N.	Material covered under this clause	Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed	Base Price of all Materials covered under clause 10 CA
		N. A.	

Clause 10CC

Clause 10CC to be applicable in contracts with stipulated period of Completion exceeding the period shown in next column	
Schedule of component of other Material, Labour, POL etc. for price escalation.	
Component of civil (except materials covered under clause 10CA) / Electrical construction Materials expressed as percent of total value of work	As per Schedule A to F for Civil Works Page No. 46 to 47.
Component of Labour : Expressed as percent of total value of work	
Component of P.O.L Expressed as percent of total value of work	

Clause 11

Specifications to be followed for execution of work — **General Specification for EI works 2013 (Part-I Internal) and 1994 (Part-II External) with up to date amendment.**

Clause 12

		Original Work
12.2 & 12.3	Deviation limit beyond which clause 12.2 & 12.3 shall apply for building work	30% of all work or as admissible.
12.5	Deviation limit beyond which clause 12.2 & 12.3 shall apply for foundation work (except earth work)	30%
	Deviation Limit for items in earth work subhead of DSR or related items	100%

Clause 16
Competent Authority for deciding reduced rates.

Clause-18 List of mandatory M/c, tools — L.T. Meggers, Multi Meter, Tong Tester, Crimping Tool up to 300 sq, mm, Tower Wagon, Power Tool for raising /lowering high mast, Aluminum ladders of appropriate size, cable unrolling jack machine etc.

Clause-25
Constitution of Dispute Redressal Committee (DRC) :

a) For total claims more than 25 lakh.

Chairman :
Member :
Member :
:

b) For total claims upto Rs. 25.00 lakh.

Chairman :
Member :
Member :
:

Place of arbitration :

As per Schedule A to F for Civil Works
Page No.47 to 49

Clause 36 (i)

Sl No	Minimum Qualification of Technical Representative		Discipline	Designation (Principal Technical / Technical representative	Minimum Experience	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36 (i)	
	Qualification	No.				Figure	Words
1.	Graduate Engineer or Diploma Holder	1	Electrical	Project Manager cum Planning/ quality/site/Billing Engineer	2 or 5 Years	Rs. 15,000/- per month	Rs. Fifteen Thousand only.

Clause 42

i) (a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates _____ printed by CPWD. **DSR (E) 2016 & Market Rate**

ii) Variations permissible on theoretical quantities

a) Cement for works with estimated cost put to tender not more than Rs. 5 lacs. Not applicable

for works with estimated cost put to tender more than Rs. 5 lacs. Not applicable

(b) Bitument for all works Not applicable

c) Steel Reinforcement and structural steel sections for each diameter, section and category. Not applicable

d) All other materials. Nil

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

Sl. No.	Description of Item	Rates in figures and words at which recovery shall be made from the contractor.	
		Excess beyond permissible variation	Less use beyond permissible variation
1.	Cement	**Not applicable**	
2.	Steel reinforcement		
3.	Structural Sections		
4.	Bitumen issued free		
5.	Bitumen issued at stipulated fixed price		

ELIGIBILITY CRITERIA FOR MAIN AGENCY WITH RESPECT TO ASSOCIATED ELECTRICAL AGENCY TO BE ENGAGED BY MAIN CONTRACTOR FOR EXECUTING THE ELECTRICAL SUBHEADS

1 For the different E&M subheads, the main contractor will have to engage the associate electrical contractor/specialized agency in the field as per following:-

a) In case of the electrical works for which the enlistment/annual prequalification is there and estimated cost of this package is within the monitory limit of the enlistment/annual pre-qualification then main firm will have to associate the enlisted/annually pre-qualified firm in the respective field of appropriate category/class.

b) In case, the estimated cost of the relevant subhead is beyond the enlistment /annual P.Q. limits OR it is the specialized work having no enlistment / Annual PQ in CPWD, then the main firm will have to engage the associate firm who fulfills the set eligibility criteria as described below:-

c) The firm should have successfully completed similar works including capacity of the equipment required as applicable as per following, during the last 7 years ending last day of the submission of bids:-

Three similar works, each of value not less than 40% of estimated cost

OR

Two similar works, each of value not less than 60% of estimated cost

OR

One similar work of value not less than 80% of estimated cost

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of bid.

i) Turnover: Average annual financial turnover should be at least 50% of the estimated cost, during the immediate last 3 consecutive financial year.
ii) Solvency Certificate: Solvency of the amount equal to 40% of the estimated cost of work.
iii) The documents required in case of works having no enlistment / Annual PQ shall be as per enclosed proforma as in Form A & B.

2 After award of work and before the first milestone, the main contractor will have to submit name/s of the proposed associate contractor (for each of the E&M works), who fulfill set eligibility criteria for the relevant sub-head. The documents will have to be submitted in detail as required, which will be checked as per NIT for approval of the associate contractors. It will be essential that proposed electrical associate agencies qualify for each sub-head as eligibility criteria given in NIT.

3 The department reserves the right to allow the main firm to submit additional documents / additional names of the associates in case of the deficiencies in documents or in case of no associate getting qualified in respect of certain subheads. The same will have to be complied with the main contractor within the time allowed. The decision of the department shall be final & binding on the intending bidders.

4 The main firm should submit the willingness from eligible electrical contractors to get associated with them for execution of the electrical component of works in wholesome manner and as per the conditions set out in the MOU to be entered into, between the one who is awarded the work and the associated eligible electrical contractor.

5 In support of the eligibility conditions of the proposed associated electrical contractor, copy of their registration documents, Electrical Contractor's License, GST, eligibility documents duly attested by the applicants (Main Contractor) shall be submitted to the EE(C) for deciding the eligibility by competent authority. Such associate electrical contractor will certify that they are not debarred as on the day of application for sale of tender.

6 In the event of the concerned E&M agency not performing satisfactorily or failure of associate/ sub-contractor to complete the E&M work, the main contractor on the written direction of the department, shall remove the Associate/sub-contractor deployed on the work and shall submit name of new associate who fulfills the conditions mentioned in NIT to execute the leftover work without any loss of time or variation in cost to the department in this regard. Such associates shall also enter into Agreement with the main tenderer shall meet all the guarantee for the equipments already supplied for which payment has been released by the department in part. If any equipment supplied for the work, during the currency of the earlier Associate/sub-contractor and paid partly by the department becomes redundant /not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of E&M work, the main contractor shall be liable for replacement of the equipment(s) at no cost to Department. No change of Electrical Contractor will be allowed without prior approval of the CPM

7 Executive Engineer (E) shall be the Engineer-in-charge as far as electrical works are concerned.

8 The main contractor shall be responsible and liable for proper and complete execution of the Electrical work and ensure coordination and completion of both civil and electrical work.

9 The main contractor has to enter into agreement with contractor(s) associated by him for execution of E&M subheads. Copy of such agreement shall be submitted to EE(E) in charge as well as to EE(C). In case of change of associate contractor, the main contractor has to enter into agreement with the new contractor associated by him.

10 The associate or sub contractor shall attend the inspection of the work by the Engineer-in-Charge of E&M works as and when required.The agencies executing the electrical work should have valid license for LT/HT as applicable and as described in eligibility criteria.

11 The main firm should either himself meet the eligibility conditions for the respective E&M packages or otherwise he will have to associate an agency meeting the eligibility requirements given above. It will have to use willingness certificate for each of the component of the Electrical work for Associate agencies by clearly indicating the applicable component of the work.

12 The Main composite category CPWD enlisted wants to carry over the work themselves and don't want to associates any agency for minor components he has to ensure that he full fill eligibility criteria as defined in bid documents and submit the details to engineer- in- charge of work and shall have to full fill the following conditions in additional to conditions mentioned above.

(a) The composite category contractor shall have valid electrical contractor license.

(b) A electrical supervisor having 5 years experience on his roll having valid electrical supervisor licenses or diploma in electrical engineer.

(c) A electrician having valid electrical wireman license/ITI in electrical engineer with 5 years experience.

For A&B i.e. electrical supervisor and electrical wireman should have valid appointment letter of agency, Pan Number, I.D. Proof, EPF/ESIC registration number as required.

13 Verifiable completion certificates of the work of registration/eligibility documents as the case may be, duly attested by the applicant shall be submitted. Valid Electrical Contractor's license, as the case may be, duly countersigned by the applicant as well as signed by the associate contractors shall also be submitted. Self attested GST documents in respect of the associated agencies as well as signed by associate firms shall be submitted along with the tender documents.

MEMORANDUM OF UNDERSTANDING [M.O.U] BETWEEN
(Separate for each sub head of E&M work)

1] M/S [Name of the firm with full address]
[Henceforth called the main contractor]
And

2] M/S [Name of the firm with full address]
[Henceforth, called Associated Electrical Contractor or Electrical Contractor]

For the execution of Electrical Work : -

We state that M.O.U between us will be treated as an agreement and has legality as per Indian Contract Act [amended upto date] and the department [PWD, Delhi] can enforce all the terms and conditions of the agreement for execution of the above work. Both of us shall be responsible for the execution of work as per the agreement to the extent this MOU allows. In case of any dispute, either of us will go for mediation/arbitration by the Chief Engineer (South)M,PWD Any of us may appeal against the mediation/arbitration to the Chief Engineer (South)M,PWD His decision shall be final and binding on both of us.

We have agreed as under:

1 The electrical contractor will execute all electrical works in the wholesome manner as per terms and conditions of the agreement. The electrical contractor shall be paid as per standard procedure followed by the department and the agreement between parties. Any type of internal transaction between the electrical contractor and the main contractor shall be as per their convenience and mutual understanding without involving the department.

2 The electrical contractor shall be liable for disciplinary action if he failed to discharge the action[s] and other legal action as per agreement.

3 All the machinery and equipments, tools and tackles required for execution of the electrical works, as per agreement, shall be the responsibility of the electrical contractor.

4 The site staff required for the electrical work shall be arranged by the electrical contractor as per terms and conditions of the agreement.

5 Site order book maintained for the said work shall be signed by the main contractor as well as by the Engineer of the Associated Contractor and by Associated Contractor himself.

6 All the correspondence regarding execution of the electrical work shall be done by the Department with the Associated Contractor with a copy to the main contractor. In case of non-compliance of the provisions of agreement, the main contractor, as well as the associated contractor shall be responsible. The action under clauses 2 and 3 shall be initiated and taken against the main contractor.

SIGNATURE OF MAIN CONTRACTOR
Date :
Place :

SIGNATURE OF ASSOCIATED ELECTRICAL CONTRACTOR

Date :
Place :

COUNTERSIGNED
EXECUTIVE ENGINEER

WILLINGNESS CERTIFICATE
(Separate for each sub head of E&M work)

Name of work: _____

I hereby give my willingness to work as electrical contractor for the above mentioned work.

I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-Charge. Also I will employee full time technically qualified supervisor for the works. I will attend inspection of officers of the department as and when required.

Dated:

Signature of the Electrical Contractor

FORM 'A' FORM OF BANKERS CERTIFICATE FROM A SCHEDULE BANK
(To be submitted separately as required)

This is to certify that to best of our knowledge and information that M/s./Sh. …..…… having noted address , a customer of our bank are / is respectable and can be treated as good for any marginally engagement up to a limit of Rs……...../-(Rupees……..…..……)

This certificate is issued without any guarantee or responsibility of the bank or any of the officers.

(Signature)
For the Bank

NOTE:-

(1) Bankers Certificate should be on letter head of the Bank.

(2) In case of partnership firm, Certificates should include names of all partners as recorded with the Bank.

FORM 'B'
DETAILS OF ALL WORKS OF SIMILAR CLASS COMPLETED DURING THE LAST SEVEN YEARS ENDING PREVIOUS DAY OF LAST DATE OF SUBMISSION OF BIDS

S. No	Name of Work / Project & Location	Owner or Sponsoring Organization	Gross amount	Date of Commencement as per contract	Stipulated date of completion	Actual date of Completion	Litigation / arbitration pending/ in progress with details*	Name & address/ Telephone number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10

*Indicate gross amount claimed and amount awarded by the Arbitrator.

SIGNATURE OF APPLICANT(S)

Note:-

1. Only those works which satisfies the eligibility criteria needs to be mentioned

General Terms &Conditions (Electrical)

1. The Work shall be carried out as per CPWD specifications for electrical works Part-I 2013 (Internal), and Part-II 1994 (EXT.) , Part IV – 2013(Electrical substation) and the Indian Electricity Rule–1956 as amended up to date for such works
2. All the materials, whatsoever, to be supplied and provided by the contractor should be of standard and approved quality. These should be got approved from the Engineer-in-Charge or his authorized representative before installation. No payment will be made for any unapproved or sub standard/ rejected materials used on the work. Rejected materials should be removed from the site of work within 48 hours failing which the same will be liable for removal by the department at the risk and cost of contractor without any liability.
3. All malba should be removed on the same day. In case of failure to do so it will be got done by the Engineer-in-Charge or his authorized representative at contractor's risk and cost.
4. Laying of the cable, position of fittings and cable routes etc. should be got approved by the Engineer-in-Charge or his authorized representative. It will be in the interest of the contractor to mark the above layout at site and get it approved before actual execution of the work otherwise it will not be accepted and the contractor will have to get it redone for which no extra payment will be made.
5. Persons employed for execution of electrical work should have electrical license as required under I.E. Act.
6. The contractor shall ensure all the safety measures such as wearing of helmet, safety belt, and safety shoes etc to all the work men deployed at site.
7. All types of T& P like Tower Wagon/Hydra/Ladder and other machinery shall be provided by contractor and no extra payment shall be made on this account.
8. The earthing shall invariably be done in presence of the AE/ JE in charge of the work.
9. Supply items to be got approved from Engineer-in-Charge in Advance, otherwise no payment shall be released.
10. The firm shall furnish certificate/ undertaking from the labour employed by him that he will not claim security of job from the department at any stage of time.
11. Before cable is laid in the ground the route must be got approved from Engineer-in-Charge the cable trench shall be as straight as possible. Otherwise it will not be acceptable and the contractor will have to get it redone for which no extra payment will be made.
12. The list of approved makes for the materials to be used at site for execution of work is attached.
13. All screws/ nuts bolts should be galvanized/ cadmium plated/ passivatee only as the case may be.

