SURAT SMART CITY DEVELOPMENT LIMITED

(SMART CITY MISSION)

Tender

For

Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Duct, Road Markings,Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk,Street Landscaping works and other Miscellaneous works along with Operation and Maintenance of Tendered works for Period of Five Years Under "SMART CITY MISSION" on Prepartion of Working Drawings, Procurement and Construction Basis

TENDER NOTICE (*ON LINE*) NO

VOLUME - I
TECHNICAL BID

Downloading of tender Documents	From 07/01/2017 to 30/01/2017 upto 17:00 Hrs.
Pre-Bid Meeting & tTme	19/01/2017 from 12.00 Hrs Bidder shall have to post their queries on E-mail address dmc@suratmunicipal.org / mnaskar@tce.co.in on or before 16/01/2017 up to 17.00 hrs. Venue of Pre Bid Conference – Second Floor, Room Number 88, Conference Hall,Muglisara, Surat – 395003
Online Submission (Last Date)	On or before date 30/01/2017 upto 17:00 hrs
Submission of Tender fee& EMD Original Demand Draft against Tender Fee and EMD and Original Affidavit's as mentioned in Tender Document. (Physical Submission only)	Upto 07/02/2017 till 17.00 hrs at the Office of "Chief Accountant, SuratMunicipal Corporation, Muglisara. Surat – 395003 by R.P.A.D. / Speed post only".

CLIENT

THE CHAIRMAN,
Surat Smart City Development Limited, MUGLISARA,SURAT – 395 003.
Phone : 91-261-2423751-56 , Fax : 91-261-2451935

NAME OF WORK :

Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Operation and Maintenance of Tendered works for Period of Five Years on Prepartion of Working Drawings. Procurement and Construction Basis

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VOLUME - I
Part -1

SURAT SMART CITY DEVELOPMENT LIMITED

Section I - Notice Inviting Tender

Tender Notice No.	GM(IT) / SSCDL /ABD(16)/01/2016-17	
Organization Name	Surat Smart City Development Limited (SSCDL)	
Department Name	East Zone/South East Zone	
Name of Work	Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Operation and Maintenance of Tendered works for Period of Five Years on Preparation of Working Drawings, Procurement and Construction Basis	
Tender Type	Procurement and Construction Basis	
Bidder Nationality	NCB	
Product	Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Operation and Maintenance of Tendered works for Period of Five Years on Preparation of Working Drawings, Procurement and Construction Basis	
Type of Contract	Single Work	
Bidding Currency	Single- Indian National Rupees	
Joint Venture	Allowed	
Schedule of E-Tender	Downloading of Tender Documents	From 07/01/2017 to 30/01/2017 upto 17:00 Hrs.
	Pre-Bid Meeting Date & Time	19/01/2017 from 12.00 Hrs Bidder shall have to post their queries on E-mail address dmc@suratmunicipal.org / mnaskar@tce.co.in on or before 16/01/2017 up to 17.00 hrs. Venue of Pre Bid Conference – Second Floor, Room Number 88, Conference Hall,Muglisara, Surat – 395003.
	Last date of online submission of Tender documents (Technical Bid with duly filled & duly signed forms and Price Bid)	On or before date 30/01/2017 upto 17:00 hrs

	Submission of Tender fee, EMD & Addenda-Corrigendum if any in Hard copy. Original Demand Draft against Tender Fee and EMD and Original Affidavit's as mentioned in Tender Document. (Physical Submission only)	Upto 07/02/2017 till 17.00 hrs at the Office of "Chief Accountant, Surat Municipal Corporation, Muglisara. Surat – 395003 by R.P.A.D. / Speed post only" .
	Opening of Bid (Online) & PQ documents submitted electronically	If possible on 13/02/2017 at 16:00 hrs.
	Opening of Price Bid (Online)	Will be intimated later on.
	Bid validity period	120 days from the opening of the price bid
	Project Duration	24 months including monsoon
Payment Details	Document Fee	Rs.18,000/- In form of Account Payee Demand Draft payable in favor of Surat Smart City Development Limited payable at Surat with bid submission.
	EMD (BID SECURITY)	Rs 1.68 Cr (Rupees One Crore and Sixty Eight Lacs only) by the way of Pay order / Demand Draft issued in favour of Surat Smart City Development Limited, Surat through Nationalized Bank only payable at Surat. Or The tenderer shall pay Fifty (50%) percent amount of EMD i.e Rs. 0.84 Cr (Rupees Eighty Four lacs) in the form of Bank Guarantee from the Nationalized Bank only , whose branch must be located at Surat only. The balance of the EMD - Remaining Fifty (50%) percent i.e Rs. 0.84 Cr (Rupees Eighty Four lacs) is to be deposited by way of pay order / Demand Draft issued in favour of Surat Smart City Development Limited, Surat through Nationalized Bank only payable at Surat. EMD in no other form shall be

		accepted.
	Estimated Value	Rs. **167,51,99,158/-** (Rupees One Hundred and Sixty Seven Crore Fifty One Lacs Ninety Nine Thousand One Hundred and Fifty Eight)
General Terms & Conditions	Bidders who wish to participate in this E-Tender will have to procure valid digital certificate as per information Technology Act 2000.Bidders can procure this certificate from any of the Government approved certifying agency i.e. (n) Code Solution. Bidders shall upload the tender documents after submitting the DD details for tender fees and EMD details online. The Demand Draft toward Tender Document fees can be submitted along with Earnest Money Deposit in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that EMD and tender fee are received for purpose of opening the bid. Accordingly, offer of those shall be opened whose EMD and tender fee is received electronically. However, for the purpose of realization of DD the Bidder shall send the DD as original through RPAD/ Speed Post so as to reach to " Chief Accountant" Surat Municipal Corporation, Muglisara, Surat -395003 before 07/02/2017 up to 17.00 hrs. Penaltative action for not submitting DD in original to Account Department (Main Office) by Bidder shall be initiated and action shall be taken for a abeyance of registration and cancelation of E-tendering code for one year. Any document in support shall be in electronic format only through online(by scanning) and hard copy will not be accepted separately. This should be as per details given online and it should be drawn before last date of the uploading of the tender. The intending bidders shall have to submit the following documents along with the EMD (BID SECURITY) and tender fees. The Bidder should submit all the forms electronically only. 1. The technical & financial details required for evaluation dully digitally signed (As per section II & III of volume-1, part-1 of the tender). 2. Power of attorney. 3. Company's profile and certificate of registration of company under the law. DOWNLOAD OF TENDER DOCUMENT : The tender document for these work are available only in Electronic format which can be downloaded free of cost by the bidder. SUBMISSION OF TENDER : Bidder shall submit their offer in electronic format on below mentioned website on or before the scheduled date and time as mentioned, after Digitally Signing the same. No Price bid in physical form will be accepted and any such offer if received by SURAT SMART CITY DEVELOPMENT LIMITED will be outrightly rejected. Bidders need not to submit Technical Bid in Hard Copy in physical form at this stage .Bidder shall have to submit separate account payee DD for Tender Fee & EMD drawn in favor of **"Surat Smart City Development Limited"** Both the envelopes shall be placed in another envelope with due mention of Tender notice No., Name of work,date and time of opening of tenders and to be submitted in the office of **The Chief Accountant, Surat Municipal Corporation, Muglisara. Surat – 395003** ,during the period	

	mentioned above.Tender documents submitted by intending bidders shall be considered for evalution only of those bidders,whose Earnest money deposit, tender fee and other documents(Addenda, Corrigendum if any) placed in the envelope are found in order.
	OPENING OF TENDER:- The Tender Bids will be opened on the specified date & venue. Bidders who wish to remain present at the Office, Surat Smart City Development Limited, Muglisara. Surat -395003, at the time of tender opening can do so. Only one Authorized representative of each firm will be allowed to remain present.
Information for online participation	1. Internet site address for e-Tendering activities will be https://smc.nprocure.com 2. Interested bidders can view detailed tender notice and download tender document from the above mentioned website. 3. Bidders who wish to participate in online tender have to register with the website through the ''New User Registration'' link provided on the home page. Bidder will create login id & password on the own in registration process. 4. Bidders who wish to participate in this tender need to procure Digital Certificate as per Information Technology Act-2000 usingthat they can digitally sign their electronic bids. Bidders can procure the same from any of the CCA approved certifying agencies, or they may contact (n) code Solution at below mentioned address and they will assist them in procuring the same.Bidders who already have a valid Digital Certificate need not to procure the same. In case bidders need any clarification regarding online participation, they can contact : M/s (n)code solution 301, G.N.F.C. Info Tower, Near Grant Bhagwati Hotel, Ahmedabad 380 015 INDIA Tel: +91 79 26857316 Tel: +91 79 26857317 Tel: +91 79 26857318 e-Mail:URL: https://smc.nprocure.com 5. Bidders who wish to participate in e-Tender need to fill data in pre defined forms of tender fee, EMD, Volume-1 of tender i.e. PQ(Technical) Or experience details and Price bid.(In electronic form only). 6. Bidder should upload scan copies of reference documents in support of their eligibility of the bid. 7. After filling data in pre defined forms bidders need to click on final submission link to submit their encrypted bid. Bidder can also submit Document Fees, EMD, Volume-1,2,3 of tender document& Reference Documents in hard copy only if such instructions is given by tendering authority in writing**.**

GENERAL MANAGER (IT)
SURAT SMART CITY DEVELOPMENT LIMITED

SECTION II - BIDDING DATA

The following specific data for the Works to be procured shall complement, amend, or supplement the provisions in the Instructions to Bidders and Conditions of Contract. Whenever there is aconflict, the provisions herein shall prevail over those in the Instructions to Bidders.

Tender Notice No.	GM(IT) / SSCDL /ABD(16)/01/2016-17
Work No.	01
Bids to be submitted to	"Chief Accountant, Surat Surat Municipal Corporation, Muglisara, Surat – 395003 by Speed Post/RPAD only."
Name of Employer and Address	The Chairman, Surat Smart City Development Limited, Muglisara, Surat-395 003 Phone : 91-261-2423751 – 56, Fax : 91-261-2451935
Name of Work	Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Operation and Maintenance of Tendered works for Period of Five Years on Preparation of Working Drawings, Procurement and Construction Basis
Period of Completion	24 months including Monsoon.
Estimated Cost of Project	Rs. **167,51,99,158/-** (Rupees One Hundred and Sixty Seven Crore Fifty One Lacs Ninety Nine Thousand One Hundred and Fifty Eight)
Earnest Money(Bid Security)	Rs 1.68 Cr (Rupees One Crore and Sixty Eight Lacs only) by the way of Pay order / Demand Draft issued in favour of Surat Smart City Development Limited, Surat through Nationalized Bank only payable at Surat. Or The tenderer shall pay Fifty (50%) percent amount of EMD i.e Rs. 0.84 Cr (Rupees Eighty Four lacs) in the form of Bank Guarantee from the Nationalized Bank only , whose branch must be located at Surat only. The balance of the EMD - Remaining Fifty (50%) percent i.e Rs. 0.84 Cr (Rupees Eighty Four lacs) is to be deposited by way of pay order / Demand Draft issued in favour of Surat Smart City Development Limited, Surat through Nationalized Bank only payable at Surat. EMD in no other form shall be accepted.
Tender Fees	Rs. 18,000/- In form of Account Payee Demand Draft payable in favor of Surat Smart City Development Limited payable at Surat with bid submission.

Performance Security	10% of Contract Value. Out of total Performance Security (10% of contract value), initial Performance Security at 5% of the contract value shall be deposited by the bidder in the form of FDR/BG of listed nationalized Bank within 15 days on acceptance of tender and remaining Performance Security shall be deducted from the each R.A. Bill at rate of 5%) The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs. 100/- if S.D. is paid in the form of Bank guarantee/D.D/Pay order or on stamp paper of Rs. 4.25% of S.D. Amount if it is paid in the form of F.D. as per the format of SSCDL. The Surety & Undertaking shall be executed on stamp paper worth Rs. 100/- each. (i) Initiall performance security deposit i.e. Bank guarantee will be released as below ➢ After completion of project **(within 60 days from the date** of the final bill payment - 5 % (ii) Remaining performance security deposit will be released as below during defect liability period ➢ After 3 years of completion - 2.5 % ➢ After 5 years of completion - 2.5 % provided that any defect if found shall have to be rectified /complied as per the direction given by E.I.C ,within the said periods.
Retention Money	7% from each Running bill.
Defect Liability Period	05 (Five) years after issue of Completion Certificate.
Operation Maintenance Period	05 (Five) years after issue of Completion certificate
Brief Scope of work	The work to be carried out under this contract shall consist of various items as generally described in Tender Documents The works under Contract comprises the construction of proposed improvement of roads, Junction, drainage works, construction of new carriageway, construction of utility ducts, cross drains, culverts, foot path, cycle track, development of parking areas & bus bays, Street landscaping, Street Furniture, Traffice Signages, Bus Shelters, Vending Kiosks,Miscellaneous works and Maintenance of Tendered works for Period of Five years The Work Shall be executed on Preparation of Working Drawings, Procurement and Construction Basis. Details and drawings given in Tender document is for information purpose only and successful bidder shall undertake confirmatory survey for accuracy and completeness of data. It is in scope of successful Bidder to undertake all Site surveys, Geotechnical investigations, Underground Utility Survey and Scanning of the roads for utility shifting, obtaining all required approvals from the relevant authorities,Carry out Design and Drawings for all the components of the work as per Employers requirement and submit the same to client for review and approval, Prepare Good for Construction Drawings, submit maintenance manual to client for approval before start of Maintenance period. The successful bidder shall have to prepare and submit 'As Built Drawings' depicting the exact construction carried out on site, in soft and hard copy format. Statutory and other charges for getting various required approvals shall be in scope of Successful bidder The scope of work also includes :

1.1 Construction and completion of the following

a. Site clearance, demolition works, earthworks, temporary works,traffic diversion, barricading the construction site, utility shifting and all ancillary works deemed necessary for the carrying out of temporary & permanent construction works.

b. Widening/ re-cambering/ raising/ miling down & overlaying of existing carriageways, flexible/ rigid pavement at grade road intersections & accesses to adjoining developments. Work also includes removal of street furniture, exiting foot path, existing median, exiting signages, trees if any way of revised ROW, existing structures that obstruct the revised ROW as per instruction of SSCDL.

c. Tree cutting (if any) as indicated in the drawings.

d. Construction of Utility ducts, cross drains as per approved drawing.

e. Retrofitting the existing roads as per the proposed road sections wrt carriageways, provision of footpath, cycle track, services lanes.

f. Installing RPM, making road markings along the road edge, road center line & as per IRC guidelines, bus stop marking, cycle track marking, construction of medians & speed breakers, & junction improvements as per the drawings & in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

g. Construction of footpaths, kerbs, railings, vehicular impact guardrails and other road related facilities as per the guidelines of IRC in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

h. Supply and installation of new traffic signage, directional signage, street name signs & re-sitting of such existing signs & other road signs to be retained, inclusive of support & foundation as per Employers Requirement.

i. Supply & installation of street furniture seating bench, planter box, bollards, cycle hoops, advertisement/ branding/ wayfinding boards & poles in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

j. Planting of trees, shrubs and installation of lawns as a part of Landscape work & installation of services for the same, as per the drawing in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

k. All other works and services ancillary or related to the full completion of the Works in accordance with the Employer's requirements

1.2 The Contractor shall ascertain, determine and verify the locations of all utility services by scaning the roads in the vicinity of the Works, and co-ordinate with utility agencies for the diversion of affected services and the laying of new services. The Contractor shall support and protect services that need not be

	diverted or pending diversion and remove all abandoned services. Contractor shall be responsible for relocation, reconstruction, reconfiguration of driveways, site accesses, temporary and permanent drains, pipe conduits and necessary connections for public lighting and traffic lighting, earth works, turfing, environmental assessments, necessary safety measures and protection works, sewer lines etc 1.3 The Contractor's responsibility for the design and build works includes the submissions to relevant government authorities / technical departments for obtaining all necessary clearances/approvals. 1.4 The Contractor shall co-ordinate and interfaces his works with that of all other contractors, subcontractors, utility services, statutory authorities, etc. and achieve the completion of the Works to the satisfaction of the Engineer 1.5 The Contractor shall verify the proposed road reserve, cadastral boundary and contract boundary and all dimensions on Site prior to submission of Tender. The Contractor is responsible for clarifying any discrepancy between the Drawings and actual condition on Site. 1.6 The Contractor shall make good all works including road surfaces, drains, concrete slabs, gratings, kerbs, pavements, turfing, railing, fence, boundary wall, etc. affected or damaged during the course of construction, to the satisfaction of the Engineer. The costs of making good all these defects shall be borne solely by the Contractor and deemed included in his Contract Sum 1.7 All works specified shall include the provision of all labour, tools, equipment, material,traffic control, transport and everything else necessary for the satisfactory completion of the Work by the Contractor to the satisfaction of the Engineer. 1.8 Description of the Works involved in this Contract is given in the Specifications for the guidance of the Contractor. The Contractor shall be solely and fully responsible for investigating and ensuring the actual extent and nature of the Works comprised in this Contract prior to submission of his Tender. 1.9 Construction, management and quality of the Works shall comply with the Drawings,Specifications and Employers requirement
Priority of Works and General Resonsibilities of Contractor	**(1) Surat Smart City Development Limited (SSCDL) intends to Showcase Road R6 – Aai Mata Road, as a Pilot Project under Smart City initiative for Surat City. The Contractor shall complete this road in all respect on top Priority with in Three (3) months from Commencement date.** **SSCDL will set up Priority of all the remaining roads and it is in Contracator's obligation to complete the works in all respect as per priority and instruction given by SSCDL.** (2) Contractor shall take care to un install the old utilities that need to be replaced by new suggested utilities so as not to damage the same and all the material such as Manhole Frame cover, Street Pole, Street Furniture.. etc obtained after Demolition / Removal / Shifting of Utilities shall be properly stacked at Designated location and handed over to SSCDL. On instruction of SSCDL such dismantled material (C & D) waste shall be

	disposed off at location within City limits as approved by SSCDL. All the charges for Stacking and dismantling of such material shall be borne by the Contractor (3) In case of Damage to Service connections like drainage, Water supply, Gas , Telephone, Electric cables for the properties along the roads , the same shall be repaired / reinstalled by the Contractor at his own cost. (4) Recarpeting of the Roads shall be done only after approval from SSCDL **(5) The Employer Surat Smart City Development Limited (SSCDL) reserves right to remove / decrease the Scope of Tendered Works. It is in Contractor's obligation to execute the work as instructed by Surat Smart City Development Limited (SSCDL) and will not be compensated for such removal / decrease in scope of Tendered works.** (6) **Quantities mentioned in Bill of Quantity are approximate and the Contractor shall not be compensated for any increase or decrease in such Quantities and shall be paid as per actual executed and certified by Engineer-In-Charge.**
Qualifying Criteria	A. **Simailar nature of Work** : The bidder must have completed similar nature of work i.e. Road works for National Highway / State Highway / Ring Road Project in Metro Cities on Engineering,Procurement & Construction basis within last seven financial years i.e. . for a period starting from 01/04/2010 and ending one month prior to Bid Submission Date One contract of Rs 134.00 Cr **(80% of the estimated cost)** Or Two contracts of Rs 84.00 Cr each **(50% of the estimated cost)** Or Three contracts of Rs 67.00 Cr each **(40% of the estimated cost)** **B. Turn Over** The average annual financial turnover during the last 3 years ending 2015-16 should not be less than 30% of the estimated amount put to tender **C. Construction Experience in Key Activities (Physical Criteria) :** I. <u>Completed Bituminous Carpeting of Road of 50,000 Sqm or above</u> II. Completed M25 grade and above Grade of concrete work of Quantity 9,000 Cum in the form of slab and wall in a Single Project III. Footpath Work (any flooring / paving of cement concrete/ stone slabs/ tiles / inter paver blocks etc.) required for the roads covering 5 Km length and above in a Single Project The bidder must have completed the above Key activities within last seven financial years . for a period starting from 01/04/2010 and ending one month prior to Bid

	Submission Date
	AND An attested copy of **Registration with any of the department of State Government, Surat Municipal Corporation, Central Government etc. Of "AA" Class** & who have a certificate of registration with Employees Provident Fund Organization C) In view of the latest circular of IT Department IT clearance certificate is not required. However the contractor shall submit copy of the PAN card.
	It is further to clarify that if any of work(s) is/are on hand with the applicant, but if the amount of the work done at the site is more than 90% of the total Project / Tender cost as on **Last date of Submission of Tender document** then those work(s) will also be taken into consideration while evaluation. Following enhancement factors will be used for the cost of works executed and the financial figures to a common base for the value ofthe works completed in India. Applicant should indicate actual figures of costs and amount for the works executed by them in the schedule without accounting for the above-mentioned factors.
	Average Annual financial turnover during the last 3 years: 1. The average annual financial turnover during the last 3 years ending 2015-16 should not be less than 30% of the estimated amount put to tender. 2. Attested copies of balance sheet with adequate document/proof shall be attached 3. The details shall be furnished in prescribed Statement - D: **Statement- A (for Similar Natute of Work y)** One contract of Rs 134.00 Cr **(80% of the estimated cost)** Or Two contracts of Rs 84.00 Cr each **(50% of the estimated cost)** Or

Sr.No	Year	Enhancing factor
1	2016-17	1.00
2	2015-16	1.10
3	2014-15	1.21
4	2013-14	1.32
5	2012-13	1.46
6	2011-12	1.61
7	2010-11	1.77

	Three contracts of Rs 67.00 Cr each **(40% of the estimated cost)** **Statement – B (**Construction Experience in Key Activities (Physical Criteria) I. Completed Bituminous Carpeting of Road of 50,000 Sqm or above II. Completed M25 grade and above grade concrete work for Quantity 9,000 Cum in the form of slab and wall in a Single Project III. Footpath Work (any flooring / paving of cement concrete/ stone slabs/ tiles / inter paver blocks etc.) required for the roads covering 5 Km length and above in a Single Project 1. Attested copies of completion certificates for each completed work from the client mentioned above shall have to be attached. **Solvency Certificate of Nationalized Bank.** 1. Solvency Certificate of Nationalized Bank for Rs. 34 Crores. (Not older than six months) 2. Attested copies of same certificates shall have to be attached.
Joint Venture	Joint venture consortium of **Maximum Two** firms/ members / companies, as partners shall be allowed for the works. All the Members of the JV shall be jointly and severally responsible for this Contract. The Member of the JV holding highest stake shall be the Lead Partner. The JV shall comply with the following requirements: (a) A Joint venture agreement must be submitted along with the documents in which minimum share of lead member shall have to be 75% and share of other members, individually shall not be less than 15%. (b) All the members of the Joint Venture firms shall have to collectively satisfy all the criteria mentioned. **Note:** In case, the applicant/JV partner has achieved physical & financial performance for the criteria mentioned above in past, in joint venture with other Contractor (other than present JV partner), the portion of the work (physically and financially) of the contractor included in their Joint Venture Agreement in original contract work shall only be considered for evaluation purpose. In joint venture consortium the lead partner shall only be an Indian citizen, Indian partnership firm or Indian private/ public limited company.

	The Lead Member shall have "AA" class Registration with any of the department of State Government, Surat Municipal Corporation, Central Government etc. (c) The individual members who join in JV shall have to give an undertaking that they will maintain status-quo till the completion of the work, if the work is awarded to the JV Consortium, the same JV Consortium shall be maintained till the satisfactory completion of the work. This undertaking shall be submitted on Stamp paper Rs. 100. duly signed by authorized signatory, which shall be notarized. (d) In case of Bidder participating as a Joint Venture, on his selection for award of contract, all the partners/members of the Joint Venture will have to sign the Contract with the employer and will be jointly and severally liable for performance of the contract. Award of Contract will be in the name of Joint Venture consortium which will be considered as "Legal Entity" as far as this Bid/ Contract is concerned. (e) The Bid, and in case of a successful bid, the Form of Contract Agreement, shall be signed with the name of Joint Venture which will be legally binding on all the partners; (f) Lead partner shall be declared as Prime Bidder authorized to be in charge; and this authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatories of all the partners; (g) The member in charge shall be authorized to incur liabilities, receive payments and receive instructions for and on behalf of any or all partners of the Joint Venture and the entire execution of the contract including defect liability period; (h) All members of the Joint Venture shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms, and a relevant statement to this effect shall be included in the Authorization mentioned under (d) above as well as in the Form of Contract Agreement (in case of a successful Bid); and, (i) A copy of the stamped and notarized agreement entered into by the Joint Venture partners shall be submitted with the Bid. Roles, responsibilities and financial stakes of all members of the Joint Venture consortium shall be clearly and unambiguously prescribed in

	the Joint Venture agreement. In case of non prescription, the JV agreement will be declared as invalid and the bid will be treated as non responsive. (j) In case of Joint Venture financial strengths (i.e Turn over and Experience in Similar Nature of Work) of each of the JV members individually shall not be less than Minimum Qualifying Criteria worked out in proportionate to their financial stakes in the JV. In case of physical criteria, either of the JV members shall meet the qualifying requirement in any single completed project without taking into account their financial stake in the JV agreement.. Each JV member shall have required registration certificate, solvency certificate,existence of company as per tender requirement. Each member shall satisfy these requirements separately. (k) The contractors participating in the name and form of a Joint Venture consortium shall have to clearly and unambiguously define the role, responsibilities and financial stake of each of the partners, the lead partner shall also have to be defined. On award of contract to such a Joint Venture consortium, each of the members of the Joint Venture consortium shall have to sign the Contract. Each member of the JV shall be jointly and severally responsible for the performance of the contract. (l) An original notarized copy of the agreement as prescribed in Tender document entered into by the joint venture partners shall be submitted with the bid. It should also distinctly show the financial participation of each member of the joint venture and the responsibility of each member as regards planning and execution of the work. (m) In case of conflict between the terms in contract agreement and the Joint Venture documents, the terms in the contract agreement shall prevail.

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Bid Evaluation criteria

Sr.no	Criteria	Single Entity	Joint Venture	
			All Partners combined together	Each Partner
1	Turnover :- The average annual financial turnover during the last 3 years ending 2015-16 should not be less than 30% of the estimated amount put to tender	Must Meet requirement	Must Meet requirement	Must meet requirement worked out in proportionate to their financial stakes in the JV
2	Similar Nature of Work : Bidder shall be Registered in with any of the department of State Government, Surat Municipal Corporation, Central Government etc. Of "AA" Class & who have a certificate of registration with Employees Provident Fund Organization. The bidder must have completed similar nature of work i.e. Road works for National Highway / State Highway / Ring Road Project in Metro Cities on Engineering,Procurement & Construction basis within last seven financial years i.e.. for a period starting from	Must Meet requirement	Must Meet requirement	Must meet requirement worked out in proportionate to their financial stakes in the JV

		01/04/2010 and ending one month prior to Bid Submission Date One contract of Rs 134.00 Cr **(80% of the estimated cost)** Or Two contracts of Rs 84.00 Cr each **(50% of the estimated cost)** Or Three contracts of Rs 67.00 Cr each **(40% of the estimated cost)**			
	3	Construction Experience in Key Activities (Physical Criteria) I. <u>Completed Bituminous Carpeting of Road of 50,000 Sqm or above</u> II. Completed M25 grade and above Grade of concrete work of Quantity 9,000 Cum in the form of slab and wall in a Single Project III. Footpath Work (any flooring / paving of cement concrete/ stone slabs/ tiles / inter paver blocks etc.) required for the roads covering 5 Km length and above in a Single Project The bidder must have completed the above Key activities within last seven financial years . for a period starting from 01/04/2010 and ending	must meet requirements	must meet requirements	Must meet experience requirement in Single completed project. .

		one month prior to Bid Submission Date			
	4	Bid Capacity : Availabilty of Bidding Capacity should be atleast equal to INR Rs 168 Crore. The bidding capacity shall be worked out by the following formula: **Bidding Capacity = [2AN-B]** Where, **A** = Maximum value of construction works executed in any one year during the last five Year staking into account the completed as well as works in progress. **N** = Number of years prescribed for completion of work for which bids has been invited. **B** = Value of existing commitments and ongoing works and LOI issued to be completed During the period of completion of work for which bids have been invited	Must Meet requirement	Must Meet requirement	Must meet requirement worked out in proportionate to their financial stakes in the JV

1. Experience of the bidder earned by him as the JV partner will be considered to the limit of its share in the completed works shown in that JV or consortium agreement.
2. Single Entity or Sole Bidder can fulfill the criteria by Nominating the Subcontractor for satisfying experience in Key activities (Physical Criteria). Work experience certificates of Nominated Subcontractor, satisfying the Criteria of Key activities shall be submitted along with Bid. Single entity or sole Bidder can nominate only one subcontractor for same and they should collectively satisfy the Criteria. In case of physical criteria, either of the JV members shall meet the qualifying requirement in any single completed project without taking into account their financial stake in the JV agreement. Joint Venture Partners shall collectively satisfy the Experience in Key activities (Physical Criteria) ,however either of the JV members shall meet the qualifying requirement in single completed project without taking into account their financial stake in the JV agreement
3. Technical score of maximum 100 marks shall be considered for Evaluation

<table>
<tr><td></td><td>purpose of Key activities (Physical Criteria).
4. Physical activity of Bituminous Concreting of Road shall carry maximum 30 marks, Physical Activity of Concrete in form of Wall and Slab shall carry Maximum 40 marks and Physical activity for Footpath work shall carry maximum 30 Marks.Bidder satisfying the required criteria shall get all the marks.However the bidders having shortfall in matching the required criteria shall be allotted marks in proportion of its deficit to meet the Criteria
i.e for Example Consider Criteria (ii) of Physical Criteria of Concrete in form of Wall and Slab,bidder having completed Concrete quantity of 9,000 Cum shall be allotted full 40 marks, Bidders having completed 7,000 Cum shall be allotted (7,000 x 40)/9,000 = 31 Marks
Bidders scoring minimum 20 marks out of maximum 30 marks in Key Activity (i) and (iii) and minimum 25 marks out of Maximum 40 Marks in Key Activity (ii) of Physical Criteria and achieving collective marks above 75 shall only be qualified under this section. This means that for Example for in Physical criteria for Bituminous concreting of road the bidder shall have minimum experience of 33,000 Sqm of Bituminous Carpeting to score minimum 20 marks in the particular category.

Financial Bid shall be opened only of that bidders , who satisfies the prescribed eligibility criteria mentioned here in tender document.The Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive in terms of minimum qualification requirement and technical requirements to the bidding documents and who has offered the Lowest Evaluated Bid Price. All the rights reserves for rejecting any or all the bids with the owner/ Surat Smart City Development Limited without assigning any reason thereof.</td></tr>
<tr><td>Water Charges</td><td>Surat Smart City Development Limited shall not provide any water for the construction and during Maintenance Period or any other purpose for the said works. The contractor shall have to make his own arrangements for supply of water,. However in any case, the quality of water shall meet with the standard requirements.</td></tr>
<tr><td>Project Milestones</td><td><table><tr><th>Mile Stone No.</th><th>Duration from the date of issue of Notice to Proceed with the work as a percentage of time limit (24 months)</th><th>Financial Target (% of contract value)</th></tr><tr><td>1</td><td>25%</td><td>10%</td></tr><tr><td>2</td><td>40%</td><td>50%</td></tr><tr><td>3</td><td>70%</td><td>75%</td></tr><tr><td>4</td><td>100%</td><td>100%</td></tr></table></td></tr>
<tr><td>Liquidated Damages</td><td>In event of these Milestones not having being achieved, an amount computed at 0.2% of Remaining Amount of Work per day subject to a Maximum of 10% of Total Contract Value shall be retained.
Liquidated Damages shall start being retained as per contract on value of Remaining work on not achieving intermediate Milestones 1,2,3.
The Liquidated damages shall be released without interest or charges if contractor achieves Milestone 4 before completion of approved time limit including extension of time limit, if approved.</td></tr>
<tr><td>Bid Language</td><td>English</td></tr>
<tr><td>Country</td><td>INDIA</td></tr>
<tr><td>Currency</td><td>India Rupees (INR)</td></tr>
</table>

Design Criteria	The Drawingattached with tender are for reference only. The design shall be carried out as per latest I.S. Codes and As per Employers Requirement as mentioned in Tender Document
Design Codes Applicable	Latest IS codes published by Bureau of Indian Standards (BIS) and all other relavent codes shall be applicable
Insurance	The contractor shall take " contractors all risk insurance policy" for the estimated cost of the Project viz. “Rs. 168 Crore " Workmen compensation policy" for all workers and labours of contractor and client working at site and "Third Party Insurance Policy" to fully cover all third party type risk. All the insurance policies shall remain in force ,upto the completion of two (2) years from the date of possession/from the date of the inaugural function i.e date of completion of all works as instructed by Engineer-in-Charge. For the rest of the defect liability period (5 years) the Insurance shall be covered for the individuals ,who are employed for the rectification of works (if any). The insurance policy so taken by the contractor for such purposes shall be in the joint name of the contractor and the client and the policy shall be deposited with the client. The Contractor All Risk (CAR) policy with third party insurance shall be submitted for (1) Construction period and (2) Defect liability period - upto 5 years from the issue of final bill of contractor.
Bid validity period	120 days from the opening of the price bid

SECTION III - QUALIFICATION INFORMATION

1. Copies of original documents defining the **constitution or legal status, place of registration and principal place of business; written power of attorney of the signatory of the Bid to commit the bidder**
2. Technical qualifications and experience of the proprietor or partners and leading technical employees in the firm (Statement-C)
   (a) Name:
   (b) Qualification:
   (c) Status:
   (d) Experience in years:
   (e) From which date appointed in this firm, in case of employee:
   (f) Date of joining the firm:
3. Whether the applicant maintains an office capable of preparing bills (Give Address):
4. Details of workshop, machines tools and plant held by the Applicant, as prescribed in Statement "J" precise number/quantum of equipment has to be mentioned.

4A . Similar works completed in last 7 years .
Statement – "A"

4 B Construction Experience in Key Activities (Physical Criteria)
Statement "A-1""

4c. Statement showing the similar works on hand / in progress
Details shall be furnished in prescribed Statement –"B"
N.B. Attested copies of work order from the client shall be attached for each of the work mentioned

5. Whether enlisted in any other dept./ organization if so, which class showing amount qualified to tender:
6. Total Turnover of the firm per year with adequate documents for last 3 years
   (The details shall be furnished in prescribed Statement –D)

(i) Rs. _____
(ii) Rs. _____
(iii) Rs. _____

7. Balance sheets with profit and loss statement for the last five financial years duly certified by Chartered Accountant along with auditor's report.
   (Attested copies shall be attached) 8. Has the applicant or his partners or share holders been black listed in the past by any Government department of any other body:

9. Details of work if any abandoned by the Contractor
10. Name of the Bank of which solvency certificate attached for a sum of **Rs.34.0 Crores**
11. Date of submission of application:
12. Details about Tender Fee of Rs.18,000/- as application fee (Non-refundable) :
13. Amount in arrears if to be paid to Government as per the demand from any Government Department or Corporation:
14. Information regarding any litigation or arbitration resulting from contracts executed by the bidder in the last five years or currently under execution. The information shall include the names of the parties concerned, the disputed amount, cause of litigation, and matter in dispute
15. **DECLARATION**
    1. I / We hereby certify that I / We am/are not partner(s) in the firm(s) blacklisted or connected with firm blacklisted in any State, C.P.W.D., M.E.S., or Railways or anyCorporation:
    2. At present I/We am/are partner(s) in the following firms which is/are registered as approved contractor(s), firm(s) in any State, C.P.W.D., M.E.S., or Railways:
    3. We, the partners of this firm, hereby give an undertaking that we are jointly and severally responsible to meet all the liabilities over and above the business of this firm and make good the above financial loss sustained by the Surat Municipal Corporation as a result of our abandoning the works entrusted to us i.e. this firm:

(Partnership firm, all partners are required to sign)
Signatory's Name

Place :
Date:

General Manager (IT)
Surat Smart City Development Limited

BID CAPACITY

1. The bidding capacity of the contractor should be equal to or more than the estimated cost of the work put to tender. The bidding capacity shall be worked out by the following formula:
   Bidding Capacity = [2AN-B] Where,

   A = Maximum value of construction works executed in any one year during the last five Year staking into account the completed as well as works in progress.
   N = Number of years prescribed for completion of work for which bids has been invited.
   B = Value of existing commitments and ongoing works and LOI issued to be completed During the period of completion of work for which bids have been invited.

2. The initial criteria prescribed above in respect of experience of similar class of work completed, bidding capacity and financial turnover etc. will first be scrutinized and the bidder's eligibility for the work to be determined.

3. In case any agency is L1 (First Lowest) in more than two works, SSCDL reserves the rights to allot the work to second lowest at the price of first lowest without any prejeduce.

4. The Chairman Surat Smart City Development Limited reserves the right to issue / not issue work of more than two packages to any single bidder even if bidder is lowest and with adequate bidding capacity.

5. The Chairman Surat Smart City Development Limited also reserves the right to reject any application /tender .
   Without assigning any reason whatsoever therof.

Place :
Date:

General Manager (IT)Surat Smart City Development Limited

STATEMENTS

The bidders qualifying the initial criteria will be evaluated for the following criteria and the said details to be submitted on prescribed forms appended with tender documents whose brief details are as under:

i)	Statement showing the similar works completed n the last seven years. i.e. for a period starting from 01/04/2010 and ending one month prior to Bid Submission Date	Statement A
ii)	Statement showing the details of work of Construction Experience in Key Activities (Physical Criteria). i.e . for a period starting from 01/04/2010 and ending one month prior to Bid Submission Date	Statement A-1
iii)	Statement showing the similar works on hand / in progress. i.e. for a period starting from 01/04/2010 and ending one month prior to Bid Submission Date	Statement B
iv)	List of Main Technical Staff Employed by the firm on Date	Statement C
v)	Details of Financial Information	Statement D
vi)	Statement of Bankers Certificate from a Nationalized Bank	Statement E
vii)	Projects Under Execution Or Awarded/Loi Issued.	Statement F
viii)	Performance report of works referred in form C & D should be duly authenticated/certified by an officer not below the rank of EE or equivalent should be furnished separately for each work completed or in progress	Statement G
ix)	Details of structure and organization	Statement H
x)	Details of technical & administrative personal to be employed for the work	Statement I
xi)	Details of construction Plants, equipment etc. likely to be used in carrying outthis work.	Statement J
xii)	Litigation Details	Statement K
xiii)	Site visit certificate	Statement L
xiv)	Intended brand by Contractor	Statement N

Surat Smart City Development Limited

STATEMENT - A

Statement showing the similar works completed in the last seven years.
i.e. for a period starting from 01/04/2010 and ending ending one month prior to Bid Submission Date

Sr.No.	Name of Department / Client with Address	Name of work	Estimated cost of work put to tender	Tendered Amount	Date of award of contract	Target date of completion of work as per contract and date of completion of work if completed		Actual Amount of work completed	Time limit in year and months		Percentage rate and amount of Penalty	Reasons for delay in completion of work	Remarks
						Target Date	Completion Date		Original Y M	Extended Y M			
1	2	3	4	5	6	7a	7b	8	9a	9b	10	11	12

Note : -(1) Attested Copies of Work Order and Completion Certificates from issuing authority have to be attached.
(2) It is mandatory to furnish details in this format only.

Signature of contractor

Surat Smart City Development Limited

Construction Experience in Key Activities (Physical Criteria)

Sr.No	Name of work	Cost of work in Rs. Lakhs	Work completed/ in progress	Particulars of item	Unit	Qty in tender	Executed Quantity
				Completed Bituminous Carpeting of Road of 50,000 Sqm or above			
				Completed M25 grade and above Grade of concrete work of Quantity 9,000 Cum in the form of slab and wall in a Single Project			
				Footpath Work (any flooring /			

				paving of cement concrete/ stone slabs/ tiles / inter paver blocks etc.) required for the roads covering 5 Km length and above in a Single Project			

For each Key Activities (Physical criteria) Statement A2 shall be submitted by the contractor duly singed by the employer. Statement A2 shall clearly mention the particulars of required Key Activities and Should be duly authenticated/certified by an officer not below the rank of EE or equivalent

STATEMENT – A-2

Statement showing the details of Construction Experience in Key Activities (Physical Criteria)
i.e. for a period starting from 01/04/2010 and ending one month prior to Bid Submission Date

Sr.No.	Name of Department / Client with Address	Name of work	Estimated cost of work put to tender	Tendered Amount	Date of award of contract	Target date of completion of work as per contract and date of completion of work if completed		Actual Amount of work completed	Time limit in year and months		Percentage rate and amount of Penalty	Reasons for delay in completion of work	Remarks
						Target Date	Completion Date		Original Y M	Extended Y M			
1	2	3	4	5	6	7a	7b	8	9a	9b	10	11	12

Note : -(1) Attested Copies of Work Order and Completion Certificates from issuing authority have to be attached.
(2) It is mandatory to furnish details in this format only.

Signature of contractor

Surat Smart City Development Limited STATEMENT - B

Statement showing the similar works on hand / in progress.

i.e. for a period starting from 01/04/2010 and ending one month prior to Bid Submission Date

Sr.No.	Name of Department / Client with Address	Name of work	Estimated cost of work put to tender	Tendered Amount	Date of award of contract	Target date of completion of work as per contract and date of completion of work if completed		Actual Amount of work done	Time limit in year and months		Reasons for delay in completion of work	Remarks
						Target Date	% Progress till Date		Original Y M	Extended (if any) Y M		
1	2	3	4	5	6	7a	7b	8	9a	9b	10	11

Note : -(1) Attested Copies of Work Order and detail progress Certificates from issuing authority have to be attached.
(2) It is mandatory to furnish details in this format only.

Signature of the Contractor:-

Surat Smart City Development Limited STATEMENT - C

List of Main **Technical Staff** Employed by the firm on Date

Sr.No.	Name	Designation	Educational Qualification	Experience in the field	Duration of Service in the firm
1		Project Cordinator Multidisciplinary (Graduate Engineer)			
2		Design Manager (Graduate Engineer)			
3		Project Manager – Multidisciplinary (Graduate Engineer)			
4		Senior Site Engineer			
5		Junior Site Engineer			
6		Electrical Engineer			
7		Junior Electrical Engineer			
8		Quality Control Engineer			

Place : Signature of the Contractor

Date : with full address

Note : -(1) Attested Copies of Educational & experienced Certificates attached.
(2) It is mandatory to furnish details in this format only.

Enclosure : -1) Photograph
2) Educational Certificates
3) Experience Certificates

STATEMENT - D

FINANCIAL INFORMATION

Financial analysis, Details to be furnished duly supported by figures in balance sheet / profit and loss account for the last five years duly certified by the Chartered accountant, as submitted by the applicant to the income Tax Department copies to be attached.

General Construction Experience Record

All individual firms are requested to complete the information in this form with regard to the management of Works contracts generally. The information supplied shall be the annual turnover of the Applicant, in terms of the amounts billed to clients for each year for work in progress or completed. A brief note on each contract should be appended, describing the nature of the work, duration and amount of contract, managerial arrangements, employer and other relevant details.

Sr.No	Description of Item	2011-12	2012-13	2013-14	2014-15	2015-16
i.	Gross annual turnover on Construction work.					
ii.	Annual Net worth					
iii.	Profit/loss					
iv	Financial arrangements for carrying out the proposed work.					
v	Solvency certificate from bankers of applicant. Form 'B'					
vi.	Tax clearance certificate under the relevant act					

Note : 1. Figures to be taken from audited balance sheets.
2. Copies of the balance sheet to be attachéd
3. The bidder shall have to provide that for a period of at least 4 months thebidder has ability to sustain negative cash balance and how he proposes tomeet with the same.
4. Cash Plan / Cash flow Statement.

Signature of the Bidder
Name & Designation of the bidder
Name of company
Rubber stamp of company
Date

Sign.of Chartered Accountant with seal.

STATEMENT - E

FORM OF BANKERS CERTIFICATE FROM A NATIONALIZED BANK

(solvency certificate from a schedule bank)

This is to certify **to** the best of our knowledge and information that M/S /Sh._____ having marginally noted address, a customer of our bank are/is respectable and can be treated financially capable of any engagements up to a limit of

INR_____(INR_____)

Though this certificate is issued without any guarantee or responsibility on the bank or any of its officers, it is based on careful opinion formed taking care of financial conduct of their transactions through the bank.

(Signature) For the Bank

NOTE:

1. Bankers certificates should be on letter head of the Bank, sealed in cover addressed to tendering authority.

2. In case of partnership firm, certificate should include names of all partners as recorded withthe Bank.

STATEMENT - F

PROJECTS UNDER EXECUTION OR AWARDED/LOI ISSUED.

TILL LAST DATE OF SUBMISSION OF TENDER

Sr. No	Name of work/ Project. And location.	Owner or sponsoring organization	Cost of work in Crores.	Date of Commencement As per contract	Stipulated date of completion.	Up to date amount of the work executed (INR)	Slow progress if any & reason thereof.	Name & address/ telephone of officer to whom reference may be made.	Remarks
1	2	3	4	5	6	7	8	9	10

Certified that above list of works are under execution or awarded/LOI issued and the information given is correct to my/our knowledge and belief

Signature of Applicant(s)

STATEMENT - G

PERFORMANCE REPORT OF WORKS REFERRED TO IN FOR "A, A1&B"

1. Sr No.
2. Name of work/Project and Location
3. For Road works:
- i) Road Work
  - (a) National Highway
  - (b) State Highway
  - (c) Ring Road in Metro cities

4. Agreement No.
5. Client name:
6. Amount of Work:
7. Date of Starting of project:
8. Stipulated date of completion:
9. Actual date of completion:
10. Completion cost:
11. Justification for Delay, if any:
12. Amount of compensation
- a. Levied for delayed completion if any
- b. Amount of reduced rate items, if any

13. Litigation tendency:
14. Feedback from client:

(i) Quality of work	☐	Very good	☐	Good	☐	Fair	☐ Poor
(ii) Finance Soundness	☐	Very good	☐	Good	☐	Fair	☐ Poor
(iii) Technical Proficiency	☐	Very good	☐	Good	☐	Fair	☐ Poor
(iv) Resourcefulness	☐	Very good	☐	Good	☐	Fair	☐ Poor
(v) General behavior	☐	Very good	☐	Good	☐	Fair	☐ Poor

Third party feedback, if any:-

Signature of applicant **Signature & stamp of client**

Note: This Form shall be submitted notarized and scan copy of each work entered shall be uploaded.

STATEMENT – H

DETAILS OF STRUCTURE & ORGANISATION

1.	Name & address of the applicant	
2	Telephone No./Telex No./Fax no.	
3	Legal status of the applicant(attach copies oforiginal document defining the legal status(s). (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 (attach attested photocopy). (a) Registration number. (b) Organization/Place of Registration 1. 2. 3.	
5	Name and titles of Directors & officers with designation to be concerned with this work.	
6	Designation of individuals authorized to act for theorganization.	
7	Was the applicant ever required to suspend construction for a period of more than six months continuously after you commenced the construction? If so give the name of the project and reason of suspension of work.	
8	Has the applicant or any constituent partner in case of partnership firm every abandoned the awarded work before its completion? If so, give name ofthe project and reason for abandonment.	
9	Has the applicant or any partnership firm, everbeen debarred/black listed for tendering in any organization at any time? If so give details.	
10	Has the applicant or any constituent partner incase of partnership firm ever been convicted bycourt of law? If so, give details	
11	In which field of Civil engineering construction you claim specialization and interest.	
12	Any other information considered necessary but not included above.	

Sign of the applicant

STATEMENT – I

DETAILS OF TECHNICAL AND ADMINISTRATIVE PERSONNEL TO BE EMPLOYED FOR THE WORK

Sr. No	Designation	Total number	Number available for this work	Name	Qualification.	Professional experience of details of work carried out.	How these would be involved in this work.	Remarks.
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Sign of the applicant

STATEMENT – J

Detail of Construction, Plant & Equipment Likely to be used in Carrying out the Work

Sr. No	Name of equipment		
1	**2**	**3**	
1	J.C.B. or excavator		
2	Concrete batching plant fully automatic of min 30 M3/hr capacity Age: Not more than 5 years).		
3	Digital weight Batcher Machine		
4	Concrete pump		
5	a)Concrete transit mixer b)Other equipment for transportation of concrete mix.		
6	Goods cum Lift for minimum capacity of 300 Kg.		
7	Shuttering (Steel formwork)		
8	Steel props (with accessories)		
9	Extended span or beams with accessories		
10	Vibrator (Needle) + Surface vibrator (Operating with electricity) +Diesel vibrator		
11	Water Tanker		
12	Trucks / Dumpers		
13	Standard Testing Laboratory (As prescribed)		
14	Crane		
15	Pump & Motor		
16	Generator		
17	Bitumen Sprayer		
18	Hot mix Plant		
19	Asphalt paver finishers		
20	Tandom rollers		
21	Rock Breaker with Excavators		
22	Vibratory rollers		

Note : - Ownership proof shall have to attach

Place : Signature of the Contractor with full address

Date :

STATEMENT – K

LITIGATION DETAILS

Name of applicant / or parties ::

Applicant should provide information on any History of litigation or arbitration resulting from contracts executed in last five years or currently under execution:

Sr. No.	Year	Award for/against applicant	Name of client, cause of litigation & matter of dispute	Disputed Amount in INR	

NOTE:-

1. The above information shall be supported with necessary documents otherwise the same shall be treated as null & void.
2. If the information to be furnished in this schedule will not be given & come to the notice subsequently will result in disqualification of bidder.

Sign of the applicant

STATEMENT – L

Site Visit Certificate

I/we_____, authorized representative of M/s _____ have visited the site of the proposed;

Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Trench, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Maintenance of Tendered works for Period of Five Under "SMART CITY MISSION" on Prepartion of Working Drawings. Procurement and Construction Basis

We have inspected and evaluated all the Roads as mentioned in Tender document with reference to its location,topography, soil conditions, shifting of services, and all other works as mentioned in tender document . We have understood the Scope of Work and shall carry the work as per Tender terms and Conditions.We have submitted this offer after satisfying ourselves about the local conditions, local costs, etc.

Sign of the applicant

To be given on Non-judicial stamp paper of **Rs 100 duly** signed by authorized notary

STATEMENT – N

Intended brand by Contractor
Contractor shall mention the intendedbrand from the List of Approved makes mentioned in Tender Document

Sr.No.	Item	Intended brand by Contractor

Seal & Sign of the applicant

UNDERTAKING

Photographs			
Name			
Designation			
Specimen Signature			

Names, Photographs and Specimen Signature of Partners, Managing Director

1. I/We agree that the decision of the Surat Smart City Development limited in prequalification/ selection of applicants/contractor, Phasing of work and in any other project related matter, will be final and binding to me/us.
2. All the information and date furnished here with are correct to my/our best of knowledge.
3. I/We agree that we have no objection if inquiries are made about our works, its related areas and any other inquiry regarding all details, projects and works listed by us in the pre-qualification document at any state.
4. I/We agree to submit signed and sealed original tender documents or qualification formats and other documents intimation from Surat Smart City Development limited.

Signature with seal of the company

NAME OF WORK : Visual Improvement of Roads consisting of Up gradation, Augmentation, Footpath & Cycle track works, Utility Trench, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Maintenance of Tendered works for Period of Five Under "SMART CITY MISSION" on Prepartion of Working Drawings. Procurement and Construction Basis

'DECLARATION OF THE CONTRACTOR'

- I / We hereby declare that I / We have made myself / ourselves thoroughly conversant with the local conditions including all materials and labour on which I / We have based my / our rates for this tender.
- The specifications and leads on this work have been carefully studied and understood before submitting this tender.
- I / We undertake to use only the best materials approved by the Engineer or his duly authorized representative during execution of the work
  and to abide by the decision.
- I/We undertake to best workmanship/line-level/plumb etc. during execution of the work and to abide by the decision.
- I/We have understood the schedule of payments and other terms of payments which is accepted by we/us .
- We further testify all informations provided in the Tender including the statements made from Statement A to Statement N are factually correct and any mis representation or concealment if discovered, we understand the same shall result in disqualification as Bidder and the decision of The Chairman Surat Smart City Development Limited shall be final and binding.

Signature of Applicant

AFFIDAVIT *

1. I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.
2. The undersigned also hereby certifies that neither our firm M/s. _____ nor any of its constituent partners are blacklisted by any of the Govt./Semi Govt. institutios and not have abandoned any work of multistoried buildings / Infrastructures works in India nor any contract awarded to us for such works have been rescinded,during last five years prior to the date of this application.
3. The undersigned here by authorize(s) and request(s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding my (our) competence and general reputation.
4. The undersigned understands and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of SSCDL

_____

Signed by an Authorized Officer of the Firm

_____

Title of Officer

_____

Name of Firm

_____

Date

_____*

To be given on Non-judicial stamp paper of **Rs 100 duly** signed by authorized notary.

AFFIDAVIT

NAME OF WORK:- Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Operation and Maintenance of Tendered works for Period of Five Years on Preparation of Working Drawings, Procurement and Construction Basis

1.0 I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.

2.0 The undersigned also hereby certifies that neither our firm M/s _____ _____ nor any of its constituent partners have abandoned any work in India nor any contract awarded to us for such works has been rescinded during last five years, prior to the date of this bid.

3.0 The undersigned hereby authorize(s) and request(s) any bank, person, authorities, government or public limited institutions, firm or corporation to furnish pertinent information deemed necessary and requested by the SMC to verify our statements or our competence and general reputation.

4.0 The undersigned understands and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the SSCDL

5.0 The SSCDL and its authorised representatives are hereby authorised to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this application and to seek clarification from our bankers and clients regarding any financial and technical aspects. This Affidavit will also serve as authorisation to any individual or authorised representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourselves to verify statements and information provided in the Tender or with regard to the resources, experience and competence of the Applicant.

_____

Signed by the authorised signatory of the firm

_____

Title of the office

_____

Name of the firm

_____

Date

Note: The affidavit format as indicated above to be furnished on non judicial stamp Paper of **Rs.100.** ***And duly notarized.***

……

ANNEXURE - B

1.0 E.M.D. & Tender fee shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that E.M.D. & Tender fee are received for purpose of opening the bid. Accordingly ,offer / tenders of those tenderers whose E.M.D. & tender fee is received electronically , shall be opened. However , for the purpose of relization of EMD and Tender fee,bidder shall send the EMD as well as Tender fee in required format in original through RPAD / Speed post so as to reach to Account Department (Main Office) within 7 Days from the last date of submission of price bid. Punitive action shall be initiated for non submission of EMD & Tender fees in original to Account Department (Main office) by bidder including abeyance of registration and cancellation of E-tendering code for one year. All document in supporting of bid shall be in electronic format only through online (by scanning) during the bidding period & hard copy will not be accepted Separately.

2.0 All Document must be coloured scanned to be seen as original. Scanning in black and white or gray shall not be acceptable.

3.0 All the document must be notarised with clearly displaying stamp stamp , number and name of the notary.

"Following Document shall only be submitted in Hard copy to Surat Smart City Development Limited by all Bidders."

1.0 Earnest Money Deposite as mentioned in the tender. (i.e. D.D. / Bank Guarantee)

2.0 Tender Fees as Mentioned in the tender.

SECTION IV – TENDER DRAWINGS

FOR REFERENCE ONLY

Sr.No.	Title of Drawing	Drawing No.
Sr No	**Drawing Title**	**Sheet No**
1	ABD Map with Road Locations	TCE-10196A-AC-1000-SI-11001
2	TP-08 Drawing	TCE-10196A-AC-1000-SI-11002
3	TP-53 Drawing	TCE-10196A-AC-1000-SI-11003
4	TP- 34 Drawing	TCE-10196A-AC-1000-SI-11004
5	TP - 07 Drawing	TCE-10196A-AC-1000-SI-11005
6	TP - 64 Drawing	TCE-10196A-AC-1000-SI-11006
7	TP - 33 Drawing	TCE-10196A-AC-1000-SI-11007
8	TP - 19 Drawing	TCE-10196A-AC-1000-SI-11008
9	60M wide Ring Road Design	TCE-10196A-AC-1000-SI-11009
10	60M wide Surat-Bardoli Road Design	TCE-10196A-AC-1000-SI-11010
11	60M wide Surat-Bardoli Road Design with Flyover	TCE-10196A-AC-1000-SI-11011
12	60M wide Canal Road Design	TCE-10196A-AC-1000-SI-11012
13	45M wide Road Design	TCE-10196A-AC-1000-SI-11013
14	36M Wide Road Design	TCE-10196A-AC-1000-SI-11014
15	Minor Road Design	TCE-10196A-AC-1000-SI-11015
16	Typical Details for Utility Trench,Footpath,Cycle Track & Planters	TCE-10196A-AC-1000-SI-11016
17	Typical Road Section for 60 M Wide Surat Bardoli Road with Flyover	TCE-10196A-AC-1000-SI-11017
18	Typical Road Section for 60 m Wide Ring Road	TCE-10196A-AC-1000-SI-11018
19	Typical Road Section for 60 m Wide Canal Road	TCE-10196A-AC-1000-SI-

		11019
20	Typical Road Section for 60 M Wide Surat Bardoli Road	TCE-10196A-AC-1000-SI-11020
21	Typical Road Section for 45 M Wide Surat Bardoli Road	TCE-10196A-AC-1000-SI-11021
22	Typical Road Section for 45 M Wide Surat Bardoli Road and Puna Patiya Road	TCE-10196A-AC-1000-SI-11022
23	Typical Road Section for 36 M Wide AAi Mata Road	TCE-10196A-AC-1000-SI-11023
24	Typical Road Section for 24 M Wide Road	TCE-10196A-AC-1000-SI-11024
25	Typical Road Section for 12 M and 9 M Wide Road	TCE-10196A-AC-1000-SI-11025
26	Details of Utility Trench	TCE-10196A-EL-SK-4011 (SHEET 1 OF 2)
27	Details of Cable Exit from Cable Tunnel	TCE-10196A-EL-SK-4011 (SHEET 2 OF 2)

VOLUME - I
Part -2

Section V
Instructions to Bidders

1. Scope of Bid

1.1 The Employer, as defined in the Bidding Data, herein after **"the Employer,"** wishes to receive bids for the Planning ,Designing & Construction of Works as described in the contract herein after referred to as "the Works."

1.2 The successful bidder will be expected to complete the Planning ,Designing & Construction of Works within the period stated in the Bidding Data and contract from the date of commencement of theWorks.

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

2. Eligible Bidders

This invitation to bid is open to any bidder meeting the requirements specified in the Bidding data.

A). Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer as the Employer shall reasonably request.

B). To be qualified for award of the Contract, bidders shall as part of their bid, furnish the information to the Employer of their capability and adequacy of resources to carry out the contract effectively. Bids shall include the documentation and information on the relevant Information Forms attached under qualification information.

C). The proposed methodology and program of Design & Construction, Environmental Management Plan (EMP), backed with equipment planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying their capability of execution and completion of work as per technical specifications and Employer's Requirements within stipulated period of completion.

3. Qualification of the Bidders shall, as part of their bid:

(a) submit a written power of attorney authorizing the signatory of the bid

to commit the bidder; and

(b) To be qualified for award of the Contract, bidders shall as part of their bid, furnish the information to the Employer of their capability and adequacy of resources to carry out the contract effectively

4. One Bid per Bidder

A firm shall submit only one bid in the same bidding process. A bidder who submits or participates in more than one bid will cause all the proposals in which the bidder has participated to be disqualified.

5. Cost of Bidding

The bidder shall bear all costs associated with the preparation and submission of its bid, including all cost necessary for site inspection and whatever investigations that may be necessary and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

6. Site Visit

The bidder will be deemed to have visited and examined the Site of Worksand its surroundings and obtained for itself at its own risk and responsibilityand liability, all information that may be necessary for preparing the bid andentering into a contract for Design & Construction of the Works

7. Content of Bidding

The Bid Document-Volume-I comprise the following sections and should be readin conjunction with Volume II and Volume III of this bid document. Documents :

Section No.	Particulars
Volume –I – Part 1	
1	Notice Inviting Tender
2	Bidding Data
3	Qualification Information
4	Drawings
Volume –I – Part 2	
5	Instruction to Bidders
6	General Instructions
7	Conditions of Contract (Draft Agreement)
	Article -1 Definitions and Interpretation
	Article-2 Scope of Project
	Article-3 Obligations of the contractor
	Article-4 Representations and warranties
	Article-5 Performance security and retention money

	Article-6 Right of way
	Article-7 Utilities and trees
	Article-8 Design and construction of the work
	Article-9 Quality assurance, monitoring and supervision
	Article-10 Completion certificate
	Article-11 Change of scope
	Article-12 Defects liability
	Article-13 SSCDL's Engineer
	Article-14 Payments
	Article-15 Insurance
	Article-16 Force majeure
	Article-17 Suspension of contractor's rights
	Article-18 Termination
	Article-19 Liability and indemnity
	Article-20 Labour laws
	Article-21 Safety code
	Article-22 Miscellaneous
	Article-23 Dispute resolution mechanism
8	Forms of Security and Contract Forms
9	Approved List of Banks
10	Abbreviation
11	Memorandum
13	IS Codes
	Vol – II Price Bid
	Vol – III General Technical Specifications For Building Works
	Vol – IV Drawings

Note:

a) In addition to all the information as contained in the above documents requires supplementary information or clarification; itshall be duty of the Bidder to obtain this from the Employer before submission of the bid.

b) It shall be duty of the bidder to invite attention of the Employer to any omission, mistake or ambiguity that may be noticed before submission of the bid.

c) Any omission, mistake, ambiguity or anomaly shall if subsequently noticed, be resolved consistent with Trade practice.

d) Adenda, corrigendum is as a part of tender and it shall be submitted by the contractor.

8. Amendment of Documents

8.1 At any time prior to the deadline for submission of bids, the Employer may amend the bidding documents by issuing Addenda and giving adequate notice for complying with the same by the Bidder and for the same may extend the deadline for submission of the Bidder.

8.2 Any Addendum thus issued shall be part of the bidding documents and shall be uploaded to the website.

9. Language of Bid

The bid, and all correspondence and documents related to the bid exchangedby the bidder and the Employer shall be written in the bid languagestipulated in the Bidding Data and Particular Conditions of Contract.Supporting documents and printed literature furnished by the bidder may bein another language provided they are accompanied by an accurate translation of the relevant passages in the above stated language, in which case, forpurposes of interpretation of the bid, the translation shall prevail.

10. Documents Comprising the Bid

The bid submitted by the bidder shall comprise the following: Tender Fees,Bid Security, Qualification information, and any information or other materials required to be completed and submitted by bidders in accordance with these instruction to Bidders

11. Bid Prices

11.1 All duties, taxes, Royalty, cess and other levies payable to the govt.as in vogue (till the date of submission of the bid) by the contractor under the Contract, or for any other cause, shall be included in the cost submitted by the bidder. Any change there in shall reasonably and equitably be compensated / reimbursed on basis of strict evidence being provided by the Contractor to the satisfaction of The Chairman, Surat Smart City Development limited (SSCDL)

12. Bid Validity Bids shall remain valid for the period stipulated in the Bidding Data.

13. Bid Security

13.1 The bidder shall furnish, as part of its bid, a bid security in the amount stipulated in the Bidding Data in the currency of the Employer's country.

13.2 Any bid not accompanied by an acceptable bid security shall be treated by the Employer as non responsive.

13.3 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than 30 days after the expiration of the original

period,or any subsequently extended period of bid validity or after successful bidder enters into agreement.

13.4 The bid security of the successful bidder will be returned when the bidder has signed the Agreement and furnished the required performance security.

13.5 The bid security may be forfeited

a) If the bidder withdraws its bid before the period of its validity expires and the tenderer may be disqualified from tendering for further works under the SURAT MUNICIPAL CORPORATION and SURAT SMART CITY DEVELOPMENT LIMITED
b) In the case of a successful bidder, if he fails within the specifiedtimelimit to sign the Agreement completing all necessary formalities for the purpose including furnishing/ payment ofperformance security

14. Pre-Bid Meeting

14.1 Pre Bid Meeting shall be held as Specified in Notice Invited in Tender.The bidder is requested, to submit any questions in writing or by e-mail,to reach the Employer not later than date specified in Notice Inviting Tender .It may not be practicable to answer questions received late, but responseto questions, including the text of the questions raised and the responses given, will be uploaded on the website. Any modification of the biddingdocuments that may become necessary as a result of the pre-bid queries shall be made by the Employer exclusively through the issue of anAddendum.

15. Format and Signing of Bid

15.1 The successful bidder shall submit one copy of the signed bid (All Volumes) within 15 days from the issuance of work order.

15.2 The bid shall contain no alterations, omissions, or additions, unless such corrections are initialed by the person or persons signing the bid.

16. Sealing and Marking of Bids

16.1 The tenderer shall pay Earnest money Deposit to the extent of 50% in the form of Bank Guarantee from the enlisted / approved Bank as per Section- IX . The balance 50 % of the Earnest Money Deposit is to be deposited by pay order/Demand Draft issued in favour of Surat Smart City Development Limited, Surat, through the enlisted / approved Bank as per Section-IX only payable at Surat.

16.2 Bank Guarantee and Demand Draft /Pay order for E.M.D & Demand Draft for Tender fee shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that E.M.D & tender fee are received for purpose of opening of bid. Accordingly offer of those shall be opened whose E.M.D & Tender fee is received electronically. However for the purpose of realization of Bank Guarantee and Demand Draft/Pay order for E.M.D and demand draft for tender fee bidder shall send them in original throughRPAD/Speed Post so as to reach to Chief Accountant, Surat Smart City Development Limited, Surat,Muglisara, Surat. Within 7 days from the last date of online submission of the bid as per tender notice. Penaltative action for not submitting Bank Guarantee and Demand Draft/Pay order for E.M.D. and Demand Draft for Tender fee in original to Chief Accountant, Surat Municipal Corporation, Surat (Main Office) by bidder shall be initiated and action shall be taken for abeyance of registration and cancellation of E-tendering code for oneyear. Any documents in supporting of bid shall be in electronic format only through online (by scanning) & hard copy will not be accepted separately.

17. Deadline for Submission of Bids

17.1 Bids (EMD & Tender Fees as mentioned in above-16) must be received by the Employer at the address specified in Notice Inviting Tender not later than the time and date stipulated in Notice Inviting Tender.

17.2 The Employer may, in exceptional circumstances and at its discretion, extend the deadline for submission of bids by issuing an Addendum, in which case all rights and obligations of the Employer and the bidders previously subjectto the original deadline will thereafter be subject to the deadline as extended.

18. Late Bids

Any bid received by the Employer after the deadline for submission of bids will be returned unopened to the bidder.

19. Modification and Withdrawal of Bids

19.1 The bidder may modify or withdraw its bid after bid submission, provided that written notice of the modification or withdrawal is received by the Employer prior to the deadline for submission of bids.

19.2 The bidder's modification or withdrawal notice shall be prepared, sealed, marked, and delivered with envelope additionally marked"modification" or "withdrawal," as appropriate.

19.3 No bid may be modified by the bidder after the deadline for submission of bids.

20. Bid Opening

20.1 The bids as received on line shall be opened in presence of authorized representative ofthe bidders who chose to remain present on date of opening.

20.2 The Employer will carryout the process of scrutiny to determine the responsiveness of documents / data submitted electronically and qualify the bidders for further action.

20.3 A suitable date and time for opening of the Price bid will be intimated to those, who is found qualified.

20.4 On the specified date the Price bid of the successful qualified bidder shall be opened online.

20.5 The Employer shall prepare minutes of the bid opening, including the information disclosed to those present.

20.6 Bids not opened and read out at bid opening shall not be considered for further evaluation.

20.7 Where there is a discrepancy between the amounts in figures and in words,the amount in words will govern.

21. Process to be Confidential

Information relating to the examination, clarification, evaluation, and comparison of bids, and recommendations for the award of a contract, shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful bidder has been announced. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in therejection of the bidder's bid.

22. The Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents and sanctioned by the Competent Authority.

23. Employer'sRight to Accept Any Bid and to Reject Any or All Bids

The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract without assigning any reason there of and without thereby incurring any liability to the affected bidderor bidders or any obligation to inform the affected bidder or bidders on the groundsfor the Employer's action.

24. Notification of Award

24.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder by letter that its bid has been accepted.

24.2 The notification of award will constitute the formation of the Contract.

25. Signing of Agreement

25.1 At the same time that the Employer notifies the successful bidder that its bid has been accepted, the Employer will send the bidder the Agreement in the form provided in the bidding documents, incorporating all agreements between the parties.

26. PerformanceSecurity

26.1 Within 15 days of receipt of the Letter of Acceptance from the Employer, the successful bidder shall furnish to the Employer a performance security and additional Performance Security for unbalanced offer quoted by the contractorin the form stipulated in the Bidding Data and the Conditions of Contract.

27. Unbalanced offer

27.1 In event of bid price being considered unbalanced in case of rates being higher or lower than 15 % of the reasonable rates as may be considered by SSCDL than SSCDL may direct the bidder to deposit separately performance security deposit of 15% of the amount of unbalanced contract in addition to regular performance/ security deposit. This deposit shall be released only on completion of the work along with the balance of performance deposit being released.

SECTION VI – GENERAL INSTRUCTIONS

The following general instructions are not exclusive and the same are issued for general guidance of the bidder and shall in no way constitute any promise or Covenant on part of SURAT SMART CITY DEVELOPMENT LIMITED but shall be binding obligations for all intents and purposes, the same are included in the Bid.

1.0 PLANNING ,DESIGNING AND EXECUTION OF THE WORKS

The Contractor shall carry out, and be responsible for the design of the Works, including any site surveys, subsoil investigations, materials testing, and all other things necessary for proper planning and design.

With 10 days from Award of work, the Contractor shall start submiting drawings, construction documents, etc., for review and approval by the Employer's Representative. The Contractor will be fully responsible for ensuring that its designs, drawings, and construction documents satisfy all requirements for constructing Works that are complete and fully functional in all respects.
The Contractor shall prepare, and keep up-to-date, a complete set of "as-built" records of the execution of the Works, showing the exact as-built locations, sizes and details of the work as executed. These records shall be kept on the Site and Two sets of such records shall be Submited to Employer.

In addition, the Contractor shall supply to the Employer's Representative as-built drawings of the Works, showing all Works as executed.

Contractor shall be responsible for Preparing Baseline Programme , upon acceptance of the Baseline Programme by the SSCDL, the Contractor shall adhere to it strictly. The Contractor shall ensure that preparation, updating and revision of programme of works are carried out by experienced and qualified personnel.

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2.0 ELECTRIC POWER SUPPLY

The Contractor shall make all the necessary arrangement for procurement of electric power required for the work. The Contractor shall submit his requirement of Electric Power Supply for carrying out permanent works, operating plants and equipments, labourers camp and field offices etc., as a part of his work plan. If necessary the employer will issue the necessary certificates,letters of recommendation etc., to the Contractor for obtaining the power supply. However,the employer shall accept no responsibility for any delays in obtaining the power connections.In addition, the Contractor shall maintain standby diesel

generators of adequate capacity.Non-availability of electric power will not be considered as a reason for delay in progress.

3.0 WATER SUPPLY FOR CONSTRUCTION, LABOUR CAMPS, OFFICES ETC.

The Contractor shall make all necessary arrangements for the procurement of water required for construction and labour. The employer shall issue on request from contractor, thenecessary certificates, letters of recommendation etc., for obtaining the necessary permissions. The employer shall assume no responsibility for delay in progress due to delay in obtaining the permissions. The Contractor may drill bore wells as a source of construction water. The water shall be got tested by the Contractor at approved laboratory at his own expense and certificates regarding the suitability for construction shall be submitted to the Engineer's Representative regularly as per his requirements.

4.0 TELEPHONES / WIRELESS COMMUNICATION FACILITIES

These will be arranged by Contractor at his own cost. The employer shall give the necessarycertificates and letters of recommendation if necessary etc., to the Contractor.

5.0 LAND FOR TEMPORARY USE

Land for labour camps, storage yards temporary site sheds,batching plant, casting yard shall be arranged by the contractor at the site or nearby plot with the consent of EIC/ SSCDL at his own cost.

6.0 CONTRACTOR'S MATERIALS, LABOUR ETC.

The Contractor shall provide everything necessary for the proper execution of the works according to the intent and meaning of the Drawings, Notes, and Specifications taken together, whether the same is or is not particularly shown or described therein; provided thesame can be reasonably enforced there from. If the Contractor finds any discrepancy thereinhe shall immediately and in writing refer the same to the Engineer's Representative. The decision of the Engineer's Representative shall be final and binding on the Contractor.Figured dimensions shall be followed and the drawings shall not be scaled from.

7.0 MATERIALS:

1. Steel, cement and other materials necessary for execution of this work shall not be supplied by Surat Smart City Development Limited (SSCDL) and same shall be procured by the contractor at his own cost. Procurement of and testing certificates for cement and reinforcement steel round bars or high yield strength steel deformed bars as required shall be arranged by the contractor at his own cost from standard, reputed manufacturers only as per approved list.The contractor shall submit statement of sources for procurement of materials.The suitability of the same for the required

quality, quantity, transport facilities etc. may be ascertained by the tenderer themselves before tendering and rates be quoted accordingly.The source of fine and coarse aggregates given in Table-1 is for general guidance only.

2. Procurement of all constructional materials as required shall be arranged bythe contractor at his own cost from standard, reputed manufacturers / suppliersas may be approved by the client. The royalty receipts,Challans etc., shall have to be submitted by the contractor from time to time to the SSCDL.
3. The contractor will have to make his own arrangement for plants, equipments,machineries to be used in the execution of this work well in time after award of the contract.
4. The approved makes for various materials to be used in the project shall be as per the table given in tender.
5. The D.I./C.I. pipes and fittings require for laying of water supply network shall be provided by SMC. It is in the Scope of Contractor for transport of all such material to the Site location.

TABLE –I

Statement of sources of procurement of coarse and fine aggregates

Sr. No.	Name of the materials	Name of the place where sources of supply is available.	Approximate lead from site of work	Remarks if any
1	Rubble	Areth	65 Km.	-
2	Crushed coarse aggregate	Areth	65 Km.	-
3	Crushed coarse aggregate	Songadh/Chikhli	85 Km.	-
4	Sand	Tapi River/Narmada River	From standard approved stretches to have materials as per specifications	Source to be beyond tidal influence.

Note: The above distances and locations are for general guidance only. The contractor shall have to verify himself the sources, its distances etc. before tendering

8.0 NIGHT WORK & WORK ON SUNDAY & HOLIDAYS & BETWEEN SUNSET & SUNRISE :

No work shall be carried out on Sundays and Corporation Holidays and no work shall be carried out before and after office hours except with special permission of Engineer-in-charge in writing previously obtained. Withholding such permission shall be no ground of complaint on the part of contractor for cause for compensation of them. Working period shall be maximum eight (8) hours per day. Permission to work beyond 8 hours and to work on Sundays and holidays will be entirely at the discretion of the Engineer-in-charge and cannot be claimed by the contractor as a matter of right and the refusal to grant such permission will be not be set up as a ground for not completing the work within the contract period. Further to above condition, when Engineer in charge feels necessary to give permission to contractor to carry out the work on Sundays, Corporation holidays and before 8 hours, extra supervision charges arising due to overtime working of corporation supervisory staff shall be borne by the contractor at prevailing rates from time to time.
Such extra supervision charges shall be deducted by corporation from running bills of contract at SSCDL discretion

No work shall be carried out between sunset and sunrise. Except with the special permission of Engineer-in-charge in writing perviously obtained and with holding such permissions shall be no ground of complaint on the part of contractor or cause for compensation to them. Working period shall be maximum eight (8) hours per days.

NIGHT WORK:

Subject to any provisions to the contrary contained in the contract, no work shall be carried out after office hours without the prior permission of the Engineer-in-charge except when the work is unavoidable or absolutely necessary, for saving life or property or for the safety of the work, in which case, the contractor shall immediately inform the Engineer-in-charge or his representative, provided always that the provision of this clause shall not be applicable in the case of any work which it is customary to carry out by double or rotary shifts in which case sufficient advance notice shall be given of the intention to work at night to the Engineer-incharge after making all requisite arrangements and management of areas, materials and equipments, required under any emergency etc.The contractor can carry on work after office hours if so required, subject to provideundertaking in writing, for expediting the progress on the works or for any other reasons of technical safety. Whenever anywork is required to be carried out at night in the interest of structural safety or anyother reason with authorized to supervise, adequate lighting and other arrangement shall be made inadvance by the contractor for proper execution and supervision of such work. The contractor shall not be however entitled to any extra payments for night work. The responsibilities of all kind shall be of contractor.

PRECAUTIONS TO AVOID ANY NUISANCE TO THE NEIGHBORHOOD/SURROUNDING

All the necessary precautions to be taken during the development of the project (either during day or night) ,to avoid any nuisance or any harm causing to the neighborhood/surroundingareas of proposed construction site.
No complaint should be arise by the neighbourhood/society dwellers ,during the development work by contractor or any of the persons directly or indirectly related to the site work.
In case of any such conditions the contractor shall be fully responsible for the settlement.

9.0 ENABLING WORKS

The Contractor shall supply, fix and maintain at his own cost during the execution of works,all the necessary centering, and scaffolding, staging, planking, timbering, strutting, shoring,pumping, fencing, hoarding, watching and lighting by night as well as the necessary equipment for protection of public and safety of any adjacent roads and railway lines. The Contractor shall remove any or all such centering scaffolding, staging planking andequipment when ordered to do so by the Engineer's Representative and make good allmatters and things disturbed during the execution of works to the satisfaction of the Engineer's Representative.

10.0 TEMPORARY DIVERSIONS, MAINTANENCE OF SAME AND TRAFFIC MANAGEMENT

This will be responsibility of the contractor.

11.0 OPPORTUNITIES AND FACILITIES FOR OTHER CONTRACTORS AGENCIES ETC.

The Contractor shall, in accordance with the requirements of the Engineer's Representative afford all reasonable opportunities for carrying out their work to any other Contractors employed by the Employer and their workmen and to the workmen of the Employer and of any other duly constituted authorities who may be employed in the execution on or near the site of any work not included in the Contract or of any contract which the Employer may enter into in connection with or ancillary to the works. If, however, the Contractor shall on the written request of the Engineer or Engineer's representative make available to any such other Contractor or to the Employer or any such authority any roads or ways for the maintenance of which the Contractor is responsible or permit the use of by any such of the Contractor's scaffolding or any other plant on the site or provide any other service of whatsoever nature,for any such the Employer shall pay to the Contractor in respect

of such use of service such sum or sums as shall in the opinion of the Engineer be reasonable.

12.0 ENVIRONMENTAL SAFEGUARDS

The Contractor shall take action of following points and note the stipulations as under asregards environmental safeguards as stipulated by the Ministry of Environment and Forests.

12.1 Appropriate measures shall be undertaken while undertaking digging activities to avoid degradation of water quality.

12.2 Borrow pits and other scars created during the road construction shall be properly leveled and treated.

12.3 Adequate provision for infrastructures facilities, i.e. water supply, fuel, sanitation, etc.shall be ensured for labourers during construction period in order to avoid damage to the environment.

12.4 No excavation from or dumping of waste materials into any water body / wetlands shall be done.

12.5 Borrow sites for earth, quarry sites for road construction and dump site shall be identified keeping in view:

a) No excavation or dumping on private property is carried out without written consent of the owner.
b) No excavation or dumping shall be allowed or wetlands, forests areas or otherecologically valuable or sensitive locations.
c) The excavation work shall be done in consultation with soil conservation and watershed development agencies working in the area:
d) Construction spoil/soil including bituminous material and other hazardous material must not be allowed to contaminate water course and the dump sitesfor such materials must be identified well in advances before construction and lined properly so that they do not leach into the ground water.
e) Any approvals required for the same shall be arranged by the contractor.

13.0 SITE OFFICE

Contractor shall provide and maintain a furnished site office for the supervisory staff of the PMC/TPI/Consultants. It shall have at least 25.00 to 50.00 Sqm floor area Air – conditioned site office, with approved flooring and shall include electrical lights, fans, computer point including proper wiring, water supply, drainage, toilets, tables, chairs, cupboards, and shall be constructed at location directed by the Engineer and shall be maintained for a period upto 6 months /as directed by E.I.C ,beyond date of completion as certified by PMC/TPI/Consultants.

The site office with all services, furniture,fixtures shall be property of the contractor. Land for site office, field laboratory etc. is not available with SSCDL and could not be provided by employer. All Electric & Telephone /Mobile bills will be paid by the contractor for entire period of contract and up to 6 month beyond completion of works and both the Electric & Telephone connections will be obtained by him.

14.0 SHIFTING OF UTILITIES

(a) Contractor is required to liaision with concerned department for identifying exact location of the utility services. Any damages by the contractor while carrying outwork to the utilities shall be repaired at his own cost.

(b) Deposits / Supervision charges levied by Govt. dept. & paid by the contractor for the purpose of shifting of utilities shall be reimbursable after due assessment, verification and scrutiny except for street light poles, set of signal poles, road signs/sign boards & consumer connection for water connections(Domestic/commercial).

15.0REMOVAL / DIVERSION OF UTILITY SERVICE

If the over ground / under ground utility services like electric poles, telephone poles, water supply pipe lines, sewer lines, oil pipe lines, cables, gasducts etc. owned by various authorities including Public Undertakings and local authorities shall be diverted by the Contractor is included in the cost quoted by the contractor and will not be paid extra. In case in the opinion of the Engineer it is not possible to divert the utilities, the Contractor shall make necessary modifications in the structure at no extra cost to the client.

16.0 UTILITY SERVICES

The Bidder shall coordinate with Utility Providers for proper Shifting/ Relocating of the Utilities. The work shall be carried as per approval of Utility Provider. All the Charges required for Shifting / relocating of Utilities shall be included in the Quoted Rate and the Contractor shall not be paid extra for the same

17.0 TAXES

In no case, octroi exemption shall be granted for any of the materials, equipment brought by contractor for execution of the work.

Surat Smart City Development Limited shall not provide "C" Form for the tax purposes.

The rates to be quoted by the tenderer shall be inclusive of all taxes like VAT, sales tax, labor,construction cess, income tax, duties, etc., including such other taxes, duties, tolls, octroi,freshly levied taxes under any rules and no claim whatsoever in this context shall be entertained.

Goods/ equipments/ materials will be permitted for unloading after the submission of octroi receipts (if any)

Out of the "amount payable/creditable to contractor's account, the Central Govt.,/State Govt.,taxes including VAT shall be deducted at source in accordance with the relevant laws/ rules prevailing from time to time.

If any Work Contract Tax or Labor welfare Tax or any other tax is levied by the Government during the course of execution of this contract, the same shall not be borne by contractor and the same shall be reimbursed on proof of payment to be appropriate authority being produced.

17.1 IMPACT OF GST LAW

If any change in existing tax liability is created , the same shall be reimbursed/recovered to/from the contractor, on proof of payments.

18.0 LABOUR EMPLOYMENT

The Contractor shall furnish to the Engineer-in-charge every week during the progressof the works classified weekly returns of the number of the people employed on the work during the week. The report of skilled and unskilled labors shall be given in the prescribed form. The contractor shall have to obtain labor license from concerned Government department and shall have to submit to Employer.

The contractor shall strictly observe all the requirements laid down in the contract labour (Regulation and Abolition) Act, 1979 and the contract labor (Regulation and Abolition) (Gujarat) Rules, 1972 and other acts as amended from time to time so far as applicable.

19.0 TREASURE TROVE

In the event of the discovery by the Contractor or his employees during the progress of the works of any treasure, coins, antiquities, fossils, minerals or other articles or things of value or interest, whether geological, archeological or any other such treasure or other things shall be deemed to be the absolute property of client.

The contractor shall take all reasonable precautions to prevent his workmen or any other persons from removing such things as above and shall immediately upon discovery thereof and before removal, acquaint the Engineer-in-charge/ SSCDL of such discovery and carry out his orders as to the disposal of the same which will be at the contractor's expense.

20.0 ADDITIONAL CONDITIONS

(a) Any damage caused to either private or public property, services, structures etc. shall be made good by Contractor without any extra cost to the employer

(b) Contractor need to ensure proper and adequate traffic safety signboards, barricades,lighting at night shall be displayed during day and night to ensure that no accidents take place.

(c) Contractor shall submit Quality Assurance plan based on ISO 9000 series document to form the basis evolving the quality system, applicable for all quality related activities.

(d) No excavated material shall allowed to be stacked on roadside/ footpaths/public premises without written permission from competent authority.

(e) Whenever new drains are constructed, the flow in the old drain will have to be suitably diverted to maintain the continuity of flow.

21.0 GENERAL INFORMATION

Canvassing in connection with the tender is strictly prohibited, and such canvassed tenders submitted by the contractor will be liable to the rejected and his earnest money shall be absolutely forfeited.

On acceptance of the tender, the name of the accredited representative of the contractor who will be responsible for taking instructions from the General Manager (IT) shall be communicated to the General Manager (IT) in writing.

Surat Smart City Development Limited reserves the right to engage suitable Project Management Consultant &/or third Party Inspection agency to Engineering Review, monitor & supervise the said work. PMC-TPI will performs its duties caring out jobs as per scope of works /TOR of RFP proposed by Surat Smart City Development Limited. The selected

contractor has to submit DBR (design basis report), drawings etc. to Surat Smart City Development Limited -PMC and to take approval well in advance before start of the work. The selected contractor has to submit all the details ,drawings and materials ,which is essential to carry out the assignment/project for the better performance to the Surat Smart City Development Limited ,along with the set of copies to PMC –TPI also.

Tenders which do not fulfill all or any of conditions or are submitted incomplete in any respect will be rejected. SSCDL, Reserves the rights to increase / decrease the scope of work and contract without assigning any reason thereof. No claim to that effect shall been entertained.

Conditional tenders will not be accepted and will be rejected outright.

In case of any dispute or clarification in specification of any tender items the decision of Surat Smart City Development Limited shall be final.

No advance such as machinery advance, mobilization advance or materials advance will be given.(Except specified in the tender).

The 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 technical bid shall be communicated to them later on.

SECTION VII –
CONDITIONS OF CONTRACT

ARTICLE 1
DEFINITIONS AND INTERPRETATION

The following definitions and interpretations shall be inclusive of the scope of denitions as per trade practice and rules of interpretation as acknowlged by law.

1.1 Interpretation

1.1.1 In this Agreement, unless the context otherwise requires,

(a) references to any legislation or any provision thereof shall include amendment orre-enactment or consolidation of such legislation or any provision thereof so far as such amendment or re-enactment or consolidation applies or is capable of applying to any transaction entered into here under;

(b) references to laws of India or Indian law or regulation having the force of law shall include the laws, acts, ordinances, rules, regulations, bye laws or notifications which have the force of law in the territory of India and as from timeto time may be amended, modified, supplemented, extended or re-enacted;

(c) references to a "person" and words denoting a natural person shall be construed as a reference to any individual, firm, company, corporation, society, trust,government, state or agency of a state or any association or partnership (whetheror not having separate legal personality) of two or more of the above and shall include successors and assigns;

(d) the table of contents, headings or sub-headings in this Agreement are for convenience of reference only and shall not be used in, and shall not affect, the construction or interpretation of this Agreement;

(e) the words "include" and "including" are to be construed without limitation and shall be deemed to be followed by "without limitation" or "but not limited to"whether or not they are followed by such phrases;

(f) references to "Scope of Work" include, unless the context otherwise requires,survey and investigation, design, developing, engineering, procurement, supply of plant, materials, equipment, labour, delivery, transportation, installation,processing, fabrication, safety measures, testing, and commissioning of theProject, including maintenance during the Construction Period, removing of defects, if any, and other activities incidental to the construction and "construct"or "build" shall be construed accordingly;

(g) references to "development" include, unless the context otherwise requires,construction, renovation, refurbishing, augmentation, up-gradation and otheractivities incidental there to during the Construction Period, and "develop" shall be construed accordingly;

(h) any reference to any period of time shall mean a reference to that according to Indian standard time;

(i) any reference to day shall mean a reference to a calendar day;

(j) any reference to month shall mean a reference to a calendar month as per the Gregorian calendar;

(k) references to any date, period or Project Milestone shall mean and include such date, period or Project Milestone as may be extended pursuant to this Agreement;

(l) any reference to any period commencing "from" a specified day or date and "till"or "until" a specified day or date shall include both such days or dates; provided that if the last day of any period computed under this Agreement is not a businessday, then the period shall run until the end of the next business day;

(m) the words importing singular shall include plural and vice versa;

(n) references to any gender shall include the other and the neutral gender;

(o) "lakh" means a hundred thousand (100,000) and "crore" means ten million(10,000,000);

(p) "indebtedness" shall be construed so as to include any obligation (whether incurred as principal or surety) for the payment or repayment of money, whether present or future, actual or contingent;

(q) references to the "winding-up", "dissolution", "insolvency", or "reorganisation"of a company or corporation shall be construed so as to include any equivalent oranalogous proceedings under the law of the jurisdiction in which such company orcorporation is incorporated or any jurisdiction in which such company orcorporation carries on business including the seeking of liquidation, winding-up,reorganisation, dissolution, arrangement, protection or relief of debtors;

(r) save and except as otherwise provided in this Agreement, any reference, at anytime, to any agreement, deed, instrument, licence or document of any description shall be construed as reference to that agreement, deed, instrument, licence orother document as amended, varied, supplemented, modified or suspended at the time of such reference; provided that this Clause shall not operate so as to increase liabilities or obligations of the SSCDL here under or pursuant here to in any manner whatsoever;

(s) any agreement, consent, approval, authorisation, notice, communication,information or report required under or pursuant to this Agreement from or by any Party or the SSCDL s Engineer shall be valid and effective only if it is in writingunder the hand of a duly authorised representative of such Party or the SSCDL sEngineer, as the case may be, in this behalf and not otherwise;

(t) all the documents forming part of the contract shall be treated as integral wholeand each one shall be in addition to being supplementary shall also be treated as complimentary to all other parts to the extent that the overall meaning andinterpretation thereof shall be in conformity with the intention and purpose of this agreement.

(u) time shall be of the essence in the performance of the Parties' respectiveobligations. If any time period specified herein is extended for the reasons specified in the Agreement, such extended time shall also be of the essence,inviting all the liabilities attached to the requirement to the performance in terms of Liquidated Damages.

1.1.2 Unless expressly provided otherwise in this Agreement, any Documentation required to be provided or furnished by the Contractor to the SSCDL shall be provided free of cost in Five copies.

1.2 Definitions

The words and expressions beginning with capital letters and defined in this Agreement shall, unless the context otherwise requires, have the meaning ascribbed there to herein, and the words and expressions defined in the Schedules and used therein shall have the meaning ascribed thereto in the Schedules.For the purposes of the Contract Documents, the following words and terms shall have the meanings specified below (other words and abbreviations that have well-knowntechnical or trade meanings are used in the Contract Documents in accordance withsuch recognized meanings),

provided, however, that the terms defined in attached Documents, including but not limited to the Agreement, shall have the meanings specified in such document.

1.2.1 Definitions (for incorporated words)

In this Agreement, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meaning herein after respectively assigned to them:

"Accounting Year" means the financial year commencing from the first day of April of any calendar year and ending on the thirty-first day of March of the next calendar year;

"Affiliate" means, in relation to either Party {and/or Members}, a person who controls,is controlled by, or is under the common control with such Party {or Member} (as usedin this definition, the expression "control" means, with respect to a person which is acompany or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person, whether by operation of law or by contract or otherwise);

"Agreement" means this Agreement, its Recitals, the Schedules here to and any amendments there to made in accordance with the provisions contained in this Agreement;

"Applicable Laws" means all laws, brought into force and effect by GOI or the StateGovernment including rules, regulations and notifications made there under, and judgements, decrees, injunctions, writs and orders of any court of record, applicable to this Agreement and the exercise, performance and discharge of the respective rights and obligations of the Parties hereunder, as may be in force and effect during the subsistence of this Agreement;

"Applicable Permits" means all clearances, licences, permits, authorisations, noobjection certificates, consents, approvals and exemptions required to be obtained or maintained under Applicable Laws in connection with the construction, operation and maintenance of the Work during the subsistence of this Agreement;

"Bank" means a bank incorporated in India and having a minimum net worth of Rs.1,000 crore (Rupees one thousand crore) or any other bank acceptable to the Surat Smart City Development Limited;

"Base Date" means the last date of that calender month, which date precedes the Bid Due Date by at least 28 (twenty eight) days;

"Bid" means the documents in their entirety comprised in the bid submitted by the [selected bidder/Consortium] in response to the Request for Proposals in accordance with the provisions thereof;

"Bid Security" means the bid security provided by the Contractor to the Surat Smart City Development Limited in accordance with the Request for Proposal, and which is to remain in force until substituted by the Performance Security;

"Change in Law" means the occurrence of any of the following after the Base Date:
(a) the enactment of any new Indian law;
(b) the repeal, modification or re-enactment of any existing Indian law;
(c) the commencement of any Indian law which has not entered into effect until the Base Date;
(d) a change in the interpretation or application of any Indian law by a judgement of a court of record which has become final, conclusive and binding, as compared to such interpretation or application by a court of record prior to the Base Date; or

"Commencement Date" means the first date on which the contractor starts mobilizing his resources Men and/or Machineries and/or Material at site.

"Consortium" means the consortium of entities which have formed a joint venture for implementation of this Project;

"Contractor" shall have the meaning attributed there to in the array of Parties here in above as set forth in the Recitals;

"Defect" means any defect or deficiency in Construction of work or any part there of,which does not conform with the Specifications and Standards.

"Document" or "Documentation" means documentation in printed or written form, orin tapes, discs, drawings, computer programmes, writings, reports, photographs,films, cassettes, or expressed in any other written, electronic, audio or visual form;

"Emergency" means a condition or situation that is likely to endanger the safety orsecurity of the individuals on or about the The Work, including Users thereof, or which poses an immediate threat of material damage to any of the Project Assets;

"Encumbrances" means, in relation to the The Work, any encumbrances such asmortgage, charge, pledge, lien, hypothecation, security interest, assignment, privilegeor priority of any kind having the effect of security or other such obligations, and shall include any designation of loss payees or beneficiaries or any similar \ arrangement under any insurance policy pertaining to the works.

The "EIC" shall mean the Engineer in charge i.e. officer of SSCDL who is designated as such for the time being in whose jurisdiction the work lies.

"Good Industry Practice" means the practices, methods, techniques, designs,standards, skills, diligence, efficiency, reliability and prudence which are generally and reasonably expected from a reasonably skilled and experienced contractor engaged in the same type of undertaking as envisaged under this Agreement andwhich would be expected to result in the performance of its obligations by the Contractor in accordance with this Agreement, Applicable Laws and Applicable Permits in reliable, safe, economical and efficient manner;

"Government Instrumentality" means any department, division or sub-division of the Government or the State Government and includes any commission, board, SMC, SSCDL agency or municipal and other local SMC or statutory body including panchayat underthe control of the Government or the State Government, as the case may be, and having jurisdiction over all or any part of the Workor the performance of all or any ofthe services or obligations of the Contractor under or pursuant to this Agreement;

"Insurance Cover" means the aggregate of the maximum sums insured under the insurances taken out by the Contractor and includes all insurances required to be takenout by the Contractor but not actually taken, and when used in the context of any act or event, it shall mean the aggregate of the maximum sums insured and payable or deemed to be insured and payable in relation to such act or event;

"Intellectual Property" means all patents, trademarks, service marks, logos, get-up,trade names, internet domain names, rights in designs, blue prints, programmes and manuals, drawings, copyright (including rights in computer software), database rights,semi-conductor, topography rights, utility models, rights in know-how and otherintellectual property rights, in each case whether registered or unregistered andincluding applications for registration, and all rights or forms of protection havingequivalent or similar effect anywhere in the world;

"Interim Payment Certificate" or "IPC" means the interim payment certificate issued by the Surat Smart City Development Limited for payment to the Contractor in respect of Contractor's claims for payment raised in accordance with the provisions of this Agreement;

"Lead Member" shall, in the case of a consortium, mean the member of such consortium who shall have the Surat Smart City Development Limited to bind the contractor and each member of the Consortium; and shall be deemed to be the Contractor for the purposes of this Agreement;

"LOA" or "Letter of Acceptance" means the letter of acceptance of offer.

"Material Adverse Effect" means a material adverse effect of any act or event on the ability of either Party to perform any of its obligations under and in accordance with the provisions of this Agreement and which act or event causes a material inancialburden or loss to either Party;

"MEPF"shall mean Mechanical,Electrical,Plumbing and Fire fighting system consultant who is designated as such for the time being in whose jurisdiction the work lies.

"Materials" are all the supplies used by the Contractor for incorporation in work or forthe maintenance of the Work;

"Parties" means the parties to this Agreement collectively and "Party" shall mean anyof the parties to this Agreement individually;

"Performance Security" shall have the meaning as given in the contract

"Plant" means the apparatus and machinery intended to form or forming part of work;

"Project" means the construction and maintenance of the Work in accordance with the provisions of this Agreement, and includes all works, services and equipment relatingto or in respect of the Scope of the Project;

"Project Completion Date" means the date on which the Provisional Certificate isissued and in the event no Provisional Certificate is issued, the date on which theCompletion Certificate is issued;

"Project Completion Schedule" means the progressive Project Milestones forcompletion of the Work on or before the Scheduled Completion Date;

"PMC" shall mean Project management consultant who is designated supervision agency during execution of this project.

"SMC" shall mean Surat Municipal Corporation in whose jurisdiction the work lies.
"SSCDL" shall mean Surat Smart City Development Limited

"Re.", "Rs." or "Rupees" or "Indian Rupees" means the lawful currency of the Republic of India;

"Right of Way" means the constructive possession of the Site free from encroachments and encumbrances, together with all way leaves, easements,unrestricted access and other rights of way, how so ever described, necessary for construction and maintenance of the Work in accordance with this Agreement;

"Specifications and Standards" means the specifications and standards relating to the quality, quantity, capacity and other requirements for the Work, and any modifications thereof, or additions thereto, as included in the design and engineering for the Work submitted by the Contractor to, and expressly approved by, the SSCDCL;

"Sub-contractor" means any person or persons to whom a part of work or the Maintenance has been subcontracted by the Contractor and the permitted legal successors in title to such person, but not an assignee to such person;

"Termination" means the expiry or termination of this Agreement;

"Termination Notice" means the communication issued in accordance with this Agreement by one Party to the other Party terminating this Agreement;

"TPI" shall mean Third party inspection consultant who is designated for quality monitoring of material & workmanship during execution of this project.

"WPI" means the wholesale price index for various commodities as published by the Ministry of Commerce and Industry, GOI and shall include any index which substitutes the WPI, and any reference to WPI shall, unless the context otherwise requires, be construed as a reference to the WPI published for the period ending withthe preceding month.

1.3 Measurements and arithmetic conventions

1.3.1 All measurements and calculations shall be in the metric system and calculations done to 2 (two) decimal places, with the third digit of 5 (five) or above being rounded upand below 5 (five) being rounded down.

1.4 Priority of agreements and errors/discrepancies

1.4.1 This Agreement, and all other agreements and documents forming part of or referred to in this Agreement are to be taken as mutually explanatory and, unless otherwise expressly provided else where in this Agreement, the priority of this Agreement and other documents and agreements forming part hereof or referred to herein shall, in the event of any conflict between them, be in the following order:

(a) this Agreement; and

(b) all other agreements and documents forming part hereof or referred to herein; i.e. this Agreement at (a) above shall prevail over the agreements and documents at (b).

1.4.2 In case of ambiguities or discrepancies within this Agreement, the following shall apply:

(a)between two or more Clauses of this Agreement, the provisions of a specific Clause relevant to the issue under consideration shall prevail over those in other Clauses;

(b) between the Clauses of this Agreement and the Schedules, the Clauses shall prevail and between Schedules and Annexes, the Schedules shall prevail;

(c) between any two Schedules, the Schedule relevant to the issue shall prevail;

(d) between the written description on the Drawings and the Specifications and Standards, the latter shall prevail;

(e) between the dimension scaled from the Drawing and its specific written dimension, the latter shall prevail; and

(f) between any value written in numerals and that in words, the latter shall prevail.

ARTICLE 2
SCOPE OF THE PROJECT

2.1Scope of the Project
Under **this** Agreement, the scope of the Project (the "Scope of the Project") shall mean and include:

(a) Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Trench, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Maintenance of Tendered works for Period of Five years on Preparation of Working Drawings, Procurement and Construction Basis

(b) maintenance of the Project in accordance with the provisions of this Agreementand in conformity with the requirements.

(c) performance and fulfilment of all other obligations of the Contractor in accordance with the provisions of this Agreement and matters incidental there to or necessary for the performance of any or all of the obligations of the Contractor under this Agreement.

(d) If due to any unavoidable circumstances, it needs to shift the location of project partly or fully, the contractor shall carry out the work partly or fully at another alternative locations without any extra claim. The expenditure towards preliminary activities if carried out by the contractor shall be reimbursed by SSCDL.(Actual expenditure or payment shown in Schedule of Payment-pre construction activities-as per stage of work carried out by the contractor which ever is less).

(e) Scope of work contained in the paragraphs mentioned below is only indicative and not exhaustive. In addition the contractor shall be responsible for executing all items required for completing the work as per direction of Engineer-in-charge. The price quoted shall include all the items and covers all details as may be required to meet the purpose and intents of the contract.

2.2 SCOPE OF WORK : (As described in Bidding Data)

A. <u>Scope of Work :-</u>

1 Contractors are requested to visit the site prior to fill/submit the tender and check all the necessary attributes/matters related for completion of this project.

2 All the activities required to be carried out for successful and timely completion of this project shall be carried out by the successful contractor.

Detail Scope of work : The detail scope of work is as under :

The works under Contract comprises the construction of proposed improvement of roads , Junction, drainage works, construction of new carriageway, construction of utility ducts, cross drains, culverts, foot path, cycle track, development of parking areas & bus bays, Street landscaping, Street Furniture, Traffice Signages, Bus Shelters, Vending Kiosks, Miscellaneous works and Maintenance of Tendered works for Period of Five years

Details and drawings given in Tender document is for information purpose only and successful

bidder shall undertake confirmatory survey for accuracy and completeness of data. It is in scope of successful Bidder to undertake all Site surveys, Geotechnical investigations,Underground Utility Surveying and Scanning of the roads for utility shifting, obtaining all required approvals from the relevant authorities,Carry out Design and Drawings for all the components of the work as per Employers requirement and submit the same to client for review and approval, Prepare Good for Construction Drawings, submit maintenance manual to client for approval before start of Maintenance period.

The successful bidder shall have to prepare and submit 'As Built Drawings' depicting the exact construction carried out on site, in soft and hard copy format.

Statutory and other charges for getting various required approvals shall be in scope of Successful bidder

The scope of work also includes :

1.10Construction and completion of the following

l. Site clearance, demolition works, earthworks, temporary works,traffic diversion, barricading the construction site, utility shifting and all ancillary works deemed necessary for the carrying out of temporary & permanent construction works.

m. Widening/ re-cambering/ raising/ miling down & overlaying of existing carriageways, flexible/ rigid pavement at grade road intersections & accesses to adjoining developments.

n. Tree cutting (if any) as indicated in the drawings.

o. Construction of Utility ducts, cross drains as per approved drawing.

p. Retrofitting the existing roads as per the proposed road sections wrt carriageways, provision of footpath, cycle track, services lanes.

q. Installing RPM, making road markings along the road edge, road center line & as per IRC guidelines, bus stop marking, cycle track marking, construction of medians & speed breakers, & junction improvements as per the drawings & in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

r. Construction of footpaths, kerbs, railings, vehicular impact guardrails and other road related facilities as per the guidelines of IRC in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

s. Supply and installation of new traffic signage, directional signage, street name signs & re-sitting of such existing signs & other road signs to be retained, inclusive of support & foundation as per Employers Requirement.

t. Supply and installation of new Electric poles and light fittings as per approved Drawings;

u. Supply & installation of street furniture seating bench, planter box, bollards, cycle hoops, advertisement/ branding/ wayfinding boards & poles in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

v. Planting of trees, shrubs and installation of lawns as a part of Landscape work & installation of services for the same, as per the drawing in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

w. All other works and services ancillary or related to the full completion of the Works in accordance with the Employer's requirements

1.11 The Contractor shall ascertain, determine and verify the locations of all utility services by scaning the roads in the vicinity of the Works, and co-ordinate with utility agencies for the diversion of affected services and the laying of new services. The Contractor shall support and protect services that need not be diverted or pending diversion and remove all abandoned services. Contractor shall be responsible for relocation, reconstruction, reconfiguration of driveways, site accesses, temporary and permanent drains, pipe conduits and necessary connections for public lighting and traffic lighting, earth works, turfing, environmental assessments, necessary safety measures and protection works, sewer lines etc

1.12 The Contractor's responsibility for the design and build works includes the submissions to relevant government authorities / technical departments for obtaining all necessary clearances/approvals.

1.13 The Contractor shall co-ordinate and interfaces his works with that of all other contractors, subcontractors, utility services, statutory authorities, etc. and achieve the completion of the Works to the satisfaction of the Engineer

1.14 The Contractor shall verify the proposed road reserve, cadastral boundary and contract boundary and all dimensions on Site prior to submission of Tender. The Contractor is responsible for clarifying any discrepancy between the Drawings and actual condition on Site.

1.15 The Contractor shall make good all works including road surfaces, drains, concrete slabs, gratings, kerbs, pavements, turfing, railing, fence, boundary wall, etc. affected or damaged during the course of construction, to the satisfaction of the Engineer. The costs of making good all these defects shall be borne solely by the Contractor and deemed included in his Contract Sum

1.16 All works specified shall include the provision of all labour, tools, equipment, material,traffic control, transport and everything else necessary for the satisfactory completion of the Work by the Contractor to the satisfaction of the Engineer.

1.17 Description of the Works involved in this Contract is given in the Specifications for the guidance of the Contractor. The Contractor shall be solely and fully responsible for investigating and

ensuring the actual extent and nature of the Works comprised in this Contract prior to submission of his Tender.

1.18Construction, management and quality of the Works shall comply with the Drawings,Specifications and Employers requirement

A. **Salient Features of Roads for Visual Improvement :**

No.	Name of road	Road Width (m)	Length (Km)
1	R1 - Ring Road	60	2.02
2	R2 - Surat Bardoli Road	60	2.85
3	R3 - Canal Road	60	3.93
4	R4 - Surat Bardoli Road	45	0.9
5	R5 - -Middle Ring Road	45	1.83
6	R6 - Aai Mata Road	36	1.9
7	R7 —- Lambe Hanuman Road	24	0.8
8	R8 – Bombay Market Road	24	1.46
9	R9 – Sports Complex Road	24	0.42
10	R10 —- Puna Gam Road	24	0.3
11	R11 –Kamela Darwaja Road	24	1.55
12	R12 –Kinnari Bhathena Road	24	1.52
13	R13 – Bombay Market Puna Gam Road	24	0.4
14	R14 – Archana School Road	24	0.68
15	R15 – Capital Corner Building Road	24	1
16	R17 – Salasar Hanuman Road (NVZ)	16	0.66

1. **Salient Features of R1 - Ring Road (60M)**

Salient Features of R1 - Ring Road (60M)	
Approximate Length of the Road	2.02KM
No. Of MV Lanes (On each sides of median)	2 Lanes With Flyover (Lane Width as per the IUT Guidlines of MOUD)
	4 MV Lanes Without Flyover (Lane Width as per the IUT Guidlines of MOUD)
Pedestrian Footpath Width (On each sides of median)	3 Mtrs
No. Of Bus Lanes (On each sides of median)	1 lane 3.5m wide (On road without flyover)
No. Of Service Lanes (On each sides of median)	2 Lanes (Total 5.5 Carriage way)
No. Of Parking Lanes (On each sides of median)	1 Lane (2.5m Minumum wide)
No. Of Cycle lanes (On each sides of median)	1 Lane (2M wide)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11009**

2. **Salient Features of R2 - Surat-Bardoli Road (60M)**

Salient Features of R2 - Surat-Bardoli Road (60M)	
Approximate Length of the Road	2.85KM
No. Of MV Lanes (On each sides of median)	3 Lanes - Karuni Mata Chowk to Puna Patiya Flyover (Lane Width as per the IUT Guidlines of MOUD)
	With Fly over - 7M Carriage way (2 lanes) (Lane Width as per the IUT Guidlines of MOUD)

Pedestrian Footpath Width (On each sides of median)	Karuni Mata Chowk to Puna Patiya Flyover - 2.5m Minumum
	With Fly over - 2M
No. Of Service Lanes (On each sides of median)	2 lanes (Total 5.5M Carriage way)
No. Of BRT Lanes (On each sides of median)	As per site
No. Of Parking Lanes (On each sides of median)	1 lane – 2.5 m (Karuni Mata Chowk to Puna Patiya Flyover)
	With Flyover – No parking on road, Parking under flyover
No. Of Cycle lanes (On each sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11010 & 11011**

3. Salient Features of R3 - Canal Road (60M)

Salient Features of R3 - Canal Road (60M)	
Approximate Length of the Road	3.93KM
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD) without flyover
	2 Lanes (Lane Width as per the IUT Guidlines of MOUD) with flyover
Pedestrian Footpath Width (On each sides of median)	2.5m Minumum
No. Of BRT Lanes (On each sides of median)	As per site
No. Of Service Lanes (On each sides of median)	5.5M Carriage way (2 lanes) Without Flyover
	NA With Flyover
No. Of Parking Lanes (On each sides of median)	No parking on road, Parking under flyover where applicable
No. Of Cycle lanes (On each sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11012**

4. Salient Features of R4- Surat Bardoli Road (45M) & R5 -Middle Ring Road (45M)

Salient Features of R4 & R5 (45M)	
Approximate Length of R4- Surat Bardoli Road	0.9KM
Approximate Length of R5- Puna Patiya Road- Middle Ring Road	1.83KM
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD) without flyover
	2 Lanes (Lane Width as per the IUT Guidlines of MOUD) with flyover
Pedestrian Footpath Width (On each sides of median)	1.5M Minimum
No. Of BRT Lanes (On each sides of median)	As per site
No. Of Service Lanes (On each sides of median)	5.5M Carriage way (2 lanes) Without Flyover
	NA With Flyover
No. Of Parking Lanes (On each sides of median)	No parking on road, Parking under flyover where applicable
No. Of Cycle lanes (On each sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11013**

5. Salient Features of R6 - Aai Mata Road (36M)

Salient Features of R6 - Aai Mata Road (36M)	
Approximate Length of the Road	1.9 Km
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD) without flyover
Pedestrian Footpath Width (On each sides of median)	2.5m Minumum
No. Of BRT Lanes (On each sides of median)	NA
No. Of Service Lanes (On each sides of median)	NA
No. Of Parking Lanes (On one sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)
No. Of Cycle lanes (On one sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11014**

6. Salient Features of R7 - R16 (24M)

Salient Features of R7 - R16 (24M)	
Approximate Length of Road R7 - Lambe Hanuman Road	0.8 Km
Approximate Length of Road R8 - Bombay Market Road	1.46 Km
Approximate Length of Road R9 - - Sports Complex Road	0.42 Km
Approximate Length of Road R10 - Puna Gam Road	0.3 Km
Approximate Length of Road R11 - - Kamela Darwaja Road	1.55 Km
Approximate Length of Road R12 - - Kinnari Bhathena Road	1.52 Km
Approximate Length of Road R13 - Bombay Market Puna Gam Road	0.4 Km
Approximate Length Road of R14 - Archana School Road	0.68 Km
Approximate Length of Road R15 – Capital Corner Building Road	1.0 Km
Approximate Length of Road R16 - Surat Kadodara Devadh Road	0.78 Km
Approximate Length of Road R 17- Salasar Hanuman Road (NVZ)	0.66 Km
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD)
Pedestrian Footpath Width (On each sides of median)	2.5m Minumum
No. Of BRT Lanes (On each sides of median)	NA

No. Of Service Lanes (On each sides of median)	NA
No. Of Parking Lanes (On one sides of median)	NA
No. Of Cycle lanes (On one sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11015**

D. <u>Approved / Expected Brands</u> :-

Sr.No.	Item	Recommended/Suggested Brands
1.	Cement	Ambuja, Ultratech,
2	White Cement	J.K. White, Birla White, Nihon White
3.	Steel	TMT Bars Fe-500 conforming to IS-1786:1985(reaffirmed 2004) Reinforcement Steel made by Primary Steel Plants like TATA Steel,SAIL,Rastriya Ispat, Jindal, Vaizag steel.
4	Structural Steel	Reinforcement Steel made by Primary Steel Plants like TATA Steel,SAIL,Rastriya Ispat, Jindal, Vaizag steel.
	Visual Improvement- Footpath Works	
1	Cement concrete paver block	Vyara Tiles, Surat- U N Sons, Surat Jay Balaji Paver And Tiles, Surat
2	Cement concrete kerb	Vyara Tiles, Surat , KK India Pvt ltd, New Delhi SK Laxmi Cement Product, Surat
3	Tactile for footpath	KK India Pvt ltd, New Delhi SK Laxmi Cement Product, Surat Krishna Precast, Surat
4	Kerb Paint	Asian Paints,ICI,Berger Automark Technologies Pvt Ltd

E	**Visual Improvement- Other Civil Works**	
1	Shared zone paving	Vyara Tiles, Surat , U N Sons, Surat Jay Balaji Paver And Tiles, Surat
F	**Visual Improvement- Signage & Street Furniture**	
1	CautionaryTraffic Signage	As per standards and as approved by Engineer in charge
2	Mandatory Traffic Signage	As per standards and as approved by Engineer in charge
3	Facility/ Informatory Signage	As per standards and as approved by Engineer in charge
4	BR1- City Information Boards	Custom design and as approved by Engineer in charge
5	BR2- Advertisement Poles	Custom design and as approved by Engineer in charge
6	BR3- Wayfinding Boards	Custom design and as approved by Engineer in charge
7	Seating Bench	Custom design and as approved by Engineer in charge
8	Dual system Litter Bins	Custom design and as approved by Engineer in charge
9	Concrete Bollards	KK India
10	Bicycle Stand hoops	Custom fabrication and as approved by the Engineer in charge
11	Railing/ gaurd rail	Custom fabrication and as approved by the Engineer in charge
12	Bus Shelter	Custom fabrication and as approved by the Engineer in charge
13	Vending Kiosk	Custom fabrication and as approved by the Engineer in charge
14	Drinking Water Fountain	Oasis WES
G	**Visual Improvement- Landscape Works**	
1	Tree grate	Vyara Tiles, SuratKK India Pvt LtdShree Gayatri Cement Pipe Works, gandhinagar
2	Planter Box	KK India Pvt Ltd
3	Bollard Lights	Wipro, Phillips

		Bajaj
4	Up- Lighter	Wipro Bajaj Osram
H	**Visual Improvement- Road Works**	
1	Road marking	3M All weather paint Asian Paints PPG Automark Technologies Pvt Ltd
2	Bus stop marking	Ride A Way by Flint Setwell Coatings India Pvt Ltd
3	Cycle track marking	Ride A Way by Flint Kataline - Plastitrak
4	Raised pavement markers	3M
5	Solar RPM	3M

Notes:

The following guidelines are to be noted with regard to use of materials in the work:

a) The contractor shall produce samples of the materials for approval of the EIC. The materials of the makes, out of the above as approved by the EIC shall be used on the work.

b) In respect of materials for which approved makes are not specified above, the make/brand will be decided by the EIC.

c) Before bulk purchase of quantities of materials, it is the responsibility of the Contractor to get the samples of materials approved from consultant and EIC.

d) All cost towards the testing shall be borne by the contractor.

e) For all the material of approved brands necessary testing as per IS standards shall be done by the agency and no extra payment shall be paid for that.

E. MINIMUM REQUIREMENT OF TECHNICAL REPRESENTATIVE(S)

SR No.	Designation	Qualification & Requirement
1	Architect	B. Arch /B.E.Civil having, licence from the authority (Licenced Architect with minimum 10 years experience.)
2	Structural Engineer	B.E.Civil / M.E.Civil having structural designer licence from the authority or as per Requirement of structural safety norms of GDCR/IS Code (structural engineer with minimum 10 years experience.)

1.)The above professionals can be hired by the Bidder/contractor as consultants/can be on payroll.
The Bidder/contractor must furnish all the documents including qualifications, experiences,memberships, pay slip (if on payroll), consulting agreement for the above mentioned professionals.
2.)If hired, the above professional shall actively participate throughout the project.

SR No.	Designation	Min Qualification	Discipline	Min. Experience	Nos	Remarks
1	Project Cordinator Multidisciplinary (Graduate Engineer)	B.E(Civil)	Civil Engg	15 Years	1	Should have 15 years experience of Similar Works
2	Design Manager (Graduate Engineer)	B.E(Civil)	Civil Engg	10 Years	1	Should have 10 years experience of Similar Works
3	Project Manager – Multidisciplin ary (Graduate Engineer)	B.E(Civil)	Civil Engg	10 Years	1	Should have 10 years experience of Similar Works
2	Senior Site Engineer	B.E(Civil)	Civil Engineering (Bldg Construction)	7 Years	1	Should have worked as site engineer atleast for 2 similar Works
3	Junior Site Engineer	Diploma (Civil)	Civil Engineering (Bldg Construction)	0 to 2 Years	2	Should have experience of Road Works
4	Senior Electrical Engineer	B.E (Electrical)	Electrical Engineering	10 Year Exp.	1	Should have experience for similar type Works
5	Junior Electrical Engineer (As & when required)	B.E / DCE (Electrical)	Electrical Engineering	2 to 3 Years	1	Should have experience for similar type Works
6	Material & Quality Control	D.C.E	-	5 Years	1	Should have worked as Material & Quality

	Engineer					Control engineer
7						

* no. of persons will depend on the size of the project and as per instruction of the General Manager (IT).

Note: Assistant Engineer(s) retired from Govt. services that are holding diploma will be treated at par with Graduate Engineer.

1. **F. General :-**

(1) All electrification work shall be executed through SMC/R & B license electrical contractor.

(2) All plumbing and sanitation work shall be executed by SMC/R & B license plumber.

(3) All water proofing work shall be executed by experienced agency.

(4) PMC / TPI may be appointed for monitoring of quality of the work by SSCDL.

ARTICLE 3
OBLIGATIONS OF THE CONTRACTOR

3.1 Obligations of the Contractor

3.1.1 Subject to and on the Terms, Conditions. Provisions and Representation of this Agreement, the Contractor shall undertake the survey, investigation, design,engineering, procurement, construction, and maintenance of the Work and observe,fulfil, comply with and perform all its obligations set out in this Agreement or arisinghereunder.

3.1.2 The Contractor shall comply with all Applicable Laws and Applicable Permits(including renewals as required) in the performance of its obligations under this Agreement.

3.1.3 The Contractor shall discharge its obligations in accordance with Good Industry Practice and as a reasonable and prudent person.

3.1.4 The Contractor shall remedy any and all loss or damage to work from the commencement until the end of the Construction Period at the Contractor's cost, save and except to the extent that any such loss or damage shall have arisen from any default or neglect of the Surat Smart City Development Limited

3.1.5 The Contractor shall remedy any and all loss or damage to work during the Defects Liability Period at the Contractor's cost to the extent that such loss or damage shallhave arisen out of the reasons specified in contract.

3.1.6 The Contractor shall remedy any and all loss or damage to work during the Maintenance Period at the Contractor's cost, save and except to the extent that anysuch loss or damage shall have arisen on account of any default or neglect of the Surat Smart City Development Limited or on account of a Force Majeure Event.

3.1.7 The Contractor shall, at its own cost and expense, in addition to and not in derogation of its obligations elsewhere set out in this Agreement: -

Ensure that the Contractor and its Sub-contractors comply with the safety and welfare measures for labour in accordance with the Applicable Laws and Good Industry Practice;Keep, on the Site, a copy of this Agreement, publications named in this Agreement,the Drawings, Documents relating to the Project, and Change of Scope Orders and other communications given under this Agreement. The Surat Smart City Development Limited and its authorised personnel shall have the right of access to all these documents at all reasonable times;Cooperate with other contractors employed by the SMC and personnel of any public SMC; and Not interfere unnecessarily or improperly with the convenience of the public, or the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the SMC or of others.

3.1.8 The Contractor shall undertake all necessary superintendence to plan, arrange,direct, manage, inspect and test work.

3.1.9 The Contractor shall maintain all records as per Instructions of Engineer in Charge.

3.2 Obligations relating to sub-contracts and any other agreements

3.2.1 The Contractor shall not sub contract any part or portion of the actual construction to any sub contractor without prior permission of the SSCDL which shall ordinarily not withhold any reasonable request thereof if the same is found in opinion of SSCDL to be in interest of the work.

3.2.2. In event any sub contract is approved by SSCDL the entire responsibility and liability as contained in the original contract shall continue to remain unaltered and diluted and the contractor shall be completely and fully responsible to SSCDL as is SSCDL is having no privity of contract with the sub contractor.

3.2.3 It is expressly agreed that the Contractor shall, at all times, be responsible and liable for all its obligations under this Agreement notwithstanding anything contained in the agreements with its Sub-contractors or any other agreement that may be entered into by the Contractor, and no default under any such agreement shall excuse the Contractor from its obligations or liability hereunder.

3.3 Contractor's personnel

3.3.1 The Contractor shall ensure that the personnel engaged by it or by its Sub-contractors in the performance of its obligations under this Agreement are at all times appropriately qualified, skilled and experienced in their respective functions in conformity with Good Industry Practice.

3.3.2 The SSDCL's Engineer may, for reasons to be specified in writing, direct the Contractorto remove any member of the Contractor's or Sub-contractor's personnel. Any direction issued by the SSDCL's Engineer shall specify the reasons for the removal of such person.

3.3.3 The Contractor shall on receiving such a direction from the SSDCL's Engineer order for the removal of such person or persons with immediate effect. The Contractor shall further ensure that such persons have no further connection with work or Maintenance under this Agreement. The Contractor shall then appoint (or cause to be appointed) are placement.

3.4 Contractor's care of work

The Contractor shall bear full risk in and take full responsibility for the care of work,and of the Materials, goods and equipment for incorporation therein, from the Date of entry upon the site until the date of completion, defect liability, maintenance period as specified or date of final take over certificate whichever is the last date.

3.5 Electricity, water and other services

The Contractor shall be responsible for procuring of all power, water and other services that it may require.

ARTICLE 4
REPRESENTATIONS AND WARRANTIES

4.1 Representations and warranties of the Contractor

The Contractor represents and warrants to the Surat Smart City Development Limited that:

(a) it is duly organised and validly existing under the laws of India, and has full power and Surat Smart City Development Limited to execute and perform its obligations under this Agreement and to carry out the transactions contemplated hereby ;
(b) it has taken all necessary corporate and/or other actions under Applicable Laws to authorise the execution and delivery of this Agreement and to validly exercise its rights and perform its obligations under this Agreement;
(c) this Agreement constitutes its legal, valid and binding obligation, enforceable against it in accordance with the terms hereof, and its obligations under this Agreement will be legally valid, binding and enforceable obligations against itin accordance with the terms hereof;
(d) it is subject to the laws of India, and hereby expressly and irrevocably waivesany immunity in any jurisdiction in respect of this Agreement or matters arising there under including any obligation, liability or responsibility hereunder;
(e) the information furnished in the Bid and as updated on or before the date of this Agreement is true and accurate in all respects as on the date of this Agreement;
(f) the execution, delivery and performance of this Agreement will not conflict with, result in the breach of, constitute a default under, or accelerate performance required by any of the terms of its memorandum and articles of association or any Applicable Laws or any covenant, contract, agreement,arrangement, understanding, decree or order to which it is a party or by which itor any of its properties or assets is bound or affected;
(g) there are no actions, suits, proceedings, or investigations pending or, to its knowledge, threatened against it at law or in equity before any court or before any other judicial, quasi-judicial or other ULB's, the outcome of which may result in the breach of this Agreement or which individually or in the aggregate may result in any material impairment of its ability to perform any of its obligations under this Agreement;
(h) it has no knowledge of any violation or default with respect to any order, writ,injunction or decree of any court or any legally binding order of any Government Instrumentality which may result in any material adverse effect onits ability to perform its obligations under this Agreement and no fact orcircumstance exists which may give rise to such proceedings that would adversely affect the performance of its obligations under this Agreement;
(i) it has complied with Applicable Laws in all material respects and has not been subject to any fines, penalties, injunctive relief or any other civil or criminalliabilities which in the aggregate have or may have a material adverse effect on its ability to perform its obligations under this Agreement;

(j) no representation or warranty by it contained herein or in any other document furnished by it to the SSCDL or to any Government Instrumentality in relation to Applicable Permits contains or will contain any untrue or misleading statement of material fact or omits or will omit to state a material fact necessary to make such representation or warranty not misleading;

(k) no sums, in cash or kind, have been paid or will be paid, by it or on its behalf, to any person by way of fees, commission or otherwise for securing the contract or entering into this Agreement or for influencing or attempting to influence any officer or employee of the SMC , SSCDL in connection therewith;

(l) all information provided by the {selected bidder/ members of the Consortium} in response to the Request for Qualification and Request for Proposals or otherwise, is to the best of its knowledge and belief, true and accurate in allmaterial respects; and

(m) nothing contained in this Agreement shall create any contractual relationship or obligation between the Surat Smart City Development Limited and any Sub-contractors, designers, consultants oragents of the Contractor.

ARTICLE 5

PERFORMANCE SECURITY AND RETENTION MONEY

5.1Performance Security

5.1.1 The Contractor shall for the performance of obligations here under during the Construction Period shall provide to Surat Smart City Development Limited, within 15 (Fifteen) days from issuance of work order, an irrevocable and unconditional guarantee for an amount equal to 5% (five percent) of the Contract Price from a listed bank in the form set forth in Schedule attached (the "Performance Security"). The such Performance Security deposit shall be valid until 60 (sixty) days after the payment of final bill. Till such Performance Security is obtained from Surat Smart City Development Limited,the EMD will not be released and the said amount of EMD may be forfeited if performance security is not deposited within **15 days** from the date of work order. In addition, Surat Smart City Development Limited shall deduct an amount of 5 % of the amount due from each R.A. Bill as submitted by the Contractor.

On completion of work to the satisfaction of Surat Smart City Development Limited, 5% of the performance security, out of the aforesaid 10% shall be released while, the balance 5% shall be retained by SSCDL toward performance of obligations pertaining to defect liability. For release of this balance 5% of performance security ,a condition precedent and mandatory.The balance 5% of performance security shall be released as per the clause 5.3. It is further agreed that the contractor is obliged to have the Bank Guarentee /Guarantees revalidated at least 30 days prior to the date of the expiry discharged by the SSCDL. For such revalidation SSCDL shall have no obligation to remind the contractor to do so.

5.1.**2 In addition as and when directed additional performance security as indicated Section V clause 27.1 also will be required to be deposited in event of** SSCDL **demanding the same because it finds the offer unbalanced.**

5.1.3 Not withstanding anything to the contrary contained in this Agreement, the Parties agree that in the event of failure of the Contractor to provide the Performance Security in accordance with the provisions and within the time specified therein or such extended period as may be provided by the SSCDL, in accordance with the provisions, the SSCDL may encash the Bid Security and appropriate the proceeds thereof as Damages, and there upon all rights, privileges, claims and entitlements of the Contractor under or arising out of this Agreement shall be deemed to have been waived by, and to have ceased with the concurrence of the Contractor, and this Agreement shall be deemed to have been terminated by mutual agreement of the Parties.

5.1.4 Delay Panalty - 0.065 % per day.

5.2 Extension of Performance Security

The Contractor may initially provide the Performance Security for a period of 2 (two) years; provided that it shall procure the extension of the validity of the Performance Security, as necessary, at least 1 (one) month prior to the date of expiry thereof.

5.3 Release of Performance Security

Initiall performance guarantee will be released as below

- After completion of project

(within 60 days from the date of the final bill payment - 5 %

Remaining performance guarantee will be released as below during defect liability period

- After 3 years of completion - 2.5 %
- After 5 years of completion - 2.5 %

provided that there is no defect detected or rectified /complied as per the direction given by E.I.C ,within the said periods.

However, after the total completion of work & after payment of final bill, the contractor may convert the same to FDR of any Nationalized Bank at Surat in favour of The Chairman Surat Smart City Development Limited, Surat, for 3 years. Provided the contractor shall have to pay additional stamp duty of Rs. 4.25% of F.D.R.

The SSCDL shall return the 5% Performance Security as per above break up to the Contractor within 60 (sixty) days of the date of the expiry of the Maintenance Period or the Defects Liability Period under this Agreement. Not withstanding the aforesaid, the Parties agree that the SSCDL shall not be obliged to release the Performance Security until all Defects identified during the Defects Liability Period have been rectified. SSCDL shall have no liability in event of any delay caused in release/ return of the performance security on any ground what so ever.

5.4 Retention Money

5.4.1 From every payment for Works due to the Contractor in accordance with the provisions, the SSCDL shall deduct 7% (seven per cent) there of as guarantee money for performance of the obligations of the Contractor during the Construction Period.

5.4.2 Upon occurrence of a Contractor's Default, the Surat Smart City Development Limited shall, without prejudice to its other rights and remedies here under or in law, be entitled to appropriate the relevant amounts from the Retention Money as Damages for such Contractor's Default.

5.4.3 The Contractor may, upon furnishing an irrevocable and unconditional bank guarantee valid for 2 years and to be extended from time to time as per direction of SSCDL substantially in the form provided , require the SSCDL to refund the Retention Money deducted by the SSCDL under the

provisions. The refund hereunder shall be made intranches of not less than 1% (one per cent) of the Contract Price.

5.4.4 The Retention money will released with payment of Final Bill.

ARTICLE 6
RIGHT OF WAY

6.1 The Site

The site of the Work (the "Site") shall comprise the site described in contract in respect of which the Right of Way shall be provided by the Surat Smart City Development Limited to the Contractor.

6.2 Special/temporary Right of Way

The Contractor shall bear all costs and charges for any special or temporary right of way required by it in connection with access to the Site. The Contractor shall obtain at its cost such facilities on or outside the Site as may be required by it for the purposes of the Work and the performance of its obligations under this Agreement.

6.3 Access to the Employer and his Engineer

6.3.1 The Right of Way given to the Contractor hereunder shall always be subject to the right of access of the SSCDL and the SSCDL'S Engineer and their employees and agents for inspection, viewing and exercise of their rights and performance of their obligations under this Agreement.