14. The inventory of executed work has to be verified by the committee of representative of client department. Agencies and PWD and above verified inventories has to handed over to client department. One copy of inventory shall be kept in record of PWD. Photocopy of inventory shall be enclosed with final bill of the work before passing the final bill.

15. The firm has to make minimum wages to its employees as per Delhi Administration Minimum Wages Act. The staff deployed by the contractor shall be purely contractor labour. Staff deployed shall not claim for any govt. job or compensation from the department

16. Rates quoted shall be inclusive of GST, Bonus if applicable etc. and nothing extra shall be paid by the department on these account.

17. Contractors shall have to submit the proof of material purchased by them i.e. Challan / Bill for the genuineness of material. However Bill / Challan shall not be prior to date of opening of tender.

18. Complete electrical installation except LED fittings shall one year defect liability period from the date of completion of work in all respect and handed over to department / client. The agency shall maintain all installation comprehensively during defect liability period. If agency fails to do so, department shall get work done and expenditure occurred shall be recovered from the dues of agency or by any other means as deemed fit.

19. Payment Terms : -
    a) 60% of Agreement Rate against supply of material in good condition.
    b) 20% of Agreement Rate after installation.
    c) 20% of Agreement Rate on successful testing & commissioning and handing over to client

22. The Contractor shall give five years warranty / guarantee of the LED fittings of any manufacturing defects. The Contractor shall replaced / repair the fittings free of cost during the guarantee period. In this regard before supplying of material the contractor shall submit an undertaking of the manufacturer of the LED fittings stating that material supplied shall stand warrantee against manufacture defects for the period of five years.

23. In addition to the Security Deposit an additional 10% of the LED fitting items amount shall be withheld in safe guard of 5 year guarantee/ warranty and shall be released every year as follows. However, Security Deposit shall be released after successful guarantee of one year of installation.

i)	On completion of 1st year	after accord of completion	=	1%
ii)	On completion of 2nd year		=	1%
iii)	On completion of 3rd year		=	2%
iv)	On completion of 4th year		=	2%
v)	On completion of 5th year		=	4%

24. Defective LED luminaries within warrantee period shall have to be repaired by agency or concerned manufacturer of LED luminaries can be replaced within 7 days after intimation. In case of no response, defective LED luminaries can be replaced by this office from elsewhere, which shall be recovered from the pending dues of the contractor and strict action shall be taken against concerned LED luminaries' manufacturer.

25. The LED flood light fittings shall have:

a) Heat resistance UV stabilized toughened glass cover with frame
b) IP 66 protection for street light/flood lights
c) High bright white power LED with LM 80 test report.
d) Colour rendering index (CRI) >70%
e) Colour temp. of luminaries shall be 3000ºK.
f) LM-79 test report of fittings.
g) Power factor >0.95
h) System Efficiency >110 Lumen / Watt
i) Operating Voltage 140 Volt to 270 Volt.
j) Total Harmonic distortion < 15%
k) LED drive current 350 MA to 1000 MA
l) LED drive Efficiency >85%
m) Housing: - Pressure Aluminum dia cast (Thermal and impact resistance ≥ IK-05
n) Safety: As per IEC 60598/IS 10322
o) Front cover: - It should be equipped with distortion free clear heat resistance toughened UV stabilized glass / poly carbonate cover in the front.
p) Driver specifications: - 140-270 V universal Electronic driver with internal surge protection of min 4 KV.
q) Operating temperature: - 10ºC to 50ºC
r) Optics: - PMMA lens for uniform distortion.
s) Surge Protection – not less than 10 KV(Internal + External)

26 Specification of HDPE Pipe

a) The DWC high density polyethylene pipe having corrugation on outer wall and plain inner wall shall confirm to IS : 14930 part – I & II amended upto date.
b) The pipe shall be ISI marked
c) Contractor has to arrange inspection of pipe at manufacturer's premises to carry out necessary tests contained in IS-14930 part-I & II (compression test, impact test, banding test etc.).
d) Job includes (laying of pipe) accessories like HDPE snap fit couplerin order to make water/damp proof joint.
e) Contractor has to produce test report of anti rodent test, toxicity test of pipe from Govt. approved test house.

28.0 INSPECTION AND TESTING

28.1 All major items i.e. Poles, cables, all type of LED fittings, DWC Pipe, Panel & Feeder Pillar etc. shall be offered for initial inspection at manufacturer's works. The contractor will intimate the date of testing of equipments at the manufacturer's works before dispatch. The successful tenderer shall give advance notice of minimum two weeks regarding the dates proposed for such tests to the department's representative to facilitate his presence during testing. The Engineer-in-Charge or his representative may witness such testing. The cost of Engineer's visit to the factory will be borne by the Department. Equipments will be inspected at the manufacturer/ authorized dealer premises before dispatch to the site by the contractor if so desired by the Engineer-in-charge.

28.2 Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturers premises shall be furnished to the Engineer-in-Charge and consignee.

28.3 After completion of the work in all respects the contractor shall offer the installation for testing and operation.

LIST OF ACCEPTABLE MAKES OF ELECTRICAL MATERIAL

S.No.	MATERIAL		ACCEPTABLE MAKE
1.	Zebra Pole	:	Eveready / Keselec / K-Lite
2.	Decorative Light Pole	:	Orient / Glowmac / Hi-Lite / K-Lite
3.	Decorative Post Top lantern	:	Orient / Glowmac / Hi-Lite / K-Lite
4.	DWC/HDPE Pipe	:	REX/Duraline/Gemini pipe
5.	LED Flood Light fittings	:	Havells/ Phillips/ Wipro/Trilux/Halonix
6.	LED Up-Down lighter	:	Havells/ Phillips/Divinity/Osram /K-lite /Halonix
7.	Linear facade Wall Washer	:	Philips / Havells /Divinity/Osram /K-lite/Halonix
8.	Armoured Cable(Aluminium)& Flexible cable (Copper)	:	Polycab / Finolex/ Gloster/ National/ Havells/ KEI/Rallison
9.	GI / MS pipe	:	Jindal/Tata/SAIL/Prakash (ISI Marked)
10.	PVC insulated copper FRLS conductor wires	:	Finolex/ Polycab /Havells / L&T
11.	Piano / Modular type switch & Accessories (ISI Marked)	:	LegrandMosaic / Havells/ Northwest/ Crabtree
12.	M.S. Conduit Pipe & its accessories (ISI Marked-ERW)	:	BEC/AKG/NIC
13.	Submersible cable (ISI marked)	:	Polycab / Finolex/ Gloster/ National/ Havells/ KEI
14.	Lugs/Ferrules	:	Dowells/Jainson.
15.	Brass compression gland (Heavy duty)	:	Commex/Gripwell/Hansel.
16.	MCB/MCB DB /TPN DB/ Isolator/ RCCB	:	Legrand/ABB/Siemens/Schneider/L&T/C&S
17.	MCCB (ICS = 100% ICU)	:	Legrand/ABB/Siemens/Schneider/L&T/C&S
18	Phenolic laminated sheet (whitecolour)	:	Hylem/Formica
19.	Ceiling Fan	:	Usha/Orient/Havells/Crompton
20.	Exhaust Fan	:	Usha/Orient/Havells/Crompton
21.	Digital Ammeter /Volt meter / BCH/ Indicating Lamp	:	AE / L&T Salzer/ L&T/ Kappa/ Kaycee/ C&S/ Siemens /HPL
22.	Sewage Submersible Pump	:	KSB / Kirloskar / Mather & Plate
23.	DOL Starter	:	L&T / BCH / C&S
24.	Gate Valve / NRV Valve	:	Sant / Leader /Kirloskar/ Zoloto / Kartar
25.	Feeder Pillar / Cubical Panel Panel/Neptune & Devices	:	System Control / Application control /Precision control/ASPL/SPC/Electro control
26.	LED Fittings for Zebra Pole	:	Eveready / Keselec / K-Lite
27.	Any other item	:	Approved by the Engineer-in-charge

PART 'D'
HORTICULTURE WORK

Index for Part-D.

Sl. No.	Description	Page No.
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5.	Detail of Similar Completed Works (Form-B)	205
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SCHEDULES

SCHEDULE 'A'

Schedule of Quantities :- - As per separate sheets attached from **Page No. 253 to 259**

SCHEDULE 'B'

Schedule of materials to be issued to the contractor.

Sl. No.	Description of Item	Quantity	Rates in figures & words at which the material will be charged to the contractor	Place of Issue
1	2	3	4	5
Nil				

SCHEDULE 'C'

Tools and Plants to be hired to the contractor

S.No	***Description***	Hire charges per day	Place of issue
1	**2**	3	4
Nil			

SCHEDULE 'D'

Extra schedule for specific requirements/documents for the work, if any. NIL

SCHEDULE 'E'

Reference to General conditions of contract :-

i)	Estimate cost of Work :	
ii)	Earnest Money :	
iii)	**Performance Guarantee :**	
iv)	**Security Deposit:**	

SCHEDULE 'F'

GENERAL RULES AND DIRECTIONS: Officer Inviting Tender		As per Schedule A to F for **Civil works Page No. 41 to 42**
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3.		
Definitions:		
2 (i)	Engineer-in-Charge/ officers in Charge	**Dy. Director (Hort.), PWD Division M-114, (GNCTD) New Delhi**
2(ii)	Accepting Authority	**Chief Engineer (South)M, PWD**
2(iii)	Percentage on cost of materials and abour to cover all overheads and profits.	15%
2(iv)	Standard Schedule of Rates	**DSR 2016(Civil),DSR-2016(Hort.) & A/R WITH UPTO DATE C.S.**
2(v)	Department	PWD(NCTD)
(vi)	Standard CPWD contract Form	**CPWD Form-7, as modified and corrected upto date of issue of Tender**

Clause 1

i) Time allowed for submission of Performance Guarantee from the date of issue of tender of acceptance, in days

ii) Maximum allowable extension **with late fee @ 0.1% per day of Performance Guarantee amount** beyond the period provided in (i) above

Clause 2

Authority for fixing compensation under clause 2.

Clause 2A

Whether Clause 2A shall be applicable No…

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start

As per Schedule A to F for Civil Works Page

to Page No.43

Clause 5.1

Table of Mile Stone (s)

SN	Description of Milestone (Physical)	Time Allowed in days (from date of start)	Amount to be with-held in case of non achievement of milestone
As per Schedule A to F for Civil Works Page No.44 to 46			

Time allowed for execution of work :

Authority to decide :

(i.) Extension of time

(ii) Rescheduling of mile stones

(iii.) Shifting of date of start in case of delay in handing over of site

As per Schedule A to F

For Civil works Page No.44 to 45

Clause 6, 6A

Clause applicable – (6 or 6A)

Clause 7

Gross work to be done together with net payment/adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment. Rs. 3.00 lacs

Clause 7A Applicable

Clause 10A

List of testing equipment to be provided by the contractor at site lab.

Clause 10B(ii)

Whether Clause 10 B (ii) shall be applicable

Clause 10C

Component of labour expressed as percent of value of work

As per Schedule A to F

for Civil works Page 45 to 46

Clause 10CA

S.N.	Material covered under this clause	Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed	Base Price of all Materials covered under clause 10 CA
		N. A.	

Clause 10CC

Clause 10CC to be applicable in contracts with stipulated period of Completion exceeding the period shown in next column	As per Schedule A to F for Civil Works Page 46 to 47
Schedule of component of other Material, Labour, POL etc. for price escalation.	
Component of civil (except materials covered under clause 10CA) / Electrical construction Materials expressed as percent of total value of work	
Component of Labour : Expressed as percent of total value of work	
Component of P.O.L Expressed as percent of total value of work	

Clause 11

Specifications to be followed for execution of work. **CPWD specification 2009 Vol.-I & II with correction slips upto the date of issue of Tender**

Clause 12

Type of work		Original Work
12.2 & 12.3	Deviation limit beyond which clause 12.2 & 12.3 shall apply for building work	30% of all work or as admissible.
12.5	Deviation limit beyond which clause 12.2 & 12.3 shall apply for foundation work (except earth work)	30%
	Deviation Limit for items in earth work subhead of DSR or related items	100%

Clause 16
Competent Authority for deciding reduced rates.

Clause-18 List of mandatory M/c, tools

Clause-25
Constitution of Dispute Redressal Committee (DRC) :
a) For total claims more than 25 lakh.
Chairman :
Member :
Member :
:
b) For total claims upto Rs. 25.00 lakh.
Chairman :
Member :
Member :
:

As per Schedule A to F for Civil Works
Page No.47 to 49

Place of arbitration :

Clause 36 (i)

Sl No	Minimum Qualification of Technical Representative		Discipline	Designation (Principal Technical / Technical representative	Minimum Experience	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36 (i)	
	Qualification	No.				Figure	Words
1	Graduate in agriculture	1	Horticulture	Project Manager cum planning/quality/site / billing Engineer	5 Years	Rs. 15,000/- Per Months	Rupees FifteenThousand only

Clause 42

i) (a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates _____ printed by CPWD. **DSR (H) 2016 Printed by CPWD**

iii) Variations permissible on theoretical quantities

a) Cement for works with estimated cost put to tender not more than Rs. 5 lacs. Not applicable

for works with estimated cost put to tender more than Rs. 5 lacs. Not applicable

(b) Bitument for all works Not applicable

c) Steel Reinforcement and structural steel sections for each diameter, section and category. Not applicable

d) All other materials. Not applicable

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

Sl. No.	Description of Item	Rates in figures and words at which recovery shall be made from the contractor.	
		Excess beyond permissible variation	Less use beyond permissible variation
1.	Cement	**Not applicable**	
2.	Steel reinforcement		
3.	Structural Sections		
4.	Bitumen issued free		
5.	Bitumen issued at stipulated fixed price		

ELIGIBILITY CRITERIA FOR MAIN AGENCY WITH RESPECT TO ASSOCIATED HORTICULTURE AGENCY TO BE ENGAGED BY MAIN CONTRACTOR FOR EXECUTING THE HORTICULTURE SUBHEADS

1 For the different Horticulture subheads, the main contractor will have to engage the associate electrical contractor/specialized agency in the field as per following:-

a) In case of the Horticulture works for which the enlistment/annual prequalification is there and estimated cost of this package is within the monitory limit of the enlistment/annual pre-qualification then main firm will have to associate the enlisted/annually pre-qualified firm in the respective field of appropriate category/class.

b) In case, the estimated cost of the relevant subhead is beyond the enlistment /annual P.Q. limits OR it is the specialized work having no enlistment / Annual PQ in CPWD, then the main firm will have to engage the associate firm who fulfills the set eligibility criteria as described below:-

c) The firm should have successfully completed similar works including capacity of the equipment required as applicable as per following, during the last 7 years ending last day of the submission of bids:-

Three similar works, each of value not less than 40% of estimated cost

OR

Two similar works, each of value not less than 60% of estimated cost

OR

One similar work of value not less than 80% of estimated cost

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of bid.

iv) Turnover: Average annual financial turnover should be at least 50% of the estimated cost, during the immediate last 3 consecutive financial year.

v) Solvency Certificate: Solvency of the amount equal to 40% of the estimated cost of work.

vi) The documents required in case of works having no enlistment / Annual PQ shall be as per enclosed proforma as in Form A & B.