6.3.2 The Contractor shall ensure, subject to all relevant safety procedures, that the SSCDL has un-restricted access to the Site during any emergency situation, as decided by the SSCDL 's Engineer.

6.4 Geological and archaeological finds

It is expressly agreed that mining, geological or archaeological rights do not form part of this Agreement with the Contractor for work, and the Contractor hereby acknowledges that it shall not have any mining rights or interest in the underlying minerals, fossils, antiquities, structures or other remnants or things either of particular geological or archaeological interest and that such rights, interest and property on or under the Site shall vest in and belong to the Surat Smart City Development Limited or the concerned Government Instrumentality. The Contractor shall take all reasonable precautions to prevent its workmen or any other person from removing or damaging such interest or propertyand shall inform the Surat Smart City Development Limited forthwith of the discovery thereof and comply with such instructions as the concerned Government Instrumentality may reasonably give for the removal of such property. For the avoidance of doubt, it is agreed that any reasonable expenses incurred by the Contractor hereunder shall be reimbursed by the Surat Smart City Development Limited. It is also agreed that the Surat Smart City Development Limited shall procure that the instructions hereunder are issued by the concerned Government Instrumentality within a reasonable period.

ARTICLE 7
UTILITIES AND TREES

7.1 Existing utilities and roads

Not withstanding anything to the contrary contained herein, the Contractor shall ensurethat the respective entities owning the existing roads, right of way, level crossings,structures, or utilities on, under or above the Site are enabled by it to keep them incontinuous satisfactory use, if necessary, by providing suitable temporary diversions with the Surat Smart City Development Limited of the controlling body of that road, right of way or utility.

7.2 Shifting of obstructing utilities

The Contractor shall, in accordance with Applicable Laws cause shifting of utility (including electric lines, water pipes and telephone cables) to an approved location or alignment. Contractor shall not be paid separately for the same.

7.3 Felling of trees

The SSCDL shall assist the Contractor in obtaining the Applicable Permits for felling of trees to be identified by the SSCDL for this purpose if and only if such trees cause a Material Adverse Effect on the construction or maintenance of the Work. The cost of such felling shall be borne by the contractor. The Parties here to agree that the felled trees shall be deemed to be owned by the and shall be disposed in such manner and subject to such conditions as the SSCDL may in its sole discretion deem appropriate. For the avoidance of doubt, the Parties agree that if any felling of trees hereunder is in a forest area, the Applicable Permit thereof shall be procured by the SSCDL within the time specified in the Agreement.

ARTICLE 8
DESIGN AND CONSTRUCTION OF THE WORK

8.1 General Design Obligations

8.1.1 The Contractor shall carry out, and be responsible for, the design of work. Design shall be prepared by qualified designers who are Engineer or other professionals who comply with the criteria (if any) stated in the Bidding Data. Unless otherwise stated inthe Contract, the Contractor shall submit to the Engineer for consent the name and particulars of each proposed designer and design Consultant.

8.1.2 The Contractor warrants that he, his design consultant have the experience and capability necessary for the design. The Contractor undertakes that the designers shall be available to attend discussions with the Engineer's Representative at all reasonable times, until the expiry date of the relevant Defects Notification Period.

8.1.3 Contractor shall submit detailed calculations, Drawings & designs for review of the Engineer,Design and drawings shall be developed in conformity with the Employers requirement and specifications and standards set out in the contract. Such design shall have to meet the approval requirement of the designated authority of State Government and shall be responsible for obtaining final approval from the approving authority.

8.2 Design and Drawings

Submission of Design and Drawings:

within 15 days from the Commencement Date the Contractor shall start submiting designs, drawings, construction documents, etc., for review and approval by the Employer's Representative. **Contractor shall prepare detail Programme for same and get it approved from Employer - SSCDL.** The Contractor shall submit all the Drawings and Design as per Schedule approved by the Employer.

- **Structural drawings will be submitted by the agency as per schedule approved by SSCDL, which** will be got proof checked from the Structural designer/institutions appointed by SSCDL / SMC. All service plans should be got approved from the concern-Government Authority/department/consultant. It is entirely the responsibility of the contractor to get the above designs approved and finalized within aforesaid period. Any delay on this account will attract penaltative actions as decided by E.I.C/SSCDL.

- Contractor has to submit all the drawings related to all services like, Road & paver block, Utility Trench, water supply line, drainage line , , SW drains etc. & get it approved from the EIC/PMC/Consultant before execution.

- The contractor(s) shall supply 2 copies of / laminated approved structural drawings/architectural drawings to the Engineer-in-charge for the use of the Surat Smart City Development Limited after having approved from the competent authority within 7 days from the receipt of approval. And the contractor(s) shall supply required copies / laminated copies approved structural drawings/architectural drawings to the PMC/TPI/Consultants.

- In addition to above sets of drawings, contractor shall keep necessary sets of drawings required at site for its execution as directed by the Engineer-in-charge.

- It is entirely the responsibility of the contractor to get the design approval, within aforesaid period with liaisoning for the, water supply & drainage work, electrical work,.,Enviroment N.O.C., with appropriate organization, not limited but includes all essential Certificates-approvals-licences-NOC related to complete the project. Any delay on this account will attract penalty

8.2.1 Design and Drawings shall be developed in conformity with the Specifications and Standards. In the event, the Contractor requires any relaxation in design standards due to restricted Right of Way in any section, the alternative design criteria for such sectionshall be provided for review of the SSCDL's Engineer.

8.2.2 In respect of the Contractor's obligations with respect to the design and Drawings of work, the following shall apply:

(a) The contractor shall submit structural drawings

(b) After submission of structural drawings.Within 15 (fifteen) days of the receipt of the Drawings, the SSCDL's shall review the same by its proof check consultant and convey its observations if any to the Contractor with particular reference to their conformity or otherwise with the Scope of the Project and the Specifications and Standards. The Contractor shall not be obliged to await the observations of the SSCDL's on the Drawings submitted pursuant here to beyond the period of 15 (fifteen) days and may begin or continue Works at its own discretion and risk;

(c) if the aforesaid observations of the SSCDL's indicate that the Drawings are not in conformity with the Scope of the Project or the Specifications and Standards,such Drawings shall be revised by the Contractor in conformity with the provisions of this Agreement and resubmitted to the SSCDL for review. The SSCDL shall give its observations, if any, within 10 (ten) days of receipt of the revised Drawings.

(d) no review and/or observation of the SSCDL's Engineer and/or its failure to review and/or convey its observations on any Drawings shall relieve the Contractor of its obligations and liabilities under this Agreement in any manner nor shall the SSCDL's Engineer or the Employer be liable for the same in any manner; and if errors,omissions, ambiguities, inconsistencies, inadequacies or other Defects are found in the Drawings, they and the construction works shall be corrected at the Contractor'scost, not withstanding any review;

(e)the Contractor shall be responsible for delays in submitting the Drawing as set forth caused by reason of delays in surveys and field investigations, and shall not be entitled to seek any relief in that regard from the SSCDL ; and

(f) the Contractor warrants that its designers, including any third parties engaged by it,shall have the required experience and capability in accordance with Good Industry Practice and it shall indemnify the SSCDL against any damage, expense, liability,loss or claim, which the SSCDL might incur, sustain or be subject to arising from any breach of the Contractor's design responsibility and/or warranty set out in this Clause.

8.2.3 Any cost or delay in construction arising from review by the SSCDL's Engineer shall be borne by theContractor.

8.2.4 Within 90 (ninety) days of the Project Completion Date, the Contractor shall furnish to the SSCDL and the SSCDL's Engineer a complete set of as-built Drawings, in 3 (Three) hardcopies and in micro film form or in such other medium as may be acceptable to the SSCDL, reflecting work as actually designed, engineered and constructed.

8.2.5 Contractors clearly understand that not withstanding all the statements above including its responsibility in respect of designs and drawings confirming to the requirements and relevant specifications, being checked and approved by proof checking agency as also having been scrutinized by Surat Smart City Development Limited, it is responsibility of the contractors that the final approval before commencement of execution shall have to be based on the drawings and design cleared and approved by the concerned authority of Government of Gujarat.All Designs and drawings shall be furnished to SSCDL in 5 copies.

8.3 Design Error

8.3.1 If errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the Contractor's documents, they and work shall be corrected at the Contractor's cost, not withstanding any consent or approval under this Clause.

8.4 Intellectual property rights

8.4.1 The intellectual property rights in respect of drawings, designs and all that is relevant to the concept of rights shall be vested in SSCDL.

8.5 Construction of the Work

8.5.1 The Contractor shall construct the works as specified, and in conformity with the Specifications and Standards set forth in the contract. The Contractor shall be responsible for the correct positioning of all parts of work, and shall rectify any errorin the positions, levels, dimensions or alignment of work. and the Contractor agrees and undertakes that the construction shall be completed on or before the scheduled Completion Date, including any extension thereof.

8.5.2 The total price of the works shall be the price as indicated in the offer acceptance letter unless the same is modified or changed by Surat Smart City Development Limited in view of any modification or change brought about after final approval of drawing, design and scheme of the work. It is clearly understood that the price quoted is the total per unit D.U price for the entire scope ofthe work as agreed.

8.6 Construction Programme

The contractor shall submit a detailed programme within 15 days after receiving the letter of acceptance. Whenever necessary contractor shall also submit a revised programme indicating how he plans to catch up with the slippages. Each programme shall include the order in which he intends to carry out the work including the anticipated timing of each stage of design, procurement, deployment of resources and quantities involved. The programme will be projected as Bar Chart / CPM – Net work presentation. Contractor shall promptly give notice of probable future events or circumstance which may adversely affect the work. The programme should include deployment of financial resources commensurate with the work planned each month.If at any time actual progress is too slow to achieve target programme and/or progress has fallen behind the current programme then the engineer may instruct the contractor to submit revised programme with plan to mitigate time.

8.7 Extension of time for completion

8.7.1 The work shall have to be completed within originally stipulated period as indicated in the contract. Time is essence of contract and failure to adhere to the time of completion shall attract liability for the contractor to pay Liquidated Damages as specified separately. However it has been agreed between the parties that in event of any variation or change taking place affecting the time of completion, time adjustment shall be made by Surat Smart City Development Limited for which no additional cost will be payable. Such time extension shall ordinarily be for exceptionally adverse

climatic conditions, enforceable shortage in availability of materials or any delay, impediment or prevention caused byor attributable to the SSCDL.

8.7.2 If contractor considered himself to be entitled to an extension of time for completion,the contractor shall give engineer a notice within 7 days from the cause justifying such extension indicating the period justified. The engineer of SSCDL shall evaluate the Time Impact and make an adjustment in time for completion. Such extension, it is reiterated shall not be associated with any compensation or claim for delay being pressed by the contractor.

8.8 Liquidated Damage/Delay Damages

If contractors fails to comply with time for completion the contractor being given notice to make good the time fails to do so to the satisfaction of engineer he shall be liable to pay LD/Delay Damages for the default. The Delay Damages shall be the sum stated in Bidding data which shall be payable for delay for each day that is caused incompletion. The total amount of such delay damages shall not exceed the amount named in the contract. It is agreed between the parties that the amount so named and the limit so fixed as compensation is the true and correct estimated damage caused to Surat Smart City Development Limited resulting from extension of time and which otherwise is not subject to any arithmetic computation. These damages shall not release the contractor from its obligation to complete the job or from any duties or responsibilities which he may have under the contract.

ARTICLE 9

QUALITY ASSURANCE, MONITORING AND SUPERVISION

9.1 Quality of Materials and workmanship

The Contractor shall ensure that the Construction, Materials and workmanship are in accordance with the requirements specified in this Agreement, Specifications and Standards and Good Industry Practice.

9.2 Quality control system

9.2.1 The Contractor shall establish a quality control mechanism to ensure compliance with the provisions of this Agreement (the “Quality Assurance Plan” or “QAP”).

9.2.2 The Contractor shall, within 30 (thirty) days of the commencement Date, submits to the SSCDL’s Engineer its Quality Assurance Plan which shall include the following:

(a) organisation, duties and responsibilities, procedures, inspections and documentation;

(b) quality control mechanism including sampling and testing of Materials, test frequencies, standards, acceptance criteria, testing facilities, reporting, recording and interpretation of test results, approvals, check list for site activities, and proforma for testing and calibration in accordance with Good Industry Practice;and

(c) Internal quality audit system.

The SSCDL's Engineer shall convey its comments to the Contractor within aperiod of 21 (twenty-one) days stating the modifications, if any, required, and the Contractor shall incorporate those in the QAP to the extent required for conforming with the provisions in the contract.

9.2.3 The Contractor shall procure all documents, apparatus and instruments, fuel,consumables, water, electricity, labour, Materials, samples, and qualified personnel as are necessary for examining and testing the Project Assets and workmanship inaccordance with the Quality Assurance Plan.

9.2.4 The cost of testing of Construction, Materials and workmanship shall be borne by theContractor.

9.3. Methodology

9.3.1 The Contractor shall, at least 15 (fifteen) days prior to the commencement of the construction, submit to the SSCDL's Engineer for review the methodology proposed to be adopted for executing work, giving details of equipment to be deployed, traffic management and measures for ensuring safety. The SSCDL's Engineer shall complete there view and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

9.4. Inspection and technical audit by the SSCDL

9.4.1 The SSCDL or any representative authorised by the SSCDL in this behalf may inspect and review the progress and quality of the construction of Work and issue appropriate directions to the SSCDL's Engineer and the Contractor for taking remedial action in the event work are not in accordance with the provisions of this Agreement.

9.5 External technical audit

9.5.1 At any time during construction, the SSCDL may appoint an external technical auditor to conduct an audit of the quality of work. The findings of the audit, to the extent accepted by the SSCDL shall be notified to the Contractor and the SSCDL's Engineer for taking remedial action in accordance with this Agreement. The Contractor shall provide all assistance as may be required by the auditor in the conduct of its audit here under. Not withstanding anything contained in the contract, the external technical audit shall not affect any obligations of the Contractor or the SSCDL's Engineer under this Agreement.

9.6 Inspection of construction records

9.6.1 The SSCDL shall have the right to inspect the records of the Contractor relating to work.

9.7 Monthly progress reports

9.7.1 During the Construction Period, the Contractor shall, no later than 10 (ten) days after the close of each month, furnish to the SSCDL a monthly reporton progress of work in the format approved by SSCDL's engineer and shall promptly give such other relevant information as may be required by the SSCDL's Engineer.

9.8 Inspection

9.8.1 The SSCDL's Engineer and its authorised representative shall at all reasonable times:

(a) have full access to all parts of the Site and to all places from which natural Materials are being obtained for use in work; and

(b) during production, manufacture and construction at the Site and at the place of production, be entitled to examine, inspect, measure and test the Materials and workmanship, and to check the progress of manufacture of Materials.

9.8.2 The Contractor shall give the SSCDL's Engineer and its authorised agents access,facilities and safety equipment for carrying out their obligations under this Agreement.

9.8.3 The Contractor shall submit a monthly inspection report (the "Inspection Report") to the SSCDLand the Contractor bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. For the avoidance of doubt, such inspection or submission of Inspection Report by the Contractor shall not relieve or absolve the Contractor of its obligations and liabilitiesunder this Agreement in any manner whatsoever.

9.9 Samples

9.9.1 The Contractor shall submit the following samples of Materials and relevant information to the SSCDL's Engineer for pre-construction review:

(a) manufacturer's test reports and standard samples of manufactured Materials; and

(b) samples of such other Materials as the SSCDL's Engineer may require.

9.10 Tests

9.10.1 For determining that work conform to the Specifications and Standards, the SSCDL's Engineer shall require the Contractor to carry out or cause to be carried out tests, at such time and frequency and in such manner as specified in this Agreement, and in accordance with Good Industry Practice for quality assurance.

9.10.2 In the event that results of any tests conducted establish any Defects or deficiencies in work, the Contractor shall carry out remedial measures and furnish a report to the SSCDL's Engineer in this behalf. The SSCDL's Engineer shall require the Contractor to carry out or cause to be carried out tests to determine that such remedial measures have brought work into compliance with the Specifications and Standards, and the procedure shall be repeated until such Works conform to the Specifications andStandards.

9.10.3All expenditure including travel, lodging boarding of SSCDLEngineers and/or its representatives shall be borne by the contractor.

Testing of materials:

When required by the Engineer-in-charge the contractor(s) shall supply for the purpose of testing samples of all materials proposed to be used in the works. Samples submitted either to govern bulk supplies or required for testing before use shall be in suitable packages to contain them and shall be provided free of charge by the contractor. The cost of testing shall be borne by the contractor even if the result of the sample confirm or do not confirm to the relevant BIS code and specifications.

(i)The test certificates regarding its property including indication of its Thermo-Mechanically treated must accompany every lot and shall be submitted to SURAT SMART CITY DEVELOPMENT

LIMITED before utilizing the same. Unless and until such certificate is submitted, the steel procure at site will not be allowed to be used.

(ii) All expenditure required to be incurred for taking the samples conveyance, packing shall be borne by the contactor himself.

(iii)The failed material shall be removed from the site by the contractor at his own cost within a week time of written order of the Engineer-in-charge.

9.11 ACTION AND COMPENSATION IN CASE OF BAD WORKMANSHIP :

If it shall appear to the Engineer-in-charge that any work has been executed with materials of inferior description, or quality or are unsound or with unsound imperfect or unskilled workmanship or otherwise not in accordance with the contract shall, no demand in writing from Engineer-in-charge or his authorised representative specifying the work, materials or articles compained of, not withstanding that the same may have been inadvertantly passed, certified and paid for forthwith rectify or remove and reconstruct the work, specified and in the event of failure to do so within a period to be specified by Engineer- in-charge in his aforesaid demand, contractor shall be liable to pay compensation at the rate of one (1) percent of the tendered cost of work for every Ten (10) days limited to a maximum of Ten (10%) Percent of the value of work while his failure to do so continue and in the case of any such failure the Engineer-in- charge may on expiry of the notice period rectify and remove and re-execut the work or remove and replace with other at the risk and cost of the Contractor. The decision of the Engineer-in- charge as to any question arising under this clause shall be final and conclusive.

STANDARD NORMS FOR QUALITY CONTROL

Sr No	Test		Frequency of tests as per I.S.	Acceptance Criteria
1	**Cement**			
a)	Setting time initial		50 -100 T- 2 sample	Not less than 30 minutes
	Final		100-200 T-3 sample	Not more than 600 minutes
			200-300 T-4 sample	
			300 - 500 T-5 sample	
			500- 800 T-6 sample	
			810- 1300 T-7sample	
b)	Fineness by Sieve		1 in 5 samples	90% passed from 90micron sieve
c)	Consistency		One sample(Each sample asabove)	Above 30 percent
d)	Compressive		One sample(Each sample	160 kg / cm2 for OPC & PPC on thirdday

	strength		asabove	
				220 kg / cm2 for OPC & PPC on seventh day
				310 kg / cm2 for OPC & PPC on twenty eight day
e)	Fineness test through Specific surface		1 in 5 samples	2250 kg/Cm2 and above for OPC FOR PPC 3000 kg/Cm2
f)	Chemical AnalysisIS 4032-986		1 in 5 samples	Mgo less than 6 percentSO3 less than 2.75 percentless on ignition upto 5 percent
2	**Sand**			
a)	Silt Content		1 sample of 10 kg/150 cu. mt.	Up to 3 percent
b)	Fineness modulus		- Do-	Specification as per specified standard. No sand of fourth zone shall be used.
3	**Kapachi - Grit for Bituminous work**			
a)	Gradation		1/200 m3	
b)	Flakiness index		1/200 m3	Max 30 %
c)	Impact		1/100 m3	Max 30 %
d)	Abrasion		1/100 m3	Max 35 %
e)	Bit. Extraction		100 MT - 1	0.80 to 4 %
f)	Bitumin (penetration test)		100 MT - 1	
g)	Stripping value		50 -100 m3 one test	Max. 25 %
3	**Kapachi - Grit for Building work**			As per IS 183-1970 standards
a)	Gradation		2 test / Season	As per relevant specifications provision
b)	Impact		2 test / Season	wearing surface overlaid surface (IS18.5-1972)30 % 45 %
c)	Abrasion		2 test / Season	30 % 5 %
d)	Soundness		2 test / Season	Loss with Loss with
4	**Bricks**			
a)	Efflorescence		20 bricks out of 2000	Moderate
			32 bricks out of 3500	
			50 bricks out of 50000	
b)	Water absorption		-DO-	Less than 20 Percent
c)	Compressive strength		-DO-	Minimum average 35 Kg/cm2 & individual result may fall below up to 20 percent
5	**Cement Concrete flooring/Mosaic tiles**			
a)	Water absorption		6 tiles /2000 tiles	Maximum 10 percent
b)	Transversestrength		12 tiles /2000 tiles	Wet Dry
				80 Kg/cm2 120 Kg/cm2

c)	Abrasion		6 tiles /2000 tiles		Average wear shall not exceed 3.5 mm		
6	**Water Chemical Analysis**		Once for approval source				
a)	PH		"		6 to 8		
b)	Chlorides		"		2000 mg/L (PCC) & 500 mg/L for RCC		
c)	Organic (matter)		"		200 mg/L Max.		
d)	Inorganic (matter)		"		3000 mg/L Max.		
e)	Sulphate (mg/L)		"		500 mg/L Max.		
f)	TDS		"		2000 mg/L Max.		
7	**Cement Concrete cubes ordinary and controlled concrete**	As per IS 456-2000			Gradedesignation	Specified characteristic cube compressive strength. At 28 days N/mm2	
		work m3	No. ofsample		M10	10	
		1-5 m3	1		M15	15	
		6-15 m3	2		M20	20	
		16-30 m3	3		M25	25	
		31-50 m3	4		M30	30	
		51 m3 & above	4+ one		M35	35	
		add sample for each50 m3 part there of			M40	40	
	ordinary andcontrolled concrete for road bridge	suces /60m3 eachfor 7 and 28 daysfurther that everyday for first six daysand once inthree days there after.	Average compressive strength of each day should notbe less than specified strengths subject to that 20% cubes per day (i.e.) 1 per 5 may fall below specified strength up to its 85 percent				
8	**Steel**						
a)	Mild steel bar	1 test /40 MT	Nominal dia of bars in mm	Ultimate tensile StrengthKg/cm2	Yieldstress	Elongation (in%)	
			0-20	42	26	23	
			20-40	42	26	23	
			over 40	42	26	23	
			Allsize	49.5	42.5	14.5	
b)	TMT bars		Fe-500 Quenched and Tempered (TMT) bars of different diameters satisfying IS : 1786, with Yield stress > 500 N/mm2 , Tensile strength > 545 N/mm2 And elongation more than 12.00 %				
c)	steel for generalstructural purpose specification IS 2062-1992		Gr.A Fe410 WS 410 N/mm2(All size) Gr.B. Fe410 WB 410 N/mm2(All size) Gr.C. Fe410 WC 410 N/mm2(All size)				

d)	steel wires forprestressedconseteIS 1785 part-1 19 lab		8.0 140 Kg/mm2 7.0 150 Kg/mm2 5.0 160 Kg/mm2 4.0 175 Kg./mm2 3.0 190 Kg./mm2
			85 % the minimum specific tensiled strength
9	**Teakwood**	As per LOT	
a)	Colour		
b)	Hardness		
c)	Density		
d)	Weight		
e)	Moisture cement		
f)	Porosity		
g)	Rasin		
h)	I.D. Mark		
10	All Other Material	As suggested by Consultant/EIC/ TPIas per relevant IS code	

NOTE :

(1) For Sand and Coarse aggregate two Nos. of full bag for one sample shall be supplied by agency.

(2) For water test 5:00 liters of water shall be supplied by agency in plastic container for each sources.

(3) Sample from the lot shall be selected by authorized representative along with representative of SSCDLor TPI or PMC.

(4) Selected sample shall be handed over personaly by representative of SSCDL. or TPI or PMC in sealed condition with letter containing sample No. and sampling date.

(5) Test report should be received by the department containing reference of department's letter, sample No. sampling date and date of testing.

(6) Tests as may be directed by Engineer in charge as shown above shall have to be Conducted

(7) Above mentioned all the tests of the materials and others shall be carried out for in construction of each and every different lot in External Laboratory.

LIST OF APPROVED LABORATORY

Sr.no	Name	Address
1	Gujarat Engineering Research Institute (GERI)	Katargam ,Surat.
2	Unique Engineering Testing & Adviosry Service	216, road 6F, New Estate, Udhyog nagar, Udhna, Surat, Gujarat 394210
3	Bhoomi researchCentre	2/1362, "Bhumi House", Sagrampura, Opp. Sub-Jail, Ring Road,, Surat, 395005

4	SVNIT	Ichchhanath,Surat.
5	Vidyabharti Trust Intstitute of Technology and Research Center	Umrakh,Bardoli, Surat, Gujarat 394345

Note : During course of the execution if any other laboratory is approved by SSCDL, the contractor can send the material in that laboratory also. The frequency for testing of samples (in either of the laboratories) shall be decided by SSCDL/E.I.C.

9.11 Examination of work before covering up

In respect of the work which the SSCDL's Engineer is entitled to examine, inspect,measure and/or test before it is covered up or put out of view or any part of the work isplaced thereon, the Contractor shall give notice to the SSCDL's Engineer whenever any such work is ready and before it is covered up. The SSCDL's Engineer shall then either carry out the examination, inspection or testing without unreasonable delay or promptly give notice to the Contractor that the SSCDL's Engineer does not require to do so. Provided, however, that if any work is of a continuous nature where it is not possible or prudent to keep it uncovered or incomplete, the Contractor shall notify the schedule of carrying out such work to give sufficient opportunity, not being less than 3(three) business days' notice, to the SSCDL's Engineer to conduct its inspection,measurement or test while the work is continuing. Provided further that in the event the Contractor receives no response from the SSCDL's Engineer within a period of 3 (three) business days from the date on which the Contractor's notice hereunder is delivered to the SSCDL's Engineer, the Contractor shall be entitled to assume that the SSCDL's Engineer would not undertake the said inspection.

9.12 Rejection

9.12.1 If, as a result of an examination, inspection, measurement or testing, any Plant,Materials, design or workmanship is found to be defective or otherwise not in accordance with the provisions of this Agreement, the SSCDL's Engineer shall reject the Plant, Materials, design or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the Defect and ensure that there placed item complies with the requirements of this Agreement.

9.12.2 If the SSCDL's Engineer requires the Plant, Materials, design or workmanship to be retested, the tests shall be repeated under the same terms and conditions, as applicablein each case. If the rejection and retesting cause the SSCDLto incur any additional costs,such cost shall be recoverable by the SSCDL's from the Contractor; and may be deducted by the SSCDLfrom any monies due to be paid to the Contractor.

9.13 Remedial work

9.13.1 Not withstanding any previous test or certification, the SSCDL's Engineer may instruct the Contractor to:

(a) remove from the Site and replace any Plant or Materials which are not in accordance with the provisions of this Agreement;

(b) remove and re-execute any work which is not in accordance with the provisions of this Agreement and the Specification and Standards; and(c) execute any work which is urgently required for the

safety of the Work, whether because of an accident, unforeseeable event or otherwise; provided that in caseof any work required on account of a Force Majeure Event.,

9.13.2 If the Contractor fails to comply with the instructions issued by the SSCDL's Engineer,within the time specified in the SSCDL's Engineer's notice or as mutually agreed, the SSCDL's Engineer may advise the SSCDL to have the work executed by another agency.The cost so incurred by the SSCDL for undertaking such work shall, without prejudice to the rights of the SSCDL's to recover Damages in accordance with the provisions of this Agreement, be recoverable from the Contractor and may be deducted by the SSCDL's from any monies due to be paid to the Contractor.

9.14 Quality control records and Documents

The Contractor shall hand over to the SSCDL's Engineer a copy of all its quality control records and documents before the Completion Certificate is issued.

9.15 Video recording and Photography

During the Construction Period, the Contractor shall provide to the SSCDLfor every calendar quarter, photographs and a video recording, which will be compiled into a 3(three)-hour compact disc or digital video disc, as the case may be, covering the status and progress of Works in that quarter. The video recording shall be provided to the SSCDLno later than 15 (fifteen) days after the close of each quarter after the commencement date.

9.16 Suspension of unsafe Construction Works

9.16.1 In event its come to the notice of SSCDLany impending risk to the work or the personnel on and around the project site, the SSCDL may by notice require the Contractor to suspend forthwith the whole or any part of work if, in the reasonable opinion of the SSCDL's Engineer, such work threatens the safety of the Users and pedestrians.

9.16.2 The Contractor shall, pursuant to the notice under contract, suspend work or any part there of for such time and in such manner as may be specified by the SSCDL and thereupon carry out remedial measures to secure the safety of suspended works, the Users and pedestrians. The Contractor may by notice require the SSCDL's Engineer to inspect such remedial measures forthwith and make a report to the SSCDL recommending whether or not the suspension hereunder may be revoked. Upon

receiving the recommendations of the SSCDL's Engineer, the SSCDL shall either revoke such suspension or instruct the Contractor to carry out such other and further remedial measures as may be necessary in the reasonable opinion of the SSCDL, shall be repeated until the suspension hereunder is revoked.

9.16.3 All costs incurred for maintaining and protecting work or part thereof during the period of suspension shall be borne by the Contractor; provided that if the suspension has occurred as a result of any breach of this Agreement by the SSCDL, the Costs shall be borne by the SSCDL. However cost for maintaining and protecting the work for first 30 days, in any event shall be borne by Contractor irrespective of SSCDL bringing aboutthe suspension for its own convenience. The

quantum of cost for maintenance and protection of the work when payable to the contractor shall be subject to approval of SSCDL engineer.

9.16.4 If suspension of Works is for reasons not attributable to the Contractor, the SSCDL'S Engineer shall determine any Time Extension to which the Contractor is reasonably entitled.

9.17 Setting of site Laboratories:

The contractor shall install testing equipment at site. The contractor shall ensure and certify the calibration of the equipment so installed and shall maintain the same in working order throughout the period of construction. The contractor shall also provide necessary trained staff for carrying out such tests for using such equipment. The tests shall be carried out under the supervision of the Engineer-in-charge/PMC/TPI.

9.18 Instructions for Composite Contract:

It will be obligatory on the part of the tenderer to sign the tender documents for all the components. (The schedule of quantities, conditions and specials conditions etc.).

In case of breakage of any existing service lines, it shall be immediately attended by the contractor failing which SSCDL has full liberty to get work done at the cost and risk of the contractor over and above repairing charges, penalty as decided by the Engineer in charge shall be imposed and deducted from Bill of the contractor.

9.19 Condition for Cement:

9.19.1 Cement required for the work shall be procured by the contractor.

The contractor shall procure, only Ordinary Portland Cement (conforming to IS:8112). This procurement shall be from reputed manufacturers of cement having a production capacity of one million tons per annum or more as approved by Ministry of Industry, Government of India and holding license to use IS certification make for their product whose name shall be got approved from Engineer-in-charge. Supply of cement shall be taken in 50 Kg. bags bearing manufacturer's name or his registered trademark, if any and grade and type of cement as well as IS marking.

9.19.2 The account of daily receipt and issue of cement shall be maintained in a register in the prescribed Performa and signed daily by the contractor or his authorized agent in token of its correctness.

9.19.3 Samples of cement arranged by the contractor shall be taken by the Engineer-in-charge and got tested in accordance with provisions of relevant BIS Code. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS codes the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-charge.

9.19.4 The contractor shall supply free of charge the cement required for testing. The cost of testing charges shall be borne by the contractor.

9.19.5 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained.

9.19.6 For non-scheduled items, the decision of the Executive Engineer regarding theoretical quantity of cement which should have been actually used shall be final and binding on the contractor.

9.19.7 Cement brought to site and remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-charge.

9.20 Condition for Steel:

(a) The contractor shall procure steel reinforcement of Thermo Mechanically Treated TMT/CRS Bars Fe-500 conforming to IS-1786:1985(reaffirmed 2004). The contractor shall have to submit documentary proof to the satisfaction of the Engineer-in-charge of having procured the steelre inforcement. The contractor shall have to obtain and furnish test certificates to the Engineer-in-charge and get tested in accordance with provision of relevant specifications. In case, test results indicate that the steel arranged by the contractor does not confirm to the specifications, the same shall stand rejected and shall be removed from the site of work by the contractor at his own cost within 7 days of written order from the Engineer-in-charge to do so.

(b) The steel reinforcement bars shall be brought to the site in bulk supply of 10 tons or more or as directed by the Engineer-in-charge.

(c) The steel reinforcement shall be stored by the contractor at site of work in such a way as toprevent distortion and corrosion and nothing extra shall be paid on this account. Bars ofdifferent sizes and lengths shall be stored separately to facilitate easy counting and checking.

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

Size of Bar.	For consignment below100 tons	For consignment above100 Tons.
Under 10mm dia bars	One sample for each 25tons or part thereof.	One sample for each 40tons or part thereof.
10mm to 16mm dia. Bars	One sample for each 35 tonsor part thereof.	One sample for each 45tons or part thereof.
Over 16mm dia bars	One sample for each 45 tonsor part thereof.	One sample for each 50tons or part thereof.

The contractor shall supply free of charge the steel required for testing. The cost of tests shall be borne by the contractor.

e) Steel brought to site and steel remaining unused shall not be removed from site without the written permission of Engineer-in-charge.

f) Every care should be taken to avoid mixing different types of grades of bars in the same structural members as main reinforcement to satisfy relevant latest IS Codes. In case of buildings wherever the situation necessitates the changeover shall be made only from anyone level onwards. In case of foundation, all foundation elements (footing and grade beams)shall have the same kind of steel. In case of columns all structural elements up to the level of change where the changeover is taking place should have the same kind of steel as those in columns,

g) The reinforcing steel brought to site of work, shall be stored on brick / timber platform of 30/40cm. height. Nothing extra shall be paid on this account.

f) During the execution of work contractor should maintained BAR BENDING SCHEDULE (BBS).

9.21 Condition for water:

a) The contractor shall make his own arrangement for providing water for construction and drinking purpose. Contactor shall get the water tested from any approved laboratory of SSCDL as per direction of Engineer-in-Charge at regular interval All expenses towards collection of samples, packing, transportation and testing charges etc. shall be borne by the contractors.

b) The contractor shall arrange at his own cost and nothing extra shall be paid to the contactor on this account. The water shall be got tested at SMC / SSCDL laboratory**.**

c) In the event of any difference of opinion among site representatives in carrying out the item of work in accordance with the agreement the Engineer-in-charge shall decide the issue and his decision shall be final and binding on the contactor and the contactor shall be bound to carry out the instruction to complete work in time. At no point of time the contractor shall stop execution of the work on any ground what so ever.

9.22 WORK IMPLEMENTATION :

SERVICES FOR MANAGEMENT OF PROJECT

The Services for management of project will include planning, scheduling monitoring progress reporting, quality assurance and quality control and overall Project Management functions. Contractor shall nominate Project Manager who will be responsible for the total scope of work under this contract and shall respond to SURAT SMART CITY DEVELOPMENT LIMITED and EIC and/or their representative.

The Contractor is expected to execute the work services under this contract on TASK FORCE concept with a dedicated team of specialists –Experienced persons, who will be responsible and

respond to the Project Manager. The Task Force shall be so organized as to give effective management and control of various services to the Project Manager.

9.22.1. PROJECT PLANNING :

a) CONTRACTOR shall provide additional resources whenever the scheduling shown on the **BAR CHART/ S Curve** indicates a possible delay in the completion date. Such additional effort may require an increase in equipment and/or personnel and / or work in excess of the normal working time. All extra costs incurred by the CONTRACTOR in order to prevent a possible delay in the completion date will be to CONTRACTOR's account.

b) CONTRACTOR shall notify the E.I.C. within 24 hours after any occurrence which will adversely affect the completion date of the project. In addition, the Contractor shall include statement of proposed remedial action for expediting these items.

c) While preparing network diagrams, monsoon period from June mid to September mid shall be kept in view. Internal roads, drains and other civil works should be planned such that rains do not have impact on the progress of the Work.

d) BAR CHART should be supported by resource based network for proper planning, monitoring, and control of the project execution, keeping the overall schedule unchanged.

e) A joint programme of execution of WORK will be prepared by the Engineer-in-Charge and CONTRACTOR which will take into account the Time Schedule of completion.

f) Monthly / weekly construction programme will be drawn up by Engineer-in-Charge/CONSULTANT jointly with the CONTRACTOR based on availability of work fronts. The CONTRACTOR shall scrupulously adhere to these Targets / programme by deploying adequate personnel and construction tools and tackles and he shall also supply all materials included his scope of supply in time to achieve the targets set out in the weekly and monthly programmes. In all matters concerning the extent of targets set out in the weekly and monthly programmes/targets and the degree of achievements, the decision of the Engineer-in-Charge / CONSULTANT shall be final and binding on the CONTRACTOR.

9.22.2 PROGRESS REPORTS DURING CONSTRUCTION

a) CONTRACTOR shall make every effort to keep the Dept. adequately informed as to the progress of the WORK throughout the Contract period.

b) CONTRACTOR shall keep the Dept. informed well in advance of the construction schedule so as to permit the Dept. to arrange for requisite inspection to be carried out

in such a manner as to minimize interference with the progress of WORK. It is imperative that close co-ordination be maintained with the E.I.C. / Dept. during all phases of Work.

c) Contractor shall give every day report on category-wise labour & equipment deployed alongwith the progress of work done on previous day in the proforma prescribed by EIC.

d) All important events shall be photographed by the contractor and to be submitted to Dept. for records.

9.22.3 PROGRESS MEASUREMENT METHODOLOGY **:**

The contractor is required to submit within **Two Weeks** of award of work, the methodology of progress measurement of sub ordering, manufacturing / delivery, sub-contracting and the basis of computation of overall service / physical progress achieved. The Owner reserves the right to modify the same in part or in full.

9.22.4 FUNCTIONAL SCHEDULES :

The contractor shall prepare detailed functional schedules in line with Bar-Diagram for function monitoring and control and submit scheduled progress curves for each function viz. Ordering, delivery and construction.

9.22.5 PROGRESS REVIEW MEETING :

The contractor shall present the program and status at various review meeting as & when required.

(A) Review Meetings	
Level of Participation	Contractor, Engineer-in-Charge,PMC/TPI,Consultants
Agenda	**a)** Weekly Program V/S actual achieved in the post week & program for next week.
	b) Remedial action and hold up analysis.
	c) Client query / Approval / Site Officer.
(B) Monthly Review Meeting	
Level of Participation	Senior Officers of Dept. / Consultant & Contractors,Engineer-inCharge,PMC/TPI,Consultants
Agenda	**a)** Progress Status / Statistics.
	b) Completion Outlook.
	c) Major Hold Ups / Slippage's.
	d) Assistance Required.
	e) Critical Issues.
	Client Query / Approval.

Venue	/ Site Office or as decided by EIC.

PROGRESS REPORTING.

The contractor shall submit the following progress reports on a regular basis for SSCDL's information:

i) Monthly Progress Report.

This report shall be submitted on a monthly basis within 5(five) calendar days from cut-off date, as agreed upon covering overall scenario of the project. The report shall include, but not limited to the following:

- Executive Summary – Summary of major events / activities, completed during the period being reported.
- Schedule versus actual percentage progress and progress curves for Sub-ordering, Sub-Contracting, Constructing and Overall Project.
- Area of concern / problem / hold-ups, impacts and action plans.
- Activities executed, achievements during the month and targets for the following months.
- Analysis of critical activities and impact on overall completion.
- Chronological achievement of key events indicating scheduled and actual occurrence dates.
- Annexures giving status summary for drawings, MRs, equipment and materials delivery, Sub-contracting and construction. (Typical formats are enclosed herewith for contractor's reference)
- Resources deployment status against planned.
- Change order status.
- Construction photographs.

ii) Weekly Reports.

This report will be prepared for Division Office and Construction site in summarized fashion and submitted on every Tuesday taking status as of Sunday by the contractor on weekly basis and will cover following items :

- Activities completed (Sub-contracting, Construction etc.)\
- Resource deployed – men and machines.
- Quantities and Productivity achieved in Key area of work.
- Programme of work for the next week.
- Record of Mandays lost, with the reasons.
- Constraints.
- The report / information may be transmitted preferably through Fax/mail.

iii) Daily Progress report.

- Important activities for the day at site.
- Receipt of major Equipment / Materials received at site.

REQUIREMENT OF COPIES FOR SUBMISSION OF SCHEDULES & REPORTS.

Sr.No.	Name of Document	No. of Copies.
1.	Overall Project Schedule	3
2.	Detailed Activity Network	3
3.	Functional Schedules	3
4.	Construction Network	3
5.	Monthly Progress Reports	3
6.	Weekly Progress Report	3
7.	Daily Bulletin	3

Various typical formats for planning and reporting various activities of the Project are enclosed as Annexure. The format can be changed as per requirement of SSCDL.

JOB NO. : _____ PROJECT NAME : _____ LOI DATE : _____ START DATE : _____ CONT. COM. DATE : _____ ANT. COM. DATE :_____	MONTHLY PROGRAMME	PROGRAM FOR THE LAST MONTH : _____ ACHIEVED IN THE LAST MONTH : _____ CUMMULATIVE SCHEDULE : _____ CUMMULATIVE ACTUAL : _____ WORK FRONT AVAILABLE : _____ SCH. FOR THE MONTH : _____ PROGRAMME FOR THE MONTH : _____

S.NO	ACTIVITY DESCRIPTION	UNIT	ESTIMATED QUANTITY	REVISED QUANTITY	WID. VALUE.	QTY PLANNED IN LAST MONTHS	QTY. ACHD. IN LAST MONTH	CUMM. . QTY ACHD	WORK FRONT	QTY PLANNED IN THIS MONTH	WEEK WISE PROGRAMME				CONSTRAINTS
											11-18	19-16	27-03	04-10	

JOB NO. : _____ LOI DATE : _____ START DATE : _____ CONT. COM. DATE : _____ ANT. COM. DATE : _____	**WEEKLY PROGRESS REPORT** DESCIPLINE : _____ WEEKLY PROGRESS : FROM _____TO _____ WEEKLY PROGRESS : FROM _____TO _____	PROGRAM FOR THE WEEK : _____ ACHIEVED DURING WEEK : _____ CUMM. SCH. PROGRESS : _____ CUMM. ACT. PROGRESS : _____ PROGRAM FOR NEXT WEEK : _____

S.NO.	ACTIVITY DESCRIPTION	UNIT	ESTIMATED QUANTITY	REVISED QUANTITY	WTD. VALUE.	PROGRAM FOR THE WEEK	ACHIEVED DURING WEEK	CUMM. QUANTITY.	WTD.VALUE ACHIEVED	WORK FRONT	PROGRAM FOR NEXT WEEK	HOLD-UPS/ REMARKS.

DAILY PROGRESS REPORT

1	**SKILLED LABOUR STRENGTH :**					
Today	1. MASON	2. CARPENTER	3. FITTER	4. ELECTRICIAN	5. PLUMBER	6. WELDER
	7.GETTYMAN	8.OPERATOR				
2	**UNSKILLED LABOUR STRENGTH:**					
	9. LABOUR (M/C)	10. LABOUR (F/C)	11. CARPENTER 'S HELPER	12. FITTER 'S HELPER	13. WIREMAN	14. OTHERS
Today						

3	**EQUIPMENT IN OPERATION**	**STATUS WORKING / NOT WORKING**
	a) CONCRETE BETCHING PLANT	
	b) CONCRETE MIXER	
	c) VIBRATOR	
	d) HOIST	
	e) J.C.B.	
	f) TRACTORS	
	g) DIGITAL WEIGH BATCHER MACHINE	
	h) WELDING MACHINE	
	i) PUMP	

4	**MATERIAL STATUS**					
	a) Cement	b) Steel	c) Bricks	d) Fine Aggregate	e) Coarse Aggregate	f) Shuttering
Today						
This Month						
Upto Date						

5	**ACTIVITIES IN PROGRESS**			
SR. NO.	**NAME OF WORK**	**LOCATION**	**APPROX.QTY. EXECUTED**	**WHETHER AS TARGETED MORE / LESS**

6	**REMARKS**	

Project Manager **Const. Manager**

9.23 QUALITY CONTROL, TESTS AND INSPECTION

9.23.1 The CONTRACTOR shall carry out the various tests as enumerated in the technical specifications of the Contract and the technical documents that will be furnished to him during the performance of the work and no separate payment shall be made unless otherwise specified in schedule of Prices.

9.23.2 All the tests either on the field or at outside laboratories concerning the execution of the work and supply of materials by the CONTRACTOR shall be carried out by CONTRACTOR at his own cost.

9.23.3 The work is subject to inspection at all times by the Engineer-in-Charge. The CONTRACTOR shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of the Contract, the technical documents and the relevant codes of practice furnished to him during the performance of the work(If necessary).

9.23.4 Any work not conforming to the execution drawings, specifications or codes shall be rejected forthwith and the CONTRACTOR shall carry out the rectifications / replacement at his own cost.

9.23.5 All results of inspection and tests will be recorded in the inspection reports, proforma of which will be approved by the Engineer-in-Charge. These reports shall form part of the completion documents.

9.23.6 Inspection and acceptance of the work shall not relieve the CONTRACTOR from any of his responsibilities under this Contract.

9.23.7 The contractor at his cost should make arrangement for the required testing facilities such as cube testing, sieve analysis apparatus, cement testing device, slump cone, cube moulds, weighing machines etc. at site in order to have regular check on works, materials used etc.

9.23.8 If any tests are required to be carried out in conjunction with the work or materials or workmanship not supplied by the contractor such tests shall be carried out by the contractor as per instruction of EIC & cost of such costs shall be reimbursed by the Surat Smart City Development Limited

9.24 FINAL INSPECTION

After completion of all tests as per specifications, the whole work will be subject to a final inspection to ensure that WORK has been completed as per requirement. If any defects noticed in the work are attributable to CONTRACTOR these shall be attended by the CONTRACTOR at his own cost, as and when they are brought to his notice by theSurat Smart City Development Limited. . The Surat Smart City Development Limited shall have the right to have these defects rectified at the risk and cost of the CONTRACTOR, if he fails to attend to these defects immediately.

9.25 Recovery for lesser material issued/consumed.

Quantity of cement & steel shall be calculated on the basis of quantity of cement and steel required for different items or work as per standard consumption, with up to date overall consumption will be checked at the time of final bill, if any material consumed is less than standard norms, same amount shall be recovered from final bill.

Cement, Reinforcement steel and other materials:

(1) Penalty for **Cement and Reinforcement steel** shall be levied as below against variation than the actual consumption:

(a) No penalty if actual total consumption is equal to or more than standard theoretical total consumption. For over consumption of cement no extra payment shall be made.

(b) **Twice the Basic Rate of Rs. 5,200/-** per MT for the variation in cement consumption less than standard theoretical consumption.

(c) **Twice the Basic Rate of Rs. 31,000/- per MT for TMT steel & 33,000/- per MT for CRS steel** for variation in steel consumption less than standard theoretical consumption.

(2) No separate payment shall be made for any kind of wastage/excess consumption in the materials.

ARTICLE 10
COMPLETION CERTIFICATE

10.1 Provisional Certificate

10.1.1 Upon completion of all Works forming part of the Work, save and except work forwhich Time Extension has been granted, the SSCDL's Engineer shall, at the request ofthe Contractor, issue a provisional certificate of completion if the Tests for and in respect of the completed Works are successful. The Provisional Certificate shall have appended there to a list of outstanding

items of work (the "Punch List") that need to be completed in accordance with the provisions of this Agreement. The Contractor undertakes to complete the minor outstanding items of works in respect of those Sections of the Work for which the Provisional Certificate has been issued, within aperiod of 30 (thirty) days of the date of Provisional Certificate, and those parts of work in respect of which Time Extension has been granted, within the extended period thereof. For the avoidance of doubt, the Parties agree that the Punch List shall include all Works for which Time Extension has been granted and shall also include any minor outstanding items of work forming part of the completed Sections if such works do not materially affect the use of the completed Sections for their intended purpose. The Parties further agree that Provisional Certificate shall not be issued if the completed Works cannot be safely and reliably placed in service of the Users thereof.

10.1.2 If the SSCDL's Engineer determines that the Work or any completed part thereof does not conform to the provisions of this Agreement and cannot be safely and reliably placed in operation, it shall forthwith make a report in this behalf and send copies hereof to the SSCDL and the Contractor and withhold issuance of the Provisional Certificate until the Defects or deficiencies are rectified by the Contractor and Tests are successful in accordance standard.

10.1.3 Not withstanding anything to the contrary contained in contract, the SSCDL may, at anytime after receiving a report from the SSCDL's Engineer under that Clause, direct the SSCDL's Engineer to issue a Provisional Certificate and such direction shall be complied forthwith.

10.2 Completion of remaining Works

All items in the Punch List shall be completed by the Contractor in accordance with the provisions of this Agreement. For any delay in their completion other than for the reasons solely attributable to the SSCDL or due to Force Majeure, the SSCDL's shall be entitled to recover Damages from the Contractor in accordance with this Agreement.

10.3 Completion Certificate

10.3.1 Upon completion of all Works and on submission of completion certificate by the contractor the SSCDL's Engineer shall forthwith issue to the Contractor a Completion certificate after verification of site..

10.3.2 Upon receiving the Completion Certificate, the Contractor shall remove its equipment,materials, debris and temporary works from the Site within a period of 30 (thirty) days thereof, failing which the SSCDL's may remove or cause to be removed, such equipment,materials, debris and temporary works and recover from the Contractor an amount equal to 120% (one hundred and twenty per cent) of the actual cost of removal incurred by the SSCDL.

10.3.3 Without prejudice to the obligations of the Contractor specified, the property and ownership of all the completed Works forming part of the Work shall vest in the SSCDL.

10.4 Handing over of Project:

Three months before the likely date of completion of flats in all respects, contractor shall intimate to the Engineer-in-charge the following.

(a) The contractor(s) shall submit the break-up of cost of construction of different parts of the project In the manner the break up as required to the E.I.C

(b) The contractors/agency shall lay the services as per approved plan by concern department. On completion of services the contractor /agency will submit the required number of completion plan to various authorities for handing over. The SSCDL also reserves the right to withhold the amount which is likely to be payable to these agencies as deficiency charges. The decision ofthe Engineer-in-charge in this regard shall be final and binding on the contractor(s)/agency(s).

10.5 AS BUILT DRAWINGS AND DOCUMENTATION :

The as built drawings and documents shall be submitted by the contractor in 3 [**Three] sets** including the drawings supplied by the contractor and the vendor designs along with one reproducible media / tracing / soft copies & Failure of such submission within the stipulated time limit attracts the penalty decided by E.I.C.

10.6 MODEL FORM :

No.1 GUARANTEE BOND TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS.

The Agreement made this ……day of……Two thousand and……between……son of …… The power of aternoy holder of company (hereinafter called the Guarantor of the one part) and the SURAT SMART CITY DEVELOPEMNT LIMITED (here in after called the SSCDL of the other part)WHEREAS THIS Agreement is supplementary to a Contract (Hereinafter called the Contract) dated…… And made between the GUARANTOR OF THE ONE part and the SSCDL of the other part, whereby the Contractor, inter-alia, undertook to render the buildings and structures in the said Contract recited completely water and leak-proof.AND WHEREAS THE GUARANTOR agreed to give a Guarantee to the effect that the said structures will remain water and leak- proof for Ten years to be reckoned from the date after the Maintenance Period prescribed in the Contract.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak- proof and the minimum life of such water proofing treatment shall be Ten years to be reckoned from the date after the maintenance period prescribed in the Contract.

Provided that the Guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose:

1. Misuse of roof shall mean any operation which will damage water proofing treatment, like chopping of firewood and things of the same nature, which might cause damage to the roof;

2. Alteration shall mean construction of an additional storey or a part of the roof orconstruction adjoining to existing roof whereby water proofing treatment is removed in parts;

3. The decision of the Engineer-in-charge with regard to cause of leakage shall be final.During this period of guarantee, the Guarantor shall make good all defects and incase of any defects being found, render the building water proof to the satisfaction ofthe Engineer-in-Charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from Engineer-in-Charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other Contractor at the GUARANTOR'S risk and cost. Thedecision of the Engineer-in-Charge as to the cost, payable by the Guarantor shall befinal and binding.That if, Guarantor fails to execute the water proofing or commits breach there underthen the Guarantor will indemnify the Principal and his successors against all loss,damage, cost, expense or otherwise which may be incurred by his by reason of any default on the part of the GUARANTOR in performance and observance of this Supplementary Agreement. As to the amount of loss and/or damage and/or costincurred by the SSCDL, the decision of the Engineer-in-Charge will be final and bindingon the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator _____and by _____ and for an on behalf of the, SURAT SMART CITY DEVELOPEMNT LIMITED onthe day, month and year first above written. SIGNED, SEALED AND DELIVERED BY OBLIGATOR IN THE PRESENCE OF –

1) _____

2) _____

SIGNED FOR AN ON BEHALF OF THE SURAT SMART CITY DEVELOPMENT LIMITED BY

_____

in the presence of -

1. _____

2. _____

No.2 GUARANTEE BOND TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF ANTI TERMITE WORKS.

The Agreement made this ……day of……Two thousand and……between……son of …… The power of aternoy holder of company (hereinafter called the Guarantor of the one part) and the SURAT SMART CITY DEVELOPEMNT LIMITED (here in after called the SSCDL of the other part) WHEREAS THIS Agreement is supplementary to a Contract (Hereinafter called the Contract) dated…….. And made between the GUARANTOR OF THE ONE part and the SSCDL of the other part, whereby the Contractor, inter-alia, undertook to render the buildings and structures in the said Contract recited completely Anti termite work.

AND WHEREAS THE GUARANTOR agreed to give a Guarantee to the effect that the said structures will remain Anti termite proof for Ten years to be reckoned from the date after the Maintenance Period prescribed in the Contract.

NOW THE GUARANTOR hereby guarantees that Anti termite treatment given by him will render the structures completely Anti termite proof and the minimum life of such Anti termite treatment shall be Ten years to be reckoned from the date after the maintenance period prescribed in the Contract.

That if, Guarantor fails to execute the ANTI TERMITE or commits breach there under then the Guarantor will indemnify the Principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by his by reason of any default on the part of the GUARANTOR in performance and observance of this Supplementary Agreement. As to the amount of loss and/or damage and/or cost incurred by the SMC, the decision of the Engineer- in-Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator _____and by _____ and for an on behalf of the SURAT SMART CITY DEVELOPEMNT LIMITED, onthe day, month and year first above written. SIGNED, SEALED AND DELIVERED BY OBLIGATOR IN THE PRESENCE OF –

1)_____Signatureofcontractor_____

2) _____

SIGNED FOR AN ON BEHALF OF THE SURAT SMART CITY DEVELOPEMNT LIMITED BY

_____

in the presence of -

1. _____

2. _____

No.3 CERTIFICATE FOR COMPLETION

I/We the undersigned Mr…….power of atternay holder/partner of ……was awarded the work of construction of …….vide work order No…….Dt……..

The work was undertaken by our agency. I/We have completed this work as per scope of work of tender with satisfactory quality and workmanship.

We assure for best services during defect liability period.

The work was completed and handed over to SSCDL on this ……..day of ……month of year 20…..

Contractor's Name :

Signature :

Architect's Name :

Signature :

License No.:

Structural engineer's Name :

Signature :

License No.:

ARTICLE 11

CHANGE OF SCOPE

11.1 Change of Scope

11.1.1 The SSCDL may, notwithstanding anything to the contrary contained in this Agreement,require the Contractor to make modifications/alterations to work ("Change of Scope")during the progress of work and before the issue of the Completion Certificate either by giving an instruction or by requesting the Contractor to submit a proposal for Change of Scope involving additional cost or reduction in cost and adjustment of time.

11.1.2 Change of Scope shall mean: any change that is brought about at the instance of SSCDL after the complete drawing and design has been approved as provided in the contract.

Such change shall be limited to -

(a) change in specifications of any item of Works;

.

(c) any additional work, Plant, Materials or services which are not originally included in the Scope of the Project.

11.1.3 If the Contractor determines at any time that a Change of Scope will, if adopted, (i)accelerate completion, (ii) reduce the cost to the SSCDL of executing, maintaining or operating the Work, (iii) improve the efficiency or value to the SSCDL of the completed the Work, or (iv) otherwise be of benefit to the SSCDL, it shall prepare a proposal with relevant details at its own cost. The Contractor shall submit such proposal, supported with the relevant details and the amount of addition or reduction in the Contract Priceto the SSCDL to consider such Change of Scope. The SSCDL shall, within 15 (fifteen) days of receipt of such proposal, either accept such Change of Scope with modifications, ifany, and initiate proceedings there for or reject the proposal and inform the Contractor of its decision. For the avoidance of doubt, the Parties agree that the Contractor shallnot undertake any Change of Scope without the express consent of the SSCDL, save and except any Works necessary for meeting any Emergency.

11.1.4 **The Employer Surat Smart City Development Limited (SSCDL) reserves right to decrease or Omit any work from the Scope of Project. It is in Contractor's obligation to execute the work as instructed by Surat Smart City Development Limited (SSCDL) and will not be compensated for such decrease or omission in scope of Tendered works.**

11.2 Procedure for Change of Scope

11.2.1 In the event of the SSCDL determining that a Change of Scope is necessary, it may direct the SSCDL's Engineer to issue to the Contractor a notice specifying in reasonable detail work and services contemplated thereunder (the "Change of Scope Notice").

11.2.2 Upon receipt of a Change of Scope Notice, the Contractor shall, with due diligence,provide to the SSCDL and the SSCDL's Engineer such information as is necessary, together with preliminary documentation in support of:

(a) the impact, if any, which the Change of Scope is likely to have on the Project Completion Schedule if work or services are required to be carried out during the Construction Period; and

(b) the options for implementing the proposed Change of Scope and the effect, if any, each such option would have on the costs and time thereof, including thefollowing details:

(i) break down of the quantities, unit rates and cost for different items ofwork;

(ii) proposed design for the Change of Scope; and

(iii) proposed modifications, if any, to the Project Completion Schedule ofthe Work.

For the avoidance of doubt, the Parties expressly agree that, the Contract Price (per DU base) shall be increased or decreased, as the case may be, on account of Change of Scope.

11.2.3 Upon reaching an agreement, the SSCDL shall issue an order (the "Change of Scope Order") requiring the Contractor to proceed with the performance thereof. In the event that the Parties are unable to agree, the SSCDL may:

(a) issue a Change of Scope Order requiring the Contractor to proceed with the performance thereof at the rates and conditions approved by the SSCDL till the matter is resolved.

11.2.4 The provisions of this Agreement, in so far as they relate to Works and Tests, shall apply mutatis mutandis to work undertaken by the Contractor.

11.3 Payment for Change of Scope

.

The payment for change of scope and extra item shall be made as per the Schedule of Rates (SOR) of the relevant year as per which the tender for SOR items are prepared plus or minus % above/below of estimated tender cost as quoted by the Contractor and for non SOR items the rates will be paid as per market rate or as per mutual concent.

11.4 Restrictions on Change of Scope

11.4.1 No Change of Scope shall be executed unless the SSCDL has issued the Change of Scope Order save and except any Works necessary for meeting any Emergency.

11.4.2 Change made because of any default of the Contractor in the performance of its obligations under this Agreement shall not be deemed to be Change of Scope, and shall not result in any adjustment of the Contract Price or the Project Completion Schedule.

ARTICLE 12
DEFECTS LIABILITY

12.1 Defects Liability Period

13.1.1 As mentioned herein above in tender.

12.2 Remedying Defects

The Contractor shall repair or rectify all Defects and deficiencies observed by the SSCDL's Engineer during the Defects Liability Period within a period of 15 (fifteen)days from the date of notice issued by the SSCDL's Engineer in this behalf, or within such reasonable period as may be determined by the SSCDL's Engineer at the request ofthe Contractor, in accordance with Good Costruction Practice.

12.3 Cost of remedying Defects

For the avoidance of doubt, any repair or rectification undertaken in accordance with the contract, including any additional testing, shall be carried out by the Contractor at its own risk and cost, to the extent that such rectification or repair is attributable to:

(a) the design of the Project;

(b) Plant, Materials or workmanship not being in accordance with this Agreement and the Specifications and Standards;

(c) improper maintenance during construction of the Work by the Contractor; and/or

(d)failure by the Contractor to comply with any other obligation under this Agreement.

12.4 Contractor's failure to rectify Defects

In the event that the Contractor fails to repair or rectify such Defect or deficiency within the period specified by the SSCDL's engineer, the SSCDL shall be entitled to get the same repaired, rectified or remedied at the Contractor's cost so as to make the Work conform to the Specifications and Standards and the provisions of this Agreement. All costs consequent there on shall, after due consultation with the SSCDL and the Contractor, be determined by the SSCDL's Engineer. The cost so determined and an amount equal to One hunderd twenty percent (120 %) of the cost as Damages shall be recoverable by the SSCDL from the Contractor and may be deducted by the SSCDL from any monies due to the Contractor.

12.5 Contractor to search cause

12.5.1 The SSCDL's Engineer may instruct the Contractor to examine the cause of any Defect in work or part thereof before the expiry of the Defects Liability Period.

12.5.2 In the event any Defect is attributable to the Contractor, the Contractor shall rectify such Defect within the period specified by the SSCDL's Engineer, and shall bear the cost of the examination and rectification of such Defect.

12.5.3 In the event such Defect is not attributable to the Contractor, the SSCDL's Engineer shall,after due consultation with the SSCDL and the Contractor, determine the costs incurred by the Contractor on such examination and notify the same to the Contractor, with a copy to the SSCDL, and the Contractor shall be entitled to payment of such costs by the SSCDL's

12.5.4 Any latent structural defects ,if noticed within the defect liability period of ten years ,the same shall be rectified at the cost of the contractor.

ARTICLE 13

SSCDL's **ENGINEER**

13.1 Appointment of the SSCDL's **Engineer**

13.1.1 The SSCDL's shall nominate and appoint the engineer-in-charge who shall carry out the duties as are necessary in performance of protection of interest of SSCDL as also may enable parties to achieve the work as intended in terms of the contract. The engineer shall have no authority to amend or alter the contract either on time or cost basis.

13.1.2 The appointment of the SSCDL's Engineer shall be made no later than 15 (fifteen) days from the date of this Agreement. The SSCDL shall notify the appointment or replacement of the SSCDL's Engineer to the Contractor.

13.1.3 The staff of the SSCDL's Engineer shall include suitably qualified engineers and other professionals who are appointed to assist the SSCDL's Engineer to carry out its duties.

13.1.4 In addition to nominating SSCDL's engineer, SSCDL shall be free to engage any agency or individual in capacity of project management engineer/Third Party Inspection agency who shall assist SSCDL engineer in fulfilling the role and duty of an engineer as required under the contract.

13.2 Instructions of the SSCDL's **Engineer**

13.2.1 The SSCDL's Engineer may issue to the Contractor instructions for remedying any Defect. The Contractor shall take such instructions from the SSCDL's Engineer, or from an assistant to whom appropriate authority has been delegated.

13.2.2 The instructions issued by the SSCDL's Engineer shall be in writing. However, if the SSCDL's Engineer issues any oral instructions to the Contractor, it shall confirm inwriting the oral instructions within 2 (two) working days of issuing them.

13.2.3 In case the Contractor does not receive the confirmation of the oral instruction withinthe time specified, the Contractor shall seek the written confirmation of the oral instructions from the SSCDL's Engineer. The Contractor shall obtain acknowledgement from the SSCDL's Engineer of the communication seeking written confirmation. In case of failure of the SSCDL's Engineer or its delegated assistant to reply to the Contractor within 2 (two) days of the receipt of the communication from the Contractor, theContractor may not carry out the instruction.

ARTICLE 14

PAYMENTS

14.1 Contract Price

14.1.1.

14.1.2 The Contract Price includes all duties, taxes, royalty and fees that may be levied in accordance with the laws and regulations in force as on the Base Date on the Contractor's equipment,

Plant, Materials and supplies acquired for the purpose of this Agreement and on the services performed under this Agreement. Nothing in this Agreement shall relieve the Contractor from its responsibility to pay any tax , that may be levied in India (by any of the Government departments) on work execution OR profits made by it in respect of this Agreement.

14.1.3 No price escalation for change in rates of any materials will be paid /recovered by SURAT SMART CITY DEVELOPMENT LIMITED

14.1.4 Unless otherwise stated in this Agreement, the Contract Price covers all the Contractor's obligations for work under this Agreement and all things necessary for the Construction and the remedying of any Defects in the Work.

14.1.5 All payments under this Agreement shall be made in Indian Rupees.

14.3 Interim Payment Statement for Works

As stated in the tender.

14.4 Time of payment

15.4.1 The SSCDL shall pay to the Contractor any amount due under any payment certificate issued by the SSCDL's Engineer.

(a) payment shall be made no later than 30 (thirty) days from the date of submission of the Interim Payment Statement by the Contractor to the SSCDL's Engineer for certification subject to, the submission being not required to be referred back to contractor for corrections.

14.5Final Payment Statement

14.5.1 Within 60 (sixty) days after receiving the Completion Certificate the Contractor shall submit to the SSCDL's Engineer for consideration six copies of a Final Payment Statement as per approved format by SSCDL's engineer (the "Final Payment Statement") for Works, with supporting documents showing in detail, in the form prescribed by the SSCDL's Engineer:

(a) the summary of Contractor's interim Payment claims for Works as submitted in accordance with contract;

(b) the amounts received from the SSCDL against each claim; and

(c) any further sums which the Contractor considers due to it from the SSCDL.