2 After award of work and before the first milestone, the main contractor will have to submit name/s of the proposed associate contractor (for each of the Horticulture works), who fulfill set eligibility criteria for the relevant sub-head. The documents will have to be submitted in detail as required, which will be checked as per NIT for approval of the associate contractors. It will be essential that proposed electrical associate agencies qualify for each sub-head as eligibility criteria given in NIT.

3 The department reserves the right to allow the main firm to submit additional documents / additional names of the associates in case of the deficiencies in documents or in case of no associate getting qualified in respect of certain subheads. The same will have to be complied with the main contractor within the time allowed. The decision of the department shall be final & binding on the intending bidders.

4 The main firm should submit the willingness from eligible Horticulture contractors to get associated with them for execution of the electrical component of works in wholesome manner and as per the conditions set out in the MOU to be entered into, between the one who is awarded the work and the associated eligible electrical contractor.

5 In support of the eligibility conditions of the proposed associated electrical contractor, copy of their registration documents, Horticulture Contractor's License, GST, eligibility documents duly attested by the applicants (Main Contractor) shall be submitted to the EE(C) for deciding the eligibility by competent authority. Such associate electrical contractor will certify that they are not debarred as on the day of application for sale of tender.

6 In the event of the concerned Horticulture agency not performing satisfactorily or failure of associate/ sub-contractor to complete the Horticulture work, the main contractor on the written direction of the department, shall remove the Associate/sub-contractor deployed on the work and shall submit name of new associate who fulfills the conditions mentioned in NIT to execute the leftover work without any loss of time or variation in cost to the department in this regard. Such associates shall also enter into Agreement with the main tenderer shall meet all the guarantee for the equipments already supplied for which payment has been released by the department in part. If any equipment supplied for the work, during the currency of the earlier Associate/sub-contractor and paid partly by the department becomes redundant /not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of Horticulture work, the main contractor shall be liable for replacement of the equipment(s) at no cost to Department. No change of Horticulture Contractor will be allowed without prior approval of the Chief Engineer (South)M,PWD.

7 Executive Engineer (E) shall be the Engineer-in-charge as far as electrical works are concerned.

8 The main contractor shall be responsible and liable for proper and complete execution of the Horticulture work and ensure coordination and completion of both civil and Horticulture work.

9 The main contractor has to enter into agreement with contractor(s) associated by him for execution of Horticulture subheads. Copy of such agreement shall be submitted to EE(E) in charge as well as to EE(C). In case of change of associate contractor, the main contractor has to enter into agreement with the new contractor associated by him.

10 The associate or sub contractor shall attend the inspection of the work by the Engineer-in-Charge of Horticulture works as and when required.The agencies executing the Horticulture work should have valid license for Horticulture as applicable and as described in eligibility criteria.

11 The main firm should either himself meet the eligibility conditions for the respective Horticulture packages or otherwise he will have to associate an agency meeting the eligibility requirements given above. It will have to use willingness certificate for each of the component of the Horticulture work for Associate agencies by clearly indicating the applicable component of the work.

12 The Main composite category CPWD enlisted wants to carry over the work themselves and don't want to associates any agency for minor components he has to ensure that he full fill eligibility criteria as defined in bid documents and submit the details to engineer- in- charge of work and shall have to full fill the following conditions in additional to conditions mentioned above.

(a) The composite category contractor shall have valid electrical contractor license.

(b) A Horticulture supervisor having 5 years experience on his roll having valid electrical supervisor licenses or diploma in Horticulture engineer.

13 Verifiable completion certificates of the work of registration/eligibility documents as the case may be, duly attested by the applicant shall be submitted. Valid Horticulture Contractor's license, as the case may be, duly countersigned by the applicant as well as signed by the associate contractors shall also be submitted. Self attested GST documents in respect of the associated agencies as well as signed by associate firms shall be submitted along with the tender documents.

MEMORANDUM OF UNDERSTANDING [M.O.U] BETWEEN

1] M/S [Name of the firm with full address]
[Henceforth called the main contractor]
And

2] M/S [Name of the firm with full address]
[Henceforth, called Associated Electrical Contractor or Electrical Contractor]

For the execution of Horticulture Work : -

We state that M.O.U between us will be treated as an agreement and has legality as per Indian Contract Act [amended upto date] and the department [PWD, Delhi] can enforce all the terms and conditions of the agreement for execution of the above work. Both of us shall be responsible for the execution of work as per the agreement to the extent this MOU allows. In case of any dispute, either of us will go for mediation/arbitration by the Chief Engineer (South)M,PWD Any of us may appeal against the mediation/arbitration to the Chief Engineer (South)M,PWD His decision shall be final and binding on both of us.
We have agreed as under:

1 The horticulture contractor will execute all horticulture works in the wholesome manner as per terms and conditions of the agreement. The horticulture contractor shall be paid as per standard procedure followed by the department and the agreement between parties. Any type of internal transaction between the horticulture contractor and the main contractor shall be as per their convenience and mutual understanding without involving the department.

2 The horticulture contractor shall be liable for disciplinary action if he failed to discharge the action[s] and other legal action as per agreement.

3 All the machinery and equipments, tools and tackles required for execution of the horticulture works, as per agreement, shall be the responsibility of the electrical contractor.

4 The site staff required for the horticulture work shall be arranged by the horticulture contractor as per terms and conditions of the agreement.

5 Site order book maintained for the said work shall be signed by the main contractor as well as by the Engineer of the Associated Contractor and by Associated Contractor himself.

6 All the correspondence regarding execution of the horticulture work shall be done by the Department with the Associated Contractor with a copy to the main contractor. In case of non-compliance of the provisions of agreement, the main contractor, as well as the associated contractor shall be responsible. The action under clauses 2 and 3 shall be initiated and taken against the main contractor.

SIGNATURE OF MAIN CONTRACTOR
Date :
Place :

SIGNATURE OF ASSOCIATED HORTICULTURE CONTRACTOR

Date :
Place :

COUNTERSIGNED
EXECUTIVE ENGINEER

WILLINGNESS CERTIFICATE

Name of work: _____

I hereby give my willingness to work as electrical contractor for the above mentioned work.

I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-Charge. Also I will employee full time technically qualified supervisor for the works. I will attend inspection of officers of the department as and when required.

Dated:

Signature of the Horticulture Contractor

FORM 'A' FORM OF BANKERS CERTIFICATE FROM A SCHEDULE BANK
(To be submitted separately as required)

This is to certify that to best of our knowledge and information that M/s./Sh. …..…… having noted address , a customer of our bank are / is respectable and can be treated as good for any marginally engagement up to a limit of Rs……...../-(Rupees……..…..……)

This certificate is issued without any guarantee or responsibility of the bank or any of the officers.

(Signature)
For the Bank

NOTE:-

(1) Bankers Certificate should be on letter head of the Bank.

(2) In case of partnership firm, Certificates should include names of all partners as recorded with the Bank.

FORM 'B'
DETAILS OF ALL WORKS OF SIMILAR CLASS COMPLETED DURING THE LAST SEVEN YEARS ENDING PREVIOUS DAY OF LAST DATE OF SUBMISSION OF BIDS

S. No	Name of Work / Project & Location	Owner or Sponsoring Organization	Gross amount	Date of Commencement as per contract	Stipulated date of completion	Actual date of Completion	Litigation / arbitration pending/ in progress with details*	Name & address/ Telephone number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10

*Indicate gross amount claimed and amount awarded by the Arbitrator.

SIGNATURE OF APPLICANT(S)

Note:-

1. Only those works which satisfies the eligibility criteria needs to be mentioned

GENERAL TERMS AND CONDITIONS

1. The work shall be carried out as per C.P.W.D. Specification - 2009 Vol. - I to II with upto date correction slips and as per CPWD Yard stick.

2. The contractor shall be responsible for arrangement of all necessary tools and plants required at site of work for which nothing shall be provided by the department.

3. The contractor shall make his own arrangements for obtaining electric/water connections, if required, and make necessary payment directly to the Department concerned.

4. The contractor shall have to pay the minimum wages to the labour in the presence of Section Officer (Hort.)/Assistant Director (Hort.) as per Minimum wages rates of Delhi Government time to time and it shall be binding on the contractor who shall have to pay increase the rates from time to time and retrospective effect to the labour and nothing will be paid extra on the account to the contractor.

5. The Department shall not be responsible for any injury partial or permanent or death of any workers at site due to accident or mal functioning of the equipment or by negligence of the staff.

6. The contractor shall at his own expense arrange for safety provision as per CPWD safety code.
7. No compensation shall be payable to the Contractor for any damage caused by rains, storms, earthquakes and other calamity during the execution of work.
8. All applicable and prevailing taxes will be recovered from the contractor`s bills as per Delhi Government rules or order issued periodically.
9. It shall be the sole responsibility of the Contractor to ensure before undertaking the maintenance work that number of trees/shrubs/hedge/ lawn area all are in healthy conditions no casualty and deficiency of plants exist at site and he has to bring the same into the notice of the Dy. Director of Hort. within 3 days of undertaking of the maintenance work failing which, it shall be presumed that there were neither casualty nor deficiency of the plants in the entire area being undertaken for maintenance.

10. In case of any casualty of shrubs and trees or any other plants, during maintenance period, contractor will have replace the trees/shrubs/other plants of the same height and specification at his own risk in this regard recovery of general shrubs and trees @ Rs. 150/- per shrubs & Rs. 300/- per tree, Rs. 200/- for each other foliage/decorative plants and Rs.100/- per Sqm.for lawns shall be made. Nothing extra shall be paid for the same in this regard. The decision of the Dy.Director of Horticulture shall be final and binding in this regard.

11. If any damage caused for public conveniences/services, the same shall have to be repaired instant, failing which necessary recovery shall be made from the Contractors bill.
12. If any Building, Road and Channels, Cable /Electrical fitting etc. damaged by the contractor the same will have to repair or made good by the contractor at his risk and cost, otherwise the complete cost will be recovered as intimated by the Civil Division Concerned.

13. Unless otherwise provided in the Schedule of Quantities/Specifications, the rates tendered by the contractor shall be all inclusive and shall apply to all height, lifts, leads and depths of the work and nothing extra shall be payable to him on account of the same. The rates will be desired in accordance with clause 12 of the agreement, if not already specified.

14. Other agencies doing works related with this project may also simultaneously execute their works and the contractor shall afford necessary facilities for the same. The contractor shall leave such necessary holes, opening etc. in the work as may be required for the other agencies. Nothing extra over the Agreement rates shall be paid for doing these.

15. Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The contractor shall be bound to follow all such restrictions/instructions and nothing extra shall be payable on account of the same.
16. The contractor shall fully comply with all legal orders and directions of the Public or local authorities of municipality and abide by their rules and regulations and pay all fees and charges for which he may be liable in this regard. Nothing extra shall by paid/reimbursed for the same.
17. The contractor will make his own arrangement for accommodation of labourers.
18. The contractor shall be responsible for removal of garden waste from the site and disposed off at designated dumping area which includes all leads and lifts as per directions of Officer-in-Charge.
19. Minimum workers shall be deputed by the contractor as per approved yard sticks of Horticulture Maintenance Manual.
20. All the labourers deputed by the contractor at site should wear fluorescent Red coloured jacket with PWD Horticulture monogram in reflective tapes at front and back of the jacket alongwith nameplate of the labour as decided by Engineer-in-charge. Nothing shall be paid extra on this account. If the contractor/agency failed to provide dress code to the labours at site, a sum of Rs. 50/- per day per labour shall be deducted from the contractor bill.
21. The contractor shall have to arrange all required tools & plants & other stock items like Bamboo, Sutli, Hessian cloth. Tokari etc. for the proper development & maintenance of garden feature. Repair cost of tools & plant items shall be borne by the contractor & nothing shall be paid extra on this account.
22. In lieu of technical staff required as per clause 36(i), contractor has to engage one no. supervisor having smart phone enabled with whatsapp. The supervisor has to send photos to concern SO/AD of daily labour deployment and all day to day major activities. Nothing extra to be paid for this. The photograph showing the maintenance/development work shall be submitted by the contractor at the end of every month from the day to start to date of completion covering all garden feature unless recovery shall be made as per clause 36(i) of the Agreement.