If the SSCDL's Engineer disagrees with or cannot verify any part of the Final Payment Statement, the Contractor shall submit such further information as the SSCDL's Engineer may reasonably require. The SSCDL's Engineer shall deliver to the SSCDL:

14.6 Discharge

Upon submission of the Final Payment Statement for Works, the Contractor shall give to the SSCDL's, with a copy to the SSCDL's Engineer, a written discharge confirming that the total of

the Final Payment Statement represents full and final settlement of all monies due to the Contractor in respect of this Agreement for all work arising out of this Agreement, except for any monies due to either Party on account of any Defect.Provided that such discharge shall become effective only after the payment due has been made in accordance with the Final Payment Certificate issued.

14.9 Final Payment Certificate

14.9.1 Within 30 (thirty) days after receipt of the Final Payment Statement for Works, and the written discharge, and there being no disputed items of claim, the SSCDL's Engineer shall deliver to the SSCDL, with a copy to the Contractor, a final payment certificate (the"Final Payment Certificate") stating the amount which, in the opinion of the SSCDL's Engineer, is finally due under this Agreement or otherwise. For the avoidance of doubt,before issuing the Final Payment Certificate, the SSCDL's Engineer shall ascertain from the SSCDL all amounts previously paid by the SSCDL and for all sums to which the SSCDL's is entitled, the balance, if any, due from the SSCDL to the Contractor or from the Contractor to the SSCDL's, as the case may be.

14.9.2 The SSCDL's shall, pay to the Contractor the amount which is stated as being finally due in the Final Payment Certificate and in that event no further amount shall ever becomedue and payable to the contractor in respect of this contract save and except as indicated in the final payment certificate.

14.10 Correction of Interim Payment Certificates

The SSCDL's Engineer may by an Interim Payment Certificate make any correction or modification in any previous Interim Payment Certificate issued by the SSCDL's Engineer.

14.11 OVERPAYMENT AND UNDERPAYMENT :

Whenever any claim forths payment of a sum to the Surat Smart city Development Limited arises out of or under this Contract against the contractor the same may be deducted by the Surat Smart city Development Limited from any sum then due or which at any time thereafter may become due to the contractor under this contract and failing that under any other contract with the Surat Smart city Development Limited or from any sum due to the contractor with the Surat Smart city Development Limited (which may be available with Surat Smart city Development Limited), or from his retention money, or he shall pay the claim on demand. The Surat Smart city Development Limited reserves the right to carry out post payment audit and technical examination of the final bill including all supporting vouchers, abstracts, etc.

The Surat Smart city Development Limited further reserves the right to enforce recovery of any over payment when detected.

If as a result of such audit and technical examination any over payment is discovered in respect of any work done by the Contractor or alleged to have been done by him under the contract, it shall be recovered by the Surat Smart city Development Limited from the contractor by way of all the means prescribed above or if any under payment is discovered by the Surat Smart city Development Limited, any amount due to the contractor under this contract or

under payment may be adjusted against any amount then due or which may at any time thereafter become due before payment is made to the contractor from him to the Surat Smart city Development Limited on any other contract account whatsoever.

ARTICLE 15

INSURANCE

15.1 Insurance for Works and Maintenance

15.1.1 The Contractor shall effect and maintain at its own cost the insurances as per the requirements of SSCDL and Law.

15.1.2 The SSCDL and the Contractor shall, in accordance with its obligations as provided forin this Agreement, be liable to bear the cost of any loss or damage that does not fall within the scope of this contract or cannot be recovered from the insurers.

15.1.3 The Contractor shall, save and except as provided for in this Agreement, fully indemnify, hold harmless and defend the SSCDL from and against any and all losses,damages, costs, charges and/or claims with respect to:

(a) the death of or injury to any person; or

(b) the loss of or damage to any property (other than work);

that may arise out of or in consequence of any breach by the Contractor of this Agreement during the execution of work or the remedying of any Defects therein.

15.1.4 The SSCDL shall fully indemnify the Contractor from and against any and all losses,damages, costs, charges, proceedings and/or claims arising out of or with respect to

(a) the use or occupation of land or any part thereof by the SSCDL;

(b) the right of the SSCDL to execute work, or any part thereof, on, over, under, in or through any land;

(c) the damage to property which is the unavoidable result of the execution and completion of work, or the remedying of any Defects therein, in accordancewith this Agreement; and

15.1.5 Without prejudice to the obligations of the Parties the Contractor shall maintain or effect such third party insurances as may be required under the Applicable Laws.

15.1.6 The Contractor shall provide to the SSCDL, within 30 days of the commencement Date,evidence of professional liability insurance maintained by its Design Director and/or consultants to cover the risk of professional negligence in the design of Works. The professional liability coverage shall be for a sum of not less than 3% (three per cent) ofthe Contract Price and shall be maintained until the end of the Defects Liability Period.

15.2Notice to the SSCDL

No later than 15 (fifteen) days after the date of this Agreement, the Contractor shall by notice furnish to the S SSCDL in reasonable detail, information in respect of the insurances that it proposes to effect and maintain in accordance with contract and tradepractice. Within 15 (fifteen) days of receipt of such notice, the SSCDL may require the Contractor to effect and maintain such other insurances as may be necessary.

15.3 Evidence of Insurance Cover

15.3.1 All insurances obtained by the Contractor in accordance with this contract shall be maintained with insurers on terms consistent with Good Industry Practice. Within10(Ten) days from the commencement date, the Contractor shall furnish to the SSCDL notarised true copies of the certificate(s) of insurance, copies of insurance policies and premium payment receipts in respect of such insurance, and no such insurance shall be cancelled, modified, or allowed to expire or lapse until the expiration of at least 45(forty-five) days after notice of such proposed cancellation, modification or nonrenewal lhas been delivered by the Contractor to the SSCDL. The Contractor shall act in accordance with the directions of the SSCDL, provided that the Contractor shall produce to the SSCDL the insurance policies in force and the receipts for payment of the current premium.

15.3.2 The Contractor shall ensure the adequacy of the insurances at all times in accordance with the provisions of this Agreement. SSCDL shall be entitled to stop any payment at any time if on demand the contractors fails to satisfy SMC about all Insurance policies being held in valid and enforceable form.

15.4 Remedy for failure to insure

If the Contractor shall fail to effect and keep in force all insurances for which it is responsible pursuant hereto, the SSCDL shall have the option to either keep in force any such insurances, and pay such premium and recover the costs thereof from the Contractor, or in the event of computation of a Termination Payment, treat an amount equal to the Insurance Cover as deemed to have been received by the Contractor.

15.5 Waiver of subrogation

All insurance policies in respect of the insurance obtained by the Contractor shall include a waiver of any and all rights of subrogation or recovery of the insurers thereunder against, inter alia, the SSCDL, and its assigns, successors, undertakings and their subsidiaries, Affiliates, employees, insurers and underwriters, and of any right of the insurers to any set-off or counter claim or any other deduction, whether by attach mentor otherwise, in respect of any liability of any such person insured under any such policy or in any way connected with any loss, liability or obligation covered by such policies of insurance.

15.6 Contractor's waiver

The Contractor hereby further releases, assigns and waives any and all rights of subrogation or recovery against, inter alia, the SSCDL and its assigns, undertakings and their subsidiaries, Affiliates, employees, successors, insurers and underwriters, which the Contractor may otherwise have or acquire in or from or in any way connected withany loss, liability or obligation covered by policies of insurance maintained or required to be maintained by the Contractor pursuant to this Agreement (other than third party liability insurance policies) or because of deductible clauses in or inadequacy of limits of any such policies of insurance.

15.7 Accident or injury to workmen

Not withstanding anything stated in this Agreement, it is hereby expressly agreed between the Parties that the SSCDL shall not be liable for or in respect of any damages orcompensation

payable to any workman or other person in the employment of theContractor or Sub-contractor, save and except as for death or injury resulting from anyact, omission or default of the SSCDL, its agents or servants. The Contractor shall indemnify and keep indemnified the SSCDL from and against all such claims,proceedings, damages, costs, charges, and expenses whatsoever in respect of the above save and except for those acts, omissions or defaults for which the SSCDL shall be liable.

15.8 Insurance against accident to workmen

The Contractor shall effect and maintain during the Agreement such insurances as maybe required to insure the Contractor's personnel and any other persons employed by it on the Work from and against any liability incurred. The Contractor's personnel/any person employed by the Contractor shall include the Sub-contractor and its personnel.

15.9 Application of insurance proceeds

The proceeds from all insurance claims, except for life and injury, shall be applied forany necessary repair, reconstruction, reinstatement, replacement, improvement,delivery or installation of the Work and the provisions of this Agreement in respect ofconstruction of works shall apply mutatis mutandis to work undertaken out of the proceeds of insurance.

15.10 Compliance with policy conditions

Each Party hereby expressly agrees to fully indemnify the other Party from and against all losses and claims arising from its failure to comply with conditions imposed by the insurance policies effected in accordance with this Agreement.

ARTICLE 16
FORCE MAJEURE

16.1 Force Majeure

As used in this Agreement, the expression "Force Majeure" or "Force Majeure Event"shall mean Acts of God beyond the control of human beings and those which cannot before seen resulting in circumstances affecting the performance of the contract. It may also include any Political. Social or Legal act whose consequence on the progress ofthe work would have analogous effect as Acts of God rendering parties to this contract completely helpless to amend the situation and keep the contract performing. The only remedy against the circumstance of force majure affecting the progress shall be grantof extension of time for performance as found reasonable in opinion of SSCDL and no other compensation what so ever shall be payable or be liability of SSCDL.

ARTICLE 17
SUSPENSION OF CONTRACTOR'S RIGHTS

17.1 Suspension upon Contractor Default

Upon occurrence of a Contractor Default, the SSCDL shall be entitled, without prejudice to its other rights and remedies under this Agreement including its rights of Termination hereunder, to (i) suspend carrying out of work or Maintenance or any part thereof, and (ii) carry out such Works or Maintenance itself or authorise any otherperson to exercise or perform the same on its behalf during such suspension (the"Suspension"). Suspension hereunder shall be effective forthwith upon issue of noticeby the SSCDL to the Contractor and may extend up to a period not exceeding 90 (ninety)days from the date of issue of such notice.

17.2 SSCDL to act on behalf of Contractor

During the period of Suspension hereunder, all rights and liabilities vested in the Contractor in accordance with the provisions of this Agreement shall continue to vesttherein and all things done or actions taken, including expenditure incurred by the SSCDL for discharging the obligations of the Contractor under and in accordance withthis Agreement shall be deemed to have been done or taken for and on behalf of the Contractor and the Contractor undertakes to indemnify the SSCDL for all costs incurredduring such period. The Contractor hereby licences and sub-licences respectively, the SSCDL or any other person authorised by to use during Suspension, all Intellectual Property belonging to or licensed to the Contractor with respect to the Work and its design, engineering, construction and maintenance, and which is used or created by the Contractor in performing its obligations under the Agreement.

17.3 Revocation of Suspension

17.3.1 In the event that the SSCDL shall have rectified or removed the cause of Suspension within a period not exceeding 60 (sixty) days from the date of Suspension, it shall revoke the Suspension forthwith and restore all rights of the Contractor under this Agreement. For the avoidance of doubt, the Parties expressly agree that the SSCDL may,in its discretion, revoke the Suspension at any time, whether or not the cause of Suspension has been rectified or removed hereunder.

17.3.2 Upon the Contractor having cured the Contractor Default within a period not exceeding 60 (sixty) days from the date of Suspension, the SSCDL shall revoke the Suspension forthwith and restore all rights of the Contractor under this Agreement.

ARTICLE 18
TERMINATION

18.1 Termination for Contractor Default

18.1.1 Save as otherwise provided in this Agreement, in the event that any of the defaults specified below shall have occurred, and the Contractor fails to cure the default within the time limit specified by SSCDL the Contractor shall be deemed to be in default of this Agreement (the

"Contractor Default"), unless the default has occurred solely as a result of any breach of this Agreement by the SSCDL or due to Force Majeure. The defaults referred to herein shall include:

(a) the Contractor fails to provide, extend or replenish, as the case may be, the Performance Security in accordance with this Agreement;

(b) subsequent to the replenishment or furnishing of fresh Performance Security, the Contractor fails to cure, within a Cure Period of 30 (thirty) days, the Contractor Default for which the whole or part of the Performance Security was appropriated;

(c) the Contractor does not achieve the latest outstanding Project Milestone due inaccordance with the provisions of contract, subject to any Time Extension, andcontinues to be in default for 45 (forty five) days;

(d) the Contractor abandons or manifests intention to abandon the construction or Maintenance of the Work without the prior written consent of the SSCDL;

(e) the Contractor fails to proceed with work in accordance with the provisions of contract or stops Works and/or the Maintenance for 30 (thirty) days without reflecting the same in the current programme and such stoppage has not been authorised by the SSCDL's Engineer;

(f) failure to complete the remarks stated from EIC, items within the periods stipulated contract;

(g) the Contractor fails to rectify any Defect, the non rectification of which shall have a Material Adverse Effect on the Project, within the time specified in this Agreement or as directed by the SSCDL's Engineer;

(h)the Contractor subcontracts work or any part thereof in violation of this Agreement or assigns any part of work or the Maintenance without the prior approval of the SSCDL;

(i) the Contractor creates any Encumbrance in breach of this Agreement;

(j) an execution levied on any of the assets of the Contractor has caused a Material Adverse Effect ;

(k) the Contractor is adjudged bankrupt or insolvent, or if a trustee or receiver is appointed for the Contractor or for the whole or material part of its assets thathas a material bearing on the Project;

(l) the Contractor has been, or is in the process of being liquidated, dissolved,wound-up, amalgamated or reconstituted in a manner that would cause, in the reasonable opinion of the SSCDL, a Material Adverse Effect;

(m) a resolution for winding up of the Contractor is passed, or any petition forwinding up of the Contractor is admitted by a court of competent jurisdiction and a provisional liquidator or receiver is appointed and such order has not been set aside within 90 (ninety) days of the date thereof or the Contractor is ordered to be wound up by court except for the purpose of amalgamation or reconstruction; provided that, as part of such amalgamation or reconstruction,the entire property, assets and undertaking of the Contractor are transferred to the amalgamated or reconstructed entity and that the amalgamated or reconstructed entity has unconditionally assumed the obligations of the Contractor under this Agreement; and provided that:

(i) the amalgamated or reconstructed entity has the capability and experience necessary for the performance of its obligations under this Agreement; and

(ii)the amalgamated or reconstructed entity has the financial standing toperform its obligations under this Agreement and has a creditworthiness at least as good as that of the Contractor.

(n) any representation or warranty of the Contractor herein contained which is, as of the date hereof, found to be materially false or the Contractor is at any timehereafter found to be in breach thereof;

(o) the Contractor submits to the SSCDL any statement, notice or other document, inwritten or electronic form, which has a material effect on the SSCDL's rights,obligations or interests and which is false in material particulars;

(p)the Contractor has failed to fulfil any obligation, for which failure Termination has been specified in this Agreement; or

(q) the Contractor commits a default in complying with any other provision of this Agreement if such a default causes a Material Adverse Effect on the Project oron the SSCDL.

18.1.2 Without prejudice to any other rights or remedies which the SSCDL may have under this Agreement, upon occurrence of a Contractor Default, the SSCDL shall be entitled to terminate this Agreement by issuing a Termination Notice to the Contractor; provided that before issuing the Termination Notice, the SSCDL shall by a notice inform the Contractor of its intention to issue such Termination Notice and grant 15 (fifteen) days to the Contractor to make a representation, and may after the expiry of such 15(fifteen) days, whether or not it is in receipt of such representation, issue the Termination Notice.

18.1.3 After termination of this Agreement for Contractor Default, the SSCDL may complete work and/or arrange for any other entities to do so. The SSCDL and these entities maythen use any Materials, Plant and equipment, Contractor's documents and other design documents made by or on behalf of the Contractor and the contractor shall have no entitlement to remove and or take possession of any plant, machineries, materials,equipments without the consent of SSCDL who shall then have the entitlement to engage and use these for completing the balance work as may be in the best interest of thework. In that event the certificate of any payment, fee, charge that may be due to contractor for such use shall be final and binding.

18.2 Termination for SSCDL's convenience

Notwithstanding anything stated hereinabove, the SSCDL may terminate this Agreement for convenience. The termination shall take effect 30 (thirty) days from the date of notice hereunder. This shall amount to foreclosure of contract whereby the parties will treat the contract as nullified and settled the account in such a way that no party retainsany unearned benefit at the point of foreclosure.

18.3 Requirements after Termination

Upon Termination of this Agreement, the Contractor shall comply with and conform tothe following:

(a) deliver to the SSCDL all Plant and Materials which shall have become the property of the SSCDL

(b) deliver all relevant records, reports, Intellectual Property and other licences pertaining to work, Maintenance, other design documents and in case of Termination occurring after the Provisional Certificate has been issued, the "asbuilt' Drawings for work;

(c) transfer and/or deliver all Applicable Permits to the extent permissible underApplicable Laws; and

(d) vacate the Site within 15 (fifteen) days or any further period if permitted by SSCDL in writing.

(e) In event contractor for whatever reason fails to vacate the site, where upon he hasno permission to enter for performance of work, he shall be declared as unauthorised person and thereafter shall be liable to all actions as trespassers as and when he, his agents, vendors, sub contractor or any one without permission of SSCDL attempts to enter the site.

18.4 Valuation of Unpaid Works

18.4.1 Within a period of 45 (forty-five) days after Termination, as the case may be, has taken effect, the SSCDL's Engineer shall proceed to determine as follows the valuation of unpaid Works (the "Valuation of Unpaid Works"):

(a) value of the completed stage of work, less payments already made;

(b)reasonable value of the partially completed stages of works as on the date of Termination, only if such works conform with the Specifications and Standards;and

(c) value of Maintenance, if any, for completed months, less payments already made, and shall adjust from the sum thereof

(i) any other amounts payable or recoverable, as the case may be, in accordance with the provisions of this Agreement; and (ii) all taxes due to be deducted at source.

(d) The rates to be operated for this clause shall be on SOR used for preparation of estimate adjusted for contract price quoted (% above/below estimated cost)including escalation if permissible.

18.4.2 The Valuation of Unpaid Works shall be communicated by SSCDL to the Contractor,within a period of 30 (thirty) days from the date of Termination.

18.5 Termination Payment

18.5.1 Upon Termination on account of Contractor's Default, the SSCDL shall:

(a) encash and appropriate the Performance Security and Retention Money, or in the event the Contractor has failed to replenish or extend the Performance Security,claim the amount, as agreed pre-determined compensation to the SSCDL for any losses, delays and cost of completing work and Maintenance, if any;

(b) encash and appropriate the bank guarantee, if any, for and in respect of any dues as may be recoverable from the contractor.

(c) pay to the Contractor, by way of Termination Payment, an amount equivalent to the Valuation of Unpaid Works after adjusting any other sums payable orrecoverable, as the case may be, in accordance with the provisions of this Agreement.

18.6 Other rights and obligations of the Parties

Upon Termination for any reason whatsoever

(a) property and ownership in all Materials, Plant and Works and the Workshall, as between the Contractor and the SSCDL, vest in the SSCDL in whole;

(b) risk of loss or damage to any Materials, Plant or Works and the care and custody thereof shall pass from the Contractor to the SSCDL; and

(c) the SSCDL shall be entitled to restrain the Contractor and any person claiming through or under the Agreement from entering upon the Site or any part of the Project except for taking possession of materials, stores, implements,construction plants and equipment of the Contractor, which have not been vestedin the SSCDL in accordance with the provisions of this Agreement.

ARTICLE 19
LIABILITY AND INDEMNITY

19.1 General indemnity

The Contractor will indemnify, defend, save and hold harmless the SSCDL and its officers, servants, agents, Government Instrumentalities and Government owned and/or controlled entities/enterprises, (the "SSCDL Indemnified Persons") against any and all suits, proceedings, actions, demands and third party claims for any loss,damage, cost and expense of whatever kind and nature, whether arising out of anybreach by the Contractor of any of its obligations under this Agreement or from any negligence under the Agreement, including any errors or deficiencies in the design documents, or tort or on any other ground whatsoever, except to the extent that anysuch suits, proceedings, actions, demands and claims have arisen due to any negligentact or omission, or breach or default of this Agreement on the part of the SSCDL Indemnified Persons.

19.2 Indemnity by the Contractor

19.2.1 The Contractor shall fully indemnify, hold harmless and defend the SSCDL and the SSCDL Indemnified Persons from and against any and all loss and/or damages arising out of orwith respect to:

(a) failure of the Contractor to comply with Applicable Laws and ApplicablePermits;

(b) payment of taxes required to be made by the Contractor in respect of the incomeor other taxes of the Sub-contractors, suppliers and representatives; or

(c) non-payment of amounts due as a result of Materials or services furnished to theContractor or any of its Sub-contractors which are payable by the Contractor orany of its Sub-contractors.

19.2.2 The Contractor shall fully indemnify, hold harmless and defend the SSCDL Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands,liabilities and damages which the SSCDL Indemnified Persons may hereafter suffer or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials,information, design or process used by

the Contractor or by the Sub-contractors inperforming the Contractor's obligations or in any way incorporated in or related to the Project. If in any such suit, action, claim or proceedings, a temporary restraint order orpreliminary injunction is granted, the Contractor shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Work, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, the Contractor shall promptly make every reasonable effort to secure for the SSCDL a licence, at no cost to the SSCDL, authorizing continued use of the infringing work. If the Contractor is unable to secure such licence within a reasonable time, the Contractor shall, at its own expense, and without impairing the Specifications and Standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process, or modify the same so thatit becomes non-infringing.

ARTICLE 20

LABOUR LAWS

20.1 Labour Laws to be complied by the Contractor.

Notwithstanding any provision as may herebelow, Contractor without an exception and limitation shall be liable for complete adherence and responsibilities arising out of all the labour laws as may be in force or as may become effective from time to time.The contractor shall obtain a valid license under the Contractor Labour (R & B) Act 1970, and the Contract Labour (Regulation and Abolition) Central Rules 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986. The contractor shall also comply with the provisions of the building and other construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

The contractor shall ensure the registration of all eligible workers (inclusive of those of subcontractors and petty contractors) with construction workers welfare board.

Any failure to fulfill these requirements shall attract the penal provisions of this contract arising out of the resultant non- execution of the work.

No labour below the age of fourteen years shall be employed on the work.

20.2 Payment of Wages:

i The contractor shall pay to labour employed by him either directly or through sub-contractors, wages not less than fair wages as defined in the Contractor's Labour Regulations or as per the provisions of the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

ii The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged byhis sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

iii In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Central Public Works Department contractor's Labour Regulations made by Government from time to time in regard to payment of wages, wages period, deductions from wages recovery of wages not paid and deductions un-authorized made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

Iv (a) The Engineer-in-Charge concerned shall have the right to deduct from the money due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reasons of non-fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.

(b) Under the provision of Minimum Wages (Central) Rules 1950, or statutory modification thereof ,the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in- Charge concerned.

In the case of Gujarat, however, as the all-inclusive minimum daily wages fixed under Notification of the Gujarat Administration ACT No.11 OF 1948 1*, dated 15th MARCH,1948 as amended from time to time are inclusive of wages for the weekly day of rest, the question of extra payment for weekly holidays would not arise.

v. The contractor shall comply with the provisions of the Payment of Wages Act, 1936,Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act,1923, Industrial Disputes Act, 1947, Maternity Benefits the modifications thereof or anyother laws relating thereto and the rules made there under from time to time.

Vi The contractor shall indemnify and keep indemnified SSCDL against payment to be made under and for the observance of the laws aforesaid and the Contractor's Labour Regulation without prejudice to his right to claim indemnify from his sub-contractors.

Vii The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

viii Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar

and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise.

ix The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

20.3 PANELTY FOR EACH DEFAULT TO PROVIDE FACILITIES:

All provisions of concerned labour law shall be liability of the Contractor and consequences therefrom from any non compliance shall be liability of the Contractor.

It shall be expressed duty of Contractor to comply with all Welfare measures as may reasonable be expected to be discharged by the Contractor.

20.4 PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS:

In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by Govt. from time to time for the protection of health and sanitary arrangements for workers employed by the SSCDL and its contractors.

20.5 LEAVE AND PAY:

Leave and pay during leave shall be regulated as follows:

1. Leave:

i) In the case of delivery-maternity leave not exceeding 8 weeks, 4 weeks up to and including the day of delivery and 4 weeks following that day,

ii) In the case of miscarriage –up to 3 weeks from the date of miscarriage.

2. Pay:

i) In the case of delivery- leave pay during maternity leave will be at the rate of the women'saverage daily earning, calculated on total wages earned on the days when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupees one only a day whichever is greater.

ii) In the case of miscarriage – leave pay at the rate of average daily earning calculated on thetotal wages earned on the days when full time work was done during a period of three months immediately preceding the date of such miscarriage.

3. CONDITIONS FOR THE GRANT OF MATERNITY LEAVE:

No maternity leave benefit shall be admissible to a woman unless she has been employeesfor a total period of not less than six months immediately preceding the date on which she proceeds on leave.

4. The contractor shall maintain a register of Maternity (Benefit) in the Prescribed Form and the same shall be kept at the place of work.

20.6 BREACH OF CONTRACTOR:

In the event of the contractor(s) committing a default or breach of any of the provisions of the, Contractor's Labour Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filling and statement under the provisions of the above Regulations and Rules which is materially incorrect, he/they shall, without prejudice to any other liability, pay to the SSCDL a sum not exceeding INR 200/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to INR 200/- per day for each day of default subject to a maximum of 5 percent of the estimated cost of the work put to tender. The decision of the Engineer-in-Charge shall be final and binding on the parties.

Should it appear to the Engineer-in-Charge that the contractor(s) is/ are not properly observing and complying with the provisions of the Contract's Labour Regulations and Model Rules and the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour(R& A) Central Rules 1971, for the protection of health and sanitary arrangements for works people employed by the contractor(s) (hereinafter referred as "the said Rules") the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/observe the said Rules and to provide the amenities to the work people as forfeited, the Engineer-in-Charge shall have the power to provide the amenities hereinbefore mentioned at the cost of the contractor(s). the contractor(s) shall erect, make and maintain at his/ their own expenses and to approved standards all necessary huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works, and if the same shall not have been created or constructed, according to approved standards, the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be remodeled and/or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel of reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

It is expected that the Contractor to comply with all Contractor's Labour Regulation Acts and Rules provided therefrom.

20.7 Employment of skilled/semi skill worker:

The contractor shall, at all stages of work, deploy skilled/semiskilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/Industrial Training Institute/National Institute of construction Management and Research (NICMAR)/ National Academy of Construction, CIDC or any similar reputed and recognized Institute mangled/certified by State/Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semiskilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer in charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failures on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of INR 100 per such tradesmen per day. Decision of Engineer in Charge as to whether particular tradesmen possess requisite skill and amount of compensation in case of default shall be final and binding.

Provided always, that the provisions of this clause shall not be applicable for works with estimated cost put to tender being less than INR 5 Crores.

20.8 Minimum Wages Act to be complied with:

The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970, amended from time to time and rules framed there under and other labour laws affecting contract labour that may be brought intoforce time to time.

ARTICLE 21

SAFETY CODE,MODEL RULES FOR PROTECTION OF HEALTH & SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY SSCDL OR ITS CONTRACTORS, LABOUR REGULATIONS.

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely fromladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical).

2. Scaffolding of staging more than 3.6m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only

such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

3. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.

4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm (3ft.).

5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11½") for ladder up to and including 3m. (10ft.) in length. For longer ladder, this width should be increased at least ¼" for each additional 30cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall bekept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.

6. Excavation and Trenching: – All trenches 1.2m. (4ft.) or more in depth, shall at all times besupplied with at least one ladder for each 30m. (100ft.) in length or fraction thereof Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5m. (5ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

7. Demolition: – Before any demolition work is commenced and also during the progress of the work.

i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.

ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned: -

9 The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken :

10 SSCDL may require, when necessary medical examination of workers.

11 All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

12 In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

13 Where drinking water is obtained from an intermittent public water supply, each workplace shall be provided with storage where such drinking water shall be stored.

14 Every water supply or storage shall be at a distance of not less than 50 feet from anylatrine drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, thewell shall be properly chlorinated before water is drawn from it for drinking. All such wellsshall be entirely closed in and be provided with a trap door which shall be dust waterproof.

15 A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.
The contractor shall supply only potable water in the labour camp sample of water shallbe drawn from the source of water supply in the labour camps every months and gottested from the Municipal Corporation's lab by the contractor .Wherever drinking wateris supplied to the labour camps through tankers. Samples shall be drawn from the tankers and got tested. Water storage tanks chlorine tablets shall be added from time to time asper requirement so that portability of water remains intact No extra payment shall bemade on this account.

ARTICLE 22
MISCELLANEOUS

22.1 Governing law and jurisdiction

This Agreement shall be construed and interpreted in accordance with and governed by the laws of India, and the courts at Surat shall have exclusive jurisdiction over matters arising out of or relating to this Agreement.

22.2 Waiver of immunity

Each Party unconditionally and irrevocably:

(a) agrees that the execution, delivery and performance by it of this Agreement constitute commercial acts done and performed for commercial purpose;

(b) agrees that, should any proceedings be brought against it or its assets, property or revenues in any jurisdiction in relation to this Agreement or any transaction contemplated by this Agreement, no immunity (whether by reason ofsovereignty or otherwise) from such proceedings shall be claimed by or onbehalf of the Party with respect to its assets;

(c) waives any right of immunity which it or its assets, property or revenues nowhas, may acquire in the future or which may be attributed to it in anyjurisdiction; and

(d) consents generally in respect of the enforcement of any judgement or awardagainst it in any such proceedings to the giving of any relief or the issue of anyprocess in any jurisdiction in connection with such proceedings (including the making, enforcement or execution against it or in respect of any assets, property or revenues whatsoever irrespective of their use or intended use of any order or judgement that may be made or given in connection therewith).

22.3 Delayed payments

The interim payments shall generally be made as per the provision of the contract.However it is clearly understood that all such payments are to be treated as and by way of advance against the final consideration and therefore there shall be no entitlement of any compensation for any inconvenience on account of delay being caused in payment of interim certificate.

22.4 Waiver

22.4.1 Waiver, including partial or conditional waiver, by either Party of any default by the other Party in the observance and performance of any provision of or obligations under this Agreement:-

(a) shall not operate or be construed as a waiver of any other or subsequent defaulthereof or of other provisions of or obligations under this Agreement;

(b) shall not be effective unless it is in writing and executed by a duly authorized representative of the Party; and

(c) shall not affect the validity or enforceability of this Agreement in any manner.

22.4.2 Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation there under nor time or

other indulgence granted by a Party to the other Party shall be treated ordeemed as waiver of such breach or acceptance of any variation or the relinquishmentof any such right hereunder.

22.5 Liability for review of Documents and Drawings

Except to the extent expressly provided in this Agreement:

(a) no review, comment or approval by the SSCDL or the SSCDL's Engineer of any Document or Drawing submitted by the Contractor nor any observation or inspection of the construction, or maintenance of the Work nor the failure to review, approve, comment, observe or inspect hereunder shall relieve or absolve the Contractor from its obligations, duties and liabilities under this Agreement,the Applicable Laws and Applicable Permits; and

(b) the SSCDL shall not be liable to the Contractor by reason of any review, comment,approval, observation or inspection referred to in Sub-clause (a) above.

22.6 Exclusion of implied warranties etc.

This Agreement expressly excludes any warranty, condition or other undertaking implied at law or by custom or otherwise arising out of any other agreement between the Parties or any representation by either Party not contained in a binding legal agreement executed by both Parties.

22.7 Entire Agreement

This Agreement and the Schedules together constitute a complete and exclusive statement of the terms of the agreement between the Parties on the subject hereof, and no amendment or modification hereto shall be valid and effective unless such modification or amendment is agreed to in writing by the Parties and duly executed by persons especially empowered in this behalf by the respective Parties. All prior writtenor oral understandings, offers or other communications of every kind pertaining to this Agreement are abrogated and withdrawn. For the avoidance of doubt, the Parties hereto agree that any obligations of the Contractor arising from the Request for Qualification or Request for Proposals, as the case may be, shall be deemed to form part of this Agreement and treated as such.

22.8 Severability

If for any reason whatever, any provision of this Agreement is or becomes invalid,illegal or unenforceable or is declared by any court of competent jurisdiction or anyother instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing to one or more provisionswhich may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure toagree upon any such provisions shall not be subject to the Dispute Resolution Procedure set forth under this Agreement or otherwise.

22.9 Notices

Any notice or other communication to be given by any Party to the other Party underor in connection with the matters contemplated by this Agreement shall be in writingand shall be addressed to following offices.

a) For Contractor

_____

b) For SSCDL

_____

22.10 Counterparts

This Agreement may be executed in two counterparts, each of which, when executed and delivered, shall constitute an original of this Agreement.

22.11 Limitation of Liability

22.11.1 Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with this Agreement'

22.11.2 The total liability of one Party to the other Party under and in accordance with the provisions of this Agreement, shall not exceed the Contract Price. For the avoidance of doubt, this Clause shall not limit the liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

22.12 WORK IN MONSOON :

When the work continues in monsoon, the contractor shall maintain minimum labour force required, for the work and plan and execute the construction and erection work according to the prescribed schedule. No extra rate will be considered for such work in monsoon. During monsoon and entire constructing period the contractor shall keep the site free from water at his own cost.

22.13 ASSISTANCE TO ENGINEER-IN-CHARGE :

Contractor shall make available to Engineer-in-charge free of cost all necessary instruments and assistance in checking of any work made by the contractor for taking measurement of work.

22.14 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK :

If at any time from the commencement of work, the owner shall for any reasons whatsoever not require the whole or part thereof a specified in the tender to be carried out, the Engineer-in-charge shall give notice in writing of the contractor, who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from execution of work in full, but which he did not derive in consequence of the full amount of the work not having been carried neither shall be have any claim for compensation by reason if any alternations having been made in original specifications, drawings, designs and

instructions which shall involve any curtailment of the work as originally contemplated. When the contractor is a partnership firm, the prior approval in writing of the SSCDL. shall be obtained before any change is made in the constitution of the firm, where the contractor is an individual or a Hindu Undivided Family business concern, such approval as aforesaid shall, likewise be obtained before sub-contractor enters into any agreement with other parties whereunder the reconstituted firm would have the right to carry out the work hereby undertaken by the contractor. In either case if prior approval as aforesaid is not obtained, the contract shall be deemed to have been allotted in contravention of sub- letting clause hereof and the same action may be taken and the same consequence shall ensure as provided in the sub-letting clause.

22.15 IN EVENT OF DEATH OF CONTRACTOR :

Without prejudice to any of the right or remdies under the contract, if the contractor dies, the owner shall have the option of terminating the contract without compensation to the contractor.

22.16 MEMBER OF THE OWNER NOT INDIVIDUALLY LIABLE :

No official or employee of the owner shall in any way be personally bound or liable for the acts or obligations of the owner under the contract or answerable for any default or ommission in the observance or performance of the acts, matters or things which are herein contained.

22.17 BREACH OF CONTRACT BY CONTRACTOR :

If the contractor fails to perform the work under the contract with due diligence or shall refuse or neglect to comply with instruction given to him, by the Engineer-in-charge in accordance with the contract, or shall contravence the provisions of the contract ,the SSCDL may give notice in writing to the contractor to make good such failure, neglect or contravention. Should the Contractor fail to comply with such written notice within twenty eight (28) days of receipt, if the The Chairman Surat Smart City Development Limited shall think fit, it shall be lawful for the SSCDL, without prejudice to any other rights, the contractor may have under the contract , to terminate the contract for all part of the works, and to make any other arrangements it shall deem necessary to complete the work outstanding under the contract at the time of termination. In this event Article 22.24 (Subletting of work) and 22.25 (Sub-Contracts for Temporary Works etc.) hereof shall be invoked and the performance security shall immediately become due and payable to the SSCDL the value of the work done on the date of termination and not paid for shall stand forfeited to the SSCDL and the SSCDL shall have entitlement to use of any works which the contractor may have at the site at the time of termination of the contract.

22.18 The following condition are being included in this tender and shall be considered as a part of tender document.

1. Contractors have to place a board showing details of work at site at his own cost as per details given by Department. i.e. Name of work, Name of Contractor, Project cost, work sanction detail, detail of work order and time limit, Address of Executive Engineer & Phone No. & Fax No.

2. If Contractor will not furnish a Photograph of the Board placed on site showing the details as above department will retain 0.25 % to 1 % of tender amount temorarily from the running bill.

3. A work of building is carried out at one plot but in the case of water supply line, drainage line etc. or any other service line, the work carried out in length, in this case one board should be placed on both ends and other boards should be places as per the instruction of Engineer in charge.

4. The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors' employ on the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements. In respect of maintenance /repair of renovation works etc. where the labour have an easy access to the individual houses, the contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour. AE/JE will display a list of contractors working in the colony/ blocks on the notice board in the colony and also at the service center, to apprise the residents about the same.

5 However, the Engineer-in-charge, through a notice, may require the contractor to removethe illegal occupation any time on or before construction and delivery.

22.19 SPECIAL NOTE :

Following details pertaining to work progress is mandatory.

(A) Bar chart: Contractor shall submit barchart showing schedule of execution of various activities within stipulated time limit

(B) Material Management : Contractor shall provide following details

- Source of materials i.e. yellow earth, Coarse aggregate, Grit, fine aggregates, bricks, cement, steel etc.
- Supply schedule : According to bar chart, the flow diagram of materials.

(C) Man power management :

The contractor shall submit details of manpower of various categories (skilled & unskilled labours) to be deployed for the work as under.

- Minimum no. of skilled and unskilled labors to be deployed on the work

- List of supervisors & engineers for supervision & quality control of the work.

(D) All the applicant contractors are required to have their own employers code number under EPF Act, 1952 and are required to comply the applicable provisions of said statute regularly and totaly.

(E) Further the contractors for services are required to produce the certified copies of paid challans in respect of employees/workers employed by said contractor in respect of work allotted by Surat Municipal Corporation, along with copies of Pay Roll and Muster Roll. If the same are not produced, the bills will not be released.

22.20 If Near relative working in SMC / SSCDL then the contractor not allowed to tender:

The contractor shall not be permitted to tender for works in the SMC circle (Division in case of contractor of Horticulture/Nursery Categories) / SSCDL responsible for award and execution of contract in which his near relative is posted as Divisional Accountant or as an officer of any capacity between the grades of Surat Municipal Corporation -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 are near relatives to any Gazetted Officer in the SMC / SSCDL 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 contractor of this Department. If however the contractor is registered in any other department, he shall be debarred from tendering in SMC / SSCDL for any breach of this condition.

Note: by the term “Near relatives” is meant wife, husband, parents and grandparents, childrenand grand-children, brothers and sisters, uncles, aunts and cousins and their corresponding inlaws.

22.21 NO Gazetted Engineer to work as Contractor within one year of retirement:

No engineer of gazetted rank or other gazette officer employed in engineering or administrative duties in an engineering department of the SMC / SSCDL shall work as contractor or employee of a contractor for a period of two years after his retirement from Government service without the previous permission of SMC / SSCDL in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of SMC / SSCDL as aforesaid, before submission of the tender of engagement in the contractor’s service, as the case may be.

22.22 SUBLETTING OF WORKS:

No part of the contract nor any share or interest thereon shall in any manner or degree be transferred, assigned or sublet by the contractor directly or indirectly to any firm or Corporation whatsoever except as provided for in the succeeding sub clause without the consent in writing of the owner.

22.23 SUB-CONTRACTORS FOR TEMPORARY WORKS ETC. :

The owner may give written consent to sub-contractors for execution of any part of the work at the site being entered upon by the contractors provided each individuals contractor is submitted to the Engineer-in-charge before being entered into and in approved by him. List of Sub-Contractors is to be supplied. Not with standing any

subletting with such approval as aforesaid and not with standing the Engineer-in-charge shall have received copies of any sub- contractors, the contractors shall be and shall remain solely responsible for the quality and proper expeditions and execution of the works and the performance of all the conditions of contract in all respects as if such submitting or sub-contracting had not taken place and as if such work had done directly by the Contractor.

ARTICLE 23
DISPUTE RESOLUTION MECHANISM

23.1 RESOLUTION OF DISPUTES :

Except or otherwise specifically provided in the contract, all disputes concerning questions of fact arising under the contract shall be decided by the Engineer in charge, subject to a written appeal by the Contractor to the Engineer in charge and these decisions shall be final and binding on the parties hereto. Any disputes or difference including those considered as such by only one of the parties arising out of or in connection with this contract shall be to the extent possible setteled amicably between the parties. If amicable settlement can not be reached then all disputed issues shall be settled as provided in (a)

(a) DISPUTE OR DIFFERENCES TO BE REFERRED TO:

If at any time, any question, disputes or differences of any kind whatsoever shall arises between Engineer and the contractor upon or in relation to or in connection with this contract, either party may forthwith give to the other, notice in writting of the existance of such question, dispute or difference as to any decesion, opinion, instruction, direction, certificate or evaluation of the Engineer in charge.

The question or difference shall be settled by the The Chairman Surat Smart City Development Limited who shall state his decesion in writing and give notice of same to the Engineer and to the contractor. Such decesion shall be final & binding upon both parties to the contract and work on contract if not already breached or abandoned shall proceed normally unless and until the same shall be revised (or upheld) due to any Judicial proceeding. Should the Chairman Surat Smart City Development Limited fail to give a decision within three (3) calendar months after issuance of notice of a question, dispute or difference or if the contractor is dissatisfied with any such decision of the Chairman Surat Smart City Development Limited , then the matter may be referred to court of law subject to SURAT JURICDICTION .

23.2 DELETION OF ARBITRATION CLAUSE

ARBRITATION word or Clause should be considered deleted whereever written in the whole tender.

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DAY, MONTH AND YEAR FIRST ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED For and on behalf of SSCDL by:	SIGNED, SEALED AND DELEVERIED For and on behalf of THE CONTRACTOR by:
(Signature) (Name) (Designation)	(Signature) (Name) (Designation)

In the presence of: 1.

2.

{COUNTERSIGNED and accepted by:
Name and particulars of other members of the Consortium}

Section VIII - Forms of Security and Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The formsfor Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

Table of Forms

UNDERTAKING ON EARNEST MONEY SURRENDER:

I/We hereby tender for carrying out Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Maintenance of Tendered works for Period of Five on Preparation of Working Drawings, Procurement and Construction Basis (herein before and herein after referred to a client of the work) as specified in the memorandum & under Price-Bid showing items of work to be carried out within time specified therein and in accordance with all specifications, designs, drawings and instructionsin writing referred to in provisions under annexed conditions of contract under contract documents and agree that all materials of construction in the work are to be procured by us.Should this tender be accepted, I/We hereby agree to abide by and fulfil all the terms and provisions of the conditions of contract annexed thereto as fully applicable, and in default thereof, agree to forfeiture of and pay to the client, the sums of Earnest money mentioned inthe said conditions.

Receipt No. _____ dated _____ from client, in respect of the sum or Rs. _____ /-deposited, be in the from of Bank GuaranteeRs. _____ /- and Pay Order/Demand Draft drawn for Rs. _____ /- bearing No. _____ dated _____ on the_____ _____ drawn in favour of_____ is herewith forwarded representing the earnest money, the full value of which is to be absolutely forfeited to client, should I/We not depositthe full amount of security deposit specified in the memorandum, and in accordance with clause 1 of para 5.1 of the said conditions, otherwise the said sum of Rs._____/- shall be refunded.

Amount to be specified in figures and words.

Place :
Date :
Address :

Signature of the
contracting agency submitting
the tender

Signed and given in presence of _____
Address :

the contracting agency.

Rs. 100/- STAMP

FORMAT FOR BANK GUARANTEE

[1] In consideration of the Terms and Conditions of an "Agreement made between The Chairman , Surat Smart City Development Limited, Surat (herein after called" Surat Smart City Development Limited ") and…… (Contractor) (hereinafter called "Contractor" for the work of ……. ……. (Name of work) for the …… deposit for the due fulfillment by the contractor of the terms and conditions contained in the said agreement, We Bank of …….. (hereinafter referred to as the Bank) at the request of …… (Name of Contractor) do hereby undertake to pay the Surat Smart City Development Limited an Amount not exceeding Rs…….. against any loss or damage caused to or suffered by Surat Smart City Development Limited by reason of any breach of any term or condition contained in the said agreement by the said Contractor.

[2] We Bank of…… do hereby undertake to pay the amount due and payable under this Guarantee without any demur merely on a demand from the Surat Smart City Development Limited stating that the amount claimed in due by way of loss of damage caused to or would be caused to or suffered by the Surat Smart City Development Limited by the reason of breach by the said contractor of any of the terms and conditions in the said agreement of by reason of the contractor failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee shall be restricted to an amount not exceeding Rs……..

[3] We undertake to pay the Surat Smart City Development Limited any money so demanded notwithstanding dispute or disputes raised by the contractor. In any suit of proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by under this bond shall be a valid discharge of our liability for payment there under and the contractor shall have no claim against us for making such payment.

[4] We Bank of ……, …… further agree that the guarantee herein contained shall remain in full force and effecting during the period that would be taken for the performance of the said agreement and that under or by virtue of said agreement have been fully paid and its clime satisfied or discharged or till The Chairman, Surat Smart City Development Limited, Surat clarified that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly discharge this guarantee. Unless a demand or claim under this agreement is made on us in

writing on or before (dt.) …… we shall be discharged from all liability under this Guarantee thereafter.

[5] We Bank of …… further agree with the Surat Smart City Development Limited that the Surat Smart City Development Limited shall have the fullest liberty without our consent and without in any manner our obligations hereunder to very and of the terms and conditions of the said agreement or to extend the time of performance by the said contractor from time to time or to postpone for any time or time to time any of the power exercisable by the Surat Smart City Development Limited against the said contractor and to Forbes 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 variation or extension being granted to the said contractor or for any béarnaise, act or omission of the part of the Surat Smart City Development Limited or any indulgence by the Surat Smart City Development Limited to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties would but for his provision have of a relieving us.

[6] This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

[7] We Bank of …… lastly under take not to revoke during its currency except with the previous consent of the Surat Smart City Development Limited in writing.

NOT WITH STANDING ANYTHING CONTAINED HERE IN :

[1] Our liability under this bank guarantee is restricted to Rs.

[2] This bank guarantee is shall valid up to ……..

[3] Our liability to make payment shall arise and we are liable to pay the guarantee amount or any part there of under this guarantee, only if serve upon us a written claim a demand in terms of the guarantee on or before dt. ……

THIS BANK GUARANTEE IS ENCASHABLE AT OUR BRANCH OFFICE AT SURAT

[4] In written of bank has executed this present the day and year first written.

Date the …… , Month …… , Year ……. for ……(Bank name).

Seal, stamp and signature
of Bank's authorized Signatory

JOINT VENTURE AGREEMENT

(To be notarized on stamp paper of appropriate value)

(1) The Joint Venture agreement made and entered into at _____(place) on _____day of _____(YEAR) by and between.

a. Firm A (Name with address of the registered office)
b. Firm B (Name with address of the registered office)

(2) Definitions: In this deed the following words and expressions shall have the meaning set out below.

a. "The Employer" shall mean Surat Smart City Development limited
b. "The Works" shall mean _____ _____(Name of work) which is more particularly described in the pre-qualification and tender documents issued thereof by the Employer.
c. "The Tender" shall mean the Tender to be submitted by Joint Venture to the Employer for the work /works.
d. "The Contract" shall mean the contract entered /to be entered into between the Joint Venture and the Employer for the works.

(3) Joint Venture (J.V):

The Parties hereto declare that they have agreed to form a Joint Venture for the purpose of submitting the pre-qualification Application/ tender document initially and then tender and if successful for the execution of the works as an integrated Joint Venture. The parties are not under this agreement entering into any permanent partnership of Joint Venture to tender or undertake any contract other than the subject works. Nothing herein contained shall be considered to constitute the parties of partners to constitute either Party the agent of the other.

(4) Witnesses : Where as .Employer Surat Smart City Development limited has invited tenders from intending bidders has permitted a group of firms (not exceeding two) forming a Joint Venture to eligible to be a bidder. And whereas_____party of the first part and _____party of the Second part/third part(if applicable) are desirous to enter into a Joint Venture in the nature of partnership engaged in the joint undertaking for the specific purpose of execution of the work of constructing _____and whereas Parties of the first and

Second part /third part(if applicable) reached understanding to submit pre-qualified/ tender, if pre-qualification, and to execute the contract if awarded;

This agreement witness as follows.

(a) The parties do not enter into an agreement of any permanent partnership of Joint Venture to tender or undertake any Contract other than the specified above;

(b) That the operation of this Joint Venture firm concerns and is confined to the work of _____of Board

(c) The name of the Joint Venture firm for convenience and continuity shall be

(d) The Address of Joint Venture for communication shall be as under.

(e) The Joint Venture shall jointly submit pre-qualification application on the above name according to all terms and conditions stated in the relevant instructions contained in the bid documents.

(f) That this Joint Venture shall regulate the relations between the parties thereto and shall include without being limited to them the following conditions.

(1) _____ firm shall be the lead company in charge of the Joint Venture for all intents and purpose.

(2) In case the said work is awarded to the Joint Venture, the partners of the Joint Venture will nominate a person with duly notarized power of Attorney on stamp paper, who will represent the Joint Venture with the authority to incur liabilities, receive instructions and payments, sign and execute the contract for an on behalf of the Joint Venture,

(i) All the (Maximum Two) parties agree to make financial participation and to place at disposal of Joint Venture the benefits of its individual experience, technical knowledge, skill and shall in all respect bear its share as regards planning and execution of the work and responsibilities including the provision of information, advice and other assistance required in the Joint Venture and participation shall be in proportion of, Firm – A.....% Firm - B.....%

(ii) All rights, interests, liabilities, obligations work experience and risks (and all net profits or net losses) arising out of the contract shall be borne by the parties in proportion to their shares. Each of the parties shall furnish its proportionate share in any bonds, guarantees, sureties required for the works as well as its proportionate share in connection with the works. The share and participation of the two/three partners in working capital and other financial requirements shall be in ratio as mentioned above.

(5) Internal responsibilities and liabilities:

(a) The division of individual scope of work may be worked out mutually by the parties but the party shall be jointly and severally liable to the employer for the whole work.

(b) The parties specifically undertake to carry out their separate works in full compliance with the contract with the employer. Each party shall be responsible jointly and severally for consequences if any arising out of defective or delayed execution of works which falls within the individual's party's area of responsibility and/ or it has been caused due to acts and /or omission of the concerned party.

(c) The parties jointly and severally agree to replace modify or repair any defect in their respective portions of works in accordance with the terms and condition of the contract with the employer.

(d) The parties jointly and severally shall indemnify and hold harmless to each other against any claim made by the employer or any other third party for injury, damage, loss or expenses is attributed to the breach /non-performance of his responsibilities by the indemnifying party in accordance with the agreements and /or contract with the employer.

(e) None of parties have joined in any other Joint Venture for the said works.

(6) Responsibilities and liabilities of Joint Venture towards the employer:

(1) Parties hereto shall be jointly and severally liable and responsible for the acts, deeds and things done or omitted to be done in respect of the execution of the contract and for any financial liability arising there from.

(2) Parties hereto shall be jointly and severally responsible to the Employer for the execution of the works in accordance with the contract conditions;

(3) Parties hereto shall be jointly and severally indemnify to the Employer against any claim made against the employer or any other third party for any injury, damage or loss which may be attributed to the breach of the obligations under the contract pursuant to the contract.

(7) Site management:

(a) The execution of the work on the site will be managed by a Project Manager appointed by the Joint Venture and who will report to the _____(J.V.) the project manager shall be authorized to represent the Joint Venture on site in respect of matters arising under the contract.

(b) The _____(Name of the J.V.) shall be jointly and severally liable to the employer for the execution of the contract commitment in respect of the works in accordance with contract conditions.

(8) Termination of the Agreement:

This agreement shall be terminated in the following circumstances.

(a) The employer awards the contract for the work to the other Bidder.

(b) The employer cancels the work to award the contract.

(c) On completion of the defect liability period as stipulated in the contract agreement of the works and all the liabilities thereof are liquidated.

(9) No partner has right to assign any benefits, obligation of liability under the agreement to any third party without prior written consent of the other partner as well as Board

(10) Financial matter:

(a) Bank Account in the name of the Joint Venture will be opened with any scheduled or nationalized Bank to be operated by an individual signatory as decided mutually by the Joint Venture partners.

(b) All the partners shall be responsible to maintain or cause to maintain proper Books of accounts balance sheet and profit and loss account as to the state of affairs of the firm as at the end of the financial year and as to the profit and loss made or incurred by the firm for the year ended on that date, respectively shall be prepared and the same shall subject to audit by a Chartered Accountant.

(c) None of the party shall be entitled to make any borrowing on behalf of the Joint Venture without express prior written consent of the other party.

(d) Bank guarantee for the application /execution of the work shall be provided jointly from a bank acceptable to the employer.

(11) Negotiation : Any negotiation of agreement between the parties hereto and the employer subsequent to the submission of the tender and prior to award, shall take place only with consent of each of the parties who shall be represented at the such negotiation by one or more representative(s) duly empowered to make such negotiation or agreement.

(12) Legal jurisdiction: All questions relating to validity interpretation of this agreement shall be governed by the law of India and shall be subject to jurisdiction of High court at AHMEDABAD.

(13) Settlement of disputes: Any dispute in interpretation of any condition mentioned herein shall be referred to an arbitrator/tribunal by mutual consent of the partners and such proceedings shall be governed by Gujarat Public Works contract disputes tribunal act of 1992 and as amended from time to time. The award of arbitrator shall be final and binding on the party hereto. Neither the obligation of each party here to the performance of contract nor the execution of work shall stop during the course of arbitration proceeding or as a result thereof.

(14) Insurance:

(a) The Joint Venture through the parties individually shall take such insurance in connection with the work in accordance with the tender condition as acceptable to the employer.

(b) The cost of the insurance premium paid by the Joint Venture shall be borne and paid by the parties in proportion to the respective shares of work. Other insurance taken individually by the parties shall be fully borne by the respective parties.

(15) No change shall be made in this agreement without prior written consent of the employer and other party. However if the employer directs the parties to make changes in the agreement so as to fulfill tender conditions the parties discuss with employer and mutually agreed such changes required to be made in the agreement.

(16) **Default and withdrawals from the Joint Venture**. : In case that either party fails to observe the provision stipulated in this agreement withdrawal from the Joint Venture, Loss and/or expenses incurred by other party due to such default and /or withdrawals shall be fully compensated by the party who has defaulted.

(17) All matter relating to or arising due to this agreement shall be treated as confidential and shall not be disclosed to any other party. In witness whereof the parties have caused their duly authorized representatives to sign below.

Witness:

1 Signed for and on behalf of firm-A
2 Date Seal

Witness:

1 Signed for and on behalf of firm-B
2

Date Seal

Witness:

1 Signed for and on behalf of firm-C
2 Date Seal

SECTION IX - APPROVED LIST OF BANKS

Where the contractor is required to submit F.D.R., bank guarantee, etc. against payment towards any deposit or advance e.g. EMD, SD,etc., such F.D.R, bank guarantees, etc. shall be produced from any one of thefollowing Nationalized banks as listed below:

1) Indian Bank
2) State Bank of India
3) Punjab National Bank
4) Bank of Baroda
5) Union Bank of India
6) Bank of India
7) Oriental Bank of Commerce
8) Canara Bank
9) Central Bank of India
10) Corporation Bank
11) Allahabad Bank
12) Indian Overseas Bank
13) Dena Bank
14) Syndicate Bank
15) Andhra Bank
16) Punjab & Sind Bank
17) Bank of Maharashtra
18) Vijaya Bank
19) United Bank of India
20) UCO Bank or Any other Nationalized Bank
21) IDBI
22) HDFC
23) AXIS Bank
24) ICICI Bank Limited
25) The Surat People's Co-operative Bank Ltd.
26) The Mehsana Urban Co-operative Bank Ltd.
27) Kotak Mahindra Bank
28) The Kalupur Commercial Co-operative Bank Ltd.
29) Rajkot Nagrik Sahkari Bank Ltd.
30) The Ahmedabad Mercantile Co-operative Bank Ltd.
31) Development Credit Bank Ltd.

SECTION XI - MEMORANDUM

I/We _____ the undersigned do hereby Tender for carrying out the work described in the schedule subject to the condition annexed in schedule attached herewith in Tender documents.

(1)	General Description of work	:-	Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path & Cycle track works, Utility Duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Maintenance of Tendered works for Period of Five Years on Preparation of Working Drawings, Procurement and Construction Basis
(2)	Estimate Cost	:-	Rs. **167,51,99,158/-** (Rupees One Hundred and Sixty Seven Crore Fifty One Lacs Ninety Nine Thousand One Hundred and Fifty Eight)
(3)	Earnest Money Deposit	:-	Rs 1.68 Cr (Rupees One Crore and Sixty Eight Lacs only) by the way of Pay order / Demand Draft issued in favour of Surat Smart City Development Limited, Surat through Nationalized Bank only payable at Surat. Or The tenderer shall pay Fifty (50%) percent amount of EMD i.e Rs. 0.84 Cr (Rupees Eighty Four lacs) in the form of Bank Guarantee from the Nationalized Bank only , whose branch must be located at Surat only. The balance of the EMD - Remaining Fifty (50%) percent i.e Rs. 0.84 Cr (Rupees Eighty Four lacs) is to be deposited by way of pay order / Demand Draft issued in favour of Surat Smart City Development Limited, Surat through Nationalized Bank only payable at Surat. EMD in no other form shall be accepted.

(4)	Performance Security	:-	10% of Contract Value (Out of total Performance Security 10% of the contract value, initial Performance Security at 5% of the contract value shall be deposited by the bidder in the form of FDR/BG of listed nationalized Bank within 15 days on acceptance of tender, and remaining Performance Security shall be deducted from the each R.A. Bill at rate of 5%) In case of unbalanced offer being found by SSCDL contractor may be asked to deposit additional performance security as provided in the contract In case of unbalanced offer being found by SSCDL contractor may be asked to deposit additional performance security as provided in the contract
	Total Performance Security		Rs. 10% of tender amount (Article-5) In case of unbalanced offer being found by SSCDL contractor may be asked to deposit additional performance security as provided in the contract
(5)	Retention Money	:-	7 % of total amount of work done (shall be released at the time of final bill)
(6)	Time allowed for the completion of work from date fixed in written order to commence	:-	24 (Twenty Four) Months (Including monsoon)
(7)	Penalty for delayed work	:-	In event of these Milestones not having being achieved, an amount computed at0.2% of Remaining Amount of Work per day subject to a Maximum of 10% of Total Contract Value shall be retained. Liquidated Damages shall start being retained as per contract on value of Remaining work on not achieving intermediate Milestones 1,2,3. The Liquidated damages shall be released

			without interest or charges if contractor achieves Milestone 4 before completion of approved time limit including extension of time limit, if approved or else the same shall be adjusted as Liquidated Damages for delay in performance.
(8)	The progress of work should confirm to the following schedule		
	Financial Target (% of contract value) - 10%	:-	25 % of the time limit
	Financial Target (% of contract value) - 50%	:-	40 % of the time limit
	Financial Target (% of contract value) - 75%	:-	75 % of the time limit
	Financial Target (% of contract value) - 100%		100 % of the time limit
(9)	Defect liability period	:-	5 (Five) years after issue of completion certificate
(10)	Construction Cess	:-	1% of Total work done & to be deducted in every bill

SIGNATURE OF THE CONTRACTOR.

NAME AND ADDRESS :-

GENERAL MANAGER (IT)

SURAT SMART CITY DEVELOPMENT LIMITED

Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions of Contract, Technical Specifications, and Drawings.

2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, wherever applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.

3. The rates and prices bid in the priced Bill of Quantities shall, except as otherwise provided under the Contract, include all required construction equipment, labor, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.

4. A rate or price shall be entered against each item in the priced Bill of Quantities. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other item rates and prices entered in the Bill of Quantities.

5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.

6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.

7. Works itemized in the BOQ will be subject to measurement. Such measurement will be in the unit of measurement shown the BOQ and payment shall be made on the measured quantities.

8. The method of execution and measurement of completed work for payment shall be in accordance to the respective procedures provided in the Technical Specifications or Particular Specifications under this Contract and in the absence of which shall be in accordance to the relevant BIS Standard and Standard Specification of the State or Standard Specification published by the Central Public Works Department, Government of India as the case may be.

9. The method of measurement of completed work for payment shall be in accordance with the relevant codes of practice.

10. Contractor shall take care to un install the old utilities that need to be replaced by new suggested utilities so as not to damage the same and all the material such as Manhole Frame cover, Street Pole, Street Furniture.. etc obtained after Demolition / Removal / Shifting of Utilities shall be properly stacked at Designated location and handed over to SSCDL. On instruction of SSCDL such dismantled material (C & D) waste shall be disposed off at location within City limits as

approved by SSCDL. All the charges for Stacking and dismantling of such material shall be borne by the Contractor. No payment shall be made to the Contractor in this regard.

11. All defective works are liable to be demolished, rebuilt and defective materials replaced by the contractor at his own cost and time

12. In view of the site location and their prevailing condition, it is mandatory to the Contractor to visit the site and make himself thoroughly familiar with the site conditions, access and account for all possible difficulties and other requirements mentioned elsewhere in his bid prior to submission. When a contractor submits his bid for this work, it will be considered that he has quoted for this work with full and complete knowledge of the site and prevailing conditions, and no claim for additional compensation shall be entertained on this account.

13. The Contractor shall be deemed to be fully conversant with and to have made full allowance in his Tender for the site conditions, the nature and complexity of the work to be undertaken, the other extensive development and construction work currently being or which may be executed on and around the Site and all changes in the nature and condition of the Site from that existing at the time of Tender.

14. Extra and excess items of work shall not vitiate the Contract. The Contractor shall be bound to execute extra items of work as directed by the Engineer. The rates for extra items will be as per rates decided under Contract Conditions.

15. Cost of temporary works like Construction and maintenance of road diversions including traffic control; Construction and maintenance of temporary dewatering and drainage arrangements, rectification of damaged utilities during excavation, temporary diversion of existing sewage flow, arrangement of mobile public toilets for residents affected due to laying of new sewer lines as replacement of existing sewer lines, establishment and maintenance of contractor's site office, store, establishment and maintenance of workshops, plant and equipment, including Project sign boards etc will be part of work and shall not be paid extra.

16. The rates and prices of various items in the Bill of Quantities shall be deemed inclusive of the cost towards implementation of environmental management and monitoring as specified in the Initial Environmental Examination Report, Environmental Management Plan and Environmental Monitoring Plan and other safeguard aspects mentioned in the contract and no additional payment shall be admissible on any such account what so ever.

17. The bidder shall quote his offer/rates for the work under this package in the BOQ downloaded from web site only and rates quoted on other BOQ or on old BOQ (if any) shall not be considered. The bidders are advised to up load the financial bid on latest BOQ downloaded from Web site.

18. The rates and prices inserted in the BOQ by the bidder shall be deemed to cover all costs, taxes, customs and import duties, levies, profits, risks, liabilities, insurance and obligations set forth or implied in the bid, as well as proper operation, maintenance and management of the Works including, but not limited to the following:
    (i) All labour and Materials including consumables;

(ii) All temporary work of every description required including over ground pumping and other requirements to avoid disruption to the service whilst maintenance or repair work is carried out;
(iii) The provision and use of all equipment, tools and Plant of every kind, whether mechanical or non-mechanical, required for the expeditious carrying out of the Works in their proper sequence;
(iv) Provision for scaffolding, staging, guard rails, temporary stairs, temporary access during execution, approach roads up to the Site for the movement of vehicles, and heavy excavation machinery with supporting transport facility;
(v) Provision for excavation, back-filling, bringing to the Site extra fill for back-fill, making good and reinstating surfaces, disposing of surplus material, dealing with all ground water and wastewater flows, and for work in close proximity to other utility apparatus including protecting that apparatus;
(vi) Provision for work on pipe line corridors such as traffic control measures, safety barriers, obtaining any approvals and permits from authorities, and reinstatement of surfaces;
(vii) Cooperation and coordination of the work with related authorities, other contractors and utilities, including obtaining their permission before starting the related Works if required; and
(viii) Providing security arrangements to guard the Site and premises at all times and to maintain strict control on the movement of Materials and labor until the completion of the work.
(ix) Sampling and testing materials and goods, testing workmanship, providing, storing, packing and transporting samples to and from the place of testing.
(x) Fixing, erecting, installing or placing of materials and goods in position.
(xi) Disposing of surplus and unsuitable materials and goods and excavated materials, including stacking, storing, loading, transporting and unloading.
(xii) All Temporary Works
(xiii) Construction and maintenance of temporary access roads within the Site and of any roads required for access to any part of the Site for the purpose of carrying out the Works, taking into account that the access roads under the Contractor's maintenance control will also be used by the Procuring Entity and his staff's vehicles.
(xiv) Construction, maintenance and removal, if required, of temporary Site drainage on the Site, and for ensuring that all drains are kept clear of debris and blockages at all times.
(xv) All general obligations, liabilities and risks involved in the execution and maintenance of the Works set forth or reasonably implied in the documents on which the Tender is based.
(xvi) Establishment charges, overheads and profits.
(xvii) Co-operating with other contractors if required.