23. The Engineer- in- charge reserve the right to change the site/location of the works.

24. The water tanker shall be filled from nearest Delhi Jal Board (S.T.Ps.)
25. The Contractor shall have to submit all receipt of water tanker received from Delhi Jal Board in original for payment purpose and payment shall be made as per the receipt submitted alongwith the bill.
26. The contractor should provide all facility such ESI, EPF, Bonus etc as per office memorandum no. DG/SE/CM/CON/Misc/ 286 issued by Director General of CPWD on dt-30-06-2015.
27. No claim for the idle Labour, machinery and establishment on account of suspension/stoppage of work for any reason whatsoever shall be admissible under any circumstances.
28. The site shall be cleared and the surplus material / horticulture waste / rubbish etc. shall be disposed off as directed by The Engineer-in-Charge.
29. The contractor will be responsible to provide safe Drinking water to Labour engaged in execution of work.
30. Royalty at prevent rate and all other incidental expenditure shall have to be paid by the contractor on all material like cattle manure, good earth, sand, sludge etc. collected by him for execution of the work.
31. There shall be no burning of leaves, plastic etc. at site.

32. The agency should ensure that at least minimum wages rates are paid to the workers. In this regard, following procedure to be adopted.
    (a) Wages due to every worker shall be paid to him direct by contractor through Bank or ECS or Online transfer to his Bank Account.
    (b) It shall be the duty of the contractor to ensure the disbursement of wages through bank account of labour.
    (c) The contractor shall obtain from the Junior Engineer or any other authorized representative of the Engineer-in-Charge as the case may be, a certificate under his signature at the end of the entries in the "Register of Wages" or the "Wage-cum-Muster Roll" as the case may be in the following form:-

    "Certified that the amount shown in column No ……. Has been paid to the workman concerned through bank account of labour on …….. at ……."

33. No contractor /Builder or any person would be permitted to store /dump Horticulture waste/material or debris on metalled road. All precautions to be taken to ensure that no dust particles are permitted to pollute the air quality as a result of such storage.

34. The contractor have to deploy minimum labour as per yard stick.

35. The basin of each shrub/plant shall be of required size so as to retain required quantity of water in a time, otherwise it will be presumed that sufficient watering to plants has not been done by the contractor, less watering to plants is not acceptable.

36. The contractor have to maintain record of watering to Shrubs /Tree/Hedge alongwith photographs and will be produced alongwith bill

37. The contractor shall take instruction from the officer-in-charge regarding supply and stacking of material at site and execution of work etc. He shall bear all charge for storage and sate custody of material.

38. The rejected and substandard material should be removed from the site of work immediately; the Department shall not be responsible for any damage/loss of rejected material. If the same will not be removed within five days after issuing notice in writing by Deputy Director of Horticulture, then necessary recovery shall be made @ Rs.500/- per day.

39. The staff deployed for horticulture work must have good knowledge about horticulture works operations like hedge cutting, lawn mowing, planting of trees/seeding, lawn maintenance, potted plants maintenance etc. and supervisor should be well behaved, experienced and qualified to communicate with the clients, occupants, staff and officers.

40. The contractor will be responsible for police verification of the labour & permission of vehicles deployed for the execution of work. The have to follow all the security norms/guidelines of the concerned Ministries/Department. A list of workers deployed will have to provide to the Officer-in-charge before starting the work to get the necessary security passes and other security clearance well in advance.

41. All the engaged workers are to be equipped with photo identity cards issued by the contractor and contractor will maintain their particulars(i.e. Name, Father's Name, Local Address and permanent address etc.). A copy of the same will be provided to the Officer-in-charge. The expenditure on this account will be borne by the contractor and nothing will be reimbursed for it.

42. The attendance register shall be maintained by the contractor. Officer-in-charge can verify this register at any time. This will be submitted with each RA bill along with particulars as mentioned above.

43. The contractor will have to engage the minimum labour(as per yard stick of the work) not below the age of 18 years.

44. In case of absence from duty by labour, amount shall be recovered @ double of current minimum wages from the contractor's bill.

45. The contractor or his representative should be available at site on every visit, of Officer-in-charge as well as visit of senior officers.

46. In order to ensure the suitability of good earth supplied for Horticulture purpose, lab test will be required for every 300 cum of good earth supplied.

47. The work shall consist of maintenance of tree saplings, plants, shrubs, hedge, lawn area in central verge or other locations within right of way including weeding, hoeing, watering, trimming, manuring, pruning of unwanted branches, spraying insecticides/pesticides/fungicide etc. at regular intervals, replacement of dead trees and any other horticulture management including routine activities, involving control of grass, weeds, bush and trees all complete as directed by the Engineer-in –Charge to be maintained over the entire contract period.

48. Pruning and Trimming: All deal or injured twigs, water shoots, unwanted branches are to be removed. Trees, shurbs and ground cover should be pruned to maintain natural shape. The hedges and shrubs shall be given special shapes and sizes to give aesthetic appearance of the greenery at regular intervals.

49. Pest and Disease Control: All trees/plants are to be inspected once in a month to determine any disease or pest infections. Once the infection is identified adequate control measures are to be taken.

ADDITIONAL CONDITIONS

1. Before tendering, the tenderer shall inspect the site of work and shall fully acquaint about the conditions with regard to site, nature of soil, availability of materials suitable location for construction of godowns, stores and labour huts, the extend of leads and lifts involved in the work (over the entire duration of the contract) including local conditions, traffic restrictions, obstructions and other conditions, as required for satisfactory execution of the work. His rates should take into consideration all such factors and contingencies. No claim whatsoever shall be entertained by the Department on this account.
2. The contractor must study the specifications & conditions carefully before tendering.
3. Before start of the work, the contractor shall submit the program of execution of work, get it approved from the Engineer-in-Charge and strictly adhere the same for the timely completion of the project work.
4. The contractor shall have to make approaches to the site, if so required and keep them in good condition for transportation of labour and materials as well as inspection of works by the Engineer-in-Charge. Nothing extra shall be paid on this account.
5. The contractor shall at all times carry out work on the Busy Road sites in a manner creating minimum hindrances in the flow of traffic as per direction of Engineer-in-Charge.
6. All arrangements for traffic diversion during Horticulture operation shall be considered as incidental to the work and contractors responsibility and nothing shall be payable to him in this respect.
7. Any damage done by the contractor to any existing trees, Shrubs ,Hedge , Kerb Stone etc. shall be replace / made good by him at his own cost.
8. The work shall be carried out in the manner complying with the requirement of relevant bye-laws of the local bodies under the jurisdiction of which the work is to be executed and nothing extra shall be paid in all respects on this account.
9. The contractor shall make his own arrangements for obtaining electric connection(s), if required, and make necessary payment directly to the Department concerned. The Department will however make all reasonable recommendations to the authority concerned in this regard.
10. The contractor or his authorised representative should always be available at the site of work to take instructions from Departmental Officers, and ensure proper execution of work. No work should be done in the absence of such authorised representative.
11. No payment will be made to the contractor for damaged caused by rains, or other natural calamities during the execution of works and no such claims on this account will be entertained.
12. The contractor will be responsible to provide safe drinking water to labour engaged in execution of work.
13. The rates for all items of work, unless clearly specified otherwise, shall include the cost of all labour, materials de-watering and other inputs involved in the execution of the items.
14. The materials to be issued to the contractor and the place of delivered shall be as mentioned elsewhere in the tender documents. If these are delivered at any other site, the difference in cost due to cartage will be adjusted accordingly. The contractor shall have to cart at his cost the materials to the site of work as soon as these are issued. The materials will be issued during the working hours and as per rules of the Central Stores of CPWD or the store of the PWD (NCTD) from time to time.
15. The contractor shall construct suitable godown at site of work for storing the materials safe against damage due to sun, rain, dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for the purpose and no extra claim whatsoever shall be entertained on this account.
16. In the tender papers the words “CPWD” shall include PWD (NCTD) where applicable.
17. Existing drains, pipes, cables, overhead wires, sewer lines, water line and similar services encountered in the course of the execution of the work shall be protected against the

damage by the contractor. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

18. The contractor will not have any claim in case of any delay by the Engineer-in-Charge in removal of trees or shifting, removing of telegraph, telephone or electric lines (overhead or underground), water and sewer lines and other structure etc. if any, which may come in the way of the work. However, suitable extension of time can be granted to cover such delays.
19. Contractor may be required to execute this work under foul position. The decision of the Engineer-in-charge whether the position is foul or not shall be final and the binding on the contractor and nothing extra for executing the work in foul position is payable, beyond what is provided in the schedule of quantities.
20. For completing the work in time, the contractor might be required to work in two or more shifts, including night shift and no claims what so ever shall be entertained on this account, notwithstanding the fact that the contractor will have to pay to the labourers and other staff engaged directly or indirectly on the work according to provisions of labour regulation and the agreement entered upon and / or extra amount for any other reasons.
21. The rates for all the items of the of work unless otherwise specified shall include cost of all labour, materials, dewatering and removal of silt, mud, vegetation etc. and other inputs required for the execution of the work. Only the material stated in the schedule of quantities and in schedule "B" shall be issued by the department. In case any material supplied free of cost by the department is lost/damaged after issue while in transit or from the custody of the contractor recovery shall be made at the current replacement cost of the material plus ten percent.
22. Unless otherwise specified the rates are applicable for all heights depths, lead & lifts involved and the execution of work in or under water and or liquid mud including making diversion channels if necessary.
23. No claim for the idle labour, machinery and establishment on account of suspension/stoppage of work for any reason whatsoever shall be admissible under any circumstances.
24. The contractor shall take all precautions to avoid accident by exhibiting necessary caution boards by providing red flags, red lights & barriers. The contractor shall be responsible for any accident at the site of work and consequences thereof.
25. The work shall be carried out in such a manner so as not to adversely effect or disturb other works being executed by other agencies near the site of work.
26. The work shall be carried out in such a manner so as not to interfere or effect or disturb other works being executed by other agency if any.
27. The Malba/garbage, removed from the site shall be disposed off by the contractor at any Suitable places as directed by Engineer-in-charge.
28. Permission coordination and liaising from any Government Department like Delhi Traffic Police, DJB etc. will be obtained by the contractor himself and for this nothing shall be paid extra.
29. Incidental charges for taking permission from traffic police/penalty imposed by traffic police for violations of traffic rules by police local bodies etc. shall be borne by the contractor.
30. The contractor shall dispose off the malba at nearby dumping ground which includes all leads and lifts no dumping ground shall be provided / arranged by the department.
31. The unserviceable material/building rubbish / Horticulture waste received from cutting / pruning / digging / surface dressing/ grassing / plantation etc shall be dumped to the dumping ground in properly covered mechanical transport with precaution. Agency shall submit the hard copy of photograph showing the properly covered truck /Tempo with precaution disposing the unserviceable material/Horticulture rubbish. Failure of which shall be sternly dealt and a penalty @ Rs. 500/- per trip of truck/Tempo shall be levied and the decision of Officer-in-charge shall be final & binding.

32. All the building material responsible for pollution shall be brought at site from sources covered by tarpaulin and shall take all precautionary measure to ensure that no dust particles are permitted to pollute the air quality, failure of which agency shall be liable to pay damages as decided by Engineer-in-charge.
33. All the trucks or vehicle of any kind, which are used for construction purpose and/or are carrying construction materials like cement, sand and other allied material shall be fully covered in the process of transporting the material.
34. There shall be no burning of leaves, plastic etc. at construction site.
35. In order to ensure the suitability of good earth supplied for Horticulture purpose, lab test will be required for every 300 cum of good earth supplied.
36. The trees and shrubs having height less than 3 metre in the medial and planters shall be washed be sprinkler attached with water tankers on monthly basis. The contractor shall take utmost care of the trees and shrubs so that the casualty is brought to a minimum. The deal and fallen tree should be removed immediately from the site of work for smooth traffic movement and it should be brought to the notice of Department so that further survey and auction of the same can be done.

For Supply of Plants

1. The plants should be free from Insect, Pest and diseases.
2. The plants should be healthy and of vigorous growth and as specified in the Schedule of Quantity.
3. The height of plants will be measured leaving the root portion.
4. The plants should be well established with good spread.
5. The main stem or trunk should be strong enough up to the required height.
6. The plants should be true to the variety and the named varieties should be tagged.
7. The material and plants shall be supplied as and when required basis, as per direction of Officer-in-charge.

PART-E

Index for Part-E.

Schedule of Quantity

Sl. No.	Description	Page No.
1.	General Abstract	
2.	Schedule of Quantities (Civil Work)	216 to 240
2.	Schedule of Quantities (Electrical Work)	241 to 252
3.	Schedule of Quantities (Horticulture Work)	253 to 259

GENERAL ABSTRACT (Part A+B+C)

Name of work:- Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.

Sl.No.	Description of Item	Amount
1	Schedule of Quantity – Civil Part	26,61,03,658.00
2	Schedule of Quantity – Electrical Part	1,91,28,278.00
3.	Schedule of Quantity – Horticulture Part	28,03,381.00
	Grand Total	**28,80,35,317.00**

Executive Engineer
South East Road-I,
PWD, New Delhi

Abstract of Cost (Civil Work)					
Name of Work:- Streetscaping of Delhi Roads of Ring road - MOOLCHAND JUNCTION to ASHRAM CHOWK					
Sl. No.	**Description**	**Quantity**	**Unit**	**2016 Rate**	**2016 amount**
	Sub Head 1 : SITE CLEARANCE AND DISMANTLING				
1	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer-in-charge.				
	a) Nominal concrete 1:3:6 or richer mix (i/c equivalent design mix)	518.00	cum	997.05	5,16,472.00
	b) Nominal concrete 1:4:8 or leaner mix (i/c equivalent design mix)	1,102.00	cum	615.15	6,77,895.00
2	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge.				
	a) In cement mortar	50.00	cum	847.75	42,388.00
3	Dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc. including dismembering and stacking within 50metres lead.	3,000.00	kg	2.40	7,200.00
4	Dismantling steel work manually/ by mechanical means in built up sections without dismembering and stacking within 50 metres lead as per direction of Engineer-in-charge.	17,275.00	kg	1.60	27,640.00
5	Dismantling stone slab flooring laid in cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 metres lead.	500.00	sqm	109.35	54,675.00

6	Dismantling precast concrete or stone slabs in paving, floorings, walls, partition walls etc. including stacking within 50 metres lead:				
	a) Thickness upto 40 mm	3,673.00	sqm	119.95	4,40,576.00
	b) Thickness above 40 mm upto 75 mm	5,509.00	sqm	179.70	9,89,967.00
7	Taking out C.I/SFRC cover with frame from R.C.C. top slab of manholes of various sizes including demolishing of R.C.C. work manually/ by mechanical means and stacking of useful materials near the site and disposal of unserviceable materials within 50 metres lead as per direction of Engineer-in-charge.	300.00	each	290.55	87,165.00
8	Dismantling manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50metres lead as per direction of Engineer-in-charge :				
	Water bound macadam road	5,043.00	sqm	90.5	4,56,392.00
9	Dismantling of flexible pavement (bituminous courses) by mechanical means and disposal of dismantled material upto a lead of 1000 metres, as per direction of Engineer-in-charge.	374.00	cum	204.50	76,483.00
10	Removing existing old mastic wearing course & cleaning the surface for relaying mastic wearing course including disposal of dismantled material rubbish up to a lead of 50m complete as direction of Engineer-in-charge :	128.00	cum	204.5	26,176.00
11	Credit for dismantled steel reinforcement/railings/all steel works to be taken by contractor (Dismantled reinforcement will be property of contractor)	17,275.00	kg	25.00	- (4,31,875.00)
12	Credit to Old Bricks to the contractor as per direction of Engineer in Charge	6,175.00	1000 nos	1500	- (9,263.00)

13	Credit to C.I/SFRC cover/SFRC as per direction of Engineer-in-charge.	300.00	each	200	- (60,000.00)
	Sub Head 2 : EARTHWORK				
14	Earth work in excavation by mechanical means (Hydraulic Excavator)/ manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sum on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
	a) All kinds of soil	18,870.00	cum	166.40	31,39,968.00
15	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
	a) All kinds of soil				
	i) Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	6,325.00	m	225.45	14,25,971.00
	ii) Pipes, cables etc. exceeding 300 mm dia but not exceeding 600 mm.	780.00	m	352.00	2,74,560.00
16	Extra for excavating trenches for pipes, cables etc in all kinds of soil for depth exceeding 1.5m, but not exceeding 3m.	300.00	m	447.04	1,34,112.00
17	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	15,096.00	cum	125.75	18,98,322.00

18	Earth work in surface excavation not exceeding 30 cm in depth but exceeding 1.5 m in width as well as 10 sqm on plan including disposal of excavated earth upto 50 m and lift upto 1.5 m, disposed soil to be levelled and neatly dressed :				
	a) All kinds of soil	2,500.00	sqm	53.00	1,32,500.00
19	Ploughing the existing ground to a depth of 15 cm to 25 cm and watering the same.				
	a) All kinds of soil	2,914.00	sqm	14.10	41,087.00
20	Clearing grass and removal of the rubbish upto a distance of 50 m outside the periphery of the area cleared.	263.00	sqm	3.65	960.00
21	Carriage of Earth by mechanical transport including loading, unloading and stacking				
	a) Up to 20 KM	3,774.00	cum	292.52	11,03,970.00
	Sub Head 3 : CEMENT CONCRETE WORK				
22	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - All work upto plinth level :				
	a) 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	35.00	cum	5481.95	1,91,868.00
23	b) 1:5:10 (1 cement : 5 coarse sand (zone-III): 10 graded stone aggregate 40 mm nominal size)	1,174.00	cum	4209.05	49,41,425.00

24	Providing and laying in position ready mixed plain cement concrete, using fly ash and cement content as per approved design mix and manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for plain cement concrete work, including pumping of R.M.C. from transit mixer to site of laying and curing, excluding the cost of centering, shuttering and finishing, including cost of curing, admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge.				
	i) All works upto plinth level:				
	a) M-15 grade plain cement concrete (cement content considered @ 240 kg/cum)	211.00	cum	6066.50	12,80,032.00
	b) M-10 grade plain cement concrete (cement content considered @ 220 kg/cum)	4,650.00	cum	5927.55	2,75,63,108.00
25	Providing and fixing at or near ground level precast cement concrete in tree grate frames, kerbs, edgings etc. as per approved pattern and setting in position with cement mortar 1:3 (1 Cement : 3 coarse sand) including the cost of required centring, shuttering and finishing smooth with 6mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete.				
	1:1½:3 (1 Cement: 1½ coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	33.00	cum	6169.85	2,03,605.00

	Sub Head 4 : REINFORCED CEMENT CONCRETE WORK				
26	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. (Note :- Cement content considered in this item is @ 330 kg/cum. Excess/ less cement used as per design mix is payable/recoverable separately).				
	a) All works upto plinth level	1,692.00	cum	6446.45	1,09,07,393.00
27	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge.a) All works upto plinth level	474.00	cum	6713.60	31,82,246.00
28	Extra for providing richer mixes at all floor levels.				

	Note:- Excess/less cement over the specified cement content used ispayable /recoverable separately.				
	a)Providing M-30 grade concrete instead of M-25 grade BMC /RMC. (Note:- Cement content considered in M-30 is @ 340 kg/kg/cum)	1,354.00	cum	69.50	94,103.00
29	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.				
	a) Thermo-Mechanically Treated bars grade FE 500 D as per IS1786	2,10,380.00	Kg.	56.60	1,19,07,508.00
30	Centring and shuttering including strutting, propping etc. and removal of form for :				
	a) Foundations, footings, bases of columns, etc. for mass concrete.	9,829.00	sqm	193.95	19,06,335.00
31	Providing, hoisting and fixing above plinth level up to floor five level precast reinforced cement concrete in lintels, beams and bressumers, including setting in cement mortar 1:3 (1 cement : 3 coarse sand), cost of required centering and shuttering but , excluding the cost of reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size)	33.00	cum	8683.55	2,86,557.00
	Sub Head 5 : BRICK WORK				
32	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in:				
	a) Cement mortar 1:6 (1 cement : 6 coarse sand)	4,210.00	cum	4751.65	2,00,04,447.00
					-
33	Tile brick masonry with common burnt clay F.P.S. (non modular) tile bricks of class designation 10 in foundation and plinth in:				-

	a) Cement mortar 1:4 (1 cement : 4 coarse sand)	36.00	cum	8209.60	2,95,546.00
					-
34	Brick work with selected F.P.S. bricks of class designation 75 in exposed brick work including making horizontal and vertical grooves 10mm wide 12mm deep complete from ground level upto plinth level in cement mortar 1:6 (1 cement : 6 coarse sand) - From ground level upto plinth level	50.00	cum	4853.70	2,42,685.00
	Sub Head 6 : STONE WORK				
35	Stone work (machine cut edges) for wall lining etc. (veneer work) backing filled with a grout of 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand) including pointing in white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade : (To be secured to the backing by means of cramps which shall be paid for separately) :				
	a) Red sand stone - exposed face machine cut and table rubbed with rough backing.				
	I) 40 mm thick.	611.00	sqm	3433.00	20,97,563.00
	b) White sand stone - exposed face machine cut and table rubbed with rough backing .				
	I) 40 mm thick.	61.00	sqm	3463.7	2,11,286.00
	Sub Head 7 : STEEL WORK				
36	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
	a) In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	42,200.00	kg	85.95	36,27,090.00

37	Supplying and fixing retro reflective sheeting grade-IV as per ASTM-D 4956-07 in two layers of approved colour pasted over Stainless sheet Dust Bins /ACM/Aluminium sheet complete with necessary adhesive and pressure method etc.The base layer of Type iv sheet shall be on full face of Stainless sheet/ACM/Aluminium sheet duly pasted in required colour and top layer of retro reflective sheet shall be grade-IV with words/directions,arrows,signs shall be pasted over base sheet complete etc. as per drawing, make and direction of Engineer-in-Charge.	50.00	each	1,061.70	53,085.00
	Sub Head 8 : FLOORING				
38	Providing and laying tactile tile (for vision impaired persons as per standards) of size 300x300x9.8mm having with water absorption less than 0.5% and conforming to IS:15622 of approved make in all colours and shades in for outdoor floors such as footpath, court yard, multi modals location etc., laid on 20mm thick base of cement mortar 1:4 (1 cement : 4 coarse sand) in all shapes & patterns including grouting the joints with white cement mixed with matching pigments etc. complete as per direction of Engineer-in-Charge.	1,328.00	sqm	1450.45	19,26,198.00
					-
39	Providing and fixing 10x10x7.50 cm and 15x15x7.50 cm surface Granite stone block hand cut and chisel dressed on top, for paving in floors, drains etc.laid over 20mm thick base mortar 1:4 (1 cement : 4 coarse sand) with joints 10mm wide filled with same mortar including recess/Flush/ Ruled pointing pointing on stone on top with cement mortar 1:3 (1 cement : 3 fine sand) & , cleaning, curing etc. complete as per approved drawing.	1,102.00	sqm	1395.25	15,37,566.00

40	Providing and fixing at ground level around the tree, factory made CC Tree Grating (1.80 mtr. high) using of M-40 grade of approved make & design including setting in position in footpath to the required level and line over a bed 50 mm thick compacted bed of dry stone aggregate of 40mm thick nominal size including spreading, well ramming, consolidating all complete as per drawing and direction of Engineer-in-charge. of size :				
	a) 1.80mx1.80m & 75mm thick	146.00	each	9136.50	13,33,929.00
	b) 1.50mx1.50m & 75mm thick	438.00	each	4,220.30	18,48,491.00
41	Providing and laying gang saw cut 30 mm thick, mirror polished pre moulded and pre polished machine cut granite stone of required size and shape of approved shade, colour and texture in footpath, flooring in road side plazas and similar locations, laid over 20mm thick base of cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement mixed with matching pigment, epoxy touch ups etc. complete as per direction of Engineer-in-Charge. a) With granite stone of area less than 0.50 sqm.	1,836.00	sqm	3339.60	61,31,506.00
					-
42	**Kota stone slab** flooring over 25 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including cleaning all complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) : a) 25 mm thick (as per the drawing & as per the direction in charge)	1,836.00	Sqm	1,158.10	21,26,272.00

43	**Stone Mosaic** flooring using various colour stone as per detailed drawing and specification (black kadapa, granite 30 mm thick any colour minimum size 100x100) over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including cleaning all complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) : a) 25 mm thick	1,469.00	Sqm	746.90	10,97,196.00
44	**Flamed granite** flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) : a) 18 mm thick	1,500.00	Sqm	2,915.40	43,73,100.00
					-
45	**Granite stone slabs 18 mm thick** in risers of steps, **skirting, dado** and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete, as per the drawings & direction of engineer - in - charge	1,364.00	Sqm	3,187.40	43,47,614.00
					-
46	**Extra for Prefinished nosing** in treads of steps in granite	317.00	m	84.85	26,897.00
					-
47	Extra for granite stone in treads of steps and risers using single length upto 1.05 m	90.00	Sqm	18.95	1,706.00
					-

48	40 mm thick stone chips flooring washed finish, under layer 34 mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone ggregate 12.5 mm nominal size) and top layer 20 mm thick with white, black, chocolate, grey, yellow or green stone chips of sizes from 5 mm to 15 mm nominal size, laid in cement marble powder mix 3:1 (3 cement : 1 marble powder) by weight in proportion of 4:7 (4 cement marble powder mix : 7 marble chips) by volume, including cement slurry etc. complete : a) Dark shade pigment with ordinary cement	367.00	Sqm	616.8	2,26,366.00
					-
49	Providing & laying rectified Glazed Ceramic mozaic tile work (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 broken fixed on walls, dome roof, columns, etc. with graphic design using different colours (broken pieces 2.0 cm to 3.5 cm diagonal) as shown in architectural drawing laid over 12mm thick plaster 1:3 (1 cement : 3 coarse sand) and joints filled with Ready mix tiles grouting compound of approved make including cleaning of tiles all complete as per direction of Engineer in Charge. (for 20% detailed work as artistic pattern for which 1:20 scale drawing will be supplied by the architect & conversion of full scale drawing shall be done by the contractor.)	100.00	sqm	1,621.60	1,62,160.00
	Sub Head 9 : FINISHING				
50	Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour				
	a) Two coats	1,431.00	sqm	73.90	1,05,751.00

51	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @0.90 ltr/10 sum over an under coat of primer applied @ 0.75 ltr/ 10 sum of approved brand or manufacture	920.00	sqm	84.75	77,970.00
52	12 mm cement plaster of mix :				
	a) 1:6 (1 cement : 6 coarse sand)	11,599.00	sqm	168.25	19,51,532.00
53	15 mm cement plaster on rough side of single or half brick wall of mix :				
	a) 1:6 (1 cement : 6 coarse sand)	300.00	sqm	194.6	58,380.00
54	20 mm cement plaster of mix :				
	a) 1:6 (1 cement : 6 coarse sand)	300.00	sqm	232.85	69,855.00
55	Painting with synthetic enamel paint, having VOC (Volatile Organic Compound) content less than 150 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour.				
	Painting of Kerbs with black/ white, black with road marking quality paint as directed by the Engineer and as per drawing and Technical Specifications, Clause 803 and as per IRC: 35-1997 complete.				
	a) Two coats	9,200.00	sqm	75.00	6,90,000.00
	Sub Head 10 : ROAD WORK				
56	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm. depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth lead upto 50 metres.	3,200.00	sqm	90.10	2,88,320.00
57	Tile brick masonry with tile bricks of class designation 10 in foundation and plinth in:				

	a) Cement mortar 1:4 (1 cement : 4 coarse sand)	74.00	cum	8209.10	6,07,473.00
58	Providing and laying design mix cement concrete of M-30 grade, in roads/ taxi tracks/ runways, using cement content as per design mix, using coarse sand and graded stone aggregate of 40 mm nominal size in appropriate proportions as per approved & specified design criteria, providing dowel bars with sleeve/ tie bars wherever required, laying at site, spreading and compacting mechanically by using needle and surface vibrators, levelling to required slope/ camber, finishing with required texture, including steel form work with sturdy M.S. channel sections, curing, making provision for contraction/ expansion, construction & longitudinal joints (10 mm wide x 50 mm deep) by groove cutting machine, providing and filling joints with approved joint filler and sealants, complete all as per direction of Engineer-in-charge (Item of joint fillers, sealants, dowel bars with sleeve/ tie bars to be paid separately).Note:- Cement content considered in M-30 is @ 340 kg/cum. Excess/ less cement used as per design mix is payable/ recoverable separately.				
	a) Cement concrete manufactured in automatic batching plant (RMC plant) i/c transportation to site in transit mixer	1,363.00	cum	7160.4	97,59,625.00
					-
59	Providing and laying Bituminous concrete using crushed stone aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site by tippers, laying with paver finisher equiped with electronic sensor to the required grade, level and alignment and rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction and density as per specification, complete and as per directions of Engineer-in-Charge.				