The bidder shall enter rates in boq for the whole work as mentioned in Bid documents.

19. All rules and regulations of the labor department, contract labor Laws, provident fund and employee state insurance and connected Laws, and all other Laws of the land are to be complied with by the Bidder within the quoted rates.

20. **Bidder shall quote the Base Rate for Various Items as mentioned in Schedule D of Price Bid. The basis of payment will be the actual quantities of work carried out, as measured and verified by the Engineer-in-Charge**.

21. **For Laying of the Water Supply line all the material such as C.I. / D.I pipes , including all Fittings and Fixtures shall be Provided by the Employer (SSCDL). It is scope of Contractor to Transporting the same to the Workplace.**

22. **For all the Material Provided by the Employer, Wastage Limit shall be as approved by the Employer. Anything above the Wastage limit shall be debited to the Contractor as per prevailing rate as approved by the Employer**

VOLUME III

EMPLOYER'S REQUIREMENTS

&

SPECIFICATIONS

A. Scope of works

The works under Contract comprises the construction of proposed improvement of roads , Junction, drainage works, construction of new carriageway, construction of utility ducts, cross drains, culverts, foot path, cycle track, development of parking areas & bus bays, Street landscaping, Street Furniture, Traffice Signages, Bus Shelters, Vending Kiosks,Miscellaneous works and Maintenance of Tendered works for Period of Five years

The Work Shall be executed onPrepartion of Working Drawings, Procurement and Construction Basis . Details and drawings given in Tender document is for information purpose only and successful bidder shall undertake confirmatory survey for accuracy and completeness of data. It is in scope of successful Bidder to undertake all Site surveys, Geotechnical investigations, Underground Utility Survey and Scanning of the roads for utility shifting, obtaining all required approvals from the relevant authorities,Carry out Design and Drawings for all the components of the work as per Employers requirement and submit the same to client for review and approval, Prepare Good for Construction Drawings, submit maintenance manual to client for approval before start of Maintenance period.

The successful bidder shall have to prepare and submit 'As Built Drawings' depicting the exact construction carried out on site, in soft and hard copy format.

Statutory and other charges for getting various required approvals shall be in scope of Successful bidder

The scope of work also includes :

1.1 Construction and completion of the following

a. Site clearance, demolition works, earthworks, temporary works,traffic diversion, barricading the construction site, utility shifting and all ancillary works deemed necessary for the carrying out of temporary & permanent construction works.

b. Widening/ re-cambering/ raising/ miling down & overlaying of existing carriageways, flexible/ rigid pavement at grade road intersections & accesses to adjoining developments. Work also includes removal of street furniture, exiting foot path, existing median, exiting signages, trees if any way of revised ROW, existing structures that obstruct the revised ROW as per instruction of SSCDL.

c. Tree cutting (if any) as indicated in the drawings.

d. Construction of Utility ducts, cross drains as per approved drawing.

e. Retrofitting the existing roads as per the proposed road sections wrt carriageways, provision of footpath, cycle track, services lanes.

f. Installing RPM, making road markings along the road edge, road center line & as per IRC guidelines, bus stop marking, cycle track marking, construction of medians & speed breakers, & junction improvements as per the drawings & in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

g. Construction of footpaths, kerbs, railings, vehicular impact guardrails and other road related facilities as per the guidelines of IRC in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

h. Supply and installation of new traffic signage, directional signage, street name signs & re-sitting of such existing signs & other road signs to be retained, inclusive of support & foundation as per Employers Requirement.

i. Supply & installation of street furniture seating bench, planter box, bollards, cycle hoops, advertisement/ branding/ wayfinding boards & poles in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

j. Planting of trees, shrubs and installation of lawns as a part of Landscape work & installation of services for the same, as per the drawing in accordance with the Employer's requirements and to the satisfaction of the Engineer in charge.

k. All other works and services ancillary or related to the full completion of the Works in accordance with the Employer's requirements

1.2 The Contractor shall ascertain, determine and verify the locations of all utility services by scaning the roads in the vicinity of the Works, and co-ordinate with utility agencies for the diversion of affected services and the laying of new services. The Contractor shall support and protect services that need not be diverted or pending diversion and remove all abandoned services. Contractor shall be responsible for relocation, reconstruction, reconfiguration of driveways, site accesses, temporary and permanent drains, pipe conduits and necessary connections for public lighting and traffic lighting, earth works, turfing, environmental assessments, necessary safety measures and protection works, sewer lines etc

1.3 The Contractor's responsibility for the design and build works includes the submissions to relevant government authorities / technical departments for obtaining all necessary clearances/approvals.

1.4 The Contractor shall co-ordinate and interfaces his works with that of all other contractors, subcontractors, utility services, statutory authorities, etc. and achieve the completion of the Works to the satisfaction of the Engineer

1.5 The Contractor shall verify the proposed road reserve, cadastral boundary and contract boundary and all dimensions on Site prior to submission of Tender. The Contractor is responsible for clarifying any discrepancy between the Drawings and actual condition on Site.

1.6 The Contractor shall make good all works including road surfaces, drains, concrete slabs, gratings, kerbs, pavements, turfing, railing, fence, boundary wall, etc. affected or damaged during the course of construction, to the satisfaction of the Engineer. The costs of making good all these defects shall be borne solely by the Contractor and deemed included in his Contract Sum

1.7 All works specified shall include the provision of all labour, tools, equipment, material,traffic control, transport and everything else necessary for the satisfactory completion of the Work by the Contractor to the satisfaction of the Engineer.

1.8 Description of the Works involved in this Contract is given in the Specifications for the guidance of the Contractor. The Contractor shall be solely and fully responsible for investigating and ensuring the actual extent and nature of the Works comprised in this Contract prior to submission of his Tender.

1.9 Construction, management and quality of the Works shall comply with the Drawings,Specifications and Employers requirement

B. CONTRACTOR'S OBLIGATION

1.1 SITE RESPONSIBILITY CHART

The Contractor shall submit, within 15 days after the Date of Commencement of the Contract, a site responsibility chart to show the functions and responsibilities of various personnel from the Project Manager to the workmen responsible for executing the Works, as well as the functions and responsibilities of the sub-contractors involved.

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1.2 SETTING OUT AND EXISTING LEVELS

The Contractor shall take levels and set out for the whole of the Works. The information on existing levels as shown on the Drawings is provided in good faith for the general guidance of the Contractor. The Contractor is to note that accuracy of information shown on the Drawings is not guaranteed. The Contractor shall visit the site and carry out field surveys if he considers it necessary to ascertain the full extent of the Works. Within one week after the commencement of the Works, the Contractor shall submit to the Engineer for his verification and endorsement, records of levels of the existing site condition. Similarly, the Contractor shall submit the as-constructed levels of the site to the Engineer upon completion of the Works. Such records shall be certified and endorsed by a Registered Surveyor engaged by the Contractor at his own cost.

1.3 DESIGN OF WORKS :

The Contractor shall carry out, and be responsible for the design of the Works, including any site surveys, subsoil investigations, materials testing, and all other things necessary for proper planning and design.

With 10 days from Award of work, the Contractor shall start submiting drawings, construction documents, etc., for review and approval by the Employer's Representative. The Contractor will be fully responsible for ensuring that its designs, drawings, and construction documents satisfy all requirements for constructing Works that are complete and fully functional in all respects.
The Contractor shall prepare, and keep up-to-date, a complete set of "as-built" records of the execution of the Works, showing the exact as-built locations, sizes and details of the work as executed. These records shall be kept on the Site and Two sets of such records shall be Submited to Employer.

In addition, the Contractor shall supply to the Employer's Representative as-built drawings of the Works, showing all Works as executed.

1.4 PROGRAMMING & PLANNING

BASELINE PROGRAMME :

1.4.1 Within 15 **days** after the award of the Contract, the Contractor shall submit six (6) hardcopies and one (1) softcopy of a Baseline Programme to the Engineer for his acceptance. The Contractor's project manager shall make a presentation of his proposed programme to the Engineer to demonstrate his understanding of the contract requirements, planning, control, monitoring of works programme and resources of the Works. Upon acceptance of the Baseline Programme by the Engineer, the Contractor shall adhere to it strictly. The Contractor shall ensure that preparation, updating and revision of programme of works are carried out by experienced and qualified personnel. The Baseline Programme shall be developed by the computerised Critical Path Method (CPM) using the Precedence Diagramming Method (PDM). The programming software shall be Primavera Project Planner or Microsoft Project or Open Plan, subject to the Engineer's approval.

1.4.2 Programme Details

The level of programme development, information and detail shall be sufficient to accurately define the Contractor's intentions and sequence of works. The programme shall show every significant activity required for the completion of the Contract that include but not limited to the following:

a. key dates, milestones, interface and handover dates, phased completion and completion of Whole of the Works;

b. Contractor's design including dates for submission to and acceptance by the Engineer;

c. submission and acceptance of road diversion plan, utilities diversion plan, Temporary Works and other works requiring approvals from authorities;

d. procurement of major equipment and material, in particular long lead items and the delivery to site;

e. all on-site works, including preliminary and Temporary Works by the Contractor, his sub-contractors and suppliers;

f. any off-site work such as the production and/or fabrication of any components or materials;

g. the different stages of traffic diversion and specific requirements with regard to traffic aspects as given in this Specification;

h. interface with Utility Agencies and work done by Utility Agencies or the Contractor for diversion;

i. interface with other contracts/contractors; and

j. any outside influence which will or may affect the progress of Works

1.5 SITE MEETINGS

The Contractor shall provide all facilities at the site for the purpose of conducting joint site meetings between the Contractor and the Engineer.The Contractor‘s key representatives (Project Manager, Construction Managers, Safety and Health Officer, Environmental Control Officer and site engineers, etc.) are required to attend daily pre-work meeting punctually prior to commencement of site activities and submit daily and weekly works programme to the Engineer (or his representatives).

1.6 NOISE CONTROL

The Contractor shall maintain noise levels for construction premises as stipulated under the Environmental Pollution Control (Control of Noise at Construction Site Regulations) (Amended) Regulations latest and subsidiary legislation and any amendments and/or reenactment thereto. All vehicles and mechanical construction plants used for the purpose of the Works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order. All compressors shall be sound reduced models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturer.All construction plants shall, where appropriate, be muffled and the Engineer shall have the authority to instruct the Contractor to shut down any which is not adequately muffled and to remove it from the Site.All machines in intermittent use shall be shut down or throttled down to a minimum in the intervening periods between works. Noise emitting equipment running continuously shall be housed in a suitable acoustic enclosure. Constructional plant shall be maintained in good and workmanlike condition so that extraneous noises from mechanical vibration, creaking and squeaking are reduced to an acceptable minimum. Percussive methods will not be permitted for breaking concrete. Equipment which breaks concrete or used for bending or such other equipment as is approved by the Engineer shall be used. All pile driving, demolition works etc shall be carried out by a recognised noise reducing system. Rotary drills and busters actuated by hydraulic or electrical power shall, where practicable, be used for excavating hard material. Noisy constructional plant shall be sited as far away as possible from occupied buildings. The use of barriers (noise barriers, site huts, acoustic sheds, screens or partitions) to absorb and or deflect noise away from occupied buildings shall be employed wherever possible. Care shall be taken when loading or unloading vehicles, dismantling scaffolding or moving materials to reduce impact noise. Access to the working areas shall be such as to ensure minimum disturbance to persons in occupied buildings. The Contractor shall not execute any of the works or carry out maintenance of construction plants in such a manner as to cause nuisance unless the work is absolutely necessary to save life or property or for the safety of the works in which case the Contractor shall immediately advise the Engineer. The Contractor shall provide all that is necessary, including competent and qualified personnel and suitable equipment for all the measurements and recordings of the noise levels as and when requested by the Engineer during the Contract duration and submit a detailed report including analysis within two days after the day of measurements to the Engineer.The Contractor shall provide and use construction plant and equipment, which have been specifically designed or modified to reduce the noise of normal operation.All night work after 6pm shall be subject to the approval of the Engineer.

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1.7 MAPPING OF EXISTING SERVICES

Prior to commencement of any part of the works under the contract, the Contractor shall locate the exact positions of all existing sewer mains, gas mains, water mains, electrical cables, telecommunication cables and other utility services.

Underground Utility Surveying shall be carried out by the Contractor, using the most advanced technology to get accurate & reliable Underground Utility information. Based on the findings of Underground Utility Surveying, the Contractor shall submit the Utility map and his plan for shifting of same to the Employer and respective Utility services Authorities. The Contrcator shall commence the work of Shifting / Relocation of Utilities only on reveiving approval for same

The Contractor shall take all precautionary measures to prevent damage to the services and minimize all inconvenience to residents, during the cutting of trial trenches.

Where utility services which are in the way of the works are not diverted or not to be diverted, they must be supported and protected during the construction of the works. The Contractor shall submit to the engineer and the relevant utility services authorities, calculations and detailed drawings, for the necessary support and protection of these services.

Any requirement that may be imposed by the utility services authorities in this connection shall be met fully and without compromise.

The Contractor shall note that the employer will not be responsible for any damage of the existing services caused by the construction works, etc. The Contractor will be liable for any damage to the existing services and carry out the repair works to the satisfaction of the engineer and the appropriate utility services authorities at his own expense.

All relevant utility services authorities shall be kept informed of any changes affecting their services

1.7.1 Diversion and Maintenance of Existing Drains

Upon award of the contract and prior to the commencement of the works, the contractor shall submit to the engineer his proposal for the diversion and maintenance of existing drains for the whole period of construction to the engineer and respective authority for approval.

The contractor shall be responsible for the maintenance of the free flow of the drains at all times. At no time shall the contractor obstruct or reduce the free flow area of the existing canal / drain without the prior approval of the engineer and respective authority.

If, in the opinion of the engineer, the contractor has not carried out or is unable to carry out such maintenance of temporary drain diversion to his satisfaction, the engineer reserves the right to employ others to carry out such works and deduct the cost of all such works from any money due to or to become due to the contractor.

The contractor shall remove all temporary works as soon as these are no longer required and reinstate the siteto its original condition to the satisfaction of the engineer and respective authority.

The contractor shall take all necessary precautions to prevent any damage to the existing culverts and drains. Existing drains/culverts/sumps etc. Made redundant when the new drains / culverts /

sumps are completed, shall be completely removed and filled with suitable materials to the satisfactory of the Engineer

1.8 Interface with Government Authorities / Consultants / Contractors / Vendors

Contractor shall Coordinate with Various Government Authorities / Agencies , State Electricity Board, Torrent Power, Gas Authority, ICT Consultant, ICT Contractor, various other Contractors / Vendors engaged by Employer for this Project for finalizing the Drawings, Implementation Schedule,shifting and Alignment of Utilities, for Proper Execution of works. All the Statutory Charges/ Fees. etc required for the same shall be borne by the Contractor.

Interface Matrix is given as a Guideline to the Contractor, However it is in the scope of Contractor to coordinate with all Relevant Authorities for Proper Execution and Completion of Works

INTERFACE MATRIX

Sr.No	Description	Coordination
1	For design & implemention of various Roads as per detail scope as mentioned in Tender document	SMC BRTS & Traffic Cell, SMC Bridge cell & Karni Mata GAD contractor, Skywalk contractor,
2	For location of Smart Bins under solid waste management project	Solid waste management contractor Engaged by Surat Smart City Development Limited (SSCDL) , SMC
3	Smart pole features regarding traffic management and sensors, Traffic Signals	ICT Consultant Engaged by Surat Smart City Development Limited for Smart City Project
4	For all Statutory / planning /Designing / Safety / Environmental norms	With Relevant departments. All charges / fees required shall be borne by the Contractor
5	Assessment of Power Requirement, Location and Space required for Supply of Power Equipments.	Torrent Power, DGVCL & relevant SMC department
6	For storm water collection pits	SMC & respective contractor
7	For utility trench proposal & implementation at proposed location	With relevant SMC departments, SSCDL , Gas Authority and Torrent power
8	Shifting of Required Utilities	Drainage / Water Department of SMC

9	Power supply for street light feeder pillars	415V supply from nearest Torrent Power Limited and DGVCL LT feeder pillar within 150m radius within their respective juridiction area
10	Utility trench for laying cables and pipe lines in DGVCL area	Coordination with DGVCL, Water Department SMC, Gujarat Gas, PHE/ Sewer Department of SMC, Storm Water Department SMC.

1.9 Operation & maintenance Requirement

During Operation & Maintenance period, it shall be the responsibility of the contractor to clean the roads, footpaths, dividers, cat's eyes, maintain the footpaths, dividers, kerb, signage and street furniture, road markings, pedestrian crossings, tree / shrub cutting, minor or major maintenance of arboriculture etc at an acceptable serviceability level as directed by the Engineer in charge.
Before Commencement of Operation & maintenance Period, the Contractor shall submit Operation & Maintenance manual to SSCDL for approval. SSCDL shall review and finalize Operation and Maintenance requirements to be carried out by the Contractor. Operation & maintenance period will commence only after getting approval to Operation & Maintenance manual from SSCDL.
During the operation and maintenance period contractor shall provide a supervisor level staff for attending to all the O& M activities during the O&M Period. All the Operation and Maintenance obligations as approved by SSCDL shall be carried out by the Contractor. The contactor shall carry out the two coat painting of all kerbs, dividers, street furniture (where applicable) twice annually and once annually for the Road markings. The monthly report on the Operation and Maintenance shall be submitted to the Enginer and Quarterly payment for O& M as per the BOQ shall be released to the contractor based on the work carried out by him and assesement by the Engineer in charge. SSCDL reserves the right for reduction in such payments, for any delay in attending the Maintenance obligation within the stipulated time as approved by SSCDL.

1.10 Design and Drawings to be submitted for review and Approval

On Award of work the Contractor shall submit the design and Drawing for review and approval. Drawings mentioned in the list are indicative and for Information. Contractor shall not limit himself to the same but it is in scope of Contractor to submit all required design and drawings for review and approval as per Instruction from Engineer-In-Charge

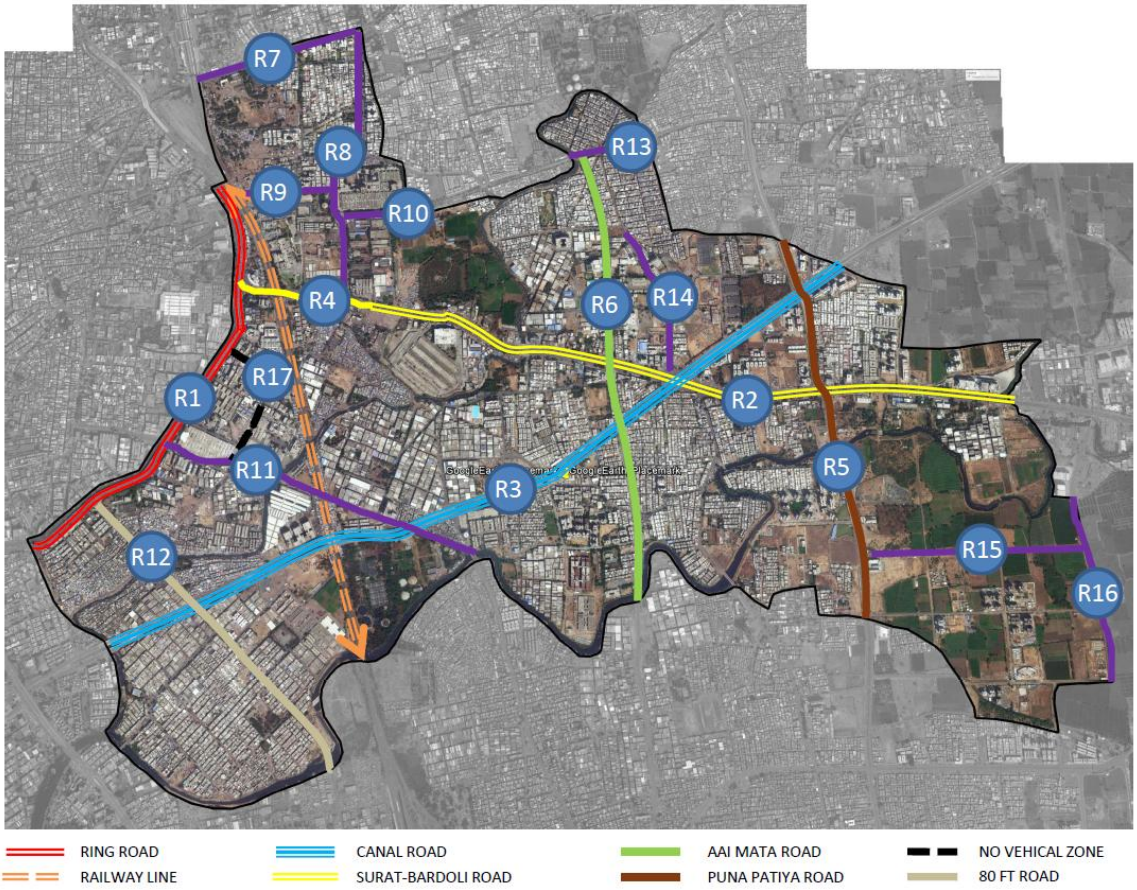
Sr.No	Documents
1	Geotechnical investigation report

2	Topography Survey Layout
3	Civil / structural design basis report
4	Structural design (calculations) report
5	Proposed Layout for Shifting of Utilities
6	Design,Drawings, Sections for all Roads indicating the Proposed Visual Development.
	Utility Trench Drawing
1	General arrangement drawing for utility trench for all Roads where Utility Trench to be Constructed
2	Structural Layout & Details of Utility trench
3	Typical details for joineries of utility trench
	Visual Improvement Drawings for Roads
A	**Road Drawings**
1	Complete Road plan showing all the items as per BOQ (For all roads from R1-R17)
2	Road Levels (For all roads from R1-R17)
3	Typical ROW cross sections (For all roads from R1-R17)
4	Section at pedestrian crossing, raised pedestrian crossing at juctions,junctions, entry exits, through flyover
5	Detail sections for Re-carpeting works for roads
6	Typical details for Pavement (For footpath, shared paving (@ junctions, tactile pavement)- Plan, sections, details
7	Typical details for medians & kerb conditions (For all roads from R1-R17)
8	Typical details for Raised Pavement Markers
9	Typical details for Road Markings (text, arrows, lines, bus stop marking, cycle lane marking, pedestrian crossing, parking area etc as per IRC guidelines)

10	Typical details for Road Delineators
11	Typical details for painting of kerbs, medians, flyover edge condition etc.
12	Traffic island design including plan , sections, typical details etc. at junctions in co-ordination with respective SMC zone
B	**Typical Detail /shop Drawings**
13	Typical details for Seating Bench- Shop drg
14	Typical details for Concrete Bollards- Shop drg
15	Typical details for Tree Grates- Shop drg
16	Typical details for Guard rail- Shop drg
17	Typical details for Traffic Signage- Shop drg
18	Typical details for Branding Items (Br1,BR2,BR3) - Shop drg with respective brand brochure
19	Typical details for Litter Bins- Shop drg
20	Typical details for Water Dispenser- Shop drg
21	Typical details for Vending Kiosk- Shop drg
22	Typical details for Bus Shelter- Shop drg
23	Typical details for Bicycle Stand- Shop drg
24	Details for plantation of Trees, Shrubs, Planter box- Plan, section, details
25	Details for Landscape lighting

C. Salient Features of Roads for Visual Improvement :

Road layout of all roads under the scope of this tender is as below



For more clarity legend of Road names and 23km Road length break-up are as below

No.	Name of road	Road Width (m)	Length (Km)
1	R1 - Ring Road	60	2.02
2	R2 - Surat Bardoli Road	60	2.85
3	R3 - Canal Road	60	3.93
4	R4 - Surat Bardoli Road	45	0.9
5	R5 - Middle Ring Road	45	1.83
6	R6 - Aai Mata Road	36	1.9

7	R7 – Lambe Hanuman Road	24	0.8
8	R8 – Bombay Market Road	24	1.46
9	R9 – Sports Complex Road	24	0.42
10	R10 – Puna Gam Road	24	0.3
11	R11 – Kamela Darwaja Road	24	1.55
12	R12 – Kinnari Bhathena Road	24	1.52
13	R13 – Bombay Market Puna Gam Road	24	0.4
14	R14 – Archana School Road	24	0.68
15	R15 – Capital Corner Building Road	24	1
17	R17 – Salasar Hanuman Road (NVZ)	16	0.66

1. Salient Features of R1 - Ring Road (60M)

Salient Features of R1 - Ring Road (60M)	
Approximate Length of the Road	2.02KM
No. Of MV Lanes (On each sides of median)	2 Lanes With Flyover (Lane Width as per the IUT Guidlines of MOUD)
	4 MV Lanes Without Flyover (Lane Width as per the IUT Guidlines of MOUD)
Pedestrian Footpath Width (On each sides of median)	3 Mtrs
No. Of Bus Lanes (On each sides of median)	1 lane 3.5m wide (On road without flyover)
No. Of Service Lanes (On each sides of median)	2 Lanes (Total 5.5 Carriage way)
No. Of Parking Lanes (On each	1 Lane (2.5m Minumum wide)

sides of median)	
No. Of Cycle lanes (On each sides of median)	1 Lane (2M wide)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11009**

2. Salient Features of R2 - Surat-Bardoli Road (60M)

Salient Features of R2 - Surat-Bardoli Road (60M)	
Approximate Length of the Road	2.85KM
No. Of MV Lanes (On each sides of median)	3 Lanes - Karuni Mata Chowk to Puna Patiya Flyover (Lane Width as per the IUT Guidlines of MOUD)
	With Fly over - 7M Carriage way (2 lanes) (Lane Width as per the IUT Guidlines of MOUD)
Pedestrian Footpath Width (On each sides of median)	Karuni Mata Chowk to Puna Patiya Flyover - 2.5m Minumum
	With Fly over - 2M
No. Of Service Lanes (On each sides of median)	2 lanes (Total 5.5M Carriage way)
No. Of BRT Lanes (On each sides of median)	As per site
No. Of Parking Lanes (On each sides of median)	1 lane – 2.5 m (Karuni Mata Chowk to Puna Patiya Flyover)
	With Flyover – No parking on road, Parking under flyover
No. Of Cycle lanes (On each sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11010 & 11011**

3. Salient Features of R3 - Canal Road (60M)

Salient Features of R3 - Canal Road (60M)

Approximate Length of the Road	3.93KM
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD) without flyover
	2 Lanes (Lane Width as per the IUT Guidlines of MOUD) with flyover
Pedestrian Footpath Width (On each sides of median)	2.5m Minumum
No. Of BRT Lanes (On each sides of median)	As per site
No. Of Service Lanes (On each sides of median)	5.5M Carriage way (2 lanes) Without Flyover
	NA With Flyover
No. Of Parking Lanes (On each sides of median)	No parking on road, Parking under flyover where applicable
No. Of Cycle lanes (On each sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11012**

4. Salient Features of R4- Surat Bardoli Road (45M) & R5 Middle Ring Road (45M)

Salient Features of R4 & R5 (45M)	
Approximate Length of R4- Surat Bardoli Road	0.9KM
Approximate Length of R5- Puna Patiya Road- Middle Ring Road	1.83KM
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD) without flyover
	2 Lanes (Lane Width as per the IUT Guidlines of MOUD) with flyover
Pedestrian Footpath Width (On each sides of median)	1.5M Minimum

No. Of BRT Lanes (On each sides of median)	As per site
No. Of Service Lanes (On each sides of median)	5.5M Carriage way (2 lanes) Without Flyover
	NA With Flyover
No. Of Parking Lanes (On each sides of median)	No parking on road, Parking under flyover where applicable
No. Of Cycle lanes (On each sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11013**

5. Salient Features of R6 - Aai Mata Road (36M)

Salient Features of R6 - Aai Mata Road (36M)	
Approximate Length of the Road	1.9 Km
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD) without flyover
Pedestrian Footpath Width (On each sides of median)	2.5m Minumum
No. Of BRT Lanes (On each sides of median)	NA
No. Of Service Lanes (On each sides of median)	NA
No. Of Parking Lanes (On one sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)
No. Of Cycle lanes (On one sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11014**

6. Salient Features of R7 - R17 (24M)

Salient Features of R7 - R16 (24M)	
Approximate Length of Road R7 - Surat Kamrej Road - Lambe Hanuman Road	0.8 Km
Approximate Length of Road R8 - Bombay Market Road	1.46 Km
Approximate Length of Road R9 - Bombay Market - Sports Complex Road	0.42 Km
Approximate Length of Road R10 - Bombay Market - Puna Gam Road	0.3 Km
Approximate Length of Road R11 - Mithi Khadi Road - Kamela Darwaja Road	1.55 Km
Approximate Length of Road R12 - 80 Feet Road - Kinnari Bhathena Road	1.52 Km
Approximate Length of Road R13 - Bombay Market Puna Gam Road	0.4 Km
Approximate Length Road of R14 - Archana School Road	0.68 Km
Approximate Length of Road R15 – Capital Corner Building Road	1.0 Km
Approximate Length of Road R16 - Surat Kadodara Devadh Road	0.78 Km
Approximate Length of Road R 17- Salasar Hanuman Road (NVZ)	0.66 Km
No. Of MV Lanes (On each sides of median)	3 Lanes (Lane Width as per the IUT Guidlines of MOUD)
Pedestrian Footpath Width (On each sides of median)	2.5m Minumum

No. Of BRT Lanes (On each sides of median)	NA
No. Of Service Lanes (On each sides of median)	NA
No. Of Parking Lanes (On one sides of median)	NA
No. Of Cycle lanes (On one sides of median)	1 Lane (Lane Width as per the IUT Guidlines of MOUD)

Typical Road Plan & Section- Refer tender drawing **TCE-10196A-AC-1000-SI-11015**

D. **SPECIFICATIONS**

1.1. PREAMBLE

This section contains the specifications for proposed work and shall be read in conjunction with the various other sections forming the Contract namely, Instructions to Tenderers, General Conditions, Special Conditions, Bill of Quantities, Drawings and other related documents mentioned in this Tender Document together with any Addendum issued thereto.

The General Technical Specifications comprise the "Specification for Road and Bridge Works" (Fifth Revision) issued by the Ministry of Road Transport and Highways (MORT&H)- Government of India and published by the Indian Road Congress, New Delhi, Latest Specifications of Gujarat Water supply & Sewerage Board (GWSSB),Latest Specifications of CPWD, Specifications as per Tender Documents and as Approved by Engineer-In-Charge.

1.1.1 A1 : Demolition & other works

Removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation & disposing where required etc. complete.

1.1.2 CLEARING AND GRABBING

1.1.2.1.1 Scope

This work shall consist of cutting, removing and disposing of all materials such as trees, bushes, shrubs, stumps , roots, grass, weeds, top organic soil not exceeding 150 mm in thickness, rubbish etc., which in the opinion of the Site Engineer are unsuitable for incorporation in the works, from the area of road land containing road embankment, drains, cross-drainage structures and such other areas as may be specified on the drawings or by the Engineer., It shall include necessary excavation, backfilling of pits resulting from uprooting of trees and stumps to required compaction, handling, salvaging, and disposal of cleared materials. Clearing and grubbing shall be performed in advance of earthwork operations and in accordance with the requirements of these Specifications.

1.1.2.1.2 Preservation of Property/Amenities

Roadside trees, shrubs, any other plants, pole lines, fences, signs, monuments, buildings, pipelines, sewers and all highway facilities within or adjacent to the highway which are not to be disturbed shall be protected from injury or damage. The Contractor shall provide and install at his own expense, suitable safeguards approved by the Engineer for this purpose.

During clearing and grubbing, the Contractor shall take all adequate precautions against soil erosion, water pollution, etc., and where required, undertake additional works to that effect Specs, Before start of operations, the Contractor shall submit to the Engineer for approval, his work plan including the procedure to be followed for disposal of waste materials, etc., and the schedules for carrying out temporary and permanent erosion control works

1.1.2.1.3 Methods, Tools and Equipments

Only such methods, tools and equipment as are approved by the Engineer and which will not affect the property to be preserved shall be adopted for the Work. If the area has thick vegetation/roots/trees, a crawler or pneumatic tyred dozer of adequate capacity may be used for clearance purposes. The dozer shall have ripper attachments for removal of tree stumps. All trees, stumps, etc., falling within excavation and fill lines shall be cut to such depth below ground level that in no case these fall within 500 mm of the sub-grade. Also, all vegetation such as roots, under-growth, grass and other deleterious matter unsuitable for incorporation in the embankment/sub-grade shall be removed between fill lines to the satisfaction of the Engineer. On areas beyond these limits, trees and stumps required to be removed as directed by the Engineer shall be cut down to 1 m below ground level so that these do not present an unsightly appearance.

All branches of trees extending above the roadway shall be trimmed as directed by the Engineer-in-Charge

All excavations below the general ground level arising out of the removal of trees, stumps, etc., shall be filled with suitable material and compacted thoroughly so as to make the surface at these points conform to the surrounding area.

Ant-hills both above and below the ground, as are liable to collapse and obstruct free subsoil water flow shall be removed and their workings, which may extend to several meters, shall be suitably treated.

1.1.2.1.4 Disposal of Materials

All materials arising from clearing and grubbing operations shall be the property of client and shall be disposed of by the Contractor as hereinafter provided or directed by the Engineer.

Trunks, branches and stumps of trees shall be cleaned of limbs and roots and slacked. Also boulders, stones and other materials usable in road construction shall be neatly stacked as directed by the Engineer. Stacking of stumps, boulders, stones etc., shall be done at specified spots with all lifts and upto a lead of 1000 m.

All products of clearing and grubbing which, in the opinion of the Engineer, cannot be used or auctioned shall be cleared away from the roadside in a manner as directed by the Engineer. Care shall be taken to see that unsuitable waste materials are disposed of in such a manner that there is no likelihood of these getting mixed up with the materials meant for embankment, sub-grade and road construction.

1.1.3 C1- Footpath

1.3.1.1.1 Scope

The work shall consist of constructing footpaths and/or separators at locations as specified in the drawings or as directed by the Engineer. The lines, levels and dimensions shall be as per the drawings. The scope of the work shall include provision of all drainage arrangements as shown in the drawings or as directed.

1.3.1.1.2 Materials

The footpaths and separators shall be constructed with any of the following types:

Cast-in-situ cement concrete of Grade M20 as per Section 1700 of the Specifications.

Precast cement concrete blocks/tiles of Grade M20 as per Section 1700 of the Specifications. The minimum thickness of the cement concrete block/tile shall be 25 mm and minimum size shall be 30 0 mm x 300 mm.

Natural stone slab cut and dressed from stone of good and sound quality, uniform in texture, free from defects and at least equal to a sample submitted by the Contractor and approved by the Engineer. The minimum thickness of the natural stone slab shall be 25 mm and minimum size shall be 300 mm x 300 mm.

1.3.1.1.3 Construction operations

Drainage pipes below the footpath originating from the kerbs shall be first laid in the required slope and connected to the drains/sumps/storm water drain/drainage chutes as per provisions of the drawings, or as specified.

Portion on back side of kerbs shall be filled and compacted with granular sub-base material as per Clause-4.1 of the Specifications in specified thickness.

The base shall be prepared and finished to the required lines, levels and dimensions as indicated in the drawings with the following ;-

Minimum 150 mm thick, compacted granular sub-base material as per Clause 4.1 of the Specifications.

Minimum 25 mm thick cement concrete of Grade M 15,

Over the prepared base, precast concrete blocks/tiles/natural stone slabs and/or cast- in-situ slab shall be set/ laid

Precast cement concrete blocks/tiles/natural stone slab: The blocks/tiles/slabs shall be set on a layer of average 12 mm thick cement- sand mortar (1:3) laid on prepared base in such a way that there is no rocking. The gaps between the blocks/tiles/slabs shall not be more than 12 mm and shall be filled with cement-sand mortar (1:3).

Cast-in-situ cement concrete: The minimum thickness of the cement concrete shall be 25 mm and it shall be cast on the prepared base in panels of specified size in a staggered manner. Construction joints shall be provided.

1.3.1.1.4 Measurements for Payment

Footpaths and separators shall be measured in sq. meter between inside of kerbs.

1.3.1.1.5 Rate

Contract unit rates shall be inclusive of full compensation of all labour, materials, tools, equipment and incidentals to construction of footpaths. Cost of providing pipes and arrangement for their discharge into appropriate drainage channels shall be incidental to the construction of footpaths.

1.3.1.1.6 Specifications Concrete Paver blocks

- The concrete blocks should be procured from manufacturer approved by Engineer-In-Charge and satisfying the following criteria. IRC SP 63 2004 shall be used as guideline for Paver Block work.
- Manufacturer shall have fully automatic vibro pressing plant with vertical vibration system to ensure maximum compaction to achieve required strength.
- The grade of concrete should be M – 40, thickness 80mm M – 30, thickness 60mm and M – 50, thickness 100mm.
- Manufacturer shall have adequate capacity mixer with digital water meter / moisture control system to maintain constant water/ cement ratio.
- Manufacturing plant shall have complete automation with computerized weigh batching system for consistent quality of paving blocks.
- Blocks shall be moist cured for initial 24 hours and then water cured for at least 15 days before dispatch to site.
- Manufacturer shall have complete laboratory setup for testing blocks as per IS 15658- 2006 and should be on approved list of SMC,.
- Manufacturer shall posses excise registration certificate.

1.3.2 C2 -CEMENT CONCRETE KERB AND KERB WITH CHANNEL

1.3.2.1.1 Scope

This work shall consist of constructing cement concrete kerbs and kerbs with channel in the central median and/or along the footpaths specified in the drawings.

1.3.2.1.2 Materials

Kerbs and kerb with channel shall be provided in cement concrete of grade M20

1.3.2.1.3 Type of Construction

These shall be cast- in-situ construction with suitable kerb casting machine in all situations except at locations where continues casting with equipment is not practicable. In those situations, precast concrete blocks shall be used.

1.3.2.1.4 Equipment

A continuous kerb casting equipment of adequate capacity and controls, capable of laying the kerbs in required cross-sections and producing a well-compacted mass of concrete free of voids and honeycombs, shall be used.

1.3.2.1.5 Construction operations

- Kerbs shall be laid on firm foundation of minimum 150 mm thickness and extending minimum 100 mm beyond the kerb which may consist of extended width of pavement or concrete of M 15

grade cast in situ or bituminous premix material of the same Specification as the profile corrective course. Before laying ti-c foundation, its base shall be leveled, watered and compacted with plate compactor/power rammer. In case of foundation consisting of granular material, the base of foundation shad be well compacted with plate compactor/power rammer and bituminous primer applied @ 14.6 kg/l0 sq. m.

- In the median portions itt the straight reaches, the kerb shall be cast in continuous lengths. In the portions where footpath is provided and/or the slope of the carriageway is towards median (as in case of super-elevated portions), there shall be sufficient gap/recess left in the kerb to facilitate drainage openings.

- After laying the kerbs and just prior to hardening of the concrete, saw-cut grooves shall be provided at 10 m intervals or as specified by the Engineer.

- Kerbs on the drainage ends such as along the footpath or the median in super elevated portions shall be cast with monolithic concrete channels as indicated in drawings. The slope of the channel towards drainage pipes shall be ensured for efficient drainage of the road surface.

- Vertical and horizontal tolerances with respect to true line and level shall be ±6 mm.

- Measurements for Payment

- Cement concrete kerb/kerb with channel shall be measured in linear metre for the complete item of work. Foundation of kerb, where separately provided shall be measured in linear metre for complete item of work.

1.3.2.1.6 Rate

The Contract unit rates for cement concrete kerb with channel and foundation for kerb shall be payment in full compensation for furnishing all materials, labour, tools, equipment for construction and other incidental cost necessary to complete the work.

C3 – Tactile for Footpath

1.3.2.1.7 Scope

Supply & laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC & to be UV light resistant. Chequered Tiles must confirm to IS 13801:1993. Installation complete as per drawing & techincal specification

1.3.2.1.8 Materials

Tactile shall be provided in cement concrete of wear resistant aggregates colour with 2 coats of UV resistant lacquer coating

1.3.3 Parameters

Sr.	Parameters	Minimum Requirements(Testing as per IS 13801:1993)
1.	Percentage Water Absorption	Not over 6%
2.	Wet transverse strength	Not less than 4N/mm^2
3.	Average wear in Thickness- Abrasion	Average wear not more than 2mm
4.	Tolerance in Size (length + breadth)	± 1.5mm
5.	Thickness of wearing layer	Not less than 8mm
6.	Variation in Thickness of tiles	± 3mm
7.	Flatness of tile surface	Concavity / convexity not to exceed 1mm
8.	Colours	UV Light resistant fast colours from Lanxess only to be used

1.3.3.1.1 Construction operations

- Portion on back side of kerbs shall be filled and compacted with granular sub-base material as per Clause-4.1 of the Specifications in specified thickness.

- The base shall be prepared and finished to the required lines, levels and dimensions as indicated in the drawings with the following ;-

- Minimum 150 mm thick, compacted granular sub-base material

- Minimum 25 mm thick cement concrete of Grade M 15,

- Over the prepared base, precast concrete blocks/tiles/natural stone slabs and/or cast- in-situ slab shall be set/ laid

- Precast cement concrete blocks/tiles/natural stone slab: The blocks/tiles/slabs shall be set on a layer of average 12 mm thick cement- sand mortar (1:3) laid on prepared base in such a way that there is no rocking. The gaps between the blocks/tiles/slabs shall not be more than 12 mm and shall be filled with cement-sand mortar (1:3).

- Cast-in-situ cement concrete: The minimum thickness of the cement concrete shall be 25 mm and it shall be cast on the prepared base in panels of specified size in a staggered manner. Construction joints shall be provided.

1.3.3.1.2 Measurements for Payment

Tactile shall be measured in sq. meter between inside of kerbs.

1.3.3.1.3 Rate

Contract unit rates shall be inclusive of full compensation of all labour, materials, tools, equipment and incidentals to construction of footpaths. Cost of providing pipes and arrangement for their discharge into appropriate drainage channels shall be incidental to the construction of footpaths

1.3.4 C4 - Kerb paint

1.3.4.1.1 Scope

Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, T&P,labour etc.

1.3.4.1.2 Material –

Synthetic Enamel paint of approved black & yellow color of Asian paint or equivalent brand

Application –

- Ensure that the road surface is clean, free from dust, oil and grease
- Heavy deposits of earlier paint or thermoplastic should be removed
- Wire brushing and water washing is recommended for removal of dust front from road surface
- The surface should be thoroughly dry and free from moisture before painting
- Surface temperature must be atleast 3°C above dew point but not above 50°C
- Do not paint at temperatures below 10°C or at relative humidity over 85%
- Under cold and humid conditions, the paint would require longer drying time
- Two coat application is recommended for optimum performance

Brush	Recommended thinner	: Municipal/ Potable water
	Volume of Thinner	: 5 - 15 %
Air Spray	Recommended Thinner	: Municipal/ Potable water
	Volume of Thinner	: 10 - 30 %
	Nozzle Orifice	: 1.5 - 3.0 mm
	Nozzle Pressure	: 0.3 - 0.4 MPa (=approx 3 - 4 atm; 43 - 57 p.s.i)
Airless Spray	Recommended Thinner	: Municipal/ Potable water
	Volume of Thinner	: 5 - 15 %
	Nozzle Orifice	: 0.33 - 0.49 mm
	Nozzle Pressure	: 12 - 15 MPa(=approx 120 - 150 atm; 1700 - 2100 p.s.i)

1.3.4.1.3 Measurements for Payment

Synthetic Enamel paint shallbe measured on per litre basis along with the total running meter of kerb painted

1.3.4.1.4 Rate

The Contract unit rates for Enamel paint shall be payment in full compensation for furnishing all materials, labour, tools, equipment for construction and other incidental cost necessary to complete the work

1.3.5 D -Visual Improvement- Carpeting / Re-Carpeting of Roads

1.3.5.1.1 Scope

Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge. SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting the same within city limit as directed by Engineer in charge.

Providing and applying evenly TACK COAT on road surface with bitumen 60/70 grade at the rate as specified below including heating the asphalt and spraying the same. Providing and laying 25mm to 100mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of asphalt for mixing shall be as arrived from mix design, provided in no case asphalt percentage shall beless than 5.5 % by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by vibrator roller including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of asphalt, aggregate and filler (if found required as per mix design)etc.complete (But excluding cost of providing & applying tack coat.) (Thickness - 50 mm compacted)

Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.

1.3.5.1.2 Materials

Binder:

The binder shall be an appropriate type of bituminous material complying with the relevant Indian Standard (IS), as defined in the appropriate Clause (MORTH) of these Specifications, or as otherwise specified herein. The choice of binder shall be stipulated in the Contract or by the Engineer. Where penetration grades of bitumen are specified, they are referred to by a single- figure designation in accordance with IS:73. Thus bitumen grade 35 refers to bitumen in the penetration range 30 to 40. Where Modified Binder is specified, the Clause 5.21 of these Specifications shall apply.

Coarse Aggregates: The coarse aggregates shall consist of crushed rock, crushed gravel or other hard material retained on the 2.36 mm sieve. They shall be clean, hard, and durable, of cubical shape, free from dust and soft or friable matter, organic or other deleterious matter. Where the Contractor's selected sources of aggregates have poor affinity for bitumen, as a condition for the approval of that source, the bitumen shall be treated with approved anti-stripping agents, as per the manufacturer's recommendations, without additional payment. Before approval of the source the aggregates shall be tested for stripping.

The aggregates shall satisfy the physical requirements set forth in the individual relevant Clause (MORTH) for the material in question.

Where crushed gravel is proposed for use as aggregate, not less than 90% by weight of the crushed material retained on the 4.75 mm sieve shall have at least two fractured faces.

Fine Aggregates:

Fine aggregates shall consist of crushed or naturally occurring material, or a combination of the two, passing 2.36mm sieve and retained on the 75 micron sieve. They shall be clean, hard, durable, dry and free from dust, and soft or friable matter, organic or other deleterious matter.

Source of material:

The source of all materials to be used on the project must be tested to the satisfaction of and be expressly approved by the Engineer. The Engineer may from time to time withdraw approval of a specific source, or attach conditions to the existing approval. Any change in aggregate source for bituminous mixes, will require a new mix design, and laying trials, where the mix is based on a job mix design. Stockpiled from different sources, approved or otherwise, shall be kept separate, such that there is no contamination between one material and another. Each source submitted for approval shall contain sufficient material for at least 5 days work.

1.3.5.1.3 Mixing

Pre-mixed bituminous materials, including bituminous macadam, dense bituminous macadam, semi-dense bituminous concrete and bituminous concrete, shall be prepared in a hot mix plant of adequate capacity and capable of yielding a mix of proper and uniform quality with thoroughly coated aggregates. Appropriate mixing temperatures can be found in Table 500-5 of these Specifications; the difference in temperature between the binder and aggregate should at no time exceed 14°C. In order to ensure uniform quality of the mix and better coating of aggregates, the hot mix plant shall be calibrated from time to time.

If a continuous mixing-plant is to be used for mixing the bituminous bound macadam; the Contractor must demonstrate by laboratory analysis that the cold feed combined grading is within the grading limits specified for that bituminous bound material. In the case of a designed job mix, the bitumen and filler content shall be derived using this combined grading. Further details are available in the Manual for Construction and Supervision of Bituminous Works.

1.3.5.1.4 Transporting

Bituminous materials shall be transported in clean insulated vehicles, and unless otherwise agreed by the Engineer, shall be covered while in transit or awaiting tipping. Subject to the approval of the Engineer, a thin coating of diesel or lubricating oil may be applied to the interior of the vehicle to prevent sticking and to facilitate discharge of the material.

1.3.5.1.5 Laying

Weather and seasonal limitations:

Laying shall be suspended while free-standing water is present on the surface to be covered, or during rain, fog and dust storms. After rain, the bituminous surface, prime or tack coat, shall be blown off with a high pressure air jet to remove excess moisture, or the surface left to dry before laying shall start. Laying of bituminous mixtures shall not be carried out when the air temperature at the surface on which it is to be laid is below 10°C or when the wind speed at any temperature exceeds 40 km/h at 2m height unless specifically approved by the Engineer.

Cleaning of surface:

The surface on which the bituminous work is to be laid shall be cleaned of all loose and extraneous matter by means of a mechanical broom or any other approved equipment / method as specified in the contract. The use of a high pressure air jet from a compressor to remove dust or loose matter shall be available full time on the site, unless otherwise specified in the Contract.

Spreading:

Except in areas where a mechanical paver cannot access, bituminous materials shall be spread, leveled and tamped by an approved self-propelled paving machine. As soon as possible after arrival at site, the materials shall be supplied continuously to the paver and laid without delay

The rate of delivery of material to the paver shall be regulated to enable the paver to operate continuously. The travel rate of the paver, and its method of operations, shall be adjusted to ensure an even and uniform flow of bituminous material across the screen, free from dragging, tearing and segregation of the material. In areas with restricted space where a mechanical pave r cannot be used, the material shall be spread, raked and levelled with suitable hand tools by experienced staff, and compacted to the satisfaction of the Engineer.

The minimum thickness of material laid in each paver pass shall be in accordance with the minimum values given in the relevant parts of these Specifications. When laying binder course or wearing course approaching an expansion joint of a structure, machine laying shall stop 300mm short of the joint. The remainder of the pavement up to the joint, and the corresponding area beyond it, shall be laid by hand, and the joint or joint cavity shall be kept clear of surfacing material.

Bituminous material, with a temperature greater than 145°C, shall p not be laid or, deposited on bridge deck waterproofing systems, unless precautions against heat damage have been approved by the Engineer.

Hand placing of pre -mixed bituminous materials shall only be permitted in the following circumstances:

For laying regulating courses of irregular shape and varying thickness.

In confined spaces where it is impracticable for a paver to operate.

For footways.

At the approaches to expansion joints at bridges, viaducts or other structures.

For filling of potholes. Where directed by the Engineer.

Manual spreading of pre - mixed wearing course material or the addition of such material by hand-spreading to the paved area, for adjustment of level, shall only be permitted in the following circumstances:

At the edges of the layers of material and at gullies and manholes.

At the approaches to expansion joints at bridges, viaducts or other structures. As directed by the Engineer.

Cleanliness and overlaying:

Bituminous material shall be kept clean and uncontaminated. The only traffic permitted to run on bituminous material to be overlaid shall be that engaged in laying and compacting the next course or, where a binder course is to be sealed or surface dressed, that engaged on such surface treatment. Should any bituminous material become contaminated the Contractor shall make it good to the satisfaction of the Engineer

Binder course material shall not remain uncovered by either the wearing course or surface treatment, whichever is specified in the Contract, for more than three consecutive days after being laid. The Engineer may extend this period, by the minimum amount of time necessary, because of weather conditions or for any other reason. If the surface of the base course is subjected to traffic, or not covered within three days, a tack coat shall be applied, as directed by the Engineer.

1.3.5.1.6 Compaction

Bituminous materials shall be laid and compacted in layers which enable the specified thickness, surface level, regularity requirements and compaction to be achieved.

Compaction of bituminous materials shall commence as soon as possible after laying. Compaction shall be substantially completed before the temperature falls below the minimum rolling temperatures stated in the relevant part of these Specifications. Rolling of the longitudinal joints shall be done immediately behind the paving operation. After this, rolling shall commence at the edges and progress towards the centre longitudinally except that on super elevated and unidirectional cambered portions, it shall progress from the lower to the upper edge parallel to the centre line of the pavement. Rolling shall continue until all roller marks have been removed from the surface. All deficiencies in the surface after laying shall be made good by the attendants behind the paver, before initial rolling is commenced. The initial or breakdown rolling shall be done with 8-10 tonnes dead weight smooth-wheeled rollers. The intermediate rolling, shall be done with 8-10 tonnes dead weight or vibratory roller or with a pneumatic tyred roller of 12 to 15 tonnes weight having nine wheels, with a tyre pressure of at least 5.6 kg/sqcm. The finish rolling shall be done with 6 to 8 tonnes smooth wheeled tandem rollers.

Where compaction is to be determined by density of cores the requirements to prove the performance of rollers shall apply in order to demonstrate that the specified density can be achieved. In such cases the Contractor shall nominate the plant, and the method by which he intends to achieve the specified level of compaction and finish at temperatures above the minimum specified rolling temperature. Laying trials shall then demonstrate the acceptability of the plant and method used. Bituminous materials shall be rolled in a longitudinal direction, with the driven rolls nearest the paver. The roller shall first compact material adjacent to joints and then work from the lower to the upper side of the layer, overlapping on successive passes by at least one-third of the width of the rear roll or, in the case of a pneumatic -tyred roller, at least the nominal width of 300mm

In portions with super-elevated and uni-directional camber, after the edge has been rolled, the roller shall progress from the lower to the upper edge.

Rollers should move at a speed of not more than 5 km per ho ur. The roller shall not be permitted to stand on pavement which has not been fully compacted, and necessary precautions shall be taken to prevent dropping of oil, grease, petrol or other foreign matter on the pavement either when the rollers are operating or standing. The wheels of rollers shall be kept moist with water, and the spray system provided with the machine shall be in good working order, to prevent the mixture from adhering to the wheels. Only sufficient moisture to prevent adhesion between the wheels of rollers and the mixture should be used. Surplus water shall not be allowed to stand on the partially compacted pavement.

Joints

Where longitudinal joints are made in pre-mixed bituminous materials, the materials shall be fully compacted and the joint made flush in one of the following ways; only method (iii) shall be used for transverse joints:

By heating the joints with an approved joint beater when the adjacent width is being laid, but without cutting back or coating with binder. The heater shall raise the temperature of the full depth of material, to within the specified range of minimum rolling temperature and maximum temperature at any stage for the material, for a width not less, Am 75 mm, The Contractor shall have equipment available, for use in the event of a beater breakdown, to form joints by method (iii);

By using two or more pavers operating in echelon, where this is practicable, and in sufficient proximity for adjacent widths to be fully compacted by continuous rolling;

By cutting back exposed for a distance equal to the specified layer thickness to vertical face, discarding all loosened material and coating the vertical face completely, with 80/100 penetration grade hot bitumen, or cold-applied bitumen, or polymer modified adhesive bitumen tape with a minimum thickness of 2 mm, before the adjacent width is laid.

All joints shall be offset at least 300 mm from parallel joints in the layer beneath or as directed, and in a layout approved by the Engineer. Joints in the wearing course shall coincide with either the lane edge or the lane marking, whichever is appropriate. Longitudinal joints shall not be situated in wheel track zones.

1.3.5.1.7 Preparation of Surface

Scope:

This work shall consist of preparing an existing granular Or black-topped surface bituminous course. The work shall be performed on such widths and lengths as shown on the drawings or as instructed by the Engineer. The existing surface shall be firm and clean, and treated with Prime or Tack coat as shown on the drawings as otherwise stated in the Contract.

Materials:

For scarifying and re -laying the granular surface: The material used shall be coarse aggregate salvaged from the scarification of the existing granular base course supplemented by fresh coarse aggregate and

screenings so that aggregates and screenings thus supplemented correspond to Clause – 4.4: Water Bound Macadam or Clause-4.6: Wet Mix Macadam of the Ministry's Specification for Road and Bridge Works (third revision) 1995.

For patching potholes and sealing cracks: Where the existing surface to be overlaid is bituminous, any existing potholes and cracks shall be repaired and sealed in as directed by the Engineer.

For profile corrective course: A profile corrective course for correcting the existing pavement profile shall be laid to varying thickness as shown on the Drawings, or as indicated in the Contract Documents. The profile corrective course shall be laid to tolerances and densities as specified for wearing course if a single layer, or base course, if it is to be covered with a wearing course layer.

Profile corrective course and its application: The type of material for use as profile corrective course shall be as shown on the drawings or as directed by the Engineer. Where it is to be laid as part of the overlay/strengthening course, the profile corrective course material shall be of the same specification as that of the overlay/ strengthening course. However, if provided as a separate layer, it shall be of the specification and details given in the contract drawings.

Any high spots in the existing surface shall be removed by a milling machine or other approved method, and all loose material shall be removed to the satisfaction of the Engineer.

Where the maximum thickness of profile corrective course will be not more than 40 mm, the profile corrective course shall be constructed as an integral pan of the overlay course. In other cases, the profile corrective course shall be constructed as a separate layer, adopting such construction procedures and using such equipment as approved

by the Engineer, to lay the specified type of material, to thickness and tolerance as specified, for the course, to be provided.

Construction Operations:

Preparing existing granular surface: Where the existing surface is granular, all loose Preparing existing granular surface: Where the existing surface is granular, all loose corrective course to be provided as a separate layer is also granular. Where the profile corrective course of bituminous material is to be laid over the existing granular surface, the latter shall, after removal of all loose material, be primed in accordance with Clause – 5.2.

The surface finish of all granular layers on which bituminous works are to be placed, shall, unless otherwise specifically instructed by the Engineer, be free from dust. All such layers must be capable of being swept, after the removal of any non- integral loose material, by means of a mechanical broom, without shedding significant quantities of material and dust removed by air jet, washing, or other means approved by the Engineer.

After cleaning the surface shall be correct to line and level, within the tolerances specified for base course.

Scarifying existing bituminous surface: Where specified or shown on the drawings, the existing bituminous layer in the specified width shall be removed with care and without causing undue disturbance to the underlying layer, by a suitable method approved by the Engineer. After removal, all loose and disintegrated material, the underlying layers which might have been disturbed should be suitably reworked and compacted to line and level. After supplementing the base material as necessary with suitable fresh stone, the compacted finished surface shall be primed . Reusable materials shall be stacked as directed by the Engineer within 1000 m of their origin.

Patching of potholes and sealing of cracks: Where the existing surface to be overlaid is bituminous, any existing potholes and cracks shall be repaired and sealed in accordance with Clause (MORTH)s 3004.2 and 3004.3, or as directed by the Engineer.

Laying the profile corrective course

Laying on granular base: After preparing the granular surface in accordance with Clause -5.1.8.3 the profile corrective course shall be laid using material as described in Clause -5.1.8.2, or as otherwise described in the Contract, and compacted to the requirements of the particular Specification.

Laying on existing bituminous surface: The existing bituminous surface shall be prepared in accordance with Clause-5.1.8.3 and after applying a tack coat conforming to Clause-5.3, the bituminous profile corrective course shall be laid and compacted to the requirements of the particular Specification.

Correction of local depressions: Where local sags or depressions occur in the existing pavement, a specific filling operation shall be instructed by the Engineer, which should be laid in accordance with Figure 500-1. Normally, the maximum layer thickness at any point should not exceed 100 mm. In placing multiple lifts, they should be arranged according to the correct method as illustrated.

For correction of camber or super -elevation of the existing carriageway, the method shown in . Morth 500-2 shall be adopted, depending on the profile of the existing carriageway.

Covering the profile corrective courses: Profile corrective course particularly shall be so planned that the layer shall be covered by the designed base/wearing course at the earliest opportunity, before opening to regular traffic.

Surface finish and quality control of work: The relevant provisions of Section 900 shall apply.

Arrangements for traffic: During construction operations, arrangements for traffic shall be made in accordance with the provisions of Clause-1.12 of the Ministry's Specification for Road and Bridge Works (third revision) 1995.

Environmental protection: The provisions of Clause -1.11 of the Ministry's Specification for Road and Bridge Works (third revision) 1995 and the provision of Annexure 2 (to Clause (MORTH) 5.1) shall apply.

Measurements for Payment

Potholes and cracks: The work of filling potholes shall be measured separately and be paid for in square meters. The work of filling cracks by applying fog spray or emulsion slurry seal shall be measured in square meters, for the area covered by the spray.

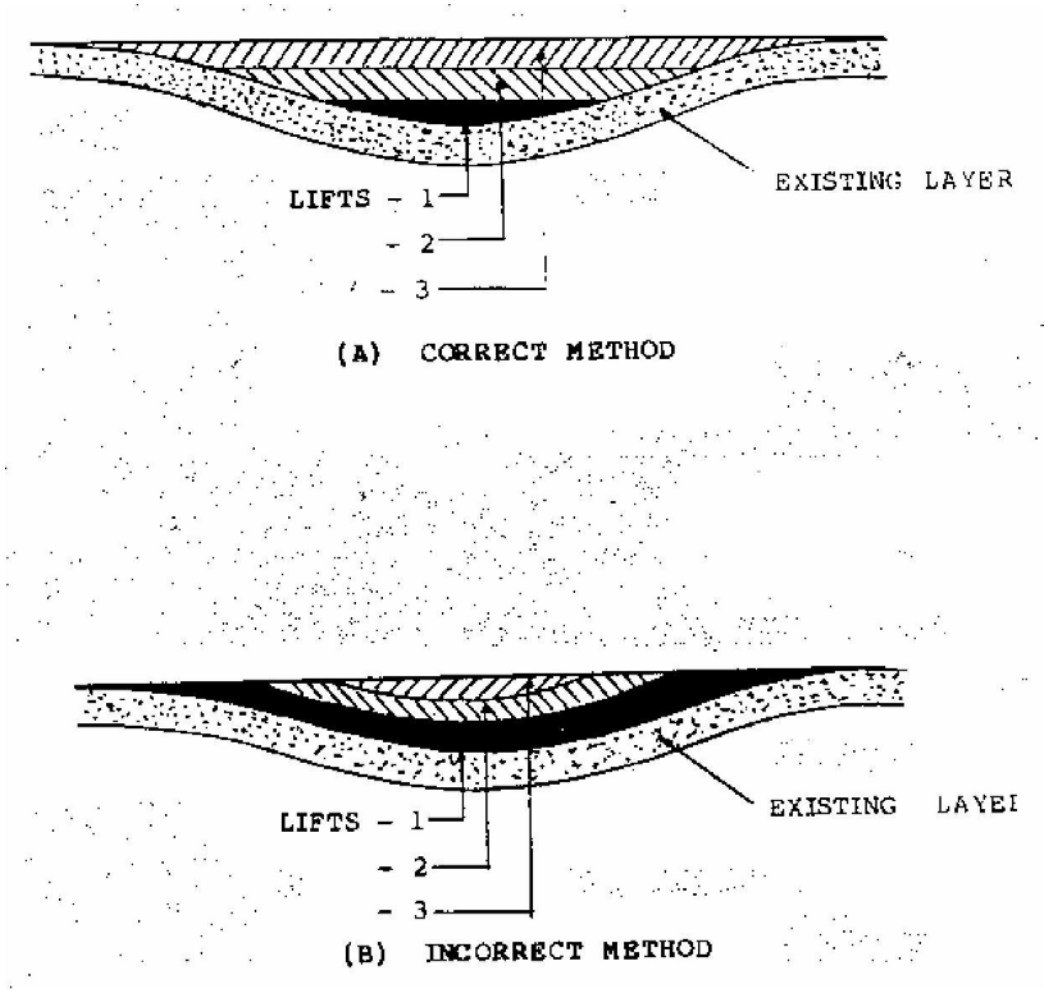


Figure 1 Methods for providing corrective course for short sags and depressions

Note: Profile corrective course material to be in accordance with the lift thickness

The work in filling-cracks larger than 3mm in width shall be measured and paid for- on a linear meter basis.

Scarifying: Scarifying the existing bituminous surface shall be measured on a square meter basis.

Profile corrective course: Profile corrective course shall be measured as the volume instructed and compacted in position and measured in cubic meters, or in tonnage, as stipulated in the Contract. The volume shall be calculated by plotting the exact profile of profile corrective course as required, and laid, superimposed on the existing pavement profile. Cross-sectional areas of the profile corrective course shall be measured at intervals as used in the design, or as determined by the Engineer, and the volume shall be calculated using the method of end areas.

Prime coat: Prime coat is to be measured and paid for on a per square meter basis.

Tack coat: This is to be a PROVISIONAL item, which may be used in-part or not at all, at the Engineers direction, and is to be measured and paid if used, on a square meter basis.

1.3.5.1.8 Rates

Rate for scarifying:

The contract unit rate for scarifying existing bituminous surfaces, including repairing / reworking disturbed underlying layers and removing and stacking reusable / unusable materials, shall include for but not necessarily be limited to, the cost of all labour, supply of materials needed for repair /reworking, hire charges of tools and plant, and transportation of scarified materials within 1000 m of their origin.

Rate for premixed bituminous material:

The contract unit rate for premixed bituminous material shall be payment in full for carrying out the required operations including full compensation for, but not necessarily limited to:

- Making arrangements for traffic except for initial treatment to verge, shoulders and construction of diversions;
- Preparation of the surface to receive the material.
- Providing all materials to be incorporated in the work including arrangement for stock yards, all royalties, fees rents where necessary and all leads and lifts;
- Mixing, transporting, laying and compacting the mix, as specified.
- All labour, tools, equipment, plant including installation of hot mix plant, power supply un its and all machinery, incidental to complete the work to these Specifications;
- Carrying out the work in part widths of the road where directed; (vii) Carrying out all tests for control of quality, and
- The rate shall cover the provision of bitumen at the rate specified in the contract, with the provision that the variation in actual percentage of bitumen used will be assessed and the payment adjusted accordingly.
- The rates for premixed material are to include for all wastage in cutting of joints etc.