	a) 40/50 mm compacted thickness with bitumen of grade VG-30 @ 5.5% (percentage by weight of total mix) and lime filler @ 3% (percentage by weight of Aggregate) prepared in Batch Type Hot Mix Plant of 100-120 TPH capacity.	3,482.00	cum	7863.85	2,73,81,926.00
60	Providing and laying Dense Graded Bituminous Macadam using crushed stone aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site by tippers, laying with paver finisher equipped with electronic sensor to the required grade, level and alignment and rolling with smooth wheeled, vibratory and tandem rollers as per specifications to achieve the desired compaction and density, complete as per specifications and directions of Engineer-in-Charge.				
	a) 50 to 100 mm average compacted thickness with bitumen of grade VG-30 @ 5% (percentage by weight of total mix) and lime filler @ 2% (percentage by weight of Aggregate) prepared in Batch Type Hot Mix Plant of 100-120 TPH capacity.	435.00	cum	7247.7	31,52,750.00
61	Providing and applying 2.5mm thick road marking strips (retro-reflective) of specified shade/ colour using hot thermoplastic material by fully/ semi automatic thermoplastic paint applicator machine fitted with profile shoe, glass beads dispenser, propane tank heater and profile shoe heater, driven by experienced operator on road surface including cost of material, labour ,T&P, cleaning the road surface of all dirt, seals, oil, grease and foreign material etc. complete as per direction of Engineer-in-charge and accordance with applicable specifications.	16428.00	sqm	391.25	64,27,455.00

62	Painting runway/taxi track/apron marking with adequate no. of coats to give uniform finish with road marking paint of superior make as approved by the Engineer-in-charge i/c cleaning the surface of all dirt, scales, oil, grease and other foreign material etc. and lining out complete.				
	a) New work (Two or more coats)	350.00	sqm	104.9	36,715.00
63	Painting road surface marking with adequate no. of coats to give uniform finish with ready mixed road marking paint conforming to IS : 164, on bituminous surface in white/yellow shade including cleaning the surface of all dirt, scales, oil, grease and foreign material etc. complete.				
	a) New work (Two or more coats).	2,788.00	sqm	133.1	3,71,083.00
64	Providing and laying 75 mm thick compacted bed of dry brick aggregate of 40 mm thick nominal size including spreading, well ramming, consolidating and grouting with jamuna sand, including finishing smooth etc. complete as per direction of Engineer-in-charge.	42,558.00	sqm	141.35	60,15,573.00

65	Providing and laying factory made chamfered edge Cement Concretepaver blocks in footpath, parks, lawns, drive ways or light traffic parking etc, of required strength, thickness & size/ shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50mm thick compacted bed of sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand. complete all as per direction of Engineer-in-Charge.a) 60mm thick cement concrete paver block of M-35 grade with approved colour, design & pattern.	29,382.00	sqm	756.15	2,22,17,199.00
					-
66	Providing and laying factory made coloured chamfered edge Cement Concrete paver blocks of required strength, thickness & size/shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50mm thick compacted bed of fine sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with jamuna sand and cutting of paver blocks as per required size direction of Engineerin-Charge. 60mm thick C.C. paver block of M-35 and pattern, finishing and sweeping extra sand in footpath, parks, lawns, drive ways or light traffic parking etc. complete as per manufacturer's specifications & direction of Engineerin-Charge. a) 80 mm thick C.C. paver block of M-30 grade with approved color design and pattern.	13,307.00	sqm	638.95	85,02,508.00
					-

67	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	1,700.00	cum	5012.65	85,21,505.00
68	Providing, laying and making kerb channel 30 cm wide and 50 mm thick with cement concrete 1:3:6 (1 cement: 3 coarse sand:6 graded stone aggregate 20 mm nominal size) over 75mm bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including finishing the top smooth etc. complete and as per drawing and direction of Engineer-in-charge.	5,175.00	sqm	382.05	19,77,109.00
69	Precasting and placing in position 400 mm dia on top, 300mm at bottom Bollards 600 mm high of required shape, including providing 2 Nos. M.S. Pipe Sleeve 50 mm dia 300 mm long in the Bollard and 2 Nos. M.S. Pipes 40 mm dia and 450 mm long with 2 Nos. 150x150x6mm M.S. plate welded at bottom and embedded 150 mm in cement concrete 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size), including necessary excavation of size 600 x 600 x 450 mm deep for the same in bitumen/concrete pavement at specified spacing.	660.00	each	1,849.55	12,20,703.00

70	Manufacturing, supplying and fixing retro reflective overhead signage boards made up of 2 mm thick aluminium sheet, face to be fully covered with high intensity and encapsulated lens type heat activated retro reflective sheeting conforming to type - III of ASTM-D-4956-01 as approved by Engineer-in-charge, letters, borders etc. as per IRC : 67-2001 in silver white with blue colour back ground and with high intensity grade, pasted on substrate by pressure sensitive adhesive backing which shall be activated by applying pressure conforming to class II of ASTM-D-4956-01 and fixing the same to the plate of structural frame work by means of suitable sized aluminium alloys, rivets or bolts & nuts @ 300 mm centre to centre all along the periphery as well as in two vertical rows along with theft resistant measures, including the cost of painting with two or more coats of epoxy paint in grey colour on the back side of aluminium sheet including appropriate priming coat.				
	The rate includes the cost of rounding off the corners, lowering down the structural frame work from the gantry, fixing and erecting the same in position all complete as per drawings, specification and direction of the engineer-incharge.(Structural frame work including M.S. plate to be provided separately. Rectangular area of the sheet only shall be measured for payment). a) Overhead informatory road signage	104.00	sqm	4722.20	4,91,109.00
					-

71	Providing Retro-reflective regulatory sign board of size 900 mm dia meter made out of 2 mm thick aluminium sheet, face to be fully covered with high intensity encapsulated lens type retro - reflective sheeting as approved by Engineer-in-charge . Letter, symbols, borders etc. will be as per IRC - 67 with required colour scheme on the boards and with the high intensity grade A. The aluminium sheet to be riveted to M.S. frame of angle iron of size 40x40x4 mm. The boards will be fixed to 1 No. 50x50 mm square post made of M.S. angle 50x50x4 mm, 4 m long welded to the frame with adequate anti-theft arrangement .Sheet work to be painted with two or more coats of synthetic enamel paint over an under coat (primer) and back side of aluminium sheet to be painted with two or more coats of epoxy paint including appropriate priming coat complete in all respects as per direction of Engineer-in-charge.	104.00	each	5266.45	5,47,711.00
72	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-incharge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	4,830.00	kg	472.4	22,81,692.00

	Sub Head 11: DRAINAGE				
73	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
	a) 300 mm dia. R.C.C. pipe	11,500.00	metre	518.55	59,63,325.00
	b) 600 mm dia. R.C.C. pipe	1,320.00	metre	1397.1	18,44,172.00
74	Constructing brick masonry road gully chamber 110x50x77.5 cm with bricks of class designation 75 in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm precast R.C.C. horizontal grating with frame and vertical grating complete as per standard design :				
	a) With F.P.S. bricks	580.00	each	7522.15	43,62,847.00
75	Raising manhole cover and frame slab to required level including dismantling existing slab and making good the damage as required (Raising depth of manhole to be paid separately) :				
	a) Rectangular manhole 120x90 cm with circular cover 560 mm dia of grade HD - 20	292.00	each	2528.3	7,38,264.00
	b) Circular manhole 140 cm dia with circular cover 600 mm dia of grade EHD - 35	98.00	each	217.0	21,266.00
76	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality				
	a) EHD - 35				
	i) Circular shape 560 mm internal dia	390.00	each	1655.2	6,45,528.00

77	Constructing brick masonry circular manhole 1.22 m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement :4 coarse sand) inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design :				
	a) 1.68 m deep with SFRC Cover and frame (heavy duty HD- 20 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182 kg. fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering, shuttering all complete. (Excavation, foot rests and 12 mm thick cement plaster at the external surface shall be paid for separately) :				
	i) With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	312.00	each	16560.8	51,66,970.00
	Sub Head 13: Irrigation Work				
78	Providing and laying S&S centrifugally cast (spun) iron pipes (Class LA) conforming to IS - 1536 :				
	a) 100 mm dia pipe	5,750.00	metre	1078.25	61,99,938.00
79	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) :				
	a) 100 mm diameter				
	i) Class II	23.00	each	3689.75	84,864.00

80	Providing and laying S&S C.I. standard specials such as tees, bends,collars, tapers, caps etc. (Heavy class):				
	a) Up to 300 mm dia	13.00	quintal	4476.3	58,192.00
81	Providing and laying flanged C.I. standard specials such as tees, bends, collars, tapers, caps etc., suitable for flanged jointing as per IS : 1538 :				
	a) Up to 300 mm dia	33.00	quintal	6683.15	2,20,544.00
82	Providing and fixing brass ferrule with C.I. mouth cover including boring and tapping the main :				
	a) 20 mm nominal bore	52.00	each	280.65	14,594.00
83	Providing lead caulked joints to spun iron or C.I. pipes and specials, including testing of joints but excluding the cost of pig lead :				
	a) 100 mm diameter pipe	150.00	each	224.65	33,698.00
84	Supplying pig lead at site of work.	8.00	quintal	16039.4	1,28,315.00
85	Providing flanged joints to double flanged C.I./ D.I. pipes and specials, including testing of joints :				
	a) 100 mm diameter pipe	100.00	each	193.85	19,385.00
86	Providing and laying S&S C.I. Standard specials such as tees, bends, collars tapers and caps etc, suitable for flanged jointing as per IS : 1538 :				
	a) Up to 300 mm dia	1.00	quintal	6625.1	6,625.00
87	Providing push-on-joints to Centrifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes including testing of joints and the cost of rubber gasket :				
	a) 100 mm dia pipes	1,438.00	each	65.1	93,614.00

88	Constructing masonry Chamber 30x30x50 cm inside, in brick work in cement mortar 1:4 (1 cement :4 coarse sand) for stop cock, with C. I. surface box 100x100 x75 mm (inside) with hinged cover fixed in cement concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12mm thick, finished with a floating coat of neat cement complete as per standard design :				
	a) With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	29.00	each	1195.35	34,665.00
89	Constructing masonry Chamber 120x120x100 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :				
	a) With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	23.00	each	16335.65	3,75,720.00
90	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.				
	i) External work				
	a) 25 mm dia nominal bore	1,450.00	each	205.85	2,98,483.00
	b) 40 mm dia nominal bore	1,150.00	each	301.05	3,46,208.00

91	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
	a) 25 mm nominal bore	116.00	each	428.2	49,671.00
	b) 40 mm nominal bore	92.00	each	584.7	53,792.00
92	Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality :				
	a) 25 mm diameter pipe	1,450.00	metre	9.10	13,195.00
	b) 40 mm diameter pipe	1,150.00	metre	12.35	14,203.00
				Total	**25,47,30,246.00**
	Add 15.69% Cost Index on DSR Items i.e. Rs.242015809				3,79,72,280.00
					29,27,02,526.00
	Deduct 9.5% as per GNCTD order 27,99,88,089/-				-2,65,98,868.00
	Net Total				**26,61,03,658.00**

Abstract of Cost (Electrical Work)					
Name of Work: Street Scaping of Ring Road from Moolchand to Ashram chowk, Delhi.					
Sub Head	**Providing External Electrical Installations for Moolchand to Ashram chowk, New Delhi**				
S. No.	**DESCRIPTION OF ITEM**	**QTY.**	**RATE**	**UNIT**	**AMOUNT (Rs.)**
	SUB HEAD - 1 (Pole, Foundation, Street Light, Fittings, Cables, Feeder Pillar and Earthing)				
1	Providing and laying in position 1:2:4 reinforced cement concrete foundation of size 500 mm.(L) X 500 mm. wide and 1200 mm. deep i/c excavation of earth, providing cutting, bending and placing in position, reinforcement of cold twisted bars of 12 mm. dia- 1350mm long (approx)- 8 Nos. and reinforcement ring of cold twisted bar of 8mm dia - 2000mm (approx) - 10nos. (with equal spacing) as required with positioning of foundation bolts (as per item below) and providing 63 mm. (O.D) DWC, HDPE Pipe for cable entry & exit as required.	116	6404.00	Each	742864.00
2	Supply, installation, testing & commissioning of 3Mtr. Decorative Pole with Mild Steel round casted base (Dia-340mmx09mm) duly welded and fixed at bottom with arrangement of fixing 4 no's foundation bolts M 16x450mm for proper fixing of pole at concrete pedestal. Base plate is duly welded with galvanized Ribbed Mild Steel Pipe having dia 105mm, minimum thickness of 3.5mm with minimum 15 nos. of grooves on entire outer circular surface and throughout the length of pole. The Pole shall be provided with built in control box for electrical connection, looping-in looping out arrangement suitable for terminating Aluminum armored cables. The control box is provided with heavy duty 4 way 32 Amp. Connector and 6 Amp. MCB. Pole is properly treated, primer coated and polyurethane painted as approved colourin Italian capcicoat graphite colour.(Production tolerance ±3%). **(Note : Drawing must be approved by the Engineer-in-Charge before supply of material).**	90	16269.00	Each	1464210.00

3	Supply, installation, testing & commissioning of 50-60 Watt Decorative LED Fixture, Made with cast aluminium body with cast aluminium four arm, casting thickness is not less than 5mm. Fixture is provided with cast aluminium heat sinks in upper part of fixture, metallic PCB mounted on it and powered by high power Led's. Fixture dimension are Height -995mm, Perimeter-425mm, Heat Sink-2.1Kgs and Gross weight-20 to 21 Kgs. Fixture shall be powder coated /polyurethane painted in Italian capcicoat graphite grey colour .Manufacturer should have BIS approval (R-Number) for post top fixtures. (Production tolerance ±3%). **(Note : drawing must be approved by the Engineer-in-Charge before supply of material).**	90	19650.00	Each	1768500.00
4	Fabrication, Supply and fixing of Polygonal high mast window cover (As per sample approved) made of 2.5 mm thick sheet moulded compound suitable for 30 meter high mast installed at various road under PWD South East division i/c providing allen screw, nut bolt etc complete as required. (Make- Syntex/Grasp/Boxxman or equivalent)	25	2301	Jobs	57525.00
5	Providing, boring and laying HDPE pipes (ISI Marked) of 120 mm O.D. confirming to IS:4984-1995 as amended upto date with pressure rating of 4 Kg/Sq.c.m by trench less technology with no dig method by making bore hole in horizontal direction across the road as per direction of Engineer-In-Charge with mouling equipment i/c jointing cleaning, roadding of pipe. Providing, suitable covers on mouth of pipes, excavation of pits of required size at a depth of 1.30 mtrs. to 2.00 mtrs.	500	1165.00	Meter	582500.00
6	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc.direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.				