- The rates are to include for all necessary testing, mix design, transporting and testing of samples, and cores. If there is not a project specific laboratory, the Contractor must arrange to carry out all necessary testing at an outside Laboratory, approved by the Engineer, and all costs incurred are deemed to be included in the rate quoted for the material.

- The cost of all plant and laying trials as specified to prove the mixing and laying methods is deemed to be included in the Contractor's rates for the material.

Rate for potholes and crack sealing:

The rate for patching potholes shall include for breaking out, trimming edges, cleaning out, painting edges and bottom with bitumen, and filling and compacting the excavation with the specified material. The rate should be inclusive of all plant, tools, labour and materials, transport, and disposal of surplus material, the contract unit rate for sealing cracks by applying fog spray shall be inclusive of providing all materials, tools, labour and plant and carrying out the work. The contract unit rate for sealing cracks by providing emulsion slurry seal

The contract unit rate for crack sealing 3mm to 6mm cracks with straight run or other specified bitumen shall be based on either a square meter basis, or linear meter of cracks as measured, as stipulated by the Contract.

The contract unit rate for cracks between 6mm and 15mm is to be measured on a linear meter basis, and the rate is to include for all materials, tools, plant, labour, and transport.

1.3.6 PRIME COAT OVER GRANULAR BASE

1.3.6.1.1 Scope

This 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 treatment or mix.

1.3.6.1.2 Materials

Primer:

The choice of a bituminous primer shall depend upon the porosity characteristics of the surface to be primed as classified in IRC: 16. These are:

- Surfaces of low porosity; such as wet mix macadam and water bound macadam,

- Surfaces of medium porosity; such as cement stabilized soil base

- Surfaces of high porosity; such as a gravel base

Primer viscosity:

The type and viscosity of the primer shall comply with the requirements of IS 8887, as sampled and tested for bituminous primer in accordance with these standards. Guidance on viscosity and rate of spray is given in Table 11.

Table 1 Viscosity Requirement and quantity of liquid bituminous primer

Type of surface	Kinematic Viscosity of Primer at 60°C (Centistokes)	Quantity of Liquid Bituminous Material per 10 Sq. m. (kg)
Low porosity	30 – 60	6 to 9
Medium porosity	70 -140	9 to 12
High porosity	250-500	12 to 15

Choice of primer:

The primer shall be bitumen emulsion, complying with IS 8887 of a type and grade as specified in the Contract or as directed by the Engineer. The use of medium curing cutback as per IS 217 shall be restricted only for sites at sub-zero temperatures or for emergency applications as directed by the Engineer.

Weather and Seasonal Limitations

Bituminous primer shall not be applied to a wet surface (see 5.2.4.2) or during a dust storm or when the weather is foggy, rainy or windy or when the temperature in the shade is less than 10°C. Surfaces which are to receive emulsion primer should be damp, but no free or standing water shall be present.

1.3.6.1.3 Construction

Equipment:

The primer distributor shall be a self-propelled pi or towed bitumen pressure sprayer equipped for spraying the material uniformly at specified rates and temperatures. Hand spraying of small & areas, inaccessible to the distributor, or in narrow strips shall be sprayed with a pressure hand sprayer, or as directed by the Engineer.

Preparation of road surd surface:

The surface to be primed shall be prepared in accordance with Clause -5.1.8. and 902 (MORTH) as appropriated Immediately prior to applying the primer the surface shall be carefully swept clean of dust and loose particles, care being taken not, to disturb the interlocked aggregate. This is best achieved when the surface layer is slightly moist (lightly sprayed with water and the surface allowed to dry) and the surface should be kept moist until the primer is applied.

Application of bituminous primer:

The viscosity and rate of application of the primer shall be as specified in the Contract, or as determined by site trials carried out as directed by the Engineer. Where a geosynthetic is proposed for use, the requirements of Clause (MORTH)s 704.3.2 and 704.4 of the Ministry's Specification for Road and Bridge Works (third revision) 1995 shall apply. The bituminous primer shall be sprayed uniformly in accordance with Clause-5.1.The method for application of the primer will depend on the type of equipment to be used, size of nozzles, pressure at the spray bar and speed of forward movement. The Contractor shall demonstrate at a spraying trial, that the equipment and method to be used is capable of producing a uniform spray, within the tolerances specified.

Curing of primer and opening to traffic:

A primed surface shall be allowed to cure for at least 24 hours or such other period as is found to be necessary to allow all the volatiles to evaporate before any subsequent surface treatment or mix is laid. Any unabsorbed primer shall first be blotted with an application of sand, using the minimum quantity possible. A primed surface shall not be opened to traffic other than that necessary to lay the next course. A very thin layer of clean sand may be applied to the surface of the primer, to prevent the primer picking up under the wheels of the paver and the trucks delivering bituminous material to the paver.

Track coat:

Over the primed surface, a tack coat should be applied in accordance with Clause – 5.3.

1.3.6.1.4 Quality Control of Work

For control of the quality of materials supplied and the works carried out, the relevant provisions of Section 900 (MORTH) shall apply.

1.3.6.1.5 Measurements for Payment

Prime coat shall be measured in terms of surface area of application in square metres.

1.3.6.1.6 Rate

The contract unit rate for prime coat with adjustments shall be payment in full for carrying out the required operations including full compensation for all components, and as applicable to the work specified in these Specifications. Payment shall be made on the basis of the provision of prime coat at an application rate of 0.6 kg per square meter, with adjustment, plus or minus, for the variation between this amount and the actual amount approved by the Engineer after the preliminary trials

1.3.7 E - Visual Improvement- Other Civil Works

1.3.8 E1 - Shared zone paving

1.3.8.1.1 Scope

Supply & laying Modular Paving Stones with PremierShield protection size as per product description. Water absorption: not over 4.5%, Compressive strength: 500kg/cu cm, Colours: UV light resistant & as approved by SMC. Installation complete as per drawing & techincal specification and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.

1.3.8.1.2 Materials

The shared zone paving shall be constructed with any of the following types:

- Cast-in-situ cement concrete of Grade M20 as per Section 1700 of the Specifications.
- Precast cement concrete blocks/tiles of Grade M20 as per Section 1700 of the Specifications. The minimum thickness of the cement concrete block/tile shall be 25 mm and minimum size shall be 30 0 mm x 300 mm.

- Natural stone slab cut and dressed from stone of good and sound quality, uniform in texture, free from defects and at least equal to a sample submitted by the Contractor and approved by the Engineer. The minimum thickness of the natural stone slab shall be 25 mm and minimum size shall be 300 mm x 300 mm.

1.3.8.1.3 Construction operations

- Drainage pipes below the shared zone originating from the kerbs shall be first laid in the required slope and connected to the drains/sumps/storm water drain/drainage chutes as per provisions of the drawings, or as specified.

- Portion on back side of kerbs shall be filled and compacted with granular sub-base material as per Clause-4.1 of the Specifications in specified thickness.

- The base shall be prepared and finished to the required lines, levels and dimensions as indicated in the drawings with the following ;-

    a) Minimum 150 mm thick, compacted granular sub-base material as per Clause 4.1 of the Specifications.

    b) Minimum 25 mm thick cement concrete of Grade M 15,

- Over the prepared base, precast concrete blocks/tiles/natural stone slabs and/or cast- in-situ slab shall be set/ laid

- Precast cement concrete blocks/tiles/natural stone slab: The blocks/tiles/slabs shall be set on a layer of average 12 mm thick cement- sand mortar (1:3) laid on prepared base in such a way that there is no rocking. The gaps between the blocks/tiles/slabs shall not be more than 12 mm and shall be filled with cement-sand mortar (1:3).

- Cast-in-situ cement concrete: The minimum thickness of the cement concrete shall be 25 mm and it shall be cast on the prepared base in panels of specified size in a staggered manner. Construction joints shall be provided.

1.3.8.1.4 Measurements for Payment

Footpaths and separators shall be measured in sq.m

1.3.8.1.5 Rate

Contract unit rates shall be inclusive of full compensation of all labour, materials, tools, equipment and incidentals to construction of footpaths. Cost of providing pipes and arrangement for their discharge into appropriate drainage channels shall be incidental to the construction of footpaths.

1.3.8.1.6 SPECIFICATIONS CONCRETE PAVER BLOCKS

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

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

1.3.9 E2 - Median

1.3.9.1.1 Scope

The work shall consist of constructing shoulder (hard/paved/ earthen with brick or stone block edging) on either side of the pavement, median in the road dividing the carriageway into separate lanes and islands for channelising the traffic at junctions in accordance with the requirements of these Specifications and in conformity with the lines, grades and cross-sections shown on the drawings or as directed by the Engineer.

1.3.9.1.2 Materials

Shoulder on either side of the road may be of selected earth/ granular material/ paved conforming to the requirement and the median may be of selected each conforming to the requirements of Clause 305.

Median/Traffic islands shall be raised and kerbed at the perimeter and the enclosed area filled with earth and suitably covered with grass turf/shrubs

Paved shoulders shall consist of sub-base, base and surfacing courses, as shown in the drawings and materials for the same shall conform to relevant Specifications of the corresponding items. Where paved or hard shoulders are not provided, the pavement shall be provided with brick/stone block edgings as shown in the drawings. The bricks shall conform to Clause (MORTH)-1003 of these Specifications. Stone blocks shall conform to Clause (MORTH)-1004 of these Specifications and shall be of size 225 mm x 110 mm x 75 mm.

Size of Shoulder/Median/Islands

Shoulder (earthen/hard/paved}/median/traffic island dimensions shall be as shown on the drawings or as directed by the Engineer.

1.3.9.1.3 Construction Operations

Shoulder:

The sequence of operations shall be such that the construction of paved shoulder is done in layers each matching the thickness of adjoining pavement layer. Only after a layer of pavement and corresponding layers in paved and earth shoulder portion have been laid and compacted, the construction of next layer of pavement and shoulder shall be taken up.

Where the materials in adjacent layers are different, these shall be laid together and the pavement layer shall be compacted first. The corresponding layer in paved shoulder portion shall be compacted thereafter, which shall be followed by compaction of earth shoulder layer. The adjacent layers having same material shall be laid and compacted together.

In all cases where paved shoulders have to be provided along side of existing carriageway, the existing shoulders shall be excavated in full width and to the required depth as per Clause -3.1.3.7. Under no circumstances, box cutting shall be done for construction of shoulders. Compaction requirement of earthen shoulder shall be as per Table 300-2. In the case of bituminous courses, work on shoulder (earthen/ hard/paved), shall start only after the pavement course has been laid and compacted.

During all stages of shoulder (earthen/hard/paved) construction, the required crossfall shall be maintained to drain off surface water.

Regardless of the method of laying, all shoulder construction material shall be placed directly on the shoulder. Any spilled material dragged on to the pavement surface shall be immediately removed, without damage to the pavement, and the area so affected thoroughly cleaned,

Median

Median shall be constructed in a manner similar to shoulder up to the road level. Thereafter the median and islands, if raised, shall be raised at least 300 mm by using kerb stones of approved material and dimensions and suitably finished and painted as directed by the Engineer. If not raised, the median and islands shall be differentiated from the shoulder/ pavement as the case may be, as directed by the Engineer. The confined area of the median and islands shall be filled with local earth or granular material or any other approved material and compacted by plate compactor/power rammer. The confined area alter filling with earth shall be turfed with grass or planted with shrubs and in case of granular fill it can be finished with tiles/slabs as directed by the Engineer.

1.3.10 F -Visual Improvement- Signage & Street Furniture

1.3.10.1.1 TRAFFIC/ ROAD SIGNS

General

The three types of road signs viz., mandatory/regulatory signs, cautionary/warning signsand informatory signs shall be provided as given in IRC:67 and Section 800 of MORTH Specifications. Proper signs shall be provided for main carriageways, service and slip roads, toll plaza and other project highway facilities. Clustering and proliferation of road signs shall be avoided for enhancing their effectiveness.

The signs shall be either reflectorised or non-reflectorised as shown on the drawings or as directed by the Engineer. When they are of reflectorised type, they shall be of retro-reflectorised type and made of

encapsulated lens type reflective sheeting vide Clause 801.3, fixed over aluminium sheeting as per these Specifications.

In general, cautionary and mandatory signs shall be fabri- cated through process of screen printing. In regard to informatory signs with inscriptions, either the message could be printed over the reflective sheeting, or cut letters of non-reflective black sheeting used for the purpose which must be bonded well on the base sheeting as directed by the Engineer.

1.3.10.1.2 Materials

The various materials and fabrication of the traffic signs shall conform to the following requirements:

Concrete : Concrete shall be of the grade shown on the Contract drawings or otherwise as directed by the Engineer.

Reinforcing steel : Reinforcing steel shall conform to the requirement of IS: 1786 unless otherwise shown on the drawing.

Bolts, nuts, washers: High strength bolts shall conform to IS : 1367 whereas precision bolts, nuts, etc., shall conform to IS: 1364.

Plates and supports : Plates and support sections for the sign posts shall conform to IS: 226 and IS: 2062 or any other relevant IS Specifications.

Aluminium: Aluminium sheets used for sign boards shall be of smooth, hard and corrosion resistant aluminium alloy conforming to IS : 736-Material designation 24345 or 190

Signs with a maximum side dimension not exceeding 600 mm shall not be less than 1.5 mm thick. All others shall be at least 2 mm thick. The thickness of the sheet shall be related to the size of the sign and its support and shall be such that it does not bend or deform under the prevailing wind and other loads.

In respect of sign sizes not covered by IRC67, the structural details (thickness, etc.) shall be as per the approved drawings.

1.3.10.1.3 Traffic Signs Having Retro -reflective Sheeting

General requirements:

The retro-reflective sheeting used on the sign shall consist of the white or coloured sheeting having a smooth outer surface which has the property of retro-reflection over its entire surface. It shall be weather-resistant and show colour fastness. It shall be new and unused and shall show no evidence of cracking, scaling, pitting, blistering, edge lifting or curling and shall have negligible shrinkage or expansion. A certificate of having tested the sheeting for these properties in an unprotected outdoor exposure facing the sun for two years and its having passed these tests shall be obtained from a reputed laboratory, by the manufacturer of the sheeting. The reflective sheeting shall be either of Engineering Grade material

with enclosed lens or of High Intensity Grade with encapsulated lens. The type of the sheeting to be used would depend upon the type, functional hierarchy and importance of the road.

High intensity grade sheeting : This sheeting shall be of encapsulated lens type consisting of spherical glass lens, elements adhered to a synthetic resin and encapsulated by a flexible, transparent water-proof plastic having a smooth surface. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection (determined in accordance with ASTM Standard E : 810) as indicated in Table below.

ACCEPTABLE MINIMUM COEFFICIENT OK RETRO- REFLECTION FOR HIGH INTENSITY GRADE SHEETING (CANDELAS PER LUX PER SQUARE METRE)

Observation angle	Entrance Angle	White	Yellow	Orange	Green / Red	Blue
0.2	- 4	250	170	100	45	20
0.2	+ 30	150	100	60	25	11
0.5	- *6*	*95*	62	30	15	73
0.5	+ 30	65	45	25	10	5.0

When totally wet, the sheeting shall not show less than 90 per cent of the values of retro-reflectance indicated in Table above. At the end of 7 years, the sheeting shall retain at least 75 per cent of its original retro-reflectance.

Engineering grade sheeting : This sheeting shall be of enclosed lens type consisting of microscopic lens elements embedded beneath the surface of a smooth, flexible, transparent, water-proof plastic, resulting in a non-exposed lens optical reflecting system. The retro- reflective surface after cleaning with soap and water and in dry condition shall have the minimum coefficient of retro-reflection (determined in accordance with ASTM Standard : E-830) as indicated in Table below;

ACCEPTABLE MINIMUM COEFFICIENT OF RETRO- REFLECTION FOR ENGINEERING GRADE SHEETING (CANDELAS PER LUX PER SQ.M)

Observation angle in	Entrance angle in	White	Yellow	Orange	Green	Red	Blue
0.2	- 4	70	50	25	9.0	14.5	4.0
0.2	+30	30	22	7.0	3.5	6.0	1.7
0.5	- 4	30	25	13.5	4.5	7.5	2.0
0.5	+30	15	13	4.0	2.2	3.0	0.8

When totally wet, the sheeting shall not show less than 90 per cent of the values, of retro-reflection indicated in Table 800-2. At the end of 5 years, the sheeting shall retain at least 50 per cent of its original retro-reflectance

Messages/borders: The messages (legends, letters, numerals etc.) and borders shall either be screen-printed or of cut-outs. Screen printing shall be processed and finished with materials and in a manner specified by the sheeting manufacturer. Cut-outs shall be of materials as specified by the sheeting manufacturer and shall be bonded with the sheeting in the manner specified by the manufacturer.

For screen-printed transparent coloured areas on white sheet- ing, the co-efficient of retro-reflection shall not be less than 50 per cent of the values of corresponding colour in Tables 800-1 and 800-2, as applicable.

Cut-out messages and borders, wherever used, shall be made out of retro-reflective sheeting (as per Clause 801.3.2 or 801.3.3 as appli- cable), except those in black which shall be of non-reflective sheeting.

Colour: Unless otherwise specified, the general colour scheme shall be as stipulated in IS : 5 "Colour for Ready Mixed Paints", viz.

Bl	-	Colour	No. 166: French
R	-	Colour	No. 537: Signal
Gr	-	Colour	No. 284: India
Or	IS-	Colour	No. 591: Deep

The Colours shall be durable and uniform in acceptable hue when viewed in day light or under normal headlights at night.

Adhesives : The sheeting shall either have a pressure- sensitive adhesive of the aggressive-tack type requiring no heat, solvent or other preparation for adhesion to a smooth clean surface, or a lack free adhesive activated by heat, applied in a heat-vacuum applicator, in a manner recommended by the sheeting manufacturer. The adhesive shall be protected by an easily removable liner (removable by peeling without soaking in water or other solvent) and shall be suitable for the type of material of the base plate used for the sign. The adhesive shall form a durable bond to smooth, corrosion and weather resistant surface of the base plate such that it shall not be possible to remove the sheeting from the sign base in one piece by use of sharp instrument. In case of pressure-sensitive adhesive sheeting, the sheeting shall be applied in accordance with the manufacturer's Specifications. Sheeting with adhe- sives requiring use of solvents or other preparation for adhesive shall be applied strictly in accordance with the manufacturer's instructions.

Refurbishment: Where existing signs are specified for refurbishment, the sheeting shall have a semi-rigid aluminium backing pre-coated with aggressive-tack type pressure sensitive adhesive. The adhesive shall be suitable for the type of material used for the sign and should thoroughly bond with that material.

Fabrication:

Surface to be reflectorised shall be effectively prepared to receive the retro-reflective sheeting. The aluminium sheeting shall be de-greased.either by acid or hot alkaline etching and all scale/dust removed to obtain a smooth plain surface before the application of retro-reflective sheeting. If the surface is rough, approved surface primer may be used. After cleaning, metal shall not be handled, except by suitable device or clean canvas gloves, between all cleaning and preparation operation and application of reflective sheeting/primer. There shall be no opportunity for metal to come in contact with grease, oil or other contaminants prior to the application of retro-reflective sheeting.

Complete sheets of the material shall be used on the signs except where it is unavoidable; at splices, sheeting with pressure sensitive adhesives shall be overlapped not less than 5 mm. Sheeting with heat-activated adhesives may be spliced with an overlap not less than 5 mm or butted with a gap not exceeding 0.75 mm. Where screen printing with transparent colours is proposed, only butt jointing shall be used. The material shall cover the sign surface evenly and shall be free from twists, cracks and folds. Cut-outs to produce legends and borders shall be bonded with the sheeting in the manner specified by the manufacturer.

Warranty and durability : The Contractor shall obtain from the manufacturer a seven-year warranty for satisfactory field performance including stipulated retro-reflectance of the retro-reflective sheeting of high intensity grade and a five year warranty for the adhesive sheeting of engineering grade, and submit the same to the Engineer. In addition, a seven year and a five year warranty for satisfactory in-field performance of the finished sign with retro-reflective sheeting of high intensity grade and engineering grade respectively, inclusive-of the screen printed or cut out letters/legends arid their bonding to the retro-reflective sheeting shall be obtained from the Contractor/supplier and passed on to the Engineer, The Contractor/supplier shall also furnish a certification that the signs and materials supplied against the assigned work meets all the stipulated requirements and carry the stipulated warranty.

Processed and applied in accordance with recommended procedures, the reflective material shall be weather resistant and, following cleaning, shall show no appreciable discolouration, cracking, blistering or dimensional change and shall not have less than 50 per cent of the specified minimum reflective intensity values (Tables 800-1 and 800-2) when subjected to accelerated weathering for 1000 hours, using type E or EH Weatherometer (AASHTO Designation M 268).

Installation

Sign posts, their foundations and sign mountings shall be so constructed as to hold these in a proper and permanent position against the normal storm wind toads or displacement by vandalism. Normally, signs with an area upto 0.9 sq. m. shall be mounted on a single post, and for greater area two or more supports shall be provided. Sign supports may be of mild steel, reinforced concrete or galvanised iron

(G.I). Post- end(s) shall be firmly fixed to the ground by means of property designed foundation. The work of foundation shall conform to relevant Specifications as specified.

All components of signs and supports, other than the reflective portion and G.1. posts shall be thoroughly descaled, cleaned, primed and painted with two coats of epoxy paint. Any part of mild steel (M.S.) post below ground shall be painted with three coats of red lead paint.

The signs shall be fixed to the posts by welding in the case of steel posts and by bolts and washers of suitable siZe in the case of reinforced concrete or G.1. posts. After the nuts have been tightened, the tails of the bolts shall be furred over with a hammer to prevent removal.

1.3.10.1.4 Measurements for Payment

The measurement of standard cautionary, mandatory and informa- tion signs shall be in numbers of different types of signs supplied and fixed, while for direction and place identification signs, these shall be measured by area in square metres.

1.3.10.1.5 Rate

The Contract unit rate shall be payment in full for the cost of making the road sign, including all materials, installing it at the site and incidentals to complete the work in accordance with the Specifications.

1.3.11 G - Visual Improvement- Landscape Works

LANDSCAPE WORK

1.3.12 *Scope of work:*

The planting contractor shall provide all horticultural operations and services specified on the drawings/ schedule of quantities as specified herein or both,as instructed by the Executive Engineer(Hort)/ including :-

(a) Provide all equipment services and transport i.e. at least 4 Nos. Tractors with Trolleys, Water Tankers, Levelers, Spray Pumps, Augers etc as required for the project.

(b) Provide all plant material

(c) Provide topsoil for all plants

(d) Provide fertilizers, chemicals and manure as specified

(e) Preparation of planting locations

(f) Prepare plants pits, back filling, prepare “saucers” at least 5” deep for watering ,adding soil after settlement.

(g) Spraying before planting

(h) Staking supporting, wrapping and tying plant materials

(i) Transplanting, if any

(j) Disposal of debris and unused materials

(k) Guarantee of trees and plants for a period as per the tender requirement

(l) Plant material – Trees, Shrubs etc.

(m) Plant list – plants are listed in the drawings. The plants list is enclosed herein.

(n) Nomenclature – The names of the plants species confirm to standardized botanical names.

Quality and general requirements of plants

Plants shall be typical of their species and variety have normal growth habits , well developed branches, densely foliated with vigorous and fibrous root systems. Plant shall be free from disease and insects. Bark shall be free from abrasion.

Plants shall be grown in pots/bags. Plants shall have been grown under climatic conditions similar to those in locality of project. Nursery grown plants shall have been at least once transplanted. Plants growing in natural ground prior to supply shall not be accepted.

Each plant shall be properly identified by weather-proof labels securely attached there to before delivery to project site. No plant shall be delivered to the project site, except for required samples, untill inspection has been made in the field or at the nursery or unless specifically authorized in writing by the Executive Engineer(Horticulture)/Landscape Architect

Baled and Burlap plants must be moved with the root system as solid units in balls of earth firmly wrapped with burlap. The diameter and depth of the balls of earth must be sufficient to encompass the fibrous and feeding root system necessary for the healthy development of the plant. No plant shall be used when the ball of earth surrounding its roots have been badly cracked or broken prior to or during the process of planting or after the equipment required in connection with its transplanting has been removed. The plant and earth ball shall remain intact as one unit during all operations.

Container grown stock shall have been grown in container long enough for the root system to have developed sufficiently to hold its soil together, firm and whole. No plant shall be loose in container.

All plants shall be hardy under climatic conditions similar to those in he locality of the project. When plants of kinds or sizes specified are not available, substitution may be made upon request by the contractor if approved by the Project Engineer/Landscape Architect .

All plants should be strong sufficiently to stand straight without any support,but exceptional trees , soon after planting shall be properly supported to ensure their safety against wind or other factor which may effect it adversely.

Size of Plants:

All plants shall be equal to or exceed the sizes given in the plant list, which are minimum acceptable sizes plants shall be measured before pruning, with branches in normal position.Trees shall be minimum length as specified and shall be straight and symmetrical with a crown and having a persistent main

stem. The size of the crown shall be in good overall proportion to the height of the tree. The height of the tree shall be measured from the top of foliage including the rootball .

Shrubs shall be well foliated with a crown typical of the species and variety. Shrub height dimension shall be taken from the top of foliage and upto, and including the rootball.

Sweet Earth :

Shall be friable foam material, fertile, typical of the cultivated top soil of the locality , containing at ,least 2% of decay organic matter sweet earth shall be taken from well drained arable sites, it shall be reasonably free of subsoil ,. Stones, weeds, earth, clods, sticks, roots or other objectionable extraneous matter or debris and shall contain no toxic materials. Representative samples shall be tested for fertility and general texture by the contractor or by a recognised commercial or government Contractor. No sweet earth shall be delivered in frozen or muddy condition.

Manure:

Shall be well – rotted, unleached (“Cow Dung Manure”) free of harmful chemicals and other substances which may affect plant life. Manure shall be free of weeds, straw leaves or inorganic debris.

1.3.12.1.1 Planting Operations

Time of planting : Planting operations shall be conducted under favorable weather conditions, the contractor will be notified by the Engineer-In-Charge when areas of work are sufficiently clear of construction work for the contractor to commence work on planting.

Planting shall be done by experienced workmen familiar with planting procedures under the supervision of a qualified foreman.

Planting pits shall be excavated with vertical sides, except for those designated to be planted in beds. Plants pits shall be of the following sizes 0.90 m x 0.90m x 0.90m depth minimum for trees. Tree points shall be large enough to accommodate the root ball + 1/3 root ball depth on all sides shrubs - 0.45m x 0.45m x 0.45m depth excluding 5” depth for watering for both trees and shrubs .

Executive Engineer(Hort)/Landscape Architect shall inspect and approve plants pits before the contractor proceeds with placing of plants. Topsoil shall be made ready for planting before plants are delivered to the site. The pits/beds shall be given anti termite treatment @ 20 ml. Radar per pit after back filling.

Placing of plants: Plants shall be placed at the centre of pits , plumb and straight. The Executive Engineer(Hort)/Landscape Architect shall inspect and approve placing of plants before the contractor proceeds with further operations.

Final Consideration: Sweet earth shall be compacted around basin of balls to fill all voids. Roots shall be properly spread out and sweet earth carefully worked in among them.

Watering: Immediately after plants pit is backfilled a shallow base slightly larger than pit shall be formed with a ridge of soil tone facilitate and contain watering. After planting cultivate the soil between plant pit and rake smooth. Spray the soil with water to settle.

Guying and Staking: All plants shall be inspected for injury to trunks, evidence of insect done immediately after planting. Trees shall stand straight without staking. Executive Engineer (Hort)/Landscape Architect shall inspect and approve plant pits before the contractor proceeds with placing of plants.

After Planting care Watering: Water tree and other plants by flooding within two hours of the time of planting.

Guarantee Period: All plants shall be guaranteed by the contractor for a period as per the tender requirement, after the certified date of completion. During this time any plant which dies due to natural causes or does not grow sufficiently shall be replaced free of cost by the contractor. Trees which perish due to unnatural causes such as human interference, cattle grazing etc. shall not be replaced free of cost but under instructions from engineer in charge and landscape architect shall be replanted and repaid for.

Replacement: All replacements of plants shall be made by the same species/variety and sizes as specified in the plant list. The cost of replacement shall be borne by the contractor.

1.3.13 H - Visual Improvement- Road Works

1.3.13.1.1 ROAD MARKING

General The colour, width and layout of road markings shall be in accordance with the Code of Practice for Road Markings with paints, IRC : 35, and as specified in the drawings or as directed by the Engineer. 803.2.

Materials Road markings shall be of ordinary road marking paint, hot applied thermoplastic compound, or reflectorised paint as specified in the item and the material shall meet the requirements as specified below.

Hot Applied Thermoplastic Road Marking

General :

The work under this section consists of marking traffic stripes using a thermoplastic compound meeting the requirements specified herein.

The thermoplastic compound shall be screeded/extruded on to the pavement surface in a molten state by suitable machine capable of controlled preparation and laying with surface application of glass beads at a specific rate. Upon cooling to ambient pavement temperature, it shall produce an adherent pavement marking of specified thickness and width and capable of resisting deformation by traffic,

The colour of the compound shall be white or yellow (IS colour No. 556) as specified in the drawings or as directed by the Engineer.

Where the compound is to be applied to cement concrete pavement, a sealing primer as recommended by the manufacturer, shall be applied to the pavement in advance of placing of the stripes to ensure

proper bonding of the compound. On new concrete surface any laitance and/or curing compound shall be removed before the markings are applied.

Thermoplastic Material

General : The thermoplastic material shall be homo geneously composed of aggregate, pigment, resins and glass reflectorizmg beads.

Requirements :

Composition: The pigment, beads, and aggregate shall be uniformly dispersed in the resin. The material shall be free from all skins, dirt and foreign objects and shall comply with requirements indicated in Table below.

PROPORTIONS OF CONSTITUENTS OF MARKING MATERIAL

(Percentage by weight)

Component	White	Yellow
Binder	18.0 min.	18.0 min.
Glass Beads	30-40	30-40
Titanium Dioxide	10.0 min.	—
Calcium Carbonate and Inert Fillers	42.0 max.	See
Yellow Pigments	—	Note

Note : Amount of yellow pigment, calcium carbonate and inert fillers shall be at the option of the manufacturer, provided all other requirements of this Specification are met

Properties: The properties of thermoplastic material, when tested in accordance with ASTM D36/BS-3 262-(Part 1), shall be as below:

Luminance :

White : Daylight luminance at 45 dcgrees-65 per cent min. as per AASHTO M 249

Yellow: Daylight luminance at 45 degrees-45 per cent min. as per AASHTO M 249

Drying time : When applied at a temperature specified by the manufacturer and to the required thickness, the material shall set LO bear traffic in not more than 15 minutes.

Skid resistance : not less than 45 as per BS 6044.

Cracking resistance at low temperature : The material shall show i-o cracks on application to concrete blocks.

Softening point : 102.5 ± 9,5° C as per ASTM D 36.

How resistance : Not more than 25 per cent as per AASHTO M 249.

Yellowness index (for white thermoplastic paint): not more than 0.12 as per AASHTO M 249

Storage life : The material shall meet the requirements of these Specifications for a period of one year. The thermoplastic material must also melt uniformly with no evidence of skins or unmelted panicles for the one year storage period. Any material not meeting the above requirements shall be replaced by the manufacturer/ supplier/Contractor.

Reflectorisation : Shall be achieved by incorporation of beads, the grading and other properties of the beads shall be as specified in Clause 803.4.3

Marking : Each container of the thermoplastic material shall be clearly and indelibly marked with the following information:

The name, trade mark or other means of identification of manufacturer

Batch number

Date of manufacture

Colour (white or yellow)

Maximum application temperature and maximum safe heating temperature.

Reflectorising glass beads

General: This Specification covers two types of glass beads 10 be used for the production of reflectorised pavement markings.

Type 1 beads are those which are a constituent of the basic thermoplastic compound vide Table above and Type 2 beads are those which are to be sprayed on the surface

The glass beads shall be transparent, colourless and free from milkiness, dark particles and excessive air inclusions.

Specific requirements

Gradation: The glass beads shall meet the gradation requirements for the two types as given in below;

GRADATION REQUIREMENTS FOR GLASS BEADS

Sieve size	Per cent retained	
	Type 1	Type 2
1.18 mm	0 to 3	
850 micron	5 to 20	0 to 5
600 -do-	-	5 to 20
425 -do-	65 to 95	-
300 -do-	-	30 to 75
ISO -do-	0 to 10	10 to 30
below 180 micron	-	0 to 15

Roundness: The glass beads shall have a minimum of 70 per cent true spheres.

Refractive index: The glass beads shall have a minimum re-fractive index of 1.50.

Free flowing properties : The glass beads shall be free of hard lumps and clusters and shall dispense readily under any conditions suitable for paint striping. They shall pass the free flow-test.

Test methods: The specific requirements shall be tested with the following methods: (i)

Free-flow test- Spread 100 grams of beads evenly in a 100 mm diameter glass dish. Place the dish in a 250 mm inside diameter desiccator which is filled within 25 mm of the lop of a desiccator plate with sulphuric acid water solution { specific gravity 1.10). Cover the desiccator and let it stand for 4 hours at 20 lo 29 degree C. Remove sample from desiccator, transfer beads to a pan aid inspect for lumps or clusters. Then pour beads into a clean, dry glass funnel having a 100 mm stern and 6 mm orifice. If necessary, initiate flow by lightly tapping the funnel. The glass spheres shall be essentially free of lumps and clusters and shall flow freely through the funnel.

The requirements of gradation, roundness and refractive index of glass beads and the amount of glass beads in the compound shall be tested as per B3 6088 and BS 3262 (Part I).

The Contractor shall furnish to the Employer a copy of certified test reports from the manufacturer of glass beads obtained from a reputed laboratory showing results of all tests specified herein mid shall certify that the material meets all requirement of this Specification. However, if so required, these tests may be carried out as directed by the Engineer.

Application properties of thermoplastic material

The thermoplastic material shall readily get screeded/ extruded at temperatures specified by the manufacturers for respective method of application to produce a tine of specified thickness which shall be continuous and uniform in shape having clear and sharp edges. 803.4.4.2. The material upon heating

to application temperatures, shall not exude fumes, which are toxic, obnoxious or injurious to persons or property.

Preparation:

The material shall be melted in accordance with the manufacturer's instructions in a healer filled with a mechanical stirrer to give a smooth consistency to the thermoplastic material lo avoid local overheating. The temperature of the mass shall be within the range specified by the manufacturer, and shall on no account be allowed lo exceed the maximum temperature stated by the manufacturer. The molten material should be used as expeditiously as possible and for thermoplastic material which has natural binders or is otherwise sensitive lo prolonged heating, the material shall not be maintained in a molten condition for more than 4 hours.

After transfer lo the laying equipment, the material shall be maintained within the temperature range specified by the manufacturer for achieving the desired consistency for laying.

The material shall be melted in accordance with the manufacturer's instructions in a healer filled with a mechanical stirrer to give a smooth consistency to the thermoplastic material lo avoid local overheating. The temperature of the mass shall be within the range specified by the manufacturer, and shall on no account be allowed lo exceed the maximum temperature stated by the manufacturer. The molten material should be used as expeditiously as possible and for thermoplastic material which has natural binders or is otherwise sensitive lo prolonged heating, the material shall not be maintained in a molten condition for more than 4 hours.

After transfer lo the laying equipment, the material shall be maintained within the temperature range specified by the manufacturer for achieving the desired consistency for laying.

Properties of finished road marking :

The stripe shall not be slippery when wet.

The marking shall not lift from the pavement in freezing weather.

After application and proper drying, the stripe shall show no appreciable deformation or discolouration under traffic and under road temperatures upto 60°C.

The marking shall not deteriorate by contact with sodium chloride, calcium chloride or oil drippings from traffic.

The stripe or marking shall maintain its original dimensions and position. Cold ductility of the material shall be such as to permit normal movement with the road surface without chopping or cracking.

The colour of yellow marking shall conform 10 IS Colour No. 356 as given in IS: 164.

Reflectorised Paint

Reflectorised paint, if used, shall conform to the Specification by the manufacturers and approved by the Engineer. Reflectorising glass beads for reflectorising paints where used shall conform to the requirement of Clause of Reflectorising glass beads.

Marking shall be done by machine. For locations where painting cannot be done by machine, approved manual methods shall be used with prior approval of the Engineer. The Contractor shall maintain control over traffic while painting operations are in progress so as to cause minimum inconvenience to traffic compatible with protecting the workmen.

The thermoplastic material shall be applied hot either by screeding or extrusion process. After transfer to the laying apparatus, the material shall be laid at a temperature within the range specified by the manufacturer for the particular method of laying being used. The paint shall be applied using a screed or extrusion machine.

The pavement temperature shall not be less than 10°C during application. All surfaces to be marked shall be thoroughly cleaned of all dust, dirt, grease, oil and all other foreign matter before application of the paint. The material, when formed into traffic stripes, must be readily renewable by placing an overlay of new material directly over an old line of compatible material. Such new material shall so bond itself to the old line that no splitting or separation takes place. Thermoplastic paint shall be applied in intermittent or continuous lines of uniform thickness of at least 2.5 mm unless specified otherwise. Where arrows or letters are to be provided, thermoplastic compound may be hand-sprayed. In addition to the beads included in the material, a further quantity of glass beads of Type 2, conforming to the above noted Specification shall be sprayed uniformly into a mono-layer on to the hot paint line in quick succession of the paint spraying operation. The glass beads shall be applied at the rate of 250 grams per square metre area.

The minimum thickness specified is exclusive of surface applied glass beads. The method of thickness measurement shall be in accordance with Appendices B and C of BS - 3262 (Part 3).

The finished lines shall be free from ruggedness on sides and ends and be parallel to the general alignment of the carriageway. The upper surface of the lines shall be level, uniform and free from streaks

Measurements for Payment

The painted markings shall be measured in sq. metres of actual area marked (excluding the gaps, if any).In respect of markings like directional arrows and lettering, etc., the measurement shall be by numbers

Rate

The Contract unit rate for road markings shall be payment in full compensation for furnishing all labour, materials, tools, equipment, including all incidental costs necessary for carrying out the work at the site conforming to these Specifications complete as per the approved drawing(s) or as directed by the Engineer and all other incidental costs necessary to complete the work to these Specifications.

CYCLE TRACK MARKING

Colour:
- Traffic green (±RAL6024)

Type
2-pack cold curing solvent free compound, based on acrylic resins for hand application.

Features:
- Easy to apply with texture roller. High durability, very good adhesion on the road surface, also on concrete.
- Especially designed to accentuate bicycle-tracks and footpath's etc.

Technical Characteristics
- Viscosity: Thick fluid compound
- Density: Approx. 1.8 gram/cm3
- Skid resistance: > 45 S.R.T.
- Hardening time: Approx. 20 minutes by 30°C | Approx. 30 minutes by 20°C | Approx. 40 minutes by 10°C
- Flashpoint: Approx. 10°C
- Storage stability: At least 6 months if stored in a cool place
- Mixing ratio: 1 sachets of hardener to 10 kg Roll on base
- Potlife (mixed): 10 minutes by 20°C

Application Method:
Mark out the surface, which has to be done, with self adhesive tape. Mix the rolcoating with hardener and divide the material equally over the whole area. Immediately after application the tape can be removed.

Spreading rate:
Approx. 1.5- 2.0 kg/m2at 0.8 -1.2 mm thickness

Temperature:
Minimum application temperature 10°C

Primer:
On dusty and sucking surfaces or fresh bituminous surfaces, we advise to apply EP PRIMER first.

Weather
Conditions: Minimum application temperature is 10°C

Cleaning:
With Thinner recommended by Kataline.

1.3.14 ROAD DELINEATORS

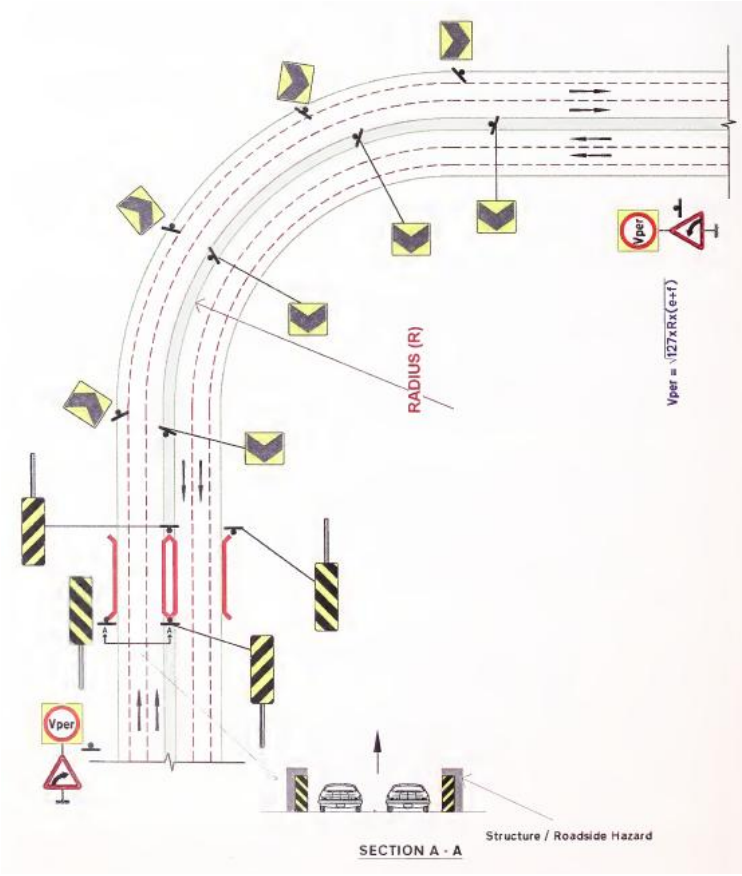
These are roadway Indicators, hazard markers and object markers as given in IRC:79.

Roadway indicators; Circular Iron Posts of 1.U m height or concrete or any manufactures product with retroreflective reflector of at least Type IV sheeting as per criteria, placement and spacing given in IRC:79 shall be provided. This will include low embankments and flat curves where crash barriers are not provided.

Hazard Markers shall be provided as given IRC:67. In addition, the objects close to the road shall be painted with black and yellow stripes using the paint conforming to IS:164.

Object Markers shall be provided as given in IRC:79 and IRC:67. All physical objects projects above the Finished Road Level (FRL) that are falling within 3 m from the carriageway edge line shall be illuminated with Object Hazard Markers (OHM). The objects shall include foot path or utility poles or parapet or concrete barrier of Major bridge. Minor bridge, Culverts, RE wall start of Underpass or flyovers. The Object Hazard Marker shall be either left OHM or right OHM or Two way Hazard Marker with respect to position of object to the traffic as shown in Fig below.In addition the kerbs in the medians/traffic islands shall be painted with black and white stripes (black and yellow stripeshazardous locations) using the paint conforming to IS: 164.

Reference Sketch below;



1.3.15 REFLECTIVE PAVEMENT MARKERS (ROAD STUDS)

General

The work cover the providing and fixing of reflective pavement marker (RPM) or road stud, a device which is bonded to or anchored within the road surface, for lane marking and delineation for night-time visibility. It reflects incident light in directions close to the direction from which it came.

Material

Plastic body of RPM/road stud shall be moulded from ASA (Acrylic Styrene Acrylonitrite) or HIPS (Hi-impact Polystyrene) or Acrylonitrile Butadiene Styrene (ABS) or any other suitable material approved by the Engineer. The markers shall support a load of 13,635 kg tested in accordance with ASTM D4280.

Reflective panels shall consist of number of lenses containing single or dual prismatic cubes capable of providing total internal reflection of the light entering the lens face. Lenses shall be moulded of methyl methecrylate conforming to ASTM D 788 or equivalent.

Design

The slope or retro-reflectinq surface shall preferably be 35± 5° to base and the area of each retro-reflecting surface shall not be less than 13.0 sq.cm.

Optical Performance

Unidirectional and bi-directional studs

Each reflector or combination of reflectors on each face of the stud shall have a Coefficient of Luminous Intensity (C.I.L), not less than that given in Table below as appropriate,

Omni-directional studs

Each Omni-directional stud shall have a minimum (C.I.L) of not less than 2 mcd/lx.

Table 1- Minimum CIL values for Category A studs

Entrance angle	Observation angle	C.I.L in mcd/lx		
		White	Amber	Red
0° U 5° L & R	0.3°	220	110	44
0° U 10° L & R	0.5°	120	60	24

Table 1- Minimum CIL values for Category B studs

Entrance angle	Observation angle	C.I.L in mcd/lx		
		White	Amber	Red
0° U 6° L & R	0.3°	20	10	4
0° U 10° L & R	0.5°	15	7.5	3

Note : 1) The entrance angle of 0° U corresponds to the normal aspect of the reflectors when the reflecting road stud is installed in horizontal road surface.

2) The stud incorporating one or more corner cube reflectors shall be included in category 'A'. The stud incorporating one or more bi-convex reflectors shall be included in category 'B'.

Tests

Co-efficient of luminance intensity can be measured by procedure described in ASTM E 809 "Practice for Measuring Photometric Characteristics" or as recommended in BS:873-Part 4: 1973. .

Under test conditions, a stud shall not be considered to fail the photometric requirements if the measured C.I.L. at any one position of measurement is less than the values specified in Table above provided that the value is not less than 80 percent of the specified minimum, and the average of the left and right measurements for the specific angle is greater than the specified minimum.

1.3.16 Solar Powered Road Markers (Solar Studs)

The solar studs shall be made of Aluminium alloy and poly carbonate material which shall be absolutely weather resistance and strong enough to support a load of 13,635 kg tested in accordance with ASTM D4280. Its colour may be white, red, yellow, green or blue or combination as directed by the Engineer. Its water resistance shall meet the requirements of IP 65 in accordance with IS :12063:1987 Category 2 for protection against water ingress. The dimensions of solar studs shall not be less than 100 mm x 100 mm x 10 mm. It shall have super bright LEDs so as to provide long visibility from a distance of more than 800 m. Its flashing rate shall not be less than 1 Hz. It should be able to give the prescribed performance in the temperature range of -40°C to ·'·55°C. Its life shall be not less than 3 years .

Fixing of Reflective Markers

Requirements

The enveloping profile of the head of the stud shall be smooth and the studs shall not present any sharp edges to traffic. The reflecting portions of the studs shall be free from crevices or ledges where dirt might accumulate. Marker height shall not be less than 10mm and shall not exceed 20 mm and its width shall not exceed 130 mm. The base of the marker shall be flat within 1.3 mm. If the bottom of the marker is configured, the outermost faces of the configurations shall not deviate more than 1.3 mm from a flat surface. All road studs shall be legibly marked with the name, trade mark or other means of identification of the manufacturer. .

Placement

The reflective marker shall be fixed to the road surface using the adhesives and the procedure recommended by the manufacturer, No nails shall be used to affix the marker so that they do not pose safety hazard on the roads. Regardless of the type of adhesive used, the markers shall not be fixed if the pavement is not surface dry and on new asphalt concrete surfacing until the surface has been opened to traffic for a period of not less than 14hours. The portions of the road surface, to which the marker is to be bonded by the adhesive, shall be free of dirt, curing compound, grease, oil, moisture, loose or unsound layers, paint and any other material which would adversely affect the bond of the adhesive. The adhesive shall be placed uniformly on the cleaned pavement surface or on the bottom

of the of the marker in a quantity sufficient to result in complete coverage of the area of contract of the marker with no voids present and with a slight excess after the marker has been lightly pressed in place. For epoxy installations, excess adhesive around the edge of the marker, excess adhesive on the pavement and adhesive on the exposed surfaces of the markers shall be immediately removed.

Warranty and durability

The Contractor shall submit a two year warranty for satisfactory field performance including stipulated retro-reflectance of the reflecting panel, to the Engineer. In addition, a two year warranty for satisfactory infield performance of the finished road marker shall also be given by the Contractor who carries out the work of fixing of reflective road markers. In case the markers are displaced, damaged, get worn out or lose their reflectivity compared to stipulated standards, the Contractor would be required to replace all such markers within 15 days of the intimation from the Engineer, at his own cost.

Measurement for Payment

The measurement of reflective road markers shall be in numbers of different types of markers supplied and fixed Rate

The contract unit rate for reflective road markers shall be payment in full compensation for furnishing all labour, materials, tools, equipment including incidental costs necessary for carrying out the Work at site conforming to the specification complete as per approved drawings or as directed by the Engineer.

1.3.17 TUBULAR STEEL RAILING

General

The work shall consist of supplying, fixing and erecting tubular steel railings as shown on the drawings and as directed by the Engineer.

The railings shall be of tubular steel in conformance to IS:1239. The fabrication and painting except for the final coat shall be completed before despatch to the site. Prior to the painting, all surfaces shall be grit blasted to the satisfaction of the Engineer and pickled. The priming coat of paint shall be applied as soon as the steel has dried,

The posts shall be vertical and of the type as shown in the drawing with a tolerance not exceeding 6 mm in a length of 3 m. The railing shall be erected true to line and grade.

Measurements for Payment

The railing shall be measured in linear metre from end to end along the face of the railing, including end and intermediate posts, with no deductions for gaps as shown on the drawings.

Rate

The Contract unit rate for Tubular Steel Railing shall be payment in full compensation for furnishing all labour, materials, tools, equipment and plant required for fabrication, connection, oiling, painting, temporary erection, inspection, test and final erection at site and a!l other incidental costs necessary to complete the work to these Specifications.

1.3.18 STREET FURNITURE

General Conditions:

The above mentioned Street Furniture items and their respective specifications are minimum. The Contractor may propose better specifications than specified above. They shall form the integral part of this project, at sole discretion of SMC. All the materials used for the street furniture items shall be non flammable and suitable for all weather conditions.

The Contractor shall follow all the bye laws, guidelines, norms and standards as set out by any Statutory Authority with regards to the erection of Street Furniture items and advertising thereon. Also, prior permission of the same shall also be taken by the Contractor at its cost and risk and payment of License fees, taxes, or any other sum payable to such authorities shall be sole responsibility of the Contractor.

The Contractor shall alone be responsible for lost/theft/damage etc. of any of the street furniture items.

The Contractor shall be responsible for the electric, water supply and other required connections required for any of the Street Furniture item. Also, he shall be responsible for disposing-off the litter, drainage, etc. at the locations approved by the S M C . Further to this, the Contractor shall be responsible to pay all the bills, charges, etc. of any services used for any street furniture items.

No bill boards or hoardings shall be a part of this project.

All the Street Furniture items shall be fixed to the ground with concrete foundation, etc. so that they cannot be removed easily

VOLUME III a

EMPLOYER'S REQUIREMENTS

&

SPECIFICATIONS

(UTILITY DUCT)

SPECIFICATION FOR CIVIL WORKS – UTILITY DUCT

ITEM NO:-1 EXCAVATION FOR UTILITY TRENCH INCLUDING ALL SAFETY PROVISIONS USING SITE RAILS AND STACKING EXCAVATED STUFF UPTO A LEAD OF 90 METERS CLEANING THE SITE ETC. COMPLETE FOR LIFTS AND STRATA AS SPECIFIED

1.1 SCOPE

This specification covers the general requirements of earthwork in excavation in different materials, site grading, filling in areas as shown in drawing, filling back around foundations and , conveyance and disposal of surplus soils or stacking them properly as shown on the drawings and as directed by the ENGINEER and all operations covered within the intent and purpose of this specification.

1.2 APPLICABLE CODES

The following Indian Standard Codes, unless otherwise specified herein, shall be applicable. In all cases, the latest revision of the codes shall be referred to.

IS: 783	-	Code of practice for laying of concrete pipes.
IS: 1200	-	Method of measurement of building and civil engineering works.
(Part 1)		Part 1 Earthwork.
(Part 27)		Part 27 Earthwork done by mechanical appliances.
IS: 3764	-	Excavation work-code of safety.
IS: 2720	-	Methods of test for soils:
(Part 1)	-	Preparation of dry soil samples for various tests.
(Part 2)	-	Determination of water content.
(Part 4)	-	Grain size analysis.
(Part 5)	-	Determination of liquid and plastic limit.
(Part 7)	-	Determination of water content-dry density relation

using light compaction.

Part (9) - Determination of dry density - moisture content relation by constant weight of soil method.

(Part 14) - Determination of density index (relative density) of cohesionless soils.

(Part 28) - Determination of dry density of soils in place, by the sand replacement method.

(Part 33) - Determination of the density in place by the ring and water replacement method.

(Part 34) - Determination of density of soil in place by rubber balloon method.

(Part 38) - Compaction control test (HILF Method).

1.3 GENERAL

The CONTRACTOR shall furnish all tools, plants, instruments, qualified supervisory personnel, labour, materials any temporary works, consumables, any and everything necessary, whether or not such items are specifically stated herein for completion of the job in accordance with the specification requirements. The CONTRACTOR shall carry out the survey of the site before excavation and set properly all lines and establish levels for various works such as earthwork in excavation for grading, basement, foundations, plinth filling, roads, drains, cable trenches, pipelines, etc. Such survey shall be carried out by taking accurate cross sections of the area perpendicular to established reference/ grid lines at 8 m. intervals or nearer as determined by the ENGINEER based on ground profile. These shall be checked by the ENGINEER and thereafter properly recorded.

The excavation shall be done to correct lines and levels. This shall also include, where required, proper shoring to maintain excavations and also the furnishing, erecting and maintaining of substantial barricades around excavated areas and warning lamps at night for ensuring safety.

The rates quoted shall also include for dumping of excavated materials in regular heaps, bunds, riprap with regular slopes as directed by the ENGINEER, within the lead specified and leveling the same so as to provide natural drainage. Rock/ soil excavated shall be stacked properly as directed by the ENGINEER. As a rule, all softer material shall be laid along the centre of heaps, the harder and more weather resisting materials forming the casing on the sides and the top. Rock shall be stacked separately.

1.4 GEOTECHNICAL INVESTIGATION

a) Detailed geotechnical investigation shall be carried out by the Contractor.

b) Based on the plot plan developed, the Contractor shall prepare field and laboratory testing scheme and obtain the approval of Employer prior to commencing the investigation .

c) Following minimum field tests shall be conducted:

- Static Plate load tests,
- Cyclic Plate load tests,
- Permeability tests,
- Field density tests,
- Vane Shear tests,
- Static Cone and dynamic cone Penetration tests,
- Soil resistivity tests,
- Pressure meter tests,
- CBR tests,
- Initial Pile Load Tests,

d) In rock strata, core recovery and Rock Quality Designation (RQD) shall be noted carefully for each run, immediately after cores are taken out of barrel.

e) During boring, the level at which ground water is struck shall be carefully noted. Ground water samples shall be collected for chemical analysis. Water samples shall be collected before the addition of water or drilling mud to the hole.

f) Following minimum laboratory tests shall be conducted: (Preferably on Undisturbed soil samples and if UDS is not possible, on remoulded soil samples.)

- Grain size analysis,

- Hydrometer analysis,
- Sieve analysis,
- Specific Gravity,
- Chemical Analysis of soil and ground water including Sulphates, Chlorides, pH value, etc.,
- Chemical Analysis of 2:1, Water: Soil extract of the samples giving SO3 content,
- Consistency Index: Liquid Limit, Plastic Limit, Plasticity Index, Shrinkage Limit and Shrinkage ratio,
- Consolidation test giving all relevant parameters,
- Swelling pressure and free swell index for expansive soils,
- Unconfined Compressive Strength on soil samples,
- Direct Shear Test,
- Tri axial Compressive Strength Tests,
- Unconsolidated Undrained Test,
- Consolidated Undrained Test,
- Consolidated Drained Test,
- Moisture-density relations for Standard Proctor and Modified Proctor tests,
- Crushing Strength, specific gravity, unit weight, water absorption test on Nx size rock specimens,

- Tests to determine CBR values for design of roads at different locations, i) The Geotechnical investigation report shall necessarily include, but not be limited to the following information.

- Recommended types of foundation,

- Allowable safe bearing capacities and settlement values in different strata for shallow foundations indicating relevant design criteria adopted, method of analysis adopted etc.,
- If pile foundations are necessary, type of piles recommended with reasons for the same, length, diameter, allowable capacity (vertical, lateral and pullout) of

individual and groups of piles, negative skin friction if any and magnitude of estimated negative skin friction,

- Type of cement to be used for concrete substructures and in stone / brick masonry foundations with reference to the chemical nature of subsoil and ground water,
- Recommendations regarding excavations (shallow & deep), embankment, safe side slopes for excavation and embankment, dewatering, site drainage, etc.,
- Recommended soil properties such as density, specific gravity, cohesion, angle of internal friction etc. for design,
- Precautions to be taken for design of lightly loaded structures when expansive soil is encountered with respect to swelling pressure and free swell index values obtained.
- CBR values for design of pavements.

1.5 CLEARING

The area to be excavated filled shall be cleared of fences, trees, plants, logs, stumps, bush, vegetation, rubbish, slush, etc. and other objectionable matter. If any roots or stumps of trees are met during excavation, they shall also be removed. The material so removed shall be burnt or disposed off as directed by the ENGINEER. Where earth fill is intended, the area shall be stripped of all loose/ soft patches, top soil containing objectionable matter/ materials before fill commences.

1.6 PRECIOUS OBJECTS, RELICS, OBJECTS OF ANTIQUITY, ETC.

All gold, silver, oil, minerals, archaeological and other findings of importance, trees cut or other materials of any description and all precious stones, coins, treasures, relics, antiquities and other similar things which may be found in or upon the site shall be the property of the OWNER and the CONTRACTOR shall duly preserve the same to the satisfaction of the OWNER and from time to time deliver the same to such person or persons as the OWNER may from time to time authorise or appoint to receive the same.

1.7 CLASSIFICATION

All materials to be excavated shall be classified by the ENGINEER, into one of the following classes and shall be paid for at the rate tendered for that particular class of

material. No distinction shall be made whether the material is dry, moist or wet. The decision of the ENGINEER regarding the classification of the material shall be final and binding on the CONTRACTOR and not be a subject matter of any appeal or arbitration.

Any earthwork will be classified under any of the following categories:

(a) Ordinary and Hard Soils

These shall include all kinds of soils containing kankar , sand, silt, murrum and/ or shingle, gravel, clay, loam, peat, ash, shale, etc., which can generally be excavated by spade, pick axes and shovel, and which is not classified under "Soft and Decomposed Rock" and "Hard Rock" defined below. This shall also include embedded rock boulders not longer than 1 metre in any one direction and not more than 200 mm in any one of the other two directions.

(b) Soft and Decomposed Rock

This shall include rock, boulders, slag, chalk, slate, hard mica schist, laterite and all other materials which in the opinion of ENGINEER is rock, but does not need blasting and could be removed with picks, hammer, crow bars, wedges, and pneumatic breaking equipment. The mere fact that the CONTRACTOR resorts to blasting for reasons of his own, shall not qualify for classification under 'Hard Rock'.

This shall also include excavation in macadam and tarred roads and pavements. This shall also include rock boulders not longer than 1 metre in any direction and not more than 500 mm in any one of the other two directions. Masonry to be dismantled will also be measured under this item.

1.8 EXCAVATION:

All excavation work shall be carried out by mechanical equipment unless, in the opinion of the ENGINEER, the work involved and time schedule permit manual work.

Excavation for permanent work shall be taken out to such widths, lengths, depths and profiles as are shown on the drawings or such other lines and grades as may be specified by the ENGINEER. Rough excavation shall be carried out to a depth 150 mm above the final level. The balance shall be excavated with special care. Soft pockets shall be removed even below the final level and extra excavation filled up as directed by the

ENGINEER. The final excavation if so instructed by the ENGINEER should be carried out just prior to laying the mud-mat.

The CONTRACTOR may, for facility of work or similar other reasons excavate, and also backfill later, if so approved by the ENGINEER, at his own cost outside the lines shown on the drawings or directed by the ENGINEER. Should any excavation be taken below the specified elevations, the CONTRACTOR shall fill it up, with concrete of the same class as in the foundation resting thereon, upto the required elevation. No extra shall be claimed by the CONTRACTOR on this account.

All excavation shall be done to the minimum dimensions as required for safety and working facility. Prior approval of the ENGINEER shall be obtained by the CONTRACTOR in each individual case, for the method he proposes to adopt for the excavation, including dimensions, side slopes, dewatering, disposal, etc. This approval, however, shall not in any way relieve the CONTRACTOR of his responsibility for any consequent loss or damage. The excavation must be carried out in the most expeditious and efficient manner. Side slopes shall be as steep as will stand safely for the actual soil conditions encountered. Every precaution shall be taken to prevent slips. Should slips occur, the slipped material shall be removed and the slope dressed to a modified stable slope. Removal of the slipped earth will not be paid for and CONTRACTOR shall take adequate precautions to avoid slips in view of the restricted plot and presence of buildings/ structures in nearby vicinity.

Excavation shall be carried out with such tools, tackles and equipment as described herein before. Blasting or other methods may be resorted to in the case of hard rock; however not without the specific permission of the ENGINEER.

2.0 FILL, BACK FILLING IN UTILITY TRENCH WITH MURRUM OR SELECTED SOIL IN LAYERS OF 20 CM THICKNESS INCLUDING WATERING, RAMMING AND CONSOLIDATING ETC. COMPLETE

2.1 GENERAL

All fill material will be subject to the ENGINEER's approval. If any material is rejected by the ENGINEER, the CONTRACTOR shall remove the same forthwith from the site at no

extra cost to the OWNER. Surplus fill material shall be deposited/ disposed off as directed by the ENGINEER after the fill work is completed.

No earthfill shall commence until surface water discharges and streams have been properly intercepted or otherwise dealt with as directed by the ENGINEER

2.2 MATERIAL

To the extent available, selected surplus soils from excavated materials shall be used as backfill. Fill material shall be free from clods, salts, sulphates, organic or other foreign material. All clods of earth shall be broken or removed. Where excavated material is mostly rock, the boulders shall be broken into pieces not larger than 150 mm size, mixed with properly graded fine material consisting of murrum or earth to fill up the voids and the mixture used for filling.

If any selected fill material is required to be borrowed, the CONTRACTOR shall make arrangements for bringing such material from outside borrow pits. The material and source shall be subject to prior approval of the ENGINEER. The approved borrow pit area shall be cleared of all bushes, roots of trees, plants, rubbish, etc. top soil containing salts/ sulphate and other foreign material shall be removed. The materials so removed shall be burnt or disposed off as directed by the ENGINEER. The CONTRACTOR shall make necessary access roads to borrow areas and maintain the same, if such access road does not exist, at his cost.

Filling with excavated earth shall be done in regular horizontal layers each not exceeding 20 cm in depth. All lumps and clods exceeding 8 cm in any direction shall be broken. Each layer shall be watered and consolidated with steel rammer or half (½) tonne roller. Where specified, every third and top most layer shall also be consolidated with power roller of minimum 8 tonnes. Wherever depth of filling exceeds 1.5 metres, vibratory power roller shall be used to consolidate the filing unless otherwise directed by ENGINEER. The CONTRACTOR shall make good all subsidence and shrinkage in earth fillings, embankments, traverses, etc. during execution and till the completion of work unless otherwise specified.

2.3 FILLING IN TRENCHES

Filling in trenches for pipes and drains shall be commenced as soon as the joints of pipes and drains have been tested and passed. The backfilling material shall be properly

consolidated by watering and ramming, taking due care that no damage is caused to the pipes. Where the trenches are excavated in soil, the filling from the bottom of the trench to the level of the centre line of the pipe shall be done by hand compaction with selected approved earth in layers not exceeding 8 cm, backfilling above the level of the centre line of the pipe shall be done with selected earth by hand compaction or other approved means in layers not exceeding 15 cm.

In case of excavation of trenches in rock, the filling upto a level 30 cm above the top of the pipe shall be done with fine materials, such as earth, murrum etc. The filling up of the level of the centre line of the pipe shall be done by hand compaction in layers not exceeding 8 cm whereas the filling above the centre line of the pipe shall be done by hand compaction or approved means in layers not exceeding 15 cm. The filling from a level 30 cm above the top of the pipe to the top of the trench shall be done by hand or other approved mechanical methods with broken rock filling of size not exceeding 15 cm mixed with fine material as available to fill up the voids. Filling of the trenches shall be carried simultaneously on both sides of the pipe to avoid unequal pressure on the pipe.

2.4 FILL DENSITY

The compaction, only where so called for, in the schedule of quantities/ items shall comply with the specified (Standard Proctor/ Modified Proctor) density at moisture content differing not more than 4 percent from the optimum moisture content. The CONTRACTOR shall demonstrate adequately at his cost, by field and laboratory tests that the specified density has been obtained.

3.0 PLAIN CEMENT CONCRETE (PROVIDING AND LAYING CEMENT CONCRETE 1:2:4 AND CURING COMPLETE EXCLUDING FORMWORK) AND REINFORCED CEMENT CONCRETE (PROVIDING AND CAST IN SITU C.C IN GRADE M-25 PROPORTION OF INGREDIENTS AS PER MIX DESIGN BY WEIGH BATCHING USING GRANITE, QUARTZITE TRAP METAL SIZE 12 MMTO 20 MM AND OR 6 MM TO 12 MM INCLUDING SCAFFOLDING CENTERING FORM WORK,NEEDLE VIBRATED CONSOLIDATION , CURING AND HYDRAULIC TESTING ETC.COMPLETE UPTO 6 METER HEIGHT/DEPTH AV. FOR ALL WATER RETAINING STRUCTURE).