6.1	90 mm dia (OD-90 mm & ID-76 mm nominal)	5000	163.00	Meter	815000.00
7	SITC of following wattage heavy duty LED Flood Light fittings having powder coated pressure die cast housing with separate compartment for LED driver dully provided with secondary optics for better distribution of light as per technical specification for outdoor luminiaries given in terms & conditions i/c dismantling of existing HPSV light fixtures (150 to 400watt) with proper safety tools and equipments etc complete as required.				
7.1	350-400 watt flood light with high power LED & control box with electronic driver, surge protection on existing high mast etc complete as required. (in place of 2 x 400 watt HPSV light fixture)	250	23335.00	Each	5833750.00
7.2	80 watt (integral type) flood light with high power LED & electronic driver on the underdeck etc complete as required. (in place of 150 watt HPSV light fixture)	30	5383.00	Each	161490.00
8	Supply, installation, testing and commissioning of Up & Down lighter of 16 Watt, IP66 with beam angle 30 degree, CCT 3000K, power factor>0.90,THD<10%, CRI>80. Housing Material should be of Aluminum Alloy body with powder coated surface- black/white. Cover material optical glass lens to highlight the pillars of Flyover i/c saddles,fasteners,setting the angle complete etc as required. (Make-Divinity Cat No-DL-OSL-6122C-6 or equivalent in Osram/K-Lite/Orient)	60	6409.00	Each	384540.00

9	Supplying, installation, testing & commissioning of 120 wattage LED fittings on existing street light pole to illuminate zebra crossing with energy efficient, IP66 protected, body made out of pressure die cast aluminium for better thermal management, potted driver, power factor>0.95, THD<10%, CRI>70% , system efficacy ≥100 Lm/W & CCT-5700-6000^{0}K i/c making connection etc complete as req. Design criteria as well in the luminaire spec as : • Vertical illuminance on this axis of pedestrian crossing at a height of 1m: Ev ≥ 40 lux avg. • Uniformity of vertical illuminance on lane in front of the driver i.e. overall uniformity (Ev min/Ev avg.): 0.20 • Horizontal illuminance on pedestrian crossing at ground level: Eh ≥ 80 lux avg. • Uniformity of horizontal illuminance i.e. overall uniformity (Eh min/Eh avg.): 0.30 (Make: Keselec/Eveready/K-lite)	26	13628.00	Each	354328.00
10	Supplying, installation, testing & commissioning of Zebra lighting pole **6 mtrs.** above the ground with 1.5 mtr overhang designed optimum results to suit Zebra light fitting. Hot dip galvanized GI Pole ensuring complete coverage with minimum 70-80 microns thickness. The pole should be coated with epoxy zinc phosphate primer of 40 microns and finished using polyurethane based painted in yellow color with black color stripes. The Pole shall be provided with flush door at the bottom with the proper strengthening to the cut out of the door openable with special panel lock key and safety chain and with sleeve type arrangement with 63 Amps 4 way heavy duty connector for loop in and loop out arrangement for cable MCB channel to mount MCB on heavy duty bakelite sheet shall be provided into the pole. (**Note-**Hardware used shall be non corrosive grade SS304 Grade & drawing of pole must be approved from E-in-C before procurment at site) (Make: Keselec/Eveready/K-lite)	26	18183.00	Each	472758.00

11	Supplying ,installation, testing & commsioning of linear facade wall washer of 18 watt, minimum length of 1000mm, IP65 with beam angle 80 degree ,CCT 3000K, power factor>0.90,THD<10%, CRI>80 , housing material of aluminum alloy body with powder coated surface, lens with tempered glass to highlight the side deck of Flyover at a height of 6-9mtrs i/c fasteners, saddling, setting an angle complete etc as required.(Note :Sample must be approved by the Engineer-in-Charge before supply of material). (Make-Divinity Cat No-DL-OHEM-WLA-18W or equivalent in Osram/K-Lite/Orient)	150	7803.00	Nos.	1170450.00
12	Supplying and laying of following size of XLPE insulated and PVC sheathed aluminium armoured conductor cable of 1.1 KV grade as required in the existing RCC/ HUME/ METAL pipe as required.				
	(a) 3½ x 50 sq. mm	400	311.00	Meter	124400.00
	(b) 4 x 25 sq. mm	7000	205.00	Meter	1435000.00
	(c) 2 x 16 Sq.mm	200	133.00	Meter	26600.00
13	Supplying, Laying and fixing of one number XLPE insulated and PVC sheathed power cable of 1.1 kV grade of following size on wall surface as required.				
	(a) 3X6 Sq.mm (clamped with 1mm thick saddle)	600	105.00	Meter	63000.00
14	Supplying and making indoor end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
	(a) 3½ x 50 sq. mm (35mm.)	26	354.00	Each	9204.00
	(b) 4 x 25 sq. mm (28mm.)	60	258.00	Each	15480.00
	(c) 2 x 16 Sq.mm (22mm.)	60	170.00	Each	10200.00
15	Supply of 12 core 4 sq. mm,1100 Volts PVC insulated & FR PVC sheathed multicore industrial flexible cable with annealed bare copper conductor, conforming IS:694 etc. complete as reqd. for 30M High Mast light fixtures.	900	385.00	Mtrs.	346500.00

16	Rewiring of 30M High Mast LED light fixtures with specified cable (paid separately on linear basis) including making connections with luminaire on one end and on terminal blocks on the other end. The rate shall include the cost of labour, tools and equipments, safety gear and any other miscellaneous item required to complete the job.	25	7737.00	Each	193425.00
17	Earthing with G.I. earth pipe 4.5 meter long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/coke and salt as required.	55	3672.00	Each	201960.00
18	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	150	351.00	Meter	52650.00
19	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	120	129.00	Meter	15480.00
20	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing along with existing surface/ recessed conduit/submain wiring/ cable as required.	15200	23.00	Meter	349600.00
21	Providing and laying eathing connection from earth from earth electrod with 6 SWG dia. G.I. wire in 15 mm. dia. G.I. pipe from earth electrod including connection with G.I. thimble excavation and re-filling as required.	100	134.00	Meter	13400.00
22	Fabrication, Supplying and Installation of outdoor type cubical Feeder Pillar of minimum front area 1 sq. mtr. and depth not less than 45 cm, made out of 2mm. thick (14 SWG) CRCA sheet steel duly compartmentalized having 4 strip bus bar of 200 Amp. capacity, front opening for switchgears with cable alley, heavy duty moulded terminal blocks for incoming/outgoing and control wiring with copper conductor 1100V grade flexible cable, double door with locking arrangement having degree of protection IP-55 from rain, dust, duly fixed on MS angle iron frame work of size 50mm. x 50mm. x 6mm. (NS) 90 cm long legs out of which 45 cm duly grouted in cement concrete 1:2:4 (1 cement : 2 sand : 4 stone aggrete 20mm) and having				

	following accessories mounted inside the cubical panel board i/c connection, interconnection with aluminium thimbles, earthing with two nos. earth studs duly painted with one coat of red oxide & two coats of superior quality enamel paint complete etc. as required.				
	Supplying and fixing of following accessories in the existing cubical panel board / feeder pillar including connection testing etc. as required.				
	Meter Compartment (Without meter)				
	Meter compartment of suitable size with CTs controlled (125/5A) 3 phase 4 wire direct type kWHr meters. - 1 No.				
	INCOMER: 1 No. 125A, 415V, Ics=Icu=35KA rupturing capacity, FP MCCB with phase spreader and extended rotary handle (Ics = Icu = 100%).				
	I No. Digital Multifunction Astronomical time switch				
	1 No. 125A FP power contactor with ON-OFF push buttons including indicating LED Lamps (R & G) for manual over riding of the timer and a set of contacts for remote ON-OFF operation				
	METERING: 1 Set of Digital Voltmeter (0-500 V) 96 sq.mm. flush type with selector switch.				
	1 Set of Digital Ammeter (0-125A) 96 sq.mm. flush type with selector switch & 125/5 Amp ratio CTs.				
	1 Set of 3 Nos. LED phase indication lamps (RYB) with 2 Amp. SP MCB.				
	BUSBAR				
	One set of 200A TPN Aluminium busbars with colored PVC sleeves and SMC/DMC busbar supports at both ends and maximum 600mm apart				
	<u>OUTGOINGS</u>	-			
	Programmable electronic timer for auto switching of the external lighting switching ON -OFF of the contractor as per the preset astranomical time settings depending upon the seasonal requirements.	-			

	3 Nos. 63A, 415V, Ics=Icu=16kA rupturing capacity, TPN, MCCB with phase spreader extended rotary handle				
	3 Nos. 40A DP 10kA MCB				
	OTHER ACCESSORIES	-			
	Provision for space for Inter face unit (SCADA Unit and energy Meter).				
	Hooter with Micro Switch and necessary Circuitry				
	2 Nos. Danger notice plate.				
	2 Nos. Godwon lock, 3 step				
	Auto/Manual By Pass arrangement.	15	86386.00	Sets	1295790.00
23.	**Credit for below mentioned Items i/c dismantling & Shifting from site:-**				
23.1.	2*400 watt HPSV Flood Light Fitting	325	500	Nos.	-162500.00
23.2.	150 watt HPSV flood Light Fitting	20	170	Nos.	-3400.00
23.3.	MS Gear Box	300	200	Kgs.	-60000.00
	SUB-HEAD - 2 (EI, Fans, Fittings and Distribution Boards)				
1	Supply, Installation, testing & commissioning of outdoor type LED display bilingual (Hindi & English) board, front side of board having lazer cut of 3mm thick Aluminum composite panel (ACP) sheet of approved quality and colour as per direction of Engineer-in-Charge. Back side of ACP sheet should be properly fixed with 3mm thick white polycarbonate sheet for glowing purpose. MS pipe welded structure made out of 25mm X 25mm X 2mm MS pipe section with stiffeners welded vertically and horizontally in regular interval with pipe frame and the pipe frame shall be covered from all sides & back with 24 Gauge G.I. sheet properly with steel screw. LED modules consisting of 3 Nos. LED of 0.24 watt each, injection moulded module of 1.2 watt , 100mA power current, 12 volt should be fitted inside the board. Minimum 20 LED modules per sq. ft. fixed in such a way to give uniform brightness to the characters letters i/c SMPS, wiring with proper size of PVC insulated copper wires etc. complete as required (actual size of board to be approved by the Engineer-in-Charge before fixing).	180	1791	Sq. Ft.	3,22,380.00

2	Supply, installation, testing & commissioning of double sided EXIT signage light of size 365x225x40mm with CRCA sheet housing, powder coated with clear acrylic, screen printed/deep engraving display with minimum power of 5 Watt with battery fitted and backup of 3-4 hours on battery etc complete as required. (Make-Halonix / Surya/Agni/ Lifegaurd / Legerand)	12	5768	Each	69,216.00
3	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	4 way (4 + 12), Double door	3	2198	Each	6,594.00
4	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	8 way, Double door	3	1061	Each	3,183.00
5	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	Single pole	48	173	Each	8,304.00
b)	Double pole	3	463	Each	1,389.00
c)	Four pole	3	2280	Each	6,840.00
6	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
a)	20 mm	200	126	Mtrs.	25200
b)	25 mm	80	147	Mtrs.	11760
7	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/recessed steel/ PVC conduit as required.				

a)	3 x 1.5 sq. mm	250	50	Mtr.	12,500.00
b)	3 x 2.5 sq. mm	210	75	Mtr.	15,750.00
c)	3 x 4 sq. mm	125	111	Mtr.	13,875.00
d)	3 x 6 sq. mm	100	162	Mtr.	16,200.00
8	Supplying and laying of following size of XLPE insulated and PVC sheathed aluminium armoured conductor cable of 1.1 KV grade as required in the existing RCC/ HUME/ METAL pipe as required.				
8.1	(a) 2 x 16 Sq.mm	300	133.00	Meter	39900.00
8.2	(b) 4 x 16 Sq.mm	150	163.00	Meter	24450.00
9	Supplying and making indoor end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
9.1	(a) 2 x 16 Sq.mm (22mm.)	6	170.00	Each	1020.00
9.2	(b) 4 x 16 Sq.mm (28mm.)	6	255.00	Each	1530.00
10	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing along with existing surface/ recessed conduit/submain wiring/ cable as required.	900	23.00	Meter	20700.00
11	Structural steel work, riveting, bolting or welding for framing work by angle iron frame made by 40mm x 40mm x 6mm angle iron i/c cutting, fixing in position, grouting and applying a primer coat & painting etc complete as required.	40	284	Mtr.	11,360.00
12	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 A & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	10	406.00	Nos.	4060.00
13	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required.				
13.1	1 or 2 Module (75 mmX75 mm)	5	175.00	Nos.	875.00
13.2	12 Module (200 mmX150 mm)	11	344.00	Nos.	3784.00