3.1 SCOPE

This Specification covers the general requirements for ready mixed concrete and for concrete using on-site production facilities including requirements in regard to the quality, handling, storage of ingredients, proportioning, batching, mixing, transporting, placing, curing, protecting, repairing, finishing and testing of concrete; formwork; requirements in regard to the quality, storage, bending and fixing of reinforcement; grouting as well as mode of measurement and payment for completed works.

It shall be very clearly understood that the specifications given herein are brief and do not cover minute details. However, all works shall have to be carried out in accordance with the relevant standards and codes of practices or in their absence in accordance with the best accepted current ENGINEERING practices or as directed by ENGINEER from time to time. The decision of ENGINEER as regards the specification to be adopted and their interpretation and the mode of execution of work shall be final and binding on CONTRACTOR and no claim whatsoever will be entertained on this account.

3.2 APPLICABLE CODES AND SPECIFICATIONS

The following specifications, standards and codes, including all official amendments/revisions and other specifications & codes referred to therein, should be considered a part of this specification. In all cases the latest issue/edition/revision shall apply. In case of discrepancy between this specification and those referred to herein below or other specifications forming a part of this bid document, this specification shall govern.

IS Code No.	Subject
GENERAL	
IS 4082	Stacking & storage of construction materials and components at site – Recommendations
EARTH WORK	
IS 3674	Safety code for excavation work
IS 1498	Classification and identification of soils for general

	engineering purposes.
IS 1200 (Pt-1)	Method of measurement of earth work
IS 1200 (Pt-27)	Method of measurement of earth work (by Mechanical Appliances)
IS 4081	Safety code for Blasting and related drilling operation
IS 4988 (Part-IV)	Excavators
MORTARS	
IS 269	Specification for 33 grade ordinary Portland cement
IS 455	Specification for Portland slag cement
IS 650	Specification for standard sand for testing of cement
IS 1269	Specification for 53 grade ordinary Portland cement
IS 1542	Specification for sand for plaster
IS 2116	Specification for sand for masonry mortar
IS 2250	Code of practice for preparation and use of masonry Mortar
IS 3025	Method of sampling and test for water
IS 3406	Specification for masonry cement
IS 3812 (Part-I)	Specification for flyash for use as pozzolana in cement mortar and concrete
IS 3812 (Part-II)	Specification for flyash for use as admixture in cement mortar and concrete
IS 8041	Rapid hardening Portland cement
IS 8042	Specification for white cement
IS 8112	Specification for 43 grade ordinary Portland cement
IS 1298	Methods of test for determination of free lime in portland cement

IS 6452	High alumina cement for structural use
IS 1489	Portland Pazzolana Cement
CONCRETE WORK	
IS 383	Specification for coarse and fine aggregate from natural source for concrete
IS 303	Coarse and fine aggregates from natural sources for concrete
IS 1830	Methods for sampling of aggregates for concrete
IS 2386	Method of test for aggregates for concrete
(a) Part-I : Particle size and shape	
(b) Part-II : Estimation of deleterious materials and organic impurities	
(c) Part-III : Specific gravity, density, voids absorption and bulking	
(d) Part-IV : Mechanical properties	
(e) Part-V : Soundness	
IS 2505	General requirements for concrete vibrators – immersion type
IS 2506	General requirements for concrete vibrators – screed board concrete vibrators
IS 2645	Specification for integral water proofing compounds for cement mortar and concrete
IS 761 (Part-I)	Code of practice for extreme weather concreting (Part-I) recommended practice for hot weather concreting
IS 7861 (Part-II)	Code of practice for extreme weather concreting (Part-II) recommended
IS 9103	Specification for concrete admixtures
IS 460	Test sieves

IS 1607	Methods for dry sieving
IS 1834	Hot applied sealing compounds for jointing concrete
REINFORCED CEMENT CONCRETE WORK	
IS 1904	Structural safety of buildings, shallow foundation
IS 1893	Criteria for earthquake resistant design of structures
IS 432 (Part-I)	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement part-I mild steel and medium tensile steel bars
IS 432 (part-II)	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement part-II hard drawn steel wire
IS 456	Code of practice for plain and reinforced concrete
IS 516	Method of test for strength of concrete
IS 1199	Method of sampling and analysis of concrete
IS 1200 (Part-II)	Method of measurement of building and civil engineering work – concrete work
IS 1200 (Part-V)	Method of measurement of building and civil engineering work – concrete work (Part 5 – Form work)
IS 1566	Specification for hard drawn steel wire fabric for concrete requirement
IS 1599	Method of bend test
IS 1343	Code of practice for Prestressed Concrete
IS 1786	Specification for high strength deformed steel and wires for concrete reinforcement
IS 1791	Specification for batch type concrete mixes
IS 2502	Code of practice for bending and fixing of bars for concrete reinforcement

IS 2751	Recommended practice for welding of mild steel plain and deformed bars for reinforced construction
IS 4925	Batch plants specification for concrete batching and mixing plant
IS 4926	Ready – Mixed Concrete
IS 10262	Recommended guidelines for concrete mix design
IS 13311 (Part-I)	Indian standard for non-destructive testing of concrete. Method of test for ultrasonic pulse velocity
IS 13311 (Part-II)	Indian standard for non-destructive testing of concrete. Method of testing by rebound hammer.
IS 3370	Concrete structures for storage of liquids
IS 1568	Wire gauge for general purposes
IS 1139	Hot rolled mild steel and medium tensile steel deformed bars for concrete reinforcements
IS 2502	Code of practice for bending and fixing of bars for concrete reinforcement
IS 2751	Code of practice for welding of mild steel bars used for reinforced concrete work
STEEL WORK	
IS 226	Structural steel
IS 2062	Steel for general structural purpose
IS 800	Code of practice for use of structural steel in general in steel construction
IS 806	Code of practice for use of steel Tubes in general building construction
IS 816	Code of practice for use of metal arc welding for general construction in mild steel
IS 818	Code of practice for safety and healthy requirements in

	electric and gas welding and cutting operations
IS 822	Code of procedure for inspection of welds
IS 1161	Steel tubes for structural purposes
IS 1728	Specification for Cast Iron Manhole Covers and Frames
IS 12592	Pre-cast Concrete Manhole Covers and Frames-Specifications
IS 5382	Specification for rubber sealing rings for gas mains, water mains and sewers
WATR PROOFING TREATMENT	
IS 3370 (Part 1)	Code of practice for concrete structures for the storage of liquid : Part-1 General Requirements

Materials

(a)	IS: 269	Specification for 33 grade Ordinary Portland Cement.
(b)	IS: 455	Specification for Portland Slag Cement.
(c)	IS: 1489	Specification for Portland Pozzolana Cement (Parts 1 & 2)
(d)	IS: 8112	Specification for 43 grade Ordinary Portland Cement.
(e)	IS: 12330	Specification for Sulphate resisting Portland Cement.
(f)	IS: 383	Specification for coarse and fine aggregates from natural sources for concrete.
(g)	IS: 432	Specification for mild steel and medium tensile (Parts steel bars and hard drawn steel wires for 1 & 2) concrete reinforcement.
(h)	IS: 1786	Specification for high strength deformed steel bars and wires for concrete reinforcement.
(i)	IS: 1566	Specification for hard drawn steel wire fabric for (Parts II) concrete reinforcement.
(j)	IS: 9103	Specification for admixtures for concrete.
(k)	IS: 2645	Specification for integral cement waterproofing compounds.
(l)	IS: 4900	Specification for plywood for concrete shuttering work.
(m)	IS: 4926	Ready Mixed Concrete.
(n)	IS: 12269	Specification for 53 grade Ordinary Portland Cement.

(o)	IS: 8041	Specification for rapid hardening cement.
(p)	IS: 12600	Specification for low heat cement.
(q)	IS: 6909	Specification for Supersulphated Cement.
(r)	IS: 12089	Specification for Granulated Ground Blast Furnace Slag.
(s)	BS: 6699	Specification for Granulated Ground Blast Furnace Slag.
(t)	BS: 6073	Specifications for precast concrete masonry units (Part 1) Methods for specifying precast concrete masonry (Part 2)

Material Testing

(a)	IS: 4031	Methods of physical tests for hydraulic cement. (Parts 1 to 15)
(b)	IS: 4032	Method of chemical analysis of hydraulic cement.
(c)	IS: 650	Specification for standard sand for testing of cement.
(d)	IS: 2430	Methods for sampling of aggregates for concrete.
(e)	IS: 2386	Methods of test for aggregates for concrete (Parts 1 to 8)
(f)	IS: 3025	Methods of sampling and test (physical and chemical) water used in industry.(Part 1 to 51)
(g)	IS: 6925	Methods of test for determination of water soluble chlorides in concrete admixtures.

Concrete Mix Design

(a)	IS: 10262	Recommended guidelines for Concrete Mix Design.
(b)	SP: 23	Handbook on Concrete Mixes.

Concrete Testing

(a)	IS: 1199	Method of sampling and analysis of concrete.
(b)	IS: 516	Method of test for strength of concrete.
(c)	IS: 9013	Method of making, curing and determining compressive strength of accelerated cured concrete test specimens.
(d)	IS: 8142	Method of test for determining setting time of concrete by penetration resistance.
(e)	IS: 9284	Method of test for abrasion resistance of concrete.
(f)	IS: 2770	Methods of testing bond in reinforced concrete.

Equipment

(a)	IS: 1791	Specification for batch type concrete mixers.
(b)	IS: 2438	Specification for roller pan mixer.
(c)	IS: 4925	Specification for concrete batching and mixing plant.

(d)	IS: 5892	Specification for concrete transit mixer and agitator.
(e)	IS: 7242	Specification for concrete spreaders.
(f)	IS: 2505	General Requirements for concrete vibrators: Immersion type.
(g)	IS: 2506	General Requirements for screed board concrete vibrators.
(h)	IS: 2514	Specification for concrete vibrating tables.
(i)	IS: 3366	Specification for pan vibrators.
(j)	IS: 4656	Specification for form vibrators for concrete.
(k)	IS: 11993	Code of practice for use of screed board concrete vibrators.
(l)	IS: 7251	Specification for concrete finishers.
(m)	IS: 2722	Specifications for portable swing weigh batchers for concrete (single and double bucket type).
(n)	IS: 2750	Specifications for steel scaffoldings.

Construction Safety

(a)	IS: 3696	Safety code for scaffolds and ladders.(Parts 1 & 2)
(b)	IS: 7969	Safety code for handling and storage of building materials.
(c)	IS: 8989	Safety code for erection of concrete framed structures.

Measurement

(a)	IS: 1200 (Part 1 to 12)	Method of measurement of building and ENGINEERING works (Part 2 and 5).

3.3 GENERAL

ENGINEER shall have the right at all times to inspect all operations including the sources of materials, procurement, layout and storage of materials, the concrete batching and mixing equipment, and the quality control system. Such an inspection shall be arranged and ENGINEER's approval obtained, prior to starting of concrete work. This shall, however, not relieve CONTRACTOR of any of his responsibilities. All materials, which do not conform to this specification, shall be rejected. Materials should be selected so that they can satisfy the design requirements of strength, serviceability, safety, durability and finish with due regards to the functional requirements and the environmental conditions to which the structure will be subjected. Materials complying with codes/standards shall only be used. Other materials may be used after approval of

the ENGINEER and after establishing their performance suitability based on previous data, experience or tests.

3.4 CEMENT

Unless otherwise specified or called for by ENGINEER/ OWNER, cement shall be Ordinary Portland Cement conforming to IS: 269, IS: 8112 or IS: 12269. The Portland Pozzolana Cement shall conform to IS: 1489 and it shall be used as directed by ENGINEER. Where Portland Pozzolana or slag cements are used, it shall be ensured that consistency of quality is maintained and there will be no adverse interactions between the materials and the finish specified is not marred.

Only one type of cement shall be used in any one mix unless specifically approved by ENGINEER. The source of supply, type or brand of cement within the same structure or portion thereof shall not be changed without prior approval from ENGINEER.

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

Fly Ash Blended Cements conforming to IS: 1489 (Part I) may be used in RCC structures as per the guidelines given below:

3.5 GENERAL

IS: 456-2000 Code of Practice for Plain and Reinforced Concrete (as amended up to date) shall be followed in regard to Concrete Mix Proportion and its production as under:

i. The concrete mix design shall be done as “Design Mix Concrete” as prescribed in clause 9 of IS: 456 mentioned above.

ii. Concrete shall be manufactured in accordance with clause 10 of above mentioned IS: 456 covering quality assurance measures both technical and organisational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.

Minimum M25 grade of concrete shall be used in all structural elements made with RCC both in load bearing and framed structure.

The mechanical properties such as modulus of elasticity, tensile strength, creep and shrinkage of fly ash mixed concrete or concrete using fly ash blended cements (PPCs) are not likely to be significantly different and their values are to be taken same as those used for concrete made with OPC.

To control higher rate of carbonation in early ages of concrete both in fly ash admixed as well as PPC based concrete, water/ binder ratio shall be kept as low as possible, which shall be closely monitored during concrete manufacture.

If necessitated due to low water/binder ratio, required workability shall be achieved by use of chloride free chemical admixtures conforming to IS 9103. The compatibility of chemical admixtures and super plasticizers with each set OPC, fly ash and/ or PPC received from different sources shall be ensured by trials.

In environment subjected to aggressive chloride or sulphate attach in particular, use of fly ash admixed or PPC based concrete is recommended. In cases, where structural concrete is exposed to excessive magnesium sulphate, flyash substitution/ content shall be limited to 18% by weight. Special type of cement with low C3A content may also be alternatively used. Durability criteria like minimum binder content and maximum water /binder ratio also need to be given due consideration in such environment.

Wet curing period shall be enhanced to a minimum of 10 days or its equivalent. In hot and arid regions, the minimum curing period shall be 14 days or its equivalent.

3.6 USE OF FLY ASH ADMIXED CEMENT CONCRETE (FACC) IN RCC STRUCTURE

There shall be no bar on use of FACC in RCC structures subject to following additional conditions.

(a) Fly ash shall have its chemical characteristics and physical requirements, etc. conforming to IS: 3812 (Parts I and II) and shall be duly certified.

(b) To ensure uniform blending of fly ash with cement in conformity with IS: 456, a specific facility needs to be created at site with complete computerised automated process control to achieve design quality or with similar facility from Ready Mix Concrete (RMC) plants.

(c) As per IS: 1489 (Part-I) maximum 35% of OPC by mass is permitted to be substituted with fly ash conforming to IS: 3812 (Part-I) and same is reiterated.

(d) Separate storage for dry fly ash shall be provided. Storage bins or silos shall be weather proof and permit a free flow and efficient discharge of fly ash. The filter or dust control system provided in the bins or silos shall be of sufficient size to allow delivery of fly ash maintained at specified pressure to prevent undue emission of fly ash dust, which may interfere weighing accuracy.

3.7 USE OF FLY ASH BLENDED CEMENTS IN CEMENT CONCRETE (PPCC) IN RCC STRUCTURE

(a) Subject to General Guidelines detailed out as above, PPC manufactured conforming to IS: 1489 (Part-I) shall be treated at par with OPC for manufacture of Design Mix concrete for structural use in RCC.

(b) Till the time, BIS makes it mandatory to print the percentage of fly ash on each bag of cement, the certificate from the PPC manufacture indicating the same shall be insisted upon before allowing use of such cements in works.

(c) While using PPC for structural concrete work, no further admixing of fly ash shall be permitted.

3.8 AGGREGATES

Aggregates shall consist of naturally occurring stones and gravel (crushed or uncrushed) and sand. They shall be chemically inert, strong, hard, clean, durable against weathering, of limited porosity, free from dust/silt/organic impurities/deleterious materials and conform to IS: 383. Aggregates such as slag, crushed over burnt bricks, bloated clay ash, sintered fly ash and tiles shall not be used. Aggregates shall be washed and screened before use where necessary or if directed by the ENGINEER. Aggregates containing reactive materials shall be used only after tests conclusively prove that there will be no adverse affect on strength, durability and finish, including long term effects, on the concrete. The fineness modulus of sand shall neither be less than 2.2 nor more than 3.2. If use of sand having fineness modulus more than 3.2 is unavoidable then it shall be suitable blended with crusher stone dust.

The maximum size of coarse aggregate shall be as stated on the drawings, but in no case greater than 1/4 of the minimum thickness of the member, provided that the

concrete can be placed without difficulty so as to surround all reinforcement thoroughly and fill the corners of the form. For most work 20 mm aggregate is suitable. Where there is no restriction to the flow of concrete into sections, 40 mm or larger size is permitted.

In concrete elements with thin sections, closely spaced reinforcements or small cover, consideration should be given to the use of 10mm nominal maximum size.

Plums 160 mm and above of a reasonable size may be used where directed. Plums shall not constitute more than 20% by volume of concrete unless specified by ENGINEER.

3.9 WATER

Water used for both mixing and curing shall conform to IS: 456. Potable water is generally satisfactory. Water containing any excess of acid, alkali, sugar or salt shall not be used.

The pH value of water shall not be less than 6.

Seawater shall not be used for concrete mixing and curing.

The proposed admixtures shall comply with requirements of specification part 11- Water sealing materials.

3.10 REINFORCEMENT

Reinforcement bars shall conform to IS: 432 and or IS: 1786 and welded wire fabric to IS: 1566 as shown on the drawing. Grade of Reinforcement shall be Fe500 TMT/CRS as approved by Engineer In Charge.

All reinforcement shall be clean, free from pitting, oil, grease, paint, loose mill scales, rust, dirt, dust or any other substance that will destroy or reduce bond.

Special precaution like coating of reinforcement may be provided with the prior approval of ENGINEER.

3.11 SAMPLE AND TESTS

All materials used for the works shall be tested before use. The frequency of such confirmatory tests shall be decided by ENGINEER. Manufacturer's test certificate shall be furnished for each batch of cement/steel and when directed by ENGINEER samples shall also be got tested by the CONTRACTOR in a laboratory approved by ENGINEER at no extra cost to OWNER. However, where material is supplied by OWNER, all testing charges shall be borne by OWNER, but transportation and preparation of material samples for the laboratory shall be done by CONTRACTOR at no extra cost.

Sampling and testing of aggregates shall be as per IS: 2386 under the supervision of ENGINEER. The cost of all tests, sampling, etc. shall be borne by CONTRACTOR. For coarse aggregate crushing value shall be tested.

Water to be used shall be tested to comply with clause 5.4 of IS: 456.

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

3.12 STORING OF MATERIALS

All material shall be stored in a manner so as to prevent its deterioration and contamination, which would preclude its use in the works. Requirements of IS: 4082 shall be complied with. CONTRACTOR will have to make his own arrangements for the storage of adequate quantity of cement even if cement is supplied by OWNER. If such cement is not stored properly and has deteriorated, the material shall be rejected. Cost of such rejected cement, where cement is supplied by OWNER, shall be recovered at issue rate or open market rate whichever is higher. Cement bags shall be stored in dry weatherproof shed with a raised floor, well away from the outer walls and insulated from the floor to avoid moisture from ground. Not more than 15 bags shall be stacked in any

tier. Storage arrangement shall be approved by ENGINEER. Storage under tarpaulins shall not be permitted. Each consignment of cement shall be stored separately and consumed in its order of receipt. CONTRACTOR shall maintain record of receipt and consumption of cement.

Each size of coarse and fine aggregates shall be stacked separately and shall be protected from dropping leaves and contamination with foreign material. The stacks shall be on hard, clean, free draining bases, draining away from the concrete mixing area.

CONTRACTOR shall make his own arrangements for storing water at site in tanks of approved capacity. The tanks shall be cleaned at least once a week to prevent contamination.

The reinforcement shall be stacked on top of timber sleepers to avoid contact with ground/ water. Each type and size shall be stacked separately.

4.0 CONCRETE

4.1 GENERAL

Concrete grade shall be as designated on drawings. Concrete in the works shall be “DESIGN MIX CONCRETE” OR “NOMINAL MIX CONCRETE”. All concrete works of upto grade M15 shall be NOMINAL MIX CONCRETE whereas all other grades, M20 and above, shall be DESIGN MIX CONCRETE.

4.2 DESIGN MIX CONCRETE

Design Mix Concrete are classified in three categories, viz. "Normal Concrete (M)", "Heavy Concrete (H)", "Super Heavy Concrete (SH)". Each class of concrete shall be identified by a prefix and two numbers. Prefix "M" would denote Normal Concrete, prefix "H" would denote heavy concrete and prefix "SH" would denote super heavy concrete. The two numbers e.g. 25 - 40 would denote the crushing strength of cube at 28 days in N/sqmm and maximum size of the coarse aggregates in millimetres respectively.

Normal concrete shall have a net dry unit weight of not less than 25 kN/cum, for the finished structure after curing, Heavy concrete shall have a net dry unit weight of not less than 36.30 kN/cum, for the finished structure after curing and special heavy concrete shall have a net dry unit weight of not less than 41 kN/cum for the finished structure after curing.

4.3 MIX DESIGN AND TESTING

For Design Mix Concrete, the mix shall be designed as per any of four methods given in SP: 23 to provide the grade of concrete having the required workability and characteristic strength not less than appropriate values given in IS: 456. The design mix shall in addition be such that it is cohesive and does not segregate during placement and should result in a dense and durable concrete capable of giving the specified finish. For liquid retaining structures, the mix shall also result in watertight concrete. The CONTRACTOR shall exercise great care while designing the concrete mix and executing the works to achieve the desired result.

The minimum grade of concrete shall be as per Table 5 of IS: 456 for various exposure conditions of concrete. For various environmental conditions, refer Table 3 of IS: 456.

The minimum cement content for Design Mix Concrete shall be as per Table 5 of IS: 456 or as given below, whichever is higher.

Grade of Concrete, M	Minimum Cement Content in kg/cum of Concrete
20	300
25	320
30	340

35	360
40	360
45	400

The minimum cement content stipulated above shall be adopted irrespective of whether the CONTRACTOR achieves the desired strength with less quantity of cement. The CONTRACTOR's quoted rates for concrete shall provide for the above eventuality and nothing extra shall become payable to the CONTRACTOR on this account. Even in the case where the quantity of cement required is higher than that specified above to achieve desired strength based on an approved mix design, nothing extra shall become payable to the CONTRACTOR.

It shall be CONTRACTOR's sole responsibility to carry out the mix designs at his own cost. He shall furnish to ENGINEER for approval at least 30 days before concreting operations, a statement of proportions proposed to be used for the various concrete mixes and the strength results obtained. The strength requirements of the concrete mixes ascertained on 150 mm cubes as per IS: 516 shall comply with the requirements of IS: 456.

Grade of Concrete	Minimum Compressive Strength N/mm^2 at 7 days	Specified Characteristic compressive strength N/mm^2 at 28 days
M15	10.0	15.0
M20	13.5	20.0
M25	17.0	25.0
M30	20.0	30.0
M35	23.5	35.0
M40	27.0	40.0
M45	30.0	45.0

A range of slumps recommended for various types of construction, unless otherwise instructed by the ENGINEER, shall be as given below:

Structure/ Member	Slump in millimetres	
	Maximum	Minimum
Reinforced foundation walls and footings	75	25
Plain footings, caissons and substructure walls	75	25
Slabs, Beams and reinforced walls	50	25
Pavements	50	25
Heavy mass construction	50	25
Liquid retaining/ conveying structures	50	25

(NOTE: These values are not meant for pumped concrete placed using slip formed technique.)

Where single size graded coarse aggregate are not available, aggregates of different sizes shall be properly combined. The CONTRACTORs mix design shall show that combined grading of coarse aggregate meets the requirements of Table 2 of IS: 383 for graded aggregates.

4.4 BATCHING AND MIXING OF CONCRETE

Proportions of aggregates and cement, as per approved concrete mix design, shall be by weight. These proportions shall be maintained during subsequent concrete batching by means of weigh batchers capable of controlling the weights within ±2% for cement and ±3% for aggregate. The batching equipment shall be calibrated at the frequency decided by ENGINEER. Amount of water added shall be such as to produce dense concrete of required consistency, specified strength and satisfactory workability and shall be so adjusted to account for moisture content in the aggregates. Water- cement ratio specified for use by ENGINEER shall be maintained. Each time the work stops, the

mixer shall be cleaned out, and while recommencing, the first batch shall have 10% additional sand and cement to allow for sticking in the drum. Arrangement should be made by CONTRACTOR to have the cubes tested at his own expense in an approved laboratory or in field with prior consent of ENGINEER. Sampling and testing of strength and workability of concrete shall be as per IS: 1199, IS: 516 and IS: 456.It is preferable to cast additional cubes (minimum 3 specimen) for testing at 7 days and 14 days.

4.5 NOMINAL MIX CONCRETE

4.5.1 MIX DESIGN AND TESTING

Mix Design and preliminary tests are not necessary for Nominal Mix Concrete. However works tests shall be carried out as per IS: 456. Proportions for Nominal Mix Concrete and water-cement ratio may be adopted as per Table 9 of IS: 456. However, it will be CONTRACTOR's sole responsibility to adopt appropriate nominal mix proportions to achieve the specified characteristic strength.

4.5.2 BATCHING AND MIXING OF CONCRETE

Based on the adopted nominal mixes, aggregates shall be measured by volume. However cement shall be by weight only. Appropriate correction shall be made for bulking of sand after testing.

4.6 READY MIXED CONCRETE

All specification as per IS: 4926 – "Specification for Ready Mixed Concrete" shall be used.

The CONTRACTOR shall identify at least two sources of ready mix concrete supplier and get it approved by ENGINEER prior to start of the Works. Any change in the source of the RMC, shall be got approved by the ENGINEER.

The design mix prepared by the RMC supplier shall be the responsibility of the CONTRACTOR. The testing of concrete as per Codal provisions and the specifications shall be done by the CONTRACTOR same as the normal concreting works.

4.7 FORMWORK

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

The design and engineering of the formwork as well as its construction shall be the responsibility of CONTRACTOR. However, if so directed by ENGINEER, the drawings and calculations for the design of the formwork shall be submitted to ENGINEER for approval.

Formwork shall be designed to fulfil the following requirements:

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

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

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

(d) Capable of easily striking without shock, disturbance or damage to the concrete.

(e) Soffit forms capable of imparting a camber if required.

(f) Soffit forms and supports capable of being left in position if required.

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

(h) The formwork may be of lined timber, waterproof / plastic coated plywood, steel, plastic depending upon the type of finish specified. Sliding forms and slip form may be used with the approval of ENGINEER. Timber for formwork shall be well seasoned, free from sap, shakes, loose knots, worm holes, warps and other surface defects. Joints between formwork and formwork and between formwork and structure shall be sufficiently tight to prevent loss of slurry from concrete using foam and rubber seals .The faces of formwork coming in contact with concrete shall be cleaned and two coats of approved mould oil applied before fixing reinforcement. All rubbish, particularly chippings, shavings, sawdust, wire

pieces, dust etc. shall be removed from the interior of the forms before the concrete is placed. Where directed, cleaning of forms shall be done by blasting with a jet of compressed air at no extra cost.Forms intended for reuse shall be treated with care. Forms that have deteriorated shall not be used. Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes suitably plugged, joints repaired and warped lumber replaced to the satisfaction of ENGINEER. CONTRACTOR shall equip himself with enough quantity of shuttering to allow for wastage so as to complete the job in time.Permanent formwork shall be checked for its durability and compatibility with adjoining concrete before it is used in the structure. It shall be properly anchored to the concrete.

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

For liquid retaining structures sleeves shall not be provided for through bolts nor shall through bolts be removed if provided. The bolts, in the latter case, shall be cut at 25 mm depth from the surface and the hole made good by cement mortar of the same proportion as the concrete just after striking the formwork.

Where specified or shown on drawings all corners and angles exposed in the finished structure shall have chamfers or fillets of 20 mm x 20 mm size.

Forms for substructure may be omitted when, in the opinion of ENGINEER, the open excavation is firm enough (in hard non-porous soils) to act as a form. Such excavation shall be slightly larger, as directed by ENGINEER, than that required as per drawing to compensate for irregularities in excavation.

CONTRACTOR shall provide adequate props of adjustable steel pipes carried down to a firm bearing without overloading any of the structures.

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

The striking time for formwork shall be determined based on the following requirements:

(a) Development of adequate concrete strength;

(b) Permissible deflection at time of striking form work;

(c) Curing procedure employed - its efficiency and effectiveness;

(d) Subsequent surface treatment to be done;

(e) Prevention of thermal cracking at re-entrant angles;

(f) Ambient temperatures; and Aggressiveness of the environment (unless immediate adequate steps are taken to prevent damage to the concrete).

Under normal circumstances (generally where temperatures are above 20 Deg. C) forms may be struck after expiry of the period given in IS: 456 unless directed otherwise by ENGINEER. For Portland Pozzolana / slag cement the stripping time shall be suitably

modified as directed by the ENGINEER. It is the CONTRACTOR's responsibility to ensure that forms are not struck until the concrete has developed sufficient strength to support itself, does not undergo excessive deformation and resists surface damage and any stresses arising during the construction period.

In addition to the above clauses, Specification Part 3- Formwork enclosed with this tender is also applicable and should be referred.

4.8 REINFORCEMENT FABRICATION AND PLACEMENT

Reinforcing bars supplied in the form of bent coils shall be straightened cold without damage at no extra cost. No bending shall be done when ambient temperature is below 5 Deg C. Suitable preheating may be permitted if steel bar bending is to be done at below 0 Deg C. Bars supplied in bent coils shall be straightened only by machine.

All bars shall be accurately bent gradually and according to the sizes and shapes shown on the drawings/ schedules or as directed by ENGINEER. Bar bending machines shall be used to achieve desired accuracy.

Re-bending or straightening incorrectly bent bars shall not be done without approval of ENGINEER.

Reinforcement shall be accurately fixed and maintained firmly in the correct position by the use of blocks, spacers, chairs, binding wire, etc. to prevent displacement during placing and compaction of concrete. The tied inplace reinforcement shall be approved by ENGINEER prior to concrete placement. Spacers (PVC or Concrete) shall be of such material and design as will be durable, not lead to corrosion of the reinforcement and not cause spalling of the concrete cover.

Binding wire shall be 16 gauge soft annealed wires. Ends of the binding wire shall be bent away from the concrete surface and in no case encroach into the concrete cover.

Substitution of reinforcement, laps/splices not shown on drawing shall be proposed by CONTRACTOR and approved by ENGINEER.

If permitted by ENGINEER, welding of reinforcement shall be done in accordance with IS: 2751, IS: 9417 and SP: 34 as applicable.

Tolerance on placement of reinforcement shall be as per Cl. 12.3 of IS: 456.

4.9 PREPARATION PRIOR TO CONCRETE PLACEMENT

Before concrete is actually placed in position, the inside of the formwork shall be cleaned and mould oil applied, inserts and reinforcement shall be correctly positioned and securely held, necessary openings, pockets, etc. provided.

All arrangements-formwork, equipment and proposed procedure, shall be approved by ENGINEER. CONTRACTOR shall maintain separate Pour Card for each pour as per the format enclosed.

4.10 TRANSPORTING, PLACING AND COMPACTING CONCRETE

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

In all cases concrete shall be deposited as nearly as practicable directly in its final position. To avoid segregation, concrete shall not be rehandled or caused to flow. For locations where direct placement is not possible and in narrow forms, CONTRACTOR shall provide suitable drops and “Elephant Trunks”. Concrete shall not be dropped from a height of more than 1.5 m as stipulated in clause 9.13.

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

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

(a) Continuously between construction joints and predetermined abutments.

(b) Without disturbance to forms or reinforcement.

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

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

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

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

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

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

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

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

Concrete shall normally be compacted in its final position within thirty minutes (Initial setting time) of leaving the mixer. Concrete shall be compacted during placing with approved vibrating equipment without causing segregation until it forms a solid mass free from voids, thoroughly worked around reinforcement and embedded fixtures and into all corners of the formwork. Immersion vibrators shall be inserted vertically at points not more than 450 mm apart and withdrawn slowly till air bubbles cease to come to the surface, leaving no voids. When placing concrete in layers advancing horizontally, care shall be taken to ensure adequate vibration, blending and melding of the concrete between successive layers. Vibrators shall not be allowed to come in contact with reinforcement, formwork and finished surfaces after start of initial set. Over-vibration leads to segregation and shall be avoided.

Concrete may be conveyed and placed by mechanically operated equipment after getting the complete procedure approved by ENGINEER. The slump shall be held to the minimum necessary for conveying concrete by this method. When concrete is to be pumped, the concrete mix shall be specially designed to suit pumping. Care shall be taken to avoid stoppages in work once pumping has started.

CONTRACTOR shall submit a method statement to ENGINEER for approval, furnishing details of pour sequence, thickness of each layer, mixing and conveying equipments proposed etc. preferably with a sketch.

Except when placing with slip forms, each placement of concrete in multiple lift work shall be allowed to set for at least 24 hours after the final set of concrete before the start of subsequent placement. Placing shall stop when concrete reaches the top of the opening in walls or bottom surface of slab, in slab and beam construction, and it shall be resumed before concrete takes initial set but not until it has had time to settle as determined by ENGINEER. Concrete shall be protected against damage until final acceptance.

4.11 PLACING OF CONCRETE BY PUMPING METHODS

4.11.1 GENERAL

Placing of concrete by pumping will be as specified or authorised by ENGINEER to achieve the required speediness of construction and maintain targeted schedules. Pumping of concrete shall be done only after conducting pumpability trials to ascertain the performance of fresh concrete on pumping in presence of the ENGINEER as per approved procedure. During pumping, concrete shall be conveyed either through rigid pipe or through flexible hose and discharged directly into the desired area. A steady supply of pumpable concrete is necessary for satisfactory pumping. Pumpable concrete requires properly graded aggregates, material uniformity, consistent batching and thorough mixing. Concrete pumps used shall be able to deliver concrete over a horizontal distance of about 400 m or of about 100 m in a vertical direction, (with intermediate figures for a combination of horizontal and vertical movements). They shall be used for concreting densely reinforced structures, internal structural elements of buildings and for large pours of concrete.

Placement of normal concrete by pumping will be permitted as specified or authorised by the ENGINEER. The decision, whether or not to pump any particular mix shall rest entirely with the ENGINEER and no extra claims for payment on this account will be entertained. The pumping equipment, pipe lines and accessories as well as proportioning of pumpable concrete shall generally confirm to the recommendations of ACI-304.2 (latest revision) – Placing of concrete by pumping method - Proportioning of pumpable mixes gives certain guide lines on concrete mix. However, final selection of mix shall be as instructed by the ENGINEER.

4.11.2 PUMPING EQUIPMENT

Requisite numbers of modern dependable concrete pumps capable of pumping concrete of specified quality at a rate required to meet the construction schedules, together with a balanced complement of pipelines, accessories, spare parts, power controlled placing booms, and experienced pump operators and maintenance staff shall be provided at locations and in a manner approved by the ENGINEER.

The pumping plant shall be completely installed on each occasion, with preliminary mock operation for a sufficient length of time prior to scheduled placement of a particular concrete pour, to enable the ENGINEER to conduct pumpability tests and necessary adjustments for the concrete mix, prior to use of the pumping for placement of concrete.

4.11.3 TYPE OF PUMP

The selection of the concrete pump shall be done as per the project requirement. The CONTRACTOR shall submit the concrete pump data sheets proving the suitability for the given project to ENGINEER for approval.

The concrete pump shall be selected on its best pumping capacity and the speediness to be achieved in the project. The piston pumps of a net horizontal pumping capacity of 30 m^3/hr or 20 m^3/hr or 15 m^3/hr or 10 m^3/hr can be utilised. The combination of various pumps to be used shall be decided by CONTRACTOR and shall submit the necessary documents and targeted progress to be achieved in line with the Time Period and Milestones.

These pumps shall have capacity to pump the concrete upto at a horizontal distance of 400 m and capable of generating a minimum pressure of 80 bar. These parameters shall depend upon the building sizes, manoeuvrability and other construction features. These

pumps shall consist of a receiving hopper with a bolted grill at top of capacity not less than 600 litres. The hoppers shall be provided with hydraulically driven re-mixing blades or other agitating devices to keep the concrete mixed continuously and maintain consistency and uniformity. The pumps shall be provided with two cylinders with max. diameter not less than 150 mm, stroke of about 1200 mm and the number of strokes not exceeding 25 per minute. The outlet valves shall be located on the discharge lines. Type of inlet and outlet valves may vary depending on the manufacturer, but they shall preferably be of sliding-rod-flat-gate type. The piston shall be hydraulically driven. Primary power shall be supplied by gasoline, diesel or electric motor of requisite power rating. Care shall be taken by the CONTRACTOR to ensure uninterrupted operation of the pumps during the entire period of concreting by providing adequate standby arrangements. The primary power and pump equipment shall be either truck or trailer mounted, and not skid mounted.

4.12 PIPELINE AND ACCESSORIES

4.12.1 RIGID PIPELINES

Concrete transported to the placement area by pumping methods shall be pumped thorough rigid pipes or a combination of rigid and heavy-duty flexible hoses. Rigid pipe shall be made available in minimum 125 mm diameter size. Aluminium alloy lines shall not be used for delivery of concrete. Rigid pipes shall be furnished in such lengths as can be manually handled by a single person.

4.12.2 FLEXIBLE CONDUIT (HOSE)

Flexible conduit shall be made of rubber, or spirally wound flexible metal, and plastic flexible conduits generally present greater resistance to movement of concrete and their performance is not the same as that of a rigid pipe and also larger sizes (100 mm to 123 mm) have a tendency to leak. Flexible conduits provided, shall be interchangeable with rigid pipes and their use restricted to curves, difficult placement areas, and as connection to moving cranes or to water borne lines.

4.12.3 COUPLINGS

The couplings provided to connect both flexible and rigid pipe sections shall be adequate in strength to withstand handling during erection of the pipe system, misalignments, and poor support along the lines. They should be nominally rated for at least 3.45 MPa and greater for rising over 30 m. The strength and tightness of joints shall be guaranteed. Couplings shall be designed to allow replacement of any pipe section without moving other pipe sections, and shall provide a full internal cross-section with no obstructions or crevices to disrupt the smooth flow of concrete.

4.12.4 ACCESSORIES

The pump and the distribution system for a particular concreting job shall use the accessories as listed below and they shall be approved by the ENGINEER.

(a) Rigid and flexible pipes in varying lengths, such as 3, 1.5, 0.9, 0.6 and 0.3 m lengths.

(b) Curved sections of rigid pipes such as large radius elbows at angles of 90°, 45°, 22° 30’ and 11°15’.

(c) Swivel joints and rotary distributors.

(d) Pin and gate valves to prevent back-flow in the pipe line.

(e) Switch valve to direct flow into another pipe line.

(f) Connection devices to fill form the bottom up.

(g) Temporary supports, rollers and other devices for protection of conduit over rock, concrete, reinforcement steel and forms. Lifting and leashing points.

(h) Extra strong coupling for vertical runs in inaccessible areas.

(i) Transition for connecting different sizes of pipes.

(j) Air vents for downhill pumping.

(k) Clean-out equipment.

(l) Adequate numbers of separate placement booms of various radius and reach, either stationary steel column mounted or tower crane mast mounted moving on rail tracks, or truck mounted shall be provided by the CONTRACTOR to match within concrete placement schedule and pumps. For maximum flexibility of operation the separate placement boom shall be such that they can be easily lifted by the tower cranes provided. Their mounting arrangements shall be quick

connecting type and interchangeable between tower crane masts, steel columns and truck mountings etc. The placement booms shall consist of three hinged parts incorporating a concrete pipe line with articulated inserts at boom joints and ending in a flexible hose. The boom shall be remote controlled.

4.13 PROPROTIONING PUMPABLE CONCRETE

4.13.1 BASIC CONSIDERATION

Although the ingredients of concrete to be placed both by pumping and by other means are the same, more emphasis shall be laid on the quality control and proportioning of a dependable pumpable mix. Dependability is affected by the equipment and the operator, with the control of all of the ingredients in the mixture, the batching and mixing operations, and the knowledge and experience of all the personnel from beginning to end.

Concrete mixes for pumping shall be “plastic” at all times. Stiff mixes shall not be used for pumping as they do not pump well. Particular attention shall be given to the mortar (cement, sand and water) and the amounts and sizes of coarse aggregates.

4.14 NORMAL WEIGHT AGGREGATES

4.14.1 COARSE NORMAL WEIGHT AGGREGATES

The maximum size of angular coarse aggregate shall be limited to one-third of the smallest inside diameter of the hose or pipe based on simple geometry of cubical shape aggregates. For well-rounded aggregates, the maximum size shall be limited to 40% of the pipe or hose diameter. Adequate provisions shall be made to eliminate over size particles in the concrete by screening or by careful selection of aggregate. Gradation of sizes of coarse aggregates shall correspond to Grades A and B of Table-9 and shall meet IS: 2386 requirements. If required, certain fractional sizes shall be combined and blended to produce the required gradation. Greater emphasis shall be laid on uniformity of gradation throughout the entire job.

The maximum size of the coarse aggregate has a significant effect on the volume or amount of coarse aggregate that may be effectively used in a mix. As will be seen from Table-10 the quantity of coarse aggregate must be substantially reduced as the maximum size become smaller. Mixes consisting of too large a portion of coarse aggregate with less cement shall be avoided.

Table-1

Grading Requirement of Coarse Aggregates For Pumped Concrete

Grade – A (Maximum Size 40 mm) **Grade – B** (Maximum Size 20 mm)

Sieve Size	Percent Passing By Weight	Sieve Size	Percent Passing By Weight
50 mm	100	25 mm	100
40 mm	95 to 100	20 mm	90 to 100
20 mm	35 to 70	12.50 mm	20 to 55
10 mm	10 to 30	10 mm	0 to 15
4.75 mm	0 to 5	4.75 mm	0 to 5

Table-2

Volume of Coarse Aggregate Per Unit Of Volume Of Concrete

Grade – A (Maximum Size 40 mm) **Grade – B** (Maximum Size 20 mm)

Maximum Size	Volume of Dry-rodded Coarse Aggregate per Unit Volume of Aggregates of Concrete for different fineness modulii of sand			
	FMS = 2.40	FMS = 2.60	FMS = 2.80	FMS = 3.00
10	0.50	0.48	0.46	0.44
12.50	0.59	0.57	0.55	0.53
20	0.66	0.64	0.62	0.60
25	0.71	0.69	0.67	0.65
40	0.76	0.74	0.72	0.70
50	0.78	0.76	0.74	0.72

Note:

- Volumes are based on aggregates in dry-rodded condition.
- These volumes are selected from empirical relationships to produce concrete with a degree of workability suitable for usual reinforced construction. When placement is to by pump, they shall be reduced by about 10 percent.
- FMS = Fineness Modulus of Sand.
-

4.14.2 FINE NORMAL WEIGHT AGGREGATE

Fine aggregate shall consist of natural sand, manufactured sand or a combination thereof and shall be graded within the following limits.

Sieve Size	Percent passing by Weight
9.50 mm	100
4.75 mm	95 to 100
2.36 mm	80 to 100
1.18 mm	50 to 85
600 microns	25 to 60
300 microns	10 to 30
150 microns	2 to 10

Fine aggregates shall conform to the requirements of IS: 2386. Particular attention shall be given to those passing through finer screen sizes. For small line system (less than 150 mm) 15 to 30 percent shall pass 300 micron sieve and 5 to 10 percent shall pass 150 micron sieve. Sands which are deficient in either of these two sizes shall be blended with selected finer sands or inert material such as quarry dust to produce these desired percentages.

The fineness modulus of sand meeting the above grading limits will fall between 2.13 and 3.37 with the median being 2.75. Pumpability of mixes will generally improve with a decrease in the fineness modulus value or in other words with the use of finer sands. Sands having a fineness modulus between 2.40 and 3.00 are generally satisfactory

provided that the percentages passing 300 micron and 150 micron sieves meet the previously stated requirements. It shall also be emphasised that for uniformity, the fineness modulus of the sand shall not vary more than 0.20 from the average value used in proportioning.

Table-10 is suggested as a guide to determine the amounts of coarse aggregate to be combined with sand of different fineness modulus. The foot note of Table-10 requires a reduction in the volume of coarse aggregate by 10 percent for pumping. This margin shall be considered as a safety margin for variations in sand gradation to reduce pumping pressure. Under conditions of good materials control and uncomplicated line systems, this reduction may not be required.

Although in practice it may not be possible to duplicate this recommended sand gradation exactly, sands having a gradation closer to the upper limit (fine sand) are more desirable for pumping than those near the lower limit (coarse sand). The fineness modulus of sand according to the recommended curve is 2.68 and the gradation meets all the requirements stated earlier.

4.15 WATER AND SLUMP

Water requirements and slump control for pumpable normal weight concrete are interrelated and extremely important considerations. The mixing water requirements for a particular mix shall be determined by the ENGINEER and modified to suit the fineness of sands, quality of admixtures, additives, cement replacements or other special materials being used in the concrete.

The CONTRACTOR shall establish the optimum slump jointly with the ENGINEER for a pumpable mix at the discharge hose end and shall maintain control of that particular slump throughout the course of a job. Excess water shall not be added in the receiving hopper to make the concrete mix pumpable; instead attempt shall be made to obtain ‘truly plastic mix’ by proper proportioning.

Slump of concrete may undergo change between initial mixing and final placement. If the slump at the discharge hose end is to be maintained within specified limits, it will be necessary for the concrete to enter the pump at a higher slump to give the required mobility during transport. Slump adjustments by re-proportioning of the constituents as may be required shall be carried out by the CONTRACTOR jointly in consultation with

the ENGINEER for every type of mix and for every new placement and set up of pump and pipelines.

4.16 CEMENT CONTENT

The determination of the cement content for a normal weight pump mix shall follow the same basic principles used for conventionally placed concrete. The water cement ratio shall be established by the ENGINEER on the basis of exposure conditions, strength requirements or minimum cement consumption, whichever governs. However, because of slightly higher ranges of slump and ratios of fine to coarse aggregates, the pump mix may require an increase in the amount of cement above those pumpable concrete mass. The total quantity of fines passing through the 300 micron sieve including cement, fine sand, stone dust etc. shall be in the range of 380 to 450 kg/cum of concrete.

Cement content in case of M50 shall be maximum 425 kg/cum, and shall be a mix with high range of workability i.e. 175 mm ± 25 mm. All the contents shall be mixed based on the mix design and trial studies.

While establishing the cement content for normal weight trial mixes, it will be necessary to take into account the capabilities of the particular pump and its operator for over strength proportioning in the laboratory to provide for field variations.

In case of pumping difficulties, it is desirable and economical to correct any deficiencies in the aggregates, especially in the sand instead of using extra quantities of sand. With well graded coarse and fine aggregates properly combined, the cement requirement for pumpable mixes shall closely resemble to those used in conventionally placed concrete.

4.17 ADMIXTURES

The use of poor aggregate grading or aggregate with continuous change in overall grading of the ‘combinations’ during concreting operation will make special admixtures quite useful in overcoming the main difficulty like blockage in pumping. These admixtures shall be incorporated in pumpable concrete to aim the following.

(a) Increase in the range of mix designs which may be successfully pumped using water reducing admixtures/ super plasticisers with the approval of the ENGINEER.

(b) Reducing the risk of pipeline blockages by preventing segregation of concrete mix.

(c) To have satisfactory/ specified performance both in fresh and hardened state.

Any admixture that increases workability in normal weight concrete may usually improve pumpability. The choice of type of admixture and the advantage gained from its use in concrete to be pumped will depend on the characteristics of the pump mix and will be finally decided by the ENGINEER in consultation with the admixture manufacturer.

For improvement of pumpability the following admixtures are generally recommended. Such admixtures used shall be conforming to ASTM C-494/ IS: 9103:

(a) Water Reducing Admixtures/ Super Plasticisers

These cause reduction in water requirements at constant slump or an increase in slump at constant water-cement ratio. They can be designed to have no apparent effect on setting time, or alternately to achieve varying degrees of acceleration or retardation in rate of hardening of the mixture. Most water reducing admixtures increase the palpability of the concrete mix through plasticising action.

(b) Air Entraining Admixtures

Air entrained concrete is considerably plastic and more workable than non air entrained concrete. It can be pumped with less coarse aggregate segregation and has less tendency for concrete to bleed. Start-up after shut down is also generally easier due to reduced bleeding. For pumped concrete these limits shall be obtained at the point of placement in the structure. To compensate for air content loss in the air entrained concrete higher entrainment of air may be required at the batching plant. The required adjustment of admixture dose shall be carried out by the ENGINEER after carrying out necessary air loss tests. An air content in the range of 3 to 5% shall be preferred as higher ranges reduces the delivery capacity of pump systems due to increased compressibility of the concrete and also reduces strength of concrete.

If air-entraining plasticizer is used, typically 13% minimum water reduction is possible. Therefore, strength loss due to air entrainment will be compensated by using such air-entraining plasticizer.

(c) Finely Divided Mineral Admixtures

CONTRACTOR, if specifically approved by the ENGINEER, can use mineral admixture. In concrete mixtures, deficient in fines, the addition of a finely divided inert mineral admixture generally improves workability, pumpability, reduces the amount of bleeding and increases the strength. The effect on strength depends on the type of mineral admixture used, conditions under which the concrete is cured, and the amount of admixture used. Water soluble polymers obtained from cellulose derivations may also be used as an admixture with a small dose of 60 to 150 gms/cum to increase viscosity of the mixing water and reduce the frictional resistance to flow and bleeding in the pipe system.

4.18 TRIAL MIXES

The trial mixes for pumping shall be prepared and tested in the Site laboratory by CONTRACTOR in accordance with clause 17.7 of this specification. The ingredients, particularly the coarse and fine aggregates shall also be checked for the conformance to the desired properties described, by the CONTRACTOR. Table-10 may be used to select the volume of coarse aggregate per cu. m. of concrete. In using this table it is recommended that the highest probable fineness modulus of sand be used rather than the average fineness modulus to ensure consistent performance during pumping. For additional plasticity, 10% reduction in coarse aggregate quantities shall be considered. Experience with the use of local aggregate and their uniformity shall also be considered in the proportioning concepts.

4.19 MIX DESIGN OF PUMP CONCRETE

Taking the above factors into account, the concrete shall first be designed for normal placement conditions and then modified as necessary to suit pumping. The following procedure shall be adopted:

(a) Design the mix for specified characteristic strength and workability.

(b) Check and ensure combined grading of aggregates i.e. as uniform grading as possible. This requirement is vital as gaps or partial gaps are the basic reasons for poor water retention property and segregation under pressure.

(c) Determine the optimum sand content for the required workability and increase sand content by reducing volume of coarse aggregate per unit volume of concrete by about 10% as a degree of protection against under sanding due to batch variations.

(d) Recheck the minimum cement content for durability.

(e) Examine the total fines content i.e. cement and fine aggregates passing through 300 micron sieve and readjust the mix, if necessary. A very rich mix with fine sand will be as problematic as a coarse sand with lean mix.

(f) Re-appraise the grading if the particle shape of any particular fraction is such as may cause excessive voids. Re-adjust as required, if necessary examining the void ratio of various combinations, using void meter to achieve minimum voids at the expense of 'sufficient fines' content.

(g) If dissatisfied with (a) to (f) as above, consider what remedial action may be taken to overcome the troublesome factor. For example, the following two situations may occur :

(h) If the sand has more coarser fraction it is worth considering the addition of a proportion of finer sand, or alternately if the sand has more of finer fraction, the addition of coarse fraction may be considered. Addition or reduction of cement may help, but the correct solution is to overcome the gap in overall grading as stated above.

(i) In a 20 mm aggregate maximum size, if there is an excess of 10 to 4.75 mm fraction, and this fraction is flaky with unduly large surface area, either increase the sand content to reduce the possibility of segregation and to reduce the inter-practical stresses, or (better) re-grade using single sized aggregates.

(j) At the trial mix stage small variations can be made preferably in the light of the pressures registered and observed performances through the pump. In certain cases admixtures may be economically and beneficially used to improve or eliminate circumstances that cannot readily be overcome by other means.

4.20 TESTING FOR PUMPABILITY

No mix shall be accepted for use on a pumping job until an actual test under field condition has been completed. Testing a mix for pumpability involves duplication of the anticipated job condition from beginning to end. The batching and conveying by truck mixers shall be the same as will be used; the same pump and operator shall be present. The pipe and hose layouts shall simulate the actual condition as far as practicable. Prior use of a mix on another job may furnish evidence of pumpability but only if conditions are duplicated. Before commencing a new concreting job, the CONTRACTOR shall carry out pumpability tests in consultation with the ENGINEER. Concrete used in such tests shall not be used in the actual construction, unless specifically permitted by the ENGINEER.

Following parameter shall be established by pumpability trials:

(a) In-situ compressive and split tensile strength of concrete by.

(b) Curing the sample at Site by sprinkling water.

(c) Curing the sample at Laboratory in curing tanks.

(d) Wet sieve analysis of concrete to ensure that proportions of ingredients before and after pumping are same.

4.21 FIELD PRACTICES

Proper planning of concrete supply, pump location, line layout, placing sequence and the entire pumping operation shall be done by the CONTRACTOR and got approved by the ENGINEER on every occasion before commencement of concreting job. The pump shall be as near the placing area as practicable, and the entire surrounding area must have adequate bearing strength to support the concrete delivery trucks, thus assuring a continuous supply of concrete. For important concrete placements and large jobs, adequate standby power and pumping equipment shall be provided as replacement, should break down occur.

Direct communications shall be maintained between the pump operator, concrete placing crew and batching plant. The placing rate shall be estimated so that concrete can be operated at an appropriate delivery rate. As a final check, the pump shall be started and operated without concrete to ascertain that, all moving parts are operating properly. As stated previously, the grout mortar shall be pumped into the line to provide

initial lubrication for the concrete. As soon as concrete is received, the pump shall be run slowly until the lines are completely full and the concrete is slowly moving. Once the pumping is started, the operator shall ensure that the hopper of the pump is not emptied beyond a certain level, as air may enter the pipeline and cause choking. Continuous pumping should be ensured. If a delay occurs because of concrete delivery, form repairs, or other factors, the pump shall be slowed down to maintain some movement of the concrete till normal supply is resumed. For longer delays, the concrete in the receiving hopper shall be made to last as long as possible by moving the concrete in the lines occasionally with one stroke of the pump. In confined areas, attempt shall be made by the CONTRACTOR to run a return line back to the pump, so that concrete can be re-circulated during delays.

The CONTRACTOR shall ensure that obstructions are not found in the pipe due to interruption in the feed of the concrete by more than 30 to 45 minutes.

Minor blockages shall be cleared by operating a few strokes of the pump in reverse momentarily and then by returning to normal forward pumping. If this fails, a succession of reverse and forward strokes shall be carried out to remove the blockage. Should this fail also, the blockage may be due to air-lock and the entrapped air has to be removed.

Attempt to push through the obstructions by repeatedly starting the pump will result in compaction of the concrete and complicate the removal of the concrete in the pipe. Blockages in the pipe are usually discovered by the sound when the pipe is struck. To remove the obstruction, the concrete pipe shall be taken apart at the assured position and cleaned. Then the pumping process shall be started all over again.

This method of checking the blockage and setting it right shall be done with great speed as excessive delay will cause setting of concrete in the pipeline downstream of the choke and will lead to further blockage. When the blockage is being found out and remedied, the pump shall periodically be given one or two strokes forward to keep the concrete in motion. If blockage occurs in the placer boom, a pipe joint near the base of the placer boom shall be opened and the boom made vertical to drain the pipeline by gravity.

Cleaning blockages are time consuming and as such major blockages shall best be avoided by ensuring a pumpable mix. Concrete that is either under or over sanded, short

of fines, gap graded, has an excess of a particular size, or excessively wet or dry will be rejected by the pump either by blockage or by hard pumping involving excessive pressures.

The termination of pumping operations shall be carefully planned to utilize the concrete dormant in the pipeline and the hopper when the pump is stopped and to avoid wastage.

When the form is nearly full, and there is enough concrete in the line to complete the placement, the pump shall be stopped and a go-devil be inserted and forced through the line to clear it out. Water under pressure shall be used to push the go-devil. The go-devil shall be stopped about one metre from the end of the line, so that the water in the line will not spill over into the placement area. After flushing, water in the pipe shall be removed by drain cock which shall be located for this purpose in the lowest part of the line. After all concrete has been removed from the lines, all lines and equipment shall be immediately cleaned thoroughly.

4.22 QUALITY CONCRETE

CONTRACTOR shall ensure that workmanship and plant shall be maintained at peak efficiency. Degree of control on all the concrete operation from selection of the ingredients to the final testing of specimen shall be in line with the assumptions made in mix design with respect to the standard deviation and co-efficient of variation.

The CONTRACTOR shall ensure that any compromise in quality is not done for the pumped concrete. To be pumpable, a high level of quality control for the assurance of uniformity must be maintained. Sampling at both the truck discharges and point of final placement shall be done by the CONTRACTOR and the ENGINEER jointly, as frequently as the ENGINEER desires to determine, if any change in the slump air content, and other significant mix characteristics occur take necessary corrective actions.

The CONTRACTOR shall engage experienced supervision at all levels. The placing crew shall be experienced and qualified and each operation shall be well planned and properly scheduled.

All the crew engaged in each of the concrete activities shall demonstrate in the presence of the ENGINEER, their skills and capabilities to produce the final product as specified.

4.23 CURING

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

(a) Premature drying out, particularly by solar radiation and wind;

(b) leaching out by rain and flowing water;

(c) rapid cooling during the first few days after placing;

(d) high internal thermal gradients;

(e) low temperature or frost;

(f) Vibration and impact which may disrupt the concrete and interfere with its bond to the reinforcement.

All concrete, unless directed otherwise by ENGINEER, shall be cured by use of continuous sprays or ponded water or continuously saturated coverings of sacking, canvas, hessian or other absorbent material for the period of complete hydration with a minimum of 7 days. The quality of curing water shall be the same as that used for mixing.

Where a curing membrane is directed to be used by the ENGINEER, the same shall be of a non-wax base and shall not impair the concrete finish in any manner. The curing compound to be used shall be got approved from the ENGINEER before use and shall be applied with spraying equipment capable of a smooth, even textured coat.

Curing may also be done by covering the surface with an impermeable material such as polyethylene, which shall be well sealed and fastened.

Extra precautions shall be exercised in curing concrete during cold and hot weather as per Clause no. 8.3 of IS: 7861 (Part II) and Clause no. 8.2 of IS: 7861 (Part I) respectively.

Curing arrangement shall be subjected to ENGINEER's approval.

4.24 CONSTRUCTION JOINTS AND KEYS

Construction joints (location and type) shall be as shown on the drawing or as approved by ENGINEER. Concrete shall be placed without interruption until completion of work

between construction joints. If stopping of concreting becomes unavoidable anywhere, a properly formed construction joint shall be made with the approval of ENGINEER.

Dowels for concrete work, not likely to be taken up in the near future, shall be coated with cement slurry and encased in lean concrete as indicated on the drawings or as directed by ENGINEER.

Before resuming concreting on a surface which has hardened all laitance and loose aggregates shall be thoroughly removed by wire brushing and/ or hacking, the surface washed with high pressure water jet and treated with thin layer of cement slurry for vertical joints and a 15 mm thick layer of cement sand mortar for horizontal joints, the ratio of cement and sand being the same as in the concrete mix.

When concreting is to be resumed on a surface, which has not fully hardened, all laitance shall be removed by wire brushing, the surface wetted, free water removed and a coat of cement slurry applied. On this a layer of concrete not exceeding 150 mm thickness shall be placed and well rammed against the old work. Thereafter work shall proceed in the normal way.

Approved epoxy Bonding agent, for bond between old (say 28 days or more) and new concrete may also be used as per manufacturer's specifications.

4.25 FINISHES

4.25.1 GENERAL

The formwork for concrete works shall be such as to give the finish as specified. The CONTRACTOR shall make good as directed any unavoidable defects consistent with the type of concrete and finish specified; defects due to bad workmanship (e.g. damaged or misaligned forms, defective or poorly compacted concrete) will not be accepted. CONTRACTOR shall construct the formwork using the correct materials and to meet the requirements of the design and to produce finished concrete to required dimensions, plumbs, planes and finishes.

4.25.2 REPAIR AND REPLACEMENT OF UNSATISFACTORY CONCRETE

Immediately after the shuttering is removed, all the defective areas such as honeycombed surfaces, rough patches, etc. shall be brought to the notice of ENGINEER

who may permit patching of the defective areas or reject the concrete work. ENGINEER's decision on rejection of concrete work shall be final.

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

Rejected concrete shall be removed and replaced by CONTRACTOR at no additional cost to OWNER.

For patching of defective areas all loose materials shall be removed and the surface shall be prepared as directed by the ENGINEER.

Bonding between hardened and fresh concrete shall be done either by placing cement mortar or by applying epoxy. The decision of the ENGINEER as to be the method of repairs to be adopted shall be final and binding on the CONTRACTOR and no extra claim shall be entertained on this account. The surface shall be saturated with water for 24 hours before patching is done with 1:5 cement sand mortar. The use of epoxy for bonding fresh concrete shall be carried out as directed by ENGINEER.

CONTRACTOR shall submit a method statement for such repairs to ENGINEER for approval..

4.26 HOT WEATHER REQUIREMENT

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

b. Adequate provisions shall be made to lower concrete temperatures which shall not exceed 40^0 C at the time of placement of fresh concrete.

c. Where directed by ENGINEER, CONTRACTOR shall spray non-wax based curing compound on unformed concrete surface at no extra costs.

4.27 COLD WEATHER REQUIRMENTS

a. Concreting during cold weather shall be carried out as per IS: 7861 (PART 2).

b. The ambient temperature during placement and upto final set shall not fall below 5^0 C. Approved anti-freeze/ accelerating additive shall be used where directed.

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

4.28 LIQUID RETAINING STRUCTURES

The CONTRACTOR shall take special care for concrete of liquid retaining structures, underground structures and those other specifically called for to guarantee the finish and water tightness.

The minimum level of surface finish for liquid retaining structures shall be of smooth type. All such structures shall be hydro-tested.

The CONTRACTOR shall include in his price hydro-testing of structure, all arrangements for testing such as temporary bulk heads, pressure gauges, pumps, pipe lines, etc.

Any temporary arrangements that may have to be made to ensure stability of the structures shall also be considered to have been taken into account while quoting the rates.

Any leakage that may occur during the hydro-test or subsequently during the defects liability period or the period for which the structure is guaranteed shall be effectively stopped either by cement/ epoxy pressure grouting, guniting or such other method as may be approved by the ENGINEER. All such rectification shall be done by the CONTRACTOR to the entire satisfaction of the OWNER/ENGINEER at no extra cost to the OWNER.

4.29 TESTING CONCRETE STRUCTURES FOR LEAKAGE

Hydro-static test for water tightness shall be done at full storage level or soffit of cover slab, as may be directed by ENGINEER, as described below:

In case of structures whose external faces are exposed, such as elevated tanks, the requirements of the test shall be deemed to be satisfied if the external faces show no sign of leakage or sweating and remain completely dry during the period of observation of seven days after allowing a seven day period for absorption after filling with water.

In the case of structures whose external faces are submerged and are not accessible for inspection, such as underground tanks, the structures shall be filled with water and after the expiry of seven days after the filling, the level of the surface of the water shall be recorded. The level of water shall be recorded again at subsequent intervals of 24 hours over period of seven days. Backfilling shall be withheld till the tanks are tested. The total drop in surface level over a period for seven days shall be taken as an indication of the water tightness of the structure. The ENGINEER shall decide on the actual permissible

nature of this drop in the surface level, taking into account whether the structures are open or closed and the corresponding effect it has on evaporation losses. Unless specified otherwise, a structure whose top is covered shall be deemed to be water tight if the total drop in the surface level over a period of seven days does not exceed 40 mm.

Each compartment/ segment of the structure shall be tested individually and then all together.

For structures such as pipes, tunnels, etc. the hydrostatic test shall be carried out by filling with water, after curing as specified, and subjecting to the specified test pressure for specified period. If during this period the loss of water does not exceed the equivalent of the specified rate, the structure shall be considered to have successfully passed the test.

4.30 OPTIONAL TESTS

If ENGINEER feels that the materials i.e. cement, sand, coarse aggregates, reinforcement and water are not in accordance with the specifications or if specified concrete strengths are not obtained, he may order tests to be carried out on these materials in laboratory, to be approved by the ENGINEER, as per relevant IS Codes. OWNER shall pay only for the testing of material supplied by the OWNER, otherwise CONTRACTOR shall have to pay for the tests. Transporting of all material to the laboratory shall however be done by the CONTRACTOR at no extra cost to OWNER.

In the event of any work being suspected of faulty material or workmanship requiring its removal or if the works cubes do not give the stipulated strength, ENGINEER reserves the right to order the CONTRACTOR to take out cores and conduct tests on them or do ultrasonic testing or load testing of structure, as per relevant IS specifications. All these tests shall be carried out by CONTRACTOR at no extra cost to the OWNER. Alternately ENGINEER also reserves the right to ask the CONTRACTOR to dismantle and re-do such unacceptable work at the cost of CONTRACTOR.

If the structure is certified by ENGINEER as having failed, the cost of the test and subsequent dismantling/reconstruction shall be borne by CONTRACTOR.

The quoted unit rates/prices of concrete shall deemed to provide for all tests mentioned above.

4.31 GROUTING

For details of grouting, refer Specification Part 4 – Grouting.