14	Supplying, installation, testing & commissioning of 18-20 Watt Energy efficient IP65 surface mounted weather proof fitting with 5700-6000K colour temperature, impact proof with PC housing & opal finish cover suitable for wet location i/c making connections, termination etc. complete as reqd.	100	4547.00	Nos.	454700.00
15	Supplying and installation of 300 mm sweep heavy duty exhaust fan in the existing opening i/c making the hole to suit the size of above fan, making good the damage, connection, testing, commissioning etc as reqd.	15	2967.00	Nos.	44505.00
	SUBHEAD - 3				
	Pumping Units for Subway				
1	Supplying & Fixing of dewatering submersible pump set suitable for operation on 230 V, 50 Hz AC Supply and suitable for discharge from 325-100 LPM at a total head of 8-9 mtr., solid handling capacity i/c cartage etc. as reqd. (KSB/ Mather-Platt/Kriloskar Make).				
	MATERIAL OF CONSTRUCTION				
	Casing : C.I.				
	Impeller : C.I.				
	Shaft : Chrome Steel	6	32992.00	No.	197952.00
2	SITC of single phase DOL starter panel suitable for upto 2 HP submersible pump set, M.S. Fabricated control panel Wall mounting type in cubicle pattern with ammeter, voltmeter, contactor, overload relay, indicating lamps, overload & high level annunciation through hooter complete as reqd.	6	10315.00	No.	61890.00
3	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc.				
	Internal work - Exposed on wall				
3.1	40 mm	70	394.15	Mtr	27590.50
3.2	50 mm	70	472.4	Mtr	33068.00

4	Supplying and fixing 3 x 4 sq.mm PVC insulated PVC sheathed flat copper submersible cable along with GI pipe/ surface/ existing pipe etc. complete as required.	180	171.00	Mtr	30780.00
	Total				**1,92,06,059.50**
	Say Rs.				**1,92,06,060.00**
	Less @ 9.5% on DSR items i.e. Rs.818758.00)				-77,782.00
	Total				**1,91,28,278.00**

Abstract of Cost (Horticulture Work)

Name of Work:-Street Scaping of Ring Road from Moolchand Junction to Ashram Chowk.

SL. No.	Description	QTY	UNIT	RATE	AMOUNT
A	**HORTICULTURE AND LAND SCAPING WORKS**				
1	Supplying and stacking of well decayed cattle manure at site including royalty and carriage upto 5 k.m. lead complete (cattle manure measured in stacks will reduced by 8% for Payment).	531	cum	189.10	1,00,412.00
2	Supplying and stacking of good earth at site including royalty and carriage upto 5 km complete (earth measured in stacks will be reduced by 20% for payment)	531	cum	332.55	1,76,584.04
3	Spreading of sludge, dump manure and/or good earth in required thickness as per direction of officer-in-charge (cost of sludge, dump manure and/ or good earth to be paid separately).	531.09	cum	30.95	16,437.00
4	Fine dressing of the ground	4389.00	sq.m	2.15	9,436.35
5	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20% : 1 part of stacked volume of manure after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any, with all leads and lifts (cost of manure, sludge or extra good earth if needed to be paid for separately) :				
a	Holes 90 cm dia, and 90 cm deep	636	each	101.40	64,490.00
b	Holes 45 cm dia, and 45 cm deep.	17400	each	13.40	2,33,160.00

6	Providing and spreading of Neem based organic manure or equivalent in 25kg (net) packing in HDPE bags at different sizes as per the direction of officer-in-charge. Manure must contain the following NPK contents (a) Bnitrogen (as N) %by weight 3.00-40. (b) Phosphorus (as P) %by weight 1.50-1.90 (c) Potassoium (as K) %by weight 1.25-1.60 **(Note: Material supplied at site will have to be tested at IARI laboratory, Pusa, New Delhi for conforming the contents of NPK).**	304	bags	850.0	2,58,400.00
B	**PLANTATION OF TREES, SHRUBS, GROUND COVER AND CREEPERS**				
7	Supplying and planting of **ground coverage's** with soft cuttings (including supply of required numbers of developed polled plants), on prepared ground, fine dressing and then planting with watering, etc complete as per direction of Officer in charge.				
a	Providing and Displaying of Wadelia trilobata plant,full of leaves in 15 cm size of Poly bags & as per direction of the officer-in-charge. @45cm c/c	5500	each	15.40	84,700.00
b	Providing and Displaying of Juniperus prostrata plant with 5 to 6 latral branches and green foliage in 20 cm size of Earthen Pot / Plastic Pot & as per direction of the officer-in-charge. placing @ 45cm c/c	2750	each	30.75	84,563.00
c	Providing and Displaying of Aloevera 30cm height well developed, fresh and healthy placed@45cm c/c in Earthen pot / Plastic pot & as per direction of the officer-in-charge	500	each	22.00	11,000.00
d	Providing and Displaying of Dianella variegated plant, with 3 to 4 variegated leaves in 20 cm size of Earthen Pot / Plastic Pot & as per direction of the officer-in-charge	4200	each	30.75	1,29,150.00
e	Providing and Displaying of Asparagus marrie plant, well developed 15 to 20 leaves, full of branches and foliage in 25 cm size of Earthen Pot / Plastic Pot & as per direction of the officer-in-charge.	5500	each	51.25	2,81,875.00

f	Providing and Displaying of Ophiopogon plant, Green/Black full of leaves in 20 cm size of Earthen Pot / Plastic Pot & as per direction of the officer-in-charge.	2800	each	20.50	57,400.00
g	Providing and Displaying of Clerodendron inerme plant of ht. 30 cm to 40 cm multi branched in 25 cm size of Earthen Pot / Plastic Pot &as per direction of the officer-in-charge.	2800	each	51.25	1,43,500.00
h	Providing and Displaying of Fountain grass ,of height 30-45 cm. with healthy foliage in Earthen Pot/Plastic Pot of size 20 cm. as per direction of the officer-in-charge.	4200	each	30.75	1,29,150.00
8	Supplying and **Shrub plantation** on prepaired pit, including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts				
a	Supply and stacking of plant Nerium oleander variegated of height 60-75 cm., multibranched in earthen pots of size 25 cm as per direction of the officer-in-charge.	850	each	60.00	51,000.00
b	Supply and stacking of plant Ficus panda of height 45-60 cm. with 6-7 branches and healthy foliage in p.bag of size 25 cm as per direction of the officer-in-charge.	850	each	50.00	42,500.00
c	Supply and stacking of plant Tecoma gaudichaudi of height 90-105 cm.,bushy in big size HDPE bag as per direction of the officer-in-charge.	850	each	110.00	93,500.00
d	Supply and stacking of plant Tabernaemontana divaricata (Chandni double) of height 90-105 cm., bushy in big size HDPE bag as per direction of the officer-in-charge.	850	each	80.00	68,000.00
e	Supply and stacking of plant Hamelia patens of height 90-105 cm. bushy in big size HDPE bags as per direction of the officer-in-charge.	1300	each	100.00	1,30,000.00
f	Supply and stacking of plant Bauhinia acuminata of height 60-75 cm. in earthen pots of size 20 cm as per direction of the officer-in-charge.	200	each	45.00	9,000.00
g	Supply and stacking of plant Largerstroemia indica of height 90-105 cm. multibranched in poly bags of size 25 cm as per direction of the officer-in-charge.	130	each	40.00	5,200.00

h	Supply and stacking of plant Cassia biflora of height 90-105 cm., well branched, bushy in big size HDPE bag as per direction of the officer-in-charge.	90	each	100.00	9,000.00
i	Providing and Displaying of Sansivera 30cm height well developed, fresh and healthy placed@45cm c/c in Earthen pot / Plastic pot & as per direction of the officer-in-charge	340	each	45.00	15,300.00
j	Providing and Displaying of Agave desmentiana 30cm height well developed, fresh and healthy placed@45cm c/c in Earthen pot / Plastic pot & as per direction of the officer-in-charge	850	each	60.00	51,000.00
k	Providing and Displaying of Ruellia simplex 30cm height well developed, fresh and healthy placed@45cm c/c in Earthen pot / Plastic pot & as per direction of the officer-in-charge	420	each	22.00	9,240.00
l	Supply and stacking of plant Calliandra hybrida of height 105-120 cm., well branched, bushy in big size HDPE bag as per direction of the officer-in-charge.	170	each	80.00	13,600.00
9	Cost of supplying and planting **Creeper plants** The height should not be less mentioned against the name ofplant. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. the plant to be planted as per site engineers instruction, the approved species are				
a	Supply and stacking of Bougainvillea (Variety Butiana, Lady Mary Baring,Mahara,Mohan,Scarlet Queen, Varigata, Glabra Formosa, Peruviana Odissi, Partha, Subhra,Thimma, Spectabilis L.N Birla, Refulgens) plant of height 30 cm. to 45 cm. with 2-3 branches in 20 cm size of Earthen pots / Plastic pots & as per direction of the officer-in-charge.	900	each	35.00	31,500.00
10	Cost of supplying and planting **Tree** The height should not be less mentioned against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. the plant to be planted as per site engineers instruction, the approved species are				

a	Supply and stacking of Tamarindus indica (Imli) plant of height 120-150 cm. in big polybags of size 25 cm as per direction of the officer-in-charge.	300	each	80.00	24,000.00
b	Supply and stacking of Lagerstroemia flosreginae plant of height 150-165 cm.in big poly bag of size 25 cm as per direction of the officer-in-charge.	20	each	120.00	2,400.00
c	Supply and stacking of Tabebuia sp. plant of height 150-165 cm. in big polybags of size 25 cm as per direction of the officer-in-charge.	22	each	60.00	1,320.00
d	Supply and stacking of Nauclea cadamba (Kadam) plant of height 150-165 cm. in big poly bag of size 25 cm as per direction of the officer-in-charge.	8	each	60.00	480.00
e	Supply and stacking of Cassia fistula (Amaltash) plant of height 120-135 cm. in big poly bags of size 25 cm as per direction of the officer-in-charge.	90	each	60.00	5,400.00
f	Supply and stacking of Bauhinia variegata of height 165-180 cm. with 3-4 branches and thick stem in big size HDPE bags as per direction of the officer-in-charge.	20	each	225.00	4,500.00
g	Supply and stacking of Crateva religiosa height 90-105 cm. in big polybag of size 25 cm placed at a700cm c/c as per direction of the officer-in-charge.	36	each	250.00	9,000.00
h	Providing and Displaying Foxtail palm well developed with fresh & healthy foliage of ht. 210 to 240 cm in big 40 cm Cement Pot as per direction of the officer-in-charge.	15	each	1100.00	16,500.00
i	Providing and Displaying Washingtonia filifera palm well developed 90 to 105 cm ht. having 5 to 6 straight fresh and healthy leaves in 35 cm Cement Pot as per direction of the officer-incharge.	50	each	500.00	25,000.00
j	Supply and stacking of Phoenix sylvestris Roxb. (Wild date palm/khajur) of height 150-165 cm. in Big HDPE Bag as per direction of the officer-in-charge.	75	each	650.00	48,750.00
11	Plantation of Trees, Shrubs, and Hedge at site i/c watering and removal of unserveiceable material's as per direction of officer in charge (excluding cost of plant & water)				
a	Trees plant	636	each	4.25	2,703.00
b	Shrubs Plant	7400	each	2.15	15,910.00

C	**MAINTENANCE WORKS**				
12	Complete maintenance of the entire garden features having as per yard stick in the garden area i.e. lawn trees, shrubs, hedge, flower beds, foliages, creepers etc. including hoeing, weeding pruning replacement of plants, gap filling, watering, mowing of lawn, grass cutting by lawn mover and brush cutter , removal of garden waste, applying insecticide, pesticide & fertilizers (whenever required) top dressing of lawn with good earth and menure and maintenance of other garden related works as directed by office-in-charge (Cost of Good Earth, Manure, Fertilizer, Insecticide, Pesticide , lawn mover and brush cutter with fuel will be provided by the Department & other T & P material/articles shall be provided by the contractor.)				
a	Open spaces(as per yard stick 1Mali =3.00Acre).	84840.00	Per Sqm per Month	0.90	76,356.00
13	Providing services of Tata 407 vehicle or equivalent vehicle model of 2015 or on ward model for carriage of pruned branches, leaves, disposal of garden rubbish/Hort. waste/ malba and type of Hort. material such as plants/pots, manure/good earth (to carry one place to another place including loading unloading lifting upto approved municipal dumping ground as per direction of Engineer-in-charge as and when required including cost of Diesel, Mobil oil, driver and Four labours all in uniform with PWD LOGO with necessary T&P such as spade, Gaiti, Bill hook, Rope, Khurpa, Phawra, Tasla, Safety Cones etc. all complete. (Atleast Tempo/Tata 407 should be loaded upto the body mark of vehicle for counting a Trip.) For removal of pruned branches of Tree and shurbs and Lawn grass cutting and other Hort.work from the required site.	120	no. of trips	1100.95	1,32,114.00

14	Cutting of designer hedge/edge removing of cut materials, cleaning, hoeing of hedge/edge bed watering manure and applying insecticides and fungicides etc.(excluding the cost of material which shall be supplied by the department) and as per direction of officer in charge (Quantity assumed per sqm per month and rate to be quoted assuming maintenance for one year)	315.00	Per Sqmper Month	26.45	99,981.00
15	Topairy cutting/shapping of plant removing of cut materials, cleaning, hoeing of plants complete design hoeing of trees (Topairy) watering manure etc. (excluding the cost of material which shall be supplied by the department) and as per direction of officer in charge as per direction of officer in charge.				
a	Height of Topairy upto 120 cm.	600	Per tree per month	49.15	29,490.00
		TOTAL			**28,03,001.00**