4.32 QUALITY CONTROL

CONTRACTOR shall note that it is required to adopt quality control formats. A copy of formats shall be furnished to CONTRACTOR by ENGINEER/ OWNER after the contract is awarded.

Alternatively, if CONTRACTOR has his own QC formats he may adopt them subjected to such modifications considered necessary by ENGINEER.

In either case CONTRACTOR shall submit his detailed Quality Assurance Plan along with the bid. This would be reviewed, appropriately modified and approved by CONSULTANT/ ENGINEER after the award of contract.

4.33 INSPECTION

All materials, workmanship and finished construction shall be subject to continuous inspection and approval of ENGINEER. Materials rejected by ENGINEER shall be expressly removed from site within 3 working days and shall be replaced by CONTRACTOR immediately at no extra cost to OWNER.

4.34 CLEAN-UP

Upon the completion of concrete work, all forms, equipment, construction tools, protective coverings and any debris, scraps of wood, etc. resulting from the work shall be removed and the premises left clean.

4.35 ACCEPTANCE CRITERIA

Any concrete work shall satisfy the requirements given below individually and collectively for it to be acceptable.

(a) properties of constituent materials;

(b) characteristic compressive strength;

(c) specified mix proportions;

(d) minimum cement content;

(e) maximum free-water/cement ratio;

(f) workability;

(g) temperature of fresh concrete;

(h) density of fully compacted concrete;

(i) cover to embedded steel;

(j) curing;

(k) tolerances in dimensions;

(l) tolerances in levels;

(m) durability;

(n) surface finishes;

(o) special requirements such as :

i. Water tightness

ii. resistance to aggressive chemicals

iii. resistance to freezing and thawing

iv. very high strength

v. improved fire resistance

vi. wear resistance

vii. resistance to early thermal cracking

ENGINEER's decision as to the acceptability or otherwise of any concrete work shall be final and binding on the CONTRACTOR.

For work not accepted, ENGINEER may review and decide whether remedial measures are feasible so as to render the work acceptable. ENGINEER shall in that case direct the CONTRACTOR to undertake the remedial measures. These shall be expeditiously and effectively implemented by CONTRACTOR. Nothing extra shall become payable to CONTRACTOR by OWNER for executing remedial measures.

4.36 CONCRETE POUR CARD

(a) CLIENT: DATE: POUR NO.

(b) PROJECT:

STRUCTURE:

(c) CONTRACTOR:

(d) MAX AGGREGATE SIZE mm SLUMP: mm

(e) DRG. NO.

(f) START/ COMPLETION TIME:

(g) CONCRETE GRADE QUANTITY: M / M^3 MIXING TIME:

SR. NO	ITEM			CONTRACTOR's REP. SIGNATURE	ENGINEER's SIGNATURE	REMARKS
1.	BEFORE CONCRETING	CENTERLINES CHECKED				
2.		FORMWORK AND STAGING CHECKED				
3.		REINFORCEMENT CHECKED				
4.		COVER TO REINFORCEMENT CHECKED				
5.		VERIFIED TEST CERTIFICATE FOR CEMENT/ STEEL		YES/ NO	YES/ NO	
6.		ADEQUENCY OF MATERIALS/ EQUIPMENT FOR POUR		YES/ NO	YES/ NO	
7.		EMBEDED PARTS CHECKED (LOCATION AND PLUMB)	CIVIL			
			MECHANICAL			
			ELECTRICAL			
POUR AUTHORISED SITE ENGINEER						
8.	SOFFIT(S) AND POUR TOP (T) LEVELS CHECKED BEFORE (B) AND AFTER (A) FROM REMOVAL (ONLY OF BEAMS OF OVER 10 M SPAN AND IMPORTANT STRUCTURES LIKE TG, ETC.)			S(B) T(B) S(A) T(A)		

SR. NO	ITEM	CONTRACTOR's REP. SIGNATURE	ENGINEER's SIGNATURE	REMARKS
9.	CONSTRUCTION JOINT LOCATION AND TIME (IF NOT AS PER DRAWING)			
10.	CEMENT CONSUMPTION IN Kg			
11.	NUMBER OF CUBES AND IDENTIFICATION MARK			
12.	TEST CUBE RESULTS (7 DAYS/ 28 DAYS)	/ / /		
13.	CONCRETE CONDITION ON FORM REMOVAL	VERY GOOD/ GOOD/ FAIR/ POOR		
SITE-IN-CHARGE				

NOTES:

(a) EACH ITEM TO BE CHECKED AND SIGNED BY THE RESPECTIVE ENGINEERS.

(b) ITEMS 8 TO 13 (BOTH INCLUSIVE) TO BE FILLED BY ONLY TCE ENGINEER.

(c) EACH POUR TO HAVE SEPARATE CARDS, IN TRIPILCATE ONE EACH FOR CLIENT, TCE AND SITE OFFICE. FORM 279

(d) UNDER REMARKS INDICATE DEVIATIONS FROM DRAWINGS AND SPECIFICATIONS, CONGESTION IN REINFORCEMENT, IF ANY, UNUSUAL OCCURENCES, SUCH AS FAILURE OF EQUIPMENT, SINKING OF SUPPORTS/ PROPS, HEAVY RAINS AFFECTING CONCRETEING, POOR COMPACTION, IMPROPER CURING, OTHER DEFICIENCIES, OBSERVATIONS, ETC.

5.0 SUPPLYING, CUTTING, BINDING AND PLACING IN POSITION STEEL AS PER PLAN AND DESIGN AND AS PER IS 2502 INCLUDING COST OF STEEL AND

BENDING WIRE FOR STRUCTURE ONLY INCLUDING LIFT UPTO 6 METER HEIGHT OR DEPTH BELOW G.L FOR ALL DIAMETERS.

Reinforcement bars shall conform to IS: 432 and or IS: 1786 , IS-2502 and welded wire fabric to IS: 1566 as shown on the drawing. Grade of Reinforcement shall be Fe500 TMT/CRS as approved by Engineer In Charge.

All reinforcement shall be clean, free from pitting, oil, grease, paint, loose mill scales, rust, dirt, dust or any other substance that will destroy or reduce bond.

Special precaution like coating of reinforcement may be provided with the prior approval of ENGINEER.

5.1 SAMPLES AND TESTS

All materials used for the works shall be tested before use. The frequency of such confirmatory tests shall be decided by ENGINEER. Manufacturer's test certificate shall be furnished for each batch of cement/steel and when directed by ENGINEER samples shall also be got tested by the CONTRACTOR in a laboratory approved by ENGINEER at no extra cost to OWNER. However, where material is supplied by OWNER, all testing charges shall be borne by OWNER, but transportation and preparation of material samples for the laboratory shall be done by CONTRACTOR at no extra cost.

Sampling and testing of aggregates shall be as per IS: 2386 under the supervision of ENGINEER. The cost of all tests, sampling, etc. shall be borne by CONTRACTOR. For coarse aggregate crushing value shall be tested.

Water to be used shall be tested to comply with clause 5.4 of IS: 456.

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

5.2 REINFORCEMENT FABRICATION AND PLACEMENT

Reinforcing bars supplied in the form of bent coils shall be straightened cold without damage at no extra cost. No bending shall be done when ambient temperature is below

5 Deg C. Suitable preheating may be permitted if steel bar bending is to be done at below 0 Deg C. Bars supplied in bent coils shall be straightened only by machine.

All bars shall be accurately bent gradually and according to the sizes and shapes shown on the drawings/ schedules or as directed by ENGINEER. Bar bending machines shall be used to achieve desired accuracy.

Re-bending or straightening incorrectly bent bars shall not be done without approval of ENGINEER.

Reinforcement shall be accurately fixed and maintained firmly in the correct position by the use of blocks, spacers, chairs, binding wire, etc. to prevent displacement during placing and compaction of concrete. The tied inplace reinforcement shall be approved by ENGINEER prior to concrete placement. Spacers (PVC or Concrete) shall be of such material and design as will be durable, not lead to corrosion of the reinforcement and not cause spalling of the concrete cover.

Binding wire shall be 16 gauge soft annealed wires. Ends of the binding wire shall be bent away from the concrete surface and in no case encroach into the concrete cover.

Substitution of reinforcement, laps/splices not shown on drawing shall be proposed by CONTRACTOR and approved by ENGINEER.

If permitted by ENGINEER, welding of reinforcement shall be done in accordance with IS: 2751, IS: 9417 and SP: 34 as applicable.

Tolerance on placement of reinforcement shall be as per Cl. 12.3 of IS: 456.

FORM WORK FOR CONSTRUCTION OF R.C.C UTILITY TERNCH

6.1 SCOPE

This specification covers the general requirements for formwork as well as mode of measurement and payment for completed works.

This specification shall be read in conjunction with Specification Reinforced concrete and allied works. It shall be very clearly understood that the specifications given herein are brief and do not cover minute details. however, all works shall have to be carried out in accordance with the relevant standards and codes of practices or in their absence in accordance with the best accepted current engineering practices or as directed by

Engineer from time to time. The decision of engineer as regards the specification to be adopted and their interpretation and the mode of execution of work shall be final and binding on contractor and no claim whatsoever will be entertained on this account.

6.2 APPLICABLE CODES AND SPECIFICATIONS

The following specifications, standards and codes, including all official amendments/ revisions and other specifications and codes referred to therein, should be considered a part of this specification. In all cases the latest issue/ edition/ revision shall apply. In case of discrepancy between this specification and those referred to herein below or other specifications forming a part of this bid document, this specification shall govern.

6.3 CODES OF PRACTICE

a)	IS: 303	Specification for plywood for general purpose.
b)	IS: 456	Code of practice for plain and reinforced concrete.
c)	IS:1200 (Part 1 to 12)	Method of measurement of building and engineering works (Parts 2 and 5).
d)	IS: 2750	Specifications for steel scaffoldings.
e)	IS:3370	Code of practice for concrete structures for storage of liquids (Parts 1 to 4).
f)	IS: 3696	Safety code for scaffolds and ladders (Parts 1 & 2).
g)	IS: 4014	Code of practice for steel tubular scaffolding. (Parts 1 & 2).
h)	IS: 4082	Recommendations on stacking and storing of construction materials at site.
i)	IS: 4900	Specification for plywood for concrete shuttering work.
j)	IS: 7969	Safety code for handling and storage of building materials.
k)	IS: 8989	Safety code for erection of concrete framed structures.

6.4 GENERAL

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

Materials should be selected so that they can satisfy the design requirements of strength, serviceability, safety, durability and finish with due regards to the functional requirements and the environmental conditions to which the structure will be subjected. Materials complying with codes/ standards shall only be used. Other materials may be used after approval of the Engineer and after establishing their performance suitability based on previous data, experience or tests.

6.5 MATERIALS

6.5.1 STORING OF MATERIALS

All material shall be stored in a manner so as to prevent its deterioration and contamination, which would preclude its use in the works. Requirements of IS: 4082 shall be complied with.

Contractor will have to make his own arrangements for the storage of adequate quantity of formwork/ shuttering material

6.6 FORMWORK

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

THE DESIGN AND ENGINEERING OF THE FORMWORK AS WELL AS ITS CONSTRUCTION SHALL BE THE RESPONSIBILITY OF CONTRACTOR. HOWEVER, IF SO DIRECTED BY ENGINEER, THE DRAWINGS AND CALCULATIONS FOR THE DESIGN OF THE FORMWORK SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.

FORMWORK SHALL BE DESIGNED TO FULFIL THE FOLLOWING REQUIREMENTS:

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

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

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

d) Capable of easily striking without shock, disturbance or damage to the concrete.

e) Soffit forms capable of imparting a camber, if required.

f) Soffit forms and supports capable of being left in position, if required.

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

The formwork may be of lined timber, waterproof/ plastic coated plywood, steel, plastic depending upon the type of finish specified. Sliding forms and slip form may be used with the approval of ENGINEER. Timber for formwork shall be well seasoned, free from sap, shakes, loose knots, worm holes, warps and other surface defects. Joints between formwork and formwork and between formwork and structure shall be sufficiently tight to prevent loss of slurry from concrete using foam and rubber seals.

The faces of formwork coming in contact with concrete shall be cleaned and two coats of approved mould oil applied before fixing reinforcement. All rubbish, particularly chippings, shavings, sawdust, wire pieces, dust, etc. shall be removed from the interior of the forms before the concrete is placed. Where directed, cleaning of forms shall be done by blasting with a jet of compressed air at no extra cost.

Forms intended for reuse shall be treated with care. Forms that have deteriorated shall not be used. Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes suitably plugged, joints repaired and warped lumber replaced to the satisfaction of Engineer. Contractor shall equip himself with enough quantity of shuttering to allow for wastage so as to complete the job in time.

Permanent formwork shall be checked for its durability and compatibility with adjoining concrete before it is used in the structure. It shall be properly anchored to the concrete.

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

For liquid retaining structures sleeves shall not be provided for through bolts nor shall through bolts be removed, if provided. The bolts, in the latter case, shall be cut at 25 mm depth from the surface and the hole made good by cement mortar of the same proportion as the concrete just after striking the formwork.

Where specified or shown on drawings all corners and angles exposed in the finished structure shall have chamfers or fillets of 20 mm x 20 mm size.

Forms for substructure may be omitted when, in the opinion of Engineer, the open excavation is firm enough (in hard non-porous soils) to act as a form. Such excavation shall be slightly larger, as directed by Engineer, than that required as per drawing to compensate for irregularities in excavation.

Contractor shall provide adequate props of adjustable steel pipes carried down to a firm bearing without overloading any of the structures.

The shuttering for beams and slabs shall be so erected that the side shuttering of beams can be removed without disturbing the bottom shuttering. If the shuttering for a column is erected for the full height of the column, one side shall be built up in sections as placing of concrete proceeds or windows left for placing concrete from the side to limit the drop of concrete to 1.5 m or as directed by Engineer. Contractor shall temporarily and securely fix items to be cast (embedment/ inserts) in a manner that will not hinder the striking of forms or permit loss of grout.

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

THE STRIKING TIME FOR FORMWORK SHALL BE DETERMINED BASED ON THE FOLLOWING REQUIREMENTS:

(a) Development of adequate concrete strength,

(b) Permissible deflection at time of striking form work,

(c) Curing procedure employed - its efficiency and effectiveness,

(d) Subsequent surface treatment to be done,

(e) Prevention of thermal cracking at re-entrant angles,

(f) Ambient temperatures; and Aggressiveness of the environment (unless immediate adequate steps are taken to prevent damage to the concrete).

Before removing formwork of soffit of slabs/ beams compressive strength at 7/ 14/ 21 days shall be checked.

UNDER NORMAL CIRCUMSTANCES (GENERALLY WHERE TEMPERATURES ARE ABOVE 20 DEG C) FORMS MAY BE STRUCK AFTER EXPIRY OF THE PERIOD GIVEN IN IS: 456 UNLESS DIRECTED OTHERWISE BY ENGINEER. FOR PORTLAND POZZOLANA / SLAG CEMENT THE STRIPPING TIME SHALL BE SUITABLY MODIFIED AS DIRECTED BY THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT FORMS ARE NOT STRUCK UNTIL THE CONCRETE HAS DEVELOPED SUFFICIENT STRENGTH TO SUPPORT ITSELF, DOES NOT UNDERGO EXCESSIVE DEFORMATION AND RESISTS SURFACE DAMAGE AND ANY STRESSES ARISING DURING THE CONSTRUCTION PERIOD.

6.7 FINISHES

6.7.1 GENERAL

The formwork for concrete works shall be such as to give the finish as specified. The Contractor shall make good any unavoidable defects as approved consistent with the type of concrete and finish specified; defects due to bad workmanship (e.g. damaged or misaligned forms, defective or poorly compacted concrete) will not be accepted. The Contractor shall construct the formwork using the correct materials and to meet the requirements of the design and to produce finished concrete to required dimensions, plumbs, planes and finishes.

6.7.2 SURFACE FINISH TYPE F1

The main requirement is that of dense, well compacted concrete. No treatment is required except repair of defective areas, filling all form tie holes and cleaning up of loose or adhering debris. For surfaces below grade which will receive waterproofing treatment the concrete shall be free of surface irregularities which would interfere with proper and effective application of waterproofing material specified for use.

6.7.3 SURFACE FINISH TYPE F2

The appearance shall be that of a smooth dense, well compacted concrete showing the slight marks of well fitted shuttering joints. The Contractor shall make good any blemishes.

6.7.4 SURFACE FINISH TYPE F3

This finish shall give an appearance of smooth, dense, well-compacted concrete with no shutter marks, stain free and with no discolouration, blemishes, arises, air holes, etc. Only lined or coated plywood with very tight joints shall be used to achieve this finish. The panel size shall be uniform and as large as practicable. Any minor blemishes that might occur shall be made good by the Contractor.

6.7.5 UNFORMED SURFACES

Finishes to unformed surfaces of concrete shall be classified as U1, U2, and U3, 'spaded or bonded concrete'. Where the class of finish is not specified the concrete shall be finished to Class U1.

Class U1 finish is the first stage for Class U2 and U3 finishes and for a bonded concrete surface. Class U1 finish shall be a levelled and screeded, uniform plain or ridged finish which (unless it is being converted to Class U2, U3, or bonded concrete) shall not be disturbed in any way after the initial set and during the period of curing, surplus concrete being struck off immediately after compaction.

Where a bonded concrete surface is specified, the laitance shall be removed from the Class U1 finished surface and the aggregate exposed while the concrete is still green.

A spaded finish shall be a surface free from voids and brought to a reasonably uniform appearance by the use of shovels as it is placed in the Works.

Class U2 finish shall be a wood float finish. Floating shall be done after the initial set of the concrete has taken place and the surface has hardened sufficiently. The concrete shall be worked no more than is necessary to produce a uniform surface free from screed marks.

Class U3 finish shall be a hard smooth steel-trowelled finish. Trowelling shall not commence until the moisture film has disappeared and the concrete has hardened sufficiently to prevent excess laitance from being worked into the surface. The surfaces shall be trowelled under firm pressure and left free from trowel marks.

The addition of dry cement, mortar or water shall not be permitted during any of the above operations.

6.8 RE-USE OF FORMS, ETC.

Forms required to be used more than once shall be maintained in serviceable condition and shall be thoroughly cleaned and repaired before reuse.

Where metal sheets are used for lining forms the sheets shall be placed and maintained in the forms with minimum amount of wrinkles, lumps or other imperfections. All forms shall be checked for shape and strength before reuse. Steel forms shall be cleaned by buffing before reuse.

6.9 EXECUTION AND REMOVAL OF FORMS

Before placing concrete the surface of all forms shall be coated with suitable non-staining form releasing agents such as raw linseed oil so as to prevent adhesion of concrete and to facilitate removal of forms.

The form releasing agent shall cover the forms fully and evenly without excess over drip. Care shall be taken to prevent form releasing agents from getting on the surface of the construction joints and on reinforcement bars. Special care shall be taken to thoroughly cover form strips for narrow grooves, so as to prevent swelling of the forms and the consequent damage to concrete prior to or during removal of forms.

Immediately before concrete is placed care shall be taken to see that all forms are in proper alignment and the supports and fixtures are properly secured and tightened.

Where forms for continuous surfaces are placed in successive units, the forms shall lap and fit tightly over the completed surface so as to prevent leakage of cement slurry from the fresh concrete and to maintain accurate alignment of the surface.

Forms shall be left in place until their removal is authorised and shall then be removed with care so as to avoid injury to concrete.

Removal of forms shall never be started until the concrete is thoroughly set and adequately hardened such that it can carry its own weight, besides the live load which is likely to come on the work during construction. The length of time for which the forms shall remain in place shall be decided by the Engineer, with reference to weather conditions, shape and position of the structure or structural member and nature and amount of dead and live loads.

In normal circumstances and where ordinary Portland cement is used, forms can be allowed to be struck as under:

1.	Beam sides, walls, unloaded columns	-	after 24 hours
2.	Slabs and arches (props left under)	-	after 4 days
3.	Props to slabs and arches	-	after 10 days
4.	Beam soffit (props left under)	-	after 8 days
5.	Props to beams	-	after 21 days
6.	Lean concrete (sides)	-	after 2 days

Note: Time shall be measured from last batch concreted in respect to the structural member under consideration.

In no case shall forms be removed until there is an assurance that removal can be accomplished without damaging the concrete surface. Heavy loads shall not be permitted until after the concrete has reached its design strength. The forms shall be removed with great caution and without causing any jerks to the structure.

Re-propping shall be done to the below floor to carry the construction load transferred through props/equipments etc. during construction of upper floor and props left under till

the period of removal of props supported to or any other load due to construction load on the upper floor. Re-propping shall be part of shuttering/formwork for concrete without any claim for extra cost.

6.10 SETTLEMENT OF FORMWORK

Due to various reasons such as closure of form joints, shrinkage of timber, dead load deflections, elastic shortening of form members or formwork, deflections, settlement may occur. The Contractor shall take precautions, including using adequately rigid formwork, in order to prevent excessive settlement/ deflection; the usual acceptable limit being 1/500 of the spans of the formwork.

6.11 TOLERANCE

Tolerance is a specified permissible variation from lines, grade or dimensions given in drawings. No tolerance specified for horizontal or vertical building lines or footings shall be construed to permit encroachment beyond the legal boundaries. Tolerance for formed and concrete dimensions shall be as per IS: 456 unless specified otherwise.

6.12 TOLERANCES IN OTHER STRUCTURES

(a) All structures

i. Variation of the construction linear outline from established position in plan

In 5 m	-	10 mm
In 10 m or more	-	15 mm

ii. Variation of dimensions to individual structure features from established positions

In 20 m or more	-	25 mm
In buried construction	-	50 mm

iii. Variations from plumb, from specified batter or from curved surfaces of all structures

In 2.5 m	-	10 mm
In 5 m	-	15 mm

In 10 m or more	-	25 mm
In buried construction	-	Twice the above values

iv. Variations from level or grade indicated on drawings in slabs, beams, soffits, horizontal grooves and visible arises

In 2.5 m	-	5 mm
In 7.5 m or more	-	10 mm
In buried construction	-	Twice the above values

v. Variation in cross-sectional dimensions of columns, beams, buttresses, piers and similar members

Minus	-	5 mm
Plus	-	10 mm

vi. Variation in the thickness of slabs, walls, arch sections and similar members.

Minus	-	5 mm
Plus	-	50 mm

(B) **FOOTING FOR WALLS AND SIMILAR MEMBERS**

i. Variation of dimension in plan

Minus	-	10 mm
Plus	-	50 mm

ii. Misplacement or eccentricity

2% footing width in the direction of misplacement but not more than 50 mm

iii. Reduction in thickness

5% of specified thickness subject to a maximum of 50 mm

CEMENT PLASTERING WORK FOR CONSTRUCTION OF R.C.C UTILITY TERNCH (CEMENT PLASTER 20 MM THICK IN C.M 1:2 USING WATER PROOFING COMPOUND APPROVED QUALITY INCLUDING FINISHING ETC. COOMPLETE.

7.1 CEMENT PLASTERING WORK

7.1.1 MATERIALS

The proportions of the cement mortar for plastering shall be 1:2 (one part of cement to two parts of sand) unless otherwise specified under the respective item of work. Cement and sand shall be mixed thoroughly in dry condition and then water added to obtain a workable consistency. The quality of water and cement shall be as per relevant IS. The quality and grading of sand for plastering shall conform to IS: 1542. The mixing shall be done thoroughly in a mechanical mixer unless hand mixing is specifically permitted by ENGINEER. If so desired by the ENGINEER sand shall be screened and washed to meet the specification requirements. The mortar thus mixed shall be used as soon as possible preferably within 30 minutes from the time water is added to cement. In case the mortar has stiffened due to evaporation of water this may be re-tempered by adding water as required to restore consistency but this will be permitted only upto 30 minutes from the time of initial mixing of water to cement. Any mortar which is partially set shall be rejected and removed forthwith from the site. Droppings of plaster shall not be re-used under any circumstances

7.1.2 WORKMANSHIP

Preparation of surfaces and application of plaster finishes shall generally confirm to the requirements specified in IS: 1661 and IS: 2402.

Plastering operations shall not be commenced until installation of all fittings and fixtures such as door/ window panels, pipes, conduits etc. are completed.

All joints in masonry shall be raked as the work proceeds to a depth of l0mm/20mm for brick/ stone masonry respectively with a tool made for the purpose when the mortar is still green. The masonry surface to be rendered shall be washed with clean-water to remove all dirt, loose materials, etc., Concrete surfaces to be rendered shall be roughened suitably by hacking or bush hammering for proper adhesion of plaster and the surface

shall be evenly wetted to provide the correct suction. The masonry surfaces should not be too wet but only damp at the time of plastering. The dampness shall be uniform to get uniform bond between the plaster and the masonry surface.

Interior Plain Faced Plaster - This plaster shall be laid in a single coat of 13mm thickness. The mortar shall be dashed against the prepared surface with a trowel. The dashing of the coat shall be done using a strong whipping motion at right angles to the face of the wall or it may be applied with a plaster machine. The coat shall be trowelled hard and tight forcing it to surface depressions to obtain a permanent bond and finished to smooth surface. Interior plaster shall be carried out on jambs, lintel and sill faces, etc. as shown in the drawing and as directed by ENGINEER. Rate quoted for plaster work shall be deemed to include for plastering of all these surfaces.

Exterior plain faced plaster - This plaster shall be applied in 2 coats. The first coat or the rendering coat shall be approximately 14mm thick. The rendering coat shall be applied as stipulated in clause 30.2 except finishing it to a true and even surface and then lightly roughened by cross scratch lines to provide bond for the finishing coat. The rendering coat shall be cured for atleast two days and then allowed to dry. The second coat or finishing coat shall be 6 mm thick. Before application of the second coat, the rendering coat shall be evenly damped. The second coat shall be applied from top to bottom in one operation without joints and shall be finished leaving an even and uniform surface. The mortar proportions for the coats shall be as specified in the respective item of work. The finished plastering work shall be cured for atleast 7 days.

Interior plain faced plaster 20mm thick if specified for uneven faces of brick walls or for random/coursed rubble masonry walls shall be executed in 2 coats similar to the procedure stipulated in clause 30.2.

7.1.3 Measurement

Measurement for plastering work shall be in sq.m correct to two places of decimal. Unless a separate item is provided for grooves, mouldings, etc., these works are deemed to be included in the unit rates quoted for plastering work. The quantity of work to be paid for under these items shall be calculated by taking the projected surface of the areas plastered after making necessary deductions for openings for doors, windows, fan

openings etc. The actual plaster work carried out on jambs/sills of windows, openings, etc. shall be measured for payment.

7.2 INSERTS AND CUTOUTS IN CONCRETE WORK

Numerous inserts are required to be fixed/ embedded in concrete as indicated in construction drawings/as directed by ENGINEER. These inserts comprise plates, angles, pipe sleeves, anchor bolt assemblies, etc. While some of the inserts may be supplied by the OWNER free of cost at his stores, for incorporation in the works, other inserts are required to be supplied and fabricated by the Contractor. These would be indicated clearly on the construction drawings.

The rate quoted by the Bidder for concrete works shall hold good for accurately fixing the inserts at the correct levels/alignment and shall include the cost of any temporary supports/anchors such as bars including cutting, bending, welding, etc. as required.

Steel templates shall be used by the CONTRACTOR to locate and very accurately position bolts, groups of bolts, inserts, embedded parts, etc. at his cost. Such templates shall be got previously approved by ENGINEER. Templates shall invariably be supported such that the same is not disturbed due to vibration, movement of labourers, materials, shuttering work, reinforcement, etc. while concreting. The CONTRACTOR will have to suitably bend, cut or otherwise adjust the reinforcement in concrete at the location of inserts, as directed by ENGINEER. If the Engineer so directs, the inserts will have to be welded to reinforcement to keep these in place. The Contractor shall be responsible for the accuracy of dimensions, levels, alignments and centre lines of the inserts in accordance with the drawings and for maintenance of the same until the erection of equipment/structure or final acceptance by the OWNER.

The Contractor shall ensure proper protection of all bolts, inserts, etc. from weather by greasing or other approved means such as applying white lead putty and wrapping them with gunny bags or canvas or by other means as directed by the Engineer to avoid damage due to movement of his labourers, materials, equipment, etc. No extra claim from the Contractor on this account shall be entertained. The Contractor shall be solely responsible for all damage caused to bolts, inserts, etc. due to his

negligence and in case damage does occur, they shall be rectified to the satisfaction of the Engineer at the Contractor's cost.

Cut outs, chamfers, pockets, etc. shall be left as indicated in the drawings and no extra cost shall be payable for providing these at their correct locations. The Contractor shall take all necessary precautions to protect the cut outs from accidentally getting filled up or the edges getting broken.

7.3 MEASUREMENT

Inserts which are fabricated by contractor at his workshop will be weighed and paid as per the items of work.

R.C.C DRAIN COVERS FOR CONSTRUCTION OF R.C.C UTILITY TERNCH

1. Fixing factory made precast RCC perforated drain covers having concrete of strength not less than M-25 and of size 600x600 shall be provided.

2. Fixing factory made precast RCC perforated drain covers having concrete of strength not less than M-25 and of size 1800x1000 shall be provided.

MS IRON LADDER WITH RLY, FRIEGHT, LOADING, UNLOADING, CARTING & ALL TAXES ETC AS DIRECTED INCLUDING PAINTS 2 COATS ETC.

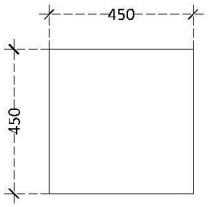
1. The ladder shall be firmly connected to brackets welded to the other places.
2. The rungs shall be welded to the stringers.
3. The length of ladder between brackets shall not exceed 2 400 mm so that vibration is reduced to a practical minimum,
4. Ladders shall be free from defects likely to cause injury to persons using the ladders, Stringers shall not have sharp edges.
5. Welding shall be in accordance with IS : 816-1969
6. The material used for the various parts of the ladder shall be as specified in IS : 226-1975 or IS : 3039-1965.

7. If the painting is damaged then it shall be remade and restored with a base coat of red lead paint and two coats of good anticorrosive oil paint of approved shade.

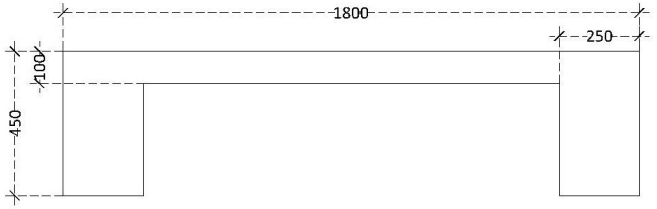
SPECIFICATION

BENCH

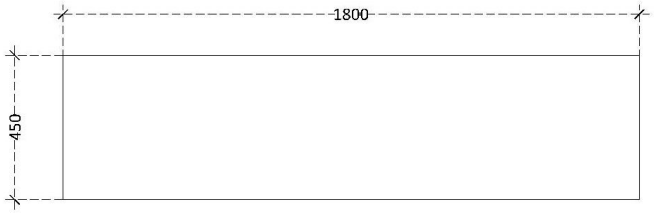
a	**Function & Sizing**	• Sitting platform size - 1800 mm length X 450mm width X 50 mm thickness; Leg size - 400mm Height X 450mm Width X 150mm thickness; Sitting height is 450 mm (overall) It has to accommodate 3-4 persons comfortably • It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user
b	**Materials**	• All components are manufactured by using M-20 grade of Concrete using vibro compaction process. • All parts are joined together with galvanized nuts & bolts of suitable size and all bolts are sealed after assembly • Sitting platform and legs should be grey in colour with smooth surface finish.
c	**Maintenance**	• Maintenance free furniture is recommended • Surface should not be rough & hard, & regular cleaning and polishing should be done to maintain the furniture • Suitably reinforced to promote long use and to prevent damage during handling, transportation & erection.
d	**Vandalism-proof**	• The bench should be either bolted or installed with a foundation by anchor fasteners or chemical fasteners which will make the furniture more vandal proof. • Bench material should be of non inflammable material.
e	**Security & Safety parameter**	• The finishing of the bench shall be such that it is safe for users and doesn't not have any sharp edges that may cause injury; also it shall be either bolted or fastened to ground as mentioned earlier. • All the edges should be of smooth semicircular chamfer finish.
f	**Durability parameter**	• Bench top and back planks are treated with special anti-corrosive, water proof coating so as to make surfaces glossy and water proof • The Foundation slab shall be made in min M25 concrete. • The cast iron nuts & bolts shall be rust proof deep galvanized , powder coated etc.
g	**Design parameter**	• The design shall be elegant with smooth curves that make it aesthetically good and appealing for the users. • It shall be innovative & contemporary & gel with the Smart City Theme of the ABD. • All components are reinforced suitably for long use and to prevent damage during handling, transportation, and erection
h	**Co-ordinated design of the various items**	• All the furniture shall be of the same colour family
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment parameter**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD.



CONCRETE BENCH- SIDE ELEVATION



CONCRETE BENCH - FRONT ELEVATION



CONCRETE BENCH - PLAN

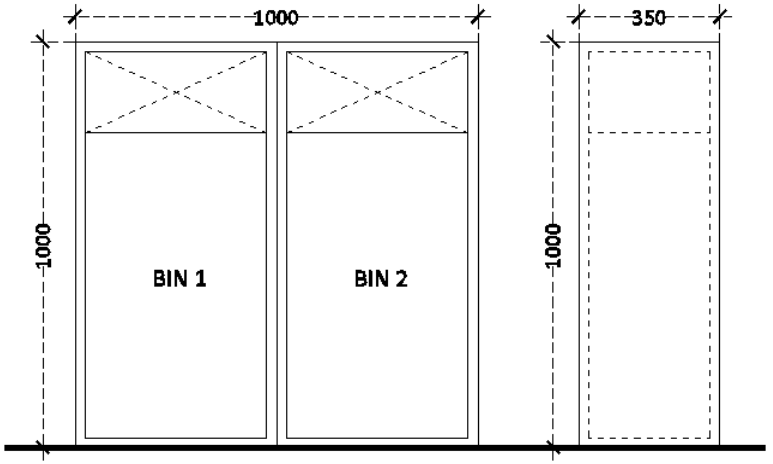
BENCH – STREET SEATING

	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – BENCH
SF- 01	Drawings not to scale. All dimensions in mm

NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

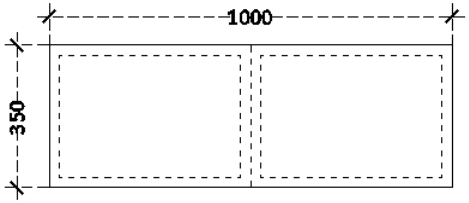
SPECIFICATION
LITTER BIN

a	**Function & Sizing**	Dual bin system should be adopted one for recycle waste & other for dry waste. Sizes may vary as per the manufacturer, recommendations are as per the drawing shown. The system should have minimum ground footprint. Each bin shall be with minimum capacity of 70Ltrs. • It should be open-able completely for ease in emptying & cleaning. • With top ashtray. • Should have triangular snap locking system.
b	**Materials**	• Recommended is galvanized steel bins and structure shall be coated with polyester coating, or an equivalent finish. • The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers • Fully constructed in heavy duty gauge of 100% Stainless Steel (18/0)
c	**Maintenance**	• Ease of maintenance to be considered, & materials to be selected accordingly. • It should be mouse, rat and bird proof • Made for heavy use and a long service life
d	**Vandalism-proof**	• Bins shall be secured by an anti vandalism locking arrangement to prevent any mishaps. • The supporting structure shall be safely secured to the ground by either bolting, or by a foundation with anchor fasteners.
e	**Security & Safety parameter**	• The design shall be free of any sharp edges, surface shall be smooth & the material used to be non-flammable • Each bin should have a premium locking system, operational for maintenance.
f	**Durability parameter**	• Hot galvanization process shall be used for steel guarantees a long rust free life.
g	**Design parameter**	• The design shall be contemporary & should be on the Smart City theme of the ABD. • Mirror & Matt Polished • Corrosion Resist
h	**Co-ordinated design of the various items**	• All the furniture shall be of the same colour family
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment parameter**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD.



DUAL BIN SYSTEM- FRONT ELEVATION

DUAL BIN SYSTEM- SIDE ELEVATION



DUAL BIN SYSTEM- PLAN

LITTER BIN

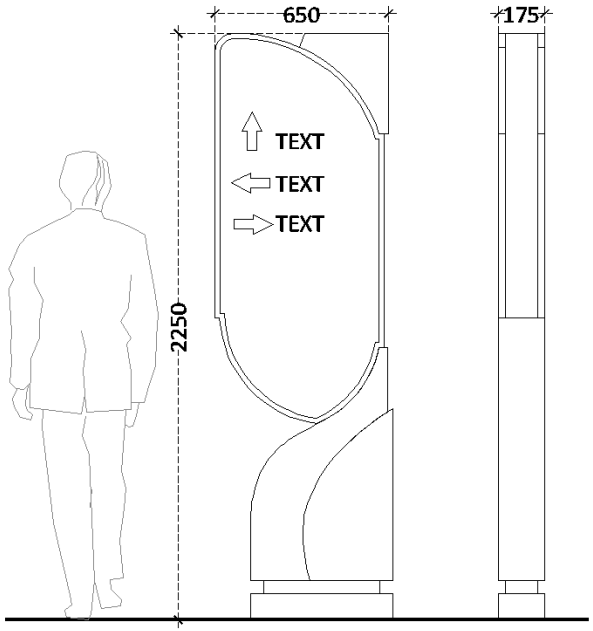
	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – LITTER BIN
SF- 02	Drawings not to scale. All dimensions in mm

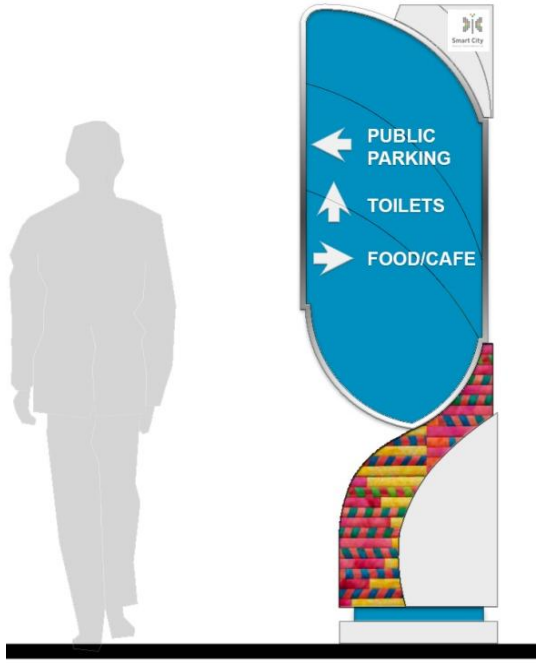
NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

SPECIFICATION

INFORMATION & WAYFINDINGBOARD

a	**Function & Sizing**	• Information board, shall cater to way finding & general information regarding the market areas in ABD. • The Information Panel shall be a light box on a stand having display area of dimension 600-900mm x 900-1200mm, on two sides. • It shall not hinder pedestrian movement. • The metal body shall be powder coated and with graphic imprints. • Provide an internal structure sufficient to support the sides of the board and end and face panels and to ensure that the board unit remains centred and secured to pole. The internal structure shall be a one piece extrusion or welded module.
b	**Materials**	• Centre Support Plate or Plates, as Applicable: Aluminium plate, minimum 0.25 inch thickness. • End plates: Aluminium plate, thickness as determined by structural design. • Recommended material shall be steel, aluminium, acrylic and tempered glass for better durability. All the steel parts shall be HDG –Hot dip galvanized and Aluminium parts shall be anodized or powder coated to give longer life and better quality. • The Foundation slab shall be made in min M25 concrete. The cast iron, nuts bolts, shall be rust proof, deep galvanized, powder coated etc.
c	**Maintenance**	• The furniture shall be regularly cleaned & all mechanical parts to be maintained by periodic servicing. • The display shall be cleaned periodically. • All the metal parts shall be coated for rust protection.
d	**Vandalism-proof**	• Furniture parts shall be structurally safe, strong, and safely secured to its foundation with anchor fasteners or chemical fasteners which make the furniture more stable and joint fasteners not visible from outside. • Joints shall be fastened using anti-theft mechanism which can be operated only by specially designed keys.
e	**Security & Safety**	• All surfaces shall be smooth without sharp angles & non flammable.
f	**Durability parameter**	• The stainless steel shall be treated to be resistant in all weathers. • The glass/acrylic shall be assembled with gaskets properly. • The furniture shall be made from materials unaffected by outdoor exposure.
g	**Design parameter**	• Looks shall be elegant and smooth curves which make it aesthetically good & appealing befitting the ABD.
h	**Co-ordinated design**	• All information board shall be of uniform shape, size, colour on the same width of the road. • Located at junctions, & in market areas.
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD.





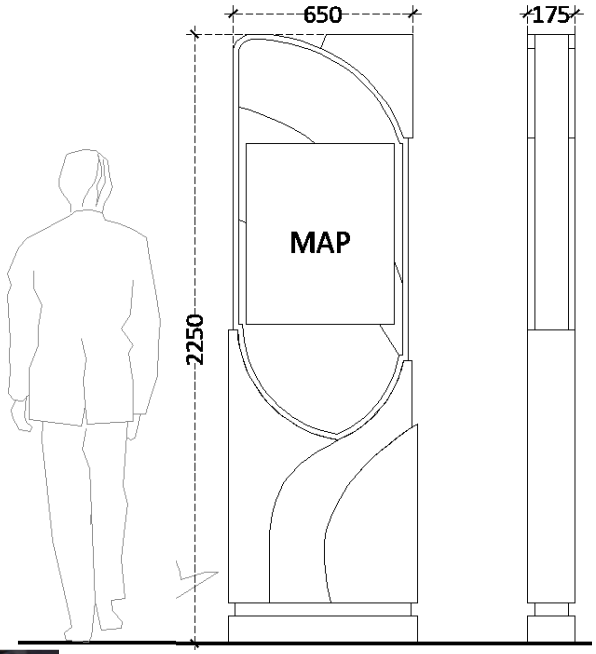
INFORMATION AND WAY INDING BOARD

	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – INFORMATION & WAY FINDING BOARDS
SF- 03	Drawings not to scale. All dimensions in mm

NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

SPECIFICATION
CITY INFORMATION PANEL (CIP)

a	**Function & Sizing**	• City Information Panel shall be installed at major public spaces, & in the market areas, equipped with touch/ smart panels. • CIP shall be display equipment with information area 600-900mm x 600-900mm double sided. • The metal body shall be powder coated and with graphic imprints
b	**Materials**	• It shall be made of Aluminium frame work as SF - 03, 8 mm toughened glass and electronic circuit to control its lighting, & the touch panel. • It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. • The structure shall be designed to withstand wind load according to regulations. • Use of steel, aluminium & toughened glass/acrylic for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron, nuts bolts, shall be rust proof, deep galvanized, powder coated etc. • The screen shall be of Touch screen LED Display (integrated)
c	**Maintenance**	• The furniture shall be regularly cleaned & all mechanical parts to be maintained by periodic servicing. • The display shall be cleaned periodically. • All the metal parts shall be coated for rust protection.
d	**Vandalism-proof**	• Furniture parts shall be structurally safe, strong, and safely secured to its foundation with anchor fasteners or chemical fasteners which make the it more stable and joint fasteners not visible from outside. • Joints shall be fastened using anti-theft m echanism which can be operated only by specially designed keys.
e	**Security & Safety parameter**	• There shall be no falling parts involved in the furniture all the parts shall be well fastened. The foundation used shall be designed in order to take loads from wind and persons leaning over the panel. • All surfaces shall be smooth without sharp angles & non flammable. • The display shall not overhang on the road to avoid any accident by passing vehicle.
f	**Durability parameter**	• The stainless steel shall be treated to be resistant in all weathers. • The material used shall be unaffected by outdoor exposure • The material shall be Non flammable. LED screen should be water proof and dust resistant
g	**Design parameter**	• The body shall have printed graphic celebrating the textile market of Surat & the Smart City theme.
h	**Co-ordinated design**	• All CIP shall be of uniform shape, size, colour on the same width of the road. The location of the CIP shall be near the public buildings, market areas, & public areas like bus stops etc.
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD.



CITY INFORMATION PANEL

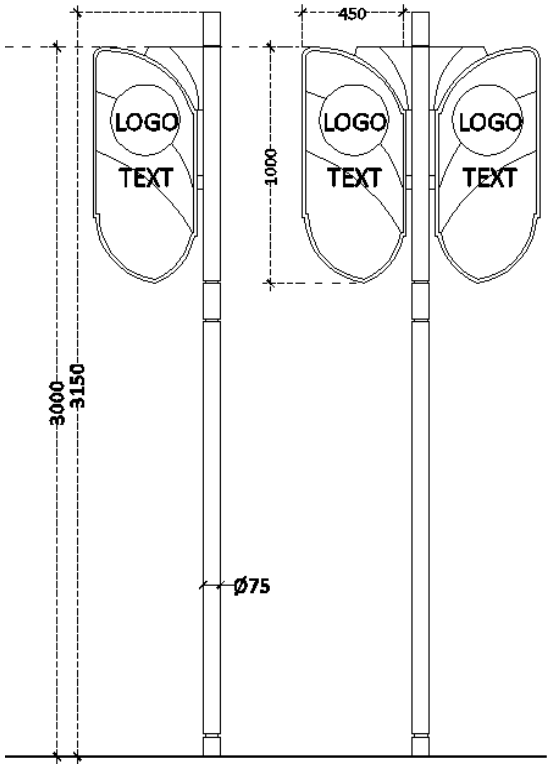
	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – CITY INFORMATION PANEL
SF- 04	Drawings not to scale. All dimensions in mm

NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

SPECIFICATION

DISPLAY/ ADVERTISEMENT POLE

a	**Function & Sizing**	• Advertisement poles shall be placed along the footpath. • It shall have a display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic & electronic circuit to control its lighting. • The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise • The structure shall be safe to withstand wind pressure as per the regulations.
b	**Materials**	• Use of steel, aluminium & toughened glass/acrylic for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron, nuts bolts, shall be rust proof, deep galvanized, powder coated etc. The stainless steel shall be treated to be resistant in all weathers. • The glazing shall be of polycarbonate material to offer good resistance against shocks and scratches.
c	**Maintenance**	• The furniture shall be regularly cleaned & all mechanical parts to be maintained by periodic servicing. • The display shall be covered with unbreakable glass or with acrylic & shall be cleaned periodically. • All the metal parts shall be coated for rust protection.
d	**Vandalism-proof**	• The supporting pole should be securely installed, either by bolting or with fixed to foundation by anchor fasteners. • All materials shall be non flammable
e	**Security & Safety parameter**	• The parts used shall not be fragile and shall be safely secured to its foundation with anchor fasteners or chemical fasteners to make the furniture more stable and joint fasteners shall not be visible from outside.. • The display shall not over hang on the road, to cause any accident by passing vehicle.
f	**Durability parameter**	• The material used shall be unaffected by outdoor exposure • The material shall be Non flammable.
g	**Design parameter**	• The looks shall be simple and well designed to gel with the Smart City Theme, & the Surat Textile Market
h	**Co-ordinated design**	• All advert poles shall be of uniform shape, size, colour on the same width of the road. • The location of the advert poles shall be on major streets, market area, & public areas like bus stops etc.
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD.



ADVERTISEMENT ON ONE SIDE

ADVERTISEMENT ON BOTH SIDES

DISPLAY / ADVERTISEMENT POLE

	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – DISPLAY/ ADVERTISEMENT POLE
SF- 05	Drawings not to scale. All dimensions in mm

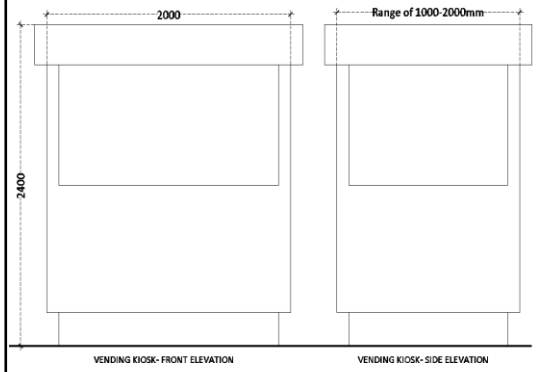
NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

SPECIFICATION
VENDING KIOSK

a	**Function & Sizing**	• Vending Kiosk shall be installed near junctions, below flyovers, near public buildings, market area etc. • The kiosk shall be have display racks, storage space & a back lit display panel. • The backlit of the different panels and backlit of the doors display racks shall illuminate goods for sale. • The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. • **The usage/users of Kiosk shall have to be got approved from SMC.**
b	**Materials**	• The materials used shall be steel/aluminium with anti corrosion treatment. • The skeleton structure shall be made in aluminium space truss for durability. • All light points, wiring, water connections, switch boards, storage, locking provisions etc off approved make to be done by the contractor.
c	**Maintenance**	• The furniture shall need little maintenance but periodic cleaning and surface polishing shall be done to maintain the furniture. • The kiosk shall be made of aluminium, steel, & tempered glass or acrylic, requiring little maintenance.
d	**Vandalism-proof**	• The parts used shall not be fragile and shall be safely secured to its foundation with anchor fasteners to make the furniture more stable & joint fasteners shall not be visible from outside. • The access doors and cash drawer and locking of display panels shall be with specific safety key.
e	**Security & Safety parameter**	• No sharp edges or corners, all surfaces shall be smooth. • The doors, display doors, front doors, shall open with specific safety key only.
f	**Durability parameter**	• The design shall be water resistant and water proof thanks to rubber gaskets. • The material used shall be unaffected by outdoor exposure • The material shall be Non flammable.
g	**Design parameter**	• Smooth curves and look are elegant, which makes it aesthetically good and appealing. • The advertising displays make the kiosk friendlier to pedestrians at night time with their lighting, signage.
h	**Co-ordinated design**	• All vending kiosk shall be of uniform shape, size, colour on the same width of the road.
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme of the ABD.

Dedicated zone for Hawkers and road side vendors- View 1

Dedicated zone for Hawkers and road side vendors - View 2



Examples for Hawker zones

VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT

TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – VENDING KIOSK

SF- 06

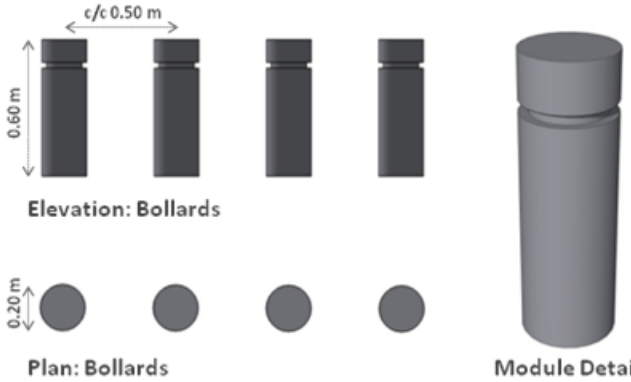
Drawings not to scale. All dimensions in mm

NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

SPECIFICATION
BOLLARD

a	**Function & Sizing**	• Bollards shall be installed at pedestrian crossing, auto stands, junctions & BRT entry/ exit. • The bollards of concrete/cast iron / steel etc shall serve the purpose of defining the edge of the road and guide pedestrians.
b	**Materials**	• Concrete Bollards of M-30 grade, & in case of steel, all the steel parts shall be HDG – Hot dip galvanized powder coated to give longer life and better quality. The Foundation slab shall be made in min M25 concrete.
c	**Maintenance**	• The furniture shall be maintained using soap water with pressured pump for washing. • The metal parts shall be coated for protection in case found damaged.
d	**Vandalism-proof**	• The bollards shall not be fragile and safely secured to its foundation
e	**Security & Safety parameter**	• The foundation used shall be designed in order to take loads from pedestrians and parked cars and other factors • There are no sharp edges visible or reachable by users
f	**Durability parameter**	• The parts used shall be of better durability for all seasons. • It should be shock resistant.
g	**Design parameter**	• The looks shall be simple and well designed to gel with the Smart City Theme.
h	**Co-ordinated design**	• All bollards shall be of uniform shape, size, colour on the same width of the road.
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment parameter**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD.

3d View: Bollards



BOLLARD

	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – BOLLARD
SF- 07	Drawings not to scale. All dimensions in mm unless and until specified.

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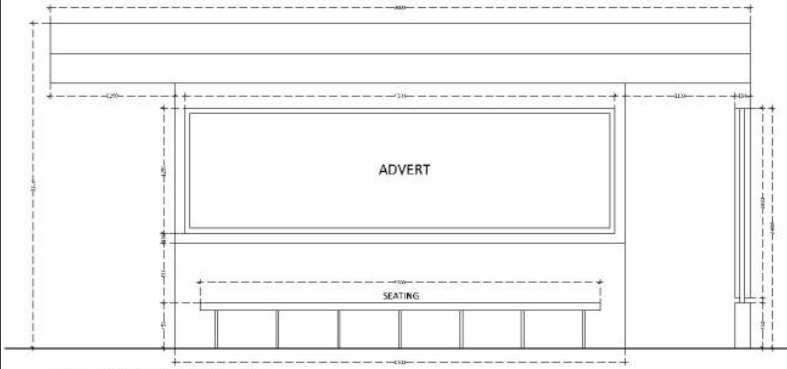
SPECIFICATION
BUS SHELTER

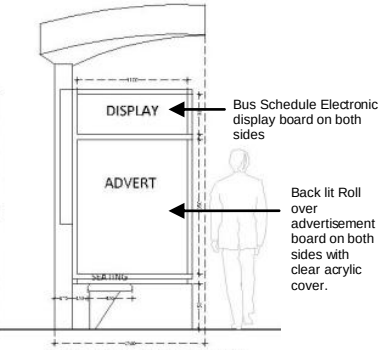
a	**Function & Sizing**	• Bus Shelter – BS shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • The structure shall be designed to withstand wind load according to regulations. • The display systems can have fixed or scrolling faces with back light • The Side Display board to have 1100X400mm Electronic display on dual sides connected with WIFI to show schedules and bus Status.
b	**Materials**	• Bus shelter shall be made of MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. • All the steel parts shall be HDG –Hot dip galvanized and aluminium parts shall be anodized or powder coated to give longer life and better quality. The material used shall be unaffected by outdoor exposure • The material shall be Non flammable. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts shall be rust proof I deep galvanized powder coated etc.
c	**Maintenance**	• The furniture shall be maintained by washing and periodic servicing. • The display shall be covered using toughened glass/ acrylic, with protective frames on its edges which shall be also cleaned periodically. • The poles and metal parts shall be coated for protection in case found damaged.
d	**Vandalism-proof**	• The Parts used shall not be fragile and safely secured to its foundation with anchor fasteners which makes the furniture more stable and joint fasteners not visible from outside. • None of the joints shall be visible from outside the furniture and it is completely sealed. Opening shall be by specialized key.
e	**Security & Safety parameter**	• There shall be no falling parts, no sharp edges involved in the furniture all the parts shall be well fastened. • The foundation used shall be designed in order to take loads from wind and persons leaning over the panel.
f	**Durability parameter**	• The parts used shall be of steel, aluminium, toughened glass or acrylic for better durability. • The stainless steel shall be treated to be resistant in all weathers.
g	**Design parameter**	• Looks shall be simple & modern well designed to go with the Smart City Theme. • The electronic display board to be of LED Scrolling type with Oval, 4.3 x 5.1mm dia. Diffused. LED's having Amber colour.
h	**Co-ordinated design**	• All BS shall be of uniform shape, size, & colour on the same width of the road & location as per the routes.
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environ Frndly**	• As far as possible recyclable materials shall be used for Street
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD. • The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise

Bus Stop- View 2

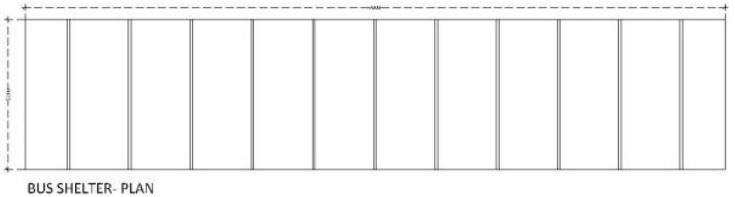
Bus stop - View 1



BUS SHELTER- FRONT ELEVATION



BUS SHELTER- SIDE ELEVATION



BUS SHELTER- PLAN

VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT

TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – BUS SHELTER

SF- 08

Drawings not to scale. All dimensions in mm

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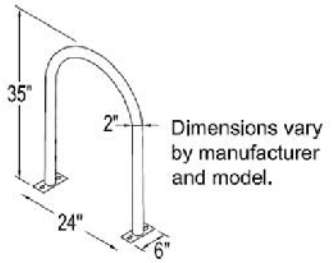
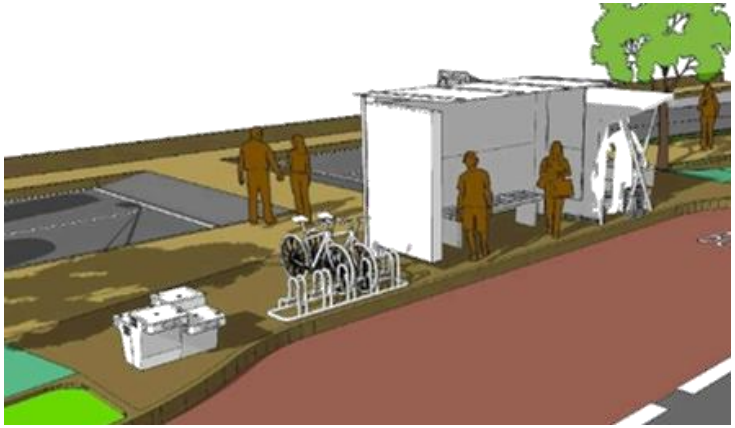
SPECIFICATION
BICYCLE STAND/ HOOPS

a	**Function & Sizing**	• Provision of cycle stands, at bus stops, junctions, market area & near public buildings. • All stand of medium duty mild steel with supporting frame.
b	**Materials**	• The cycle stand shall be of mild steel or cast iron with finished hot dip Galvanised as standard can be powder coated. • All the steel parts shall be HDG – Hot dip galvanized powder coated to give longer life and better quality. • The Foundation slab shall be made in min M25 concrete. The cast iron, nuts bolts, shall be rust proof, deep galvanized , powder coated etc.
c	**Maintenance**	• The furniture shall be maintained using soap water with pressured pump for washing. • The cycle stand metal parts shall be coated for protection in case found damaged.
d	**Vandalism-proof**	• The cycle stand shall not be fragile and safely secured to its foundation
e	**Security & Safety parameter**	• The foundation used shall be designed in order to take loads of pedestrians, parked cycles and other factors • There shall be no sharp edges visible or reachable by citizens,
f	**Durability parameter**	• The stainless steel, Metal parts and blots shall be treated to be resistant in all weathers.
g	**Design parameter**	• The looks shall be simple & well designed to gel with the Smart City Theme.
h	**Co-ordinated design of the various items**	• All cycle stand shall be of uniform shape, size, colour on the same width of the road.
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment parameter**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD.





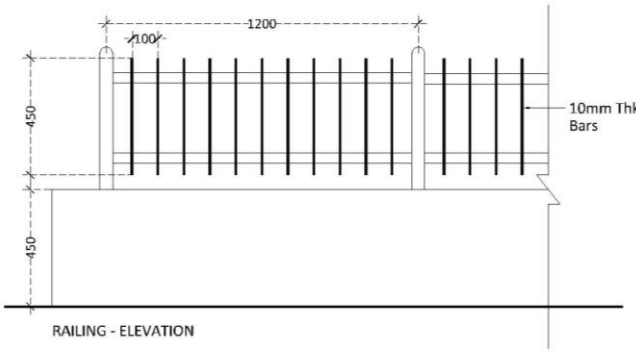
	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – BICYCLE STAND/ HOOPS
SF- 09	Drawings not to scale. All dimensions in mm unless and until specified.

NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

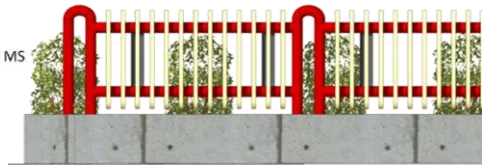
SPECIFICATION

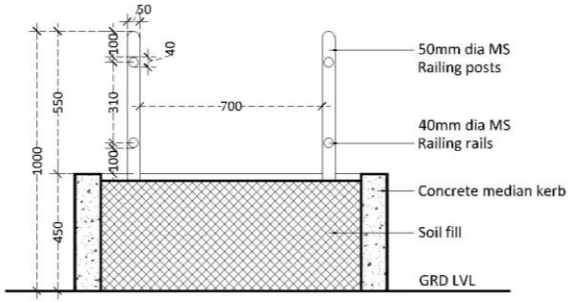
MS RAILING

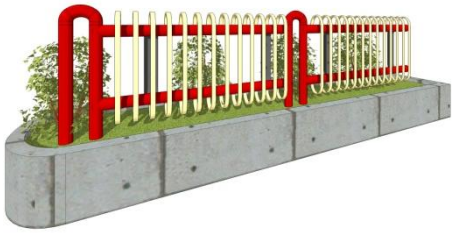
a	**Function, Sizing & Design**	• All structural steel shall conform to IS 226-1963 sections for grills and shall be free from loose mill scales, rusts, pitting or any other defects affecting its strength and durability. • The ms grill shall be fixed on concrete base and 500mm should be the visible height above the fixing finished surface. • MS posts with 50mm ø shall be placed 1200mm c/c • The grills shall be fabricated to the design and pattern shown in the drawings. • Manufactured M.S. Grills then be fixed in between the posts, balusters, M.S. frame work etc. to correct alignment. Any undulations, bends etc. found shall be rectified by the contractor at his own cost. The complete assembly of rill / railing so fixed shall be firm and there shall not be any lateral movements.
b	**Materials**	• All the steel parts shall be HDG – Hot dip galvanized powder coated to give longer life and better quality. • The Foundation shall be made in min M25 concrete. Cast iron, nuts bolts if any shall be rust proof, deep galvanized , powder coated etc. • M.S. grills, balusters, etc. also to be painted with flat two coats of oil paint of approved make and shade over one coat of approved primer or be powder coated of approved shade.
c	**Maintenance**	• The edge of the M.S. flats shall be suitably mitred before welding to get the desired shape. The joints shall be filled to remove excess stay after welding screws, nuts, washers, bolts, rivets and any other miscellaneous fastenings devices shall be of steel and shall be provided by the contractor. • The approved grills shall be fixed in position where specified and shown in drawings including in soil, masonry walls, concrete kerbs etc. Any damages to walls, kerbs etc. caused during fixing the grills shall be made good by grouting with cement mortar/packing /repairing properly at the contractors cost.
d	**Vandalism-proof**	• The railing shall not be fragile and safely secured to its foundation
e	**Security & Safety parameter**	• There shall be no sharp edges visible or reachable by citizens, • Samples of grill and railings shall be submitted for approval of the Engineer-in-charge and to be got approved before taking up for mass fabrication.
f	**Durability parameter**	• The stainless steel, Metal parts and blots shall be treated to be resistant in all weathers.
g	**Design parameter**	• The looks shall be simple & well designed to gel with the Smart City Theme.
h	**Measurement of the Railing**	• Actual area of M.S. grill manufactured and fixed in position shall only be measured in square metre for payment. The rate is to include the cost of all materials, labour, transporting, fabricating, installing
i	**Modular**	• Modular design is recommended for Street Furniture
j	**Environment parameter**	• As far as possible recyclable materials shall be used for Street Furniture
k	**Universal design**	• The furniture should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
l	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD

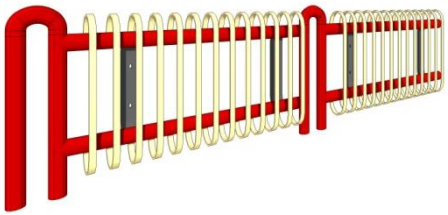


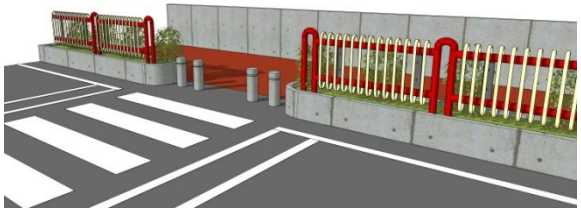
RAILING - ELEVATION











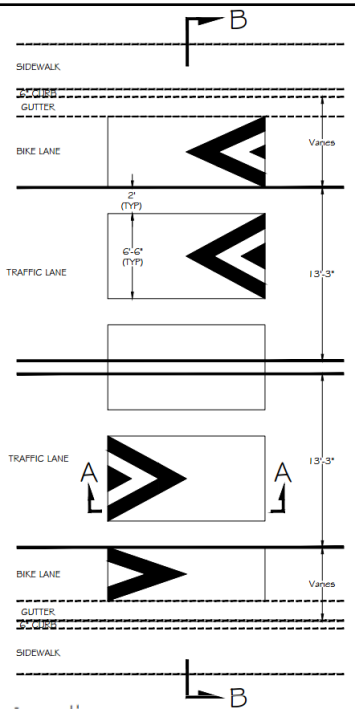
	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – MS RAILING
SF- 10	Drawings not to scale. All dimensions in mm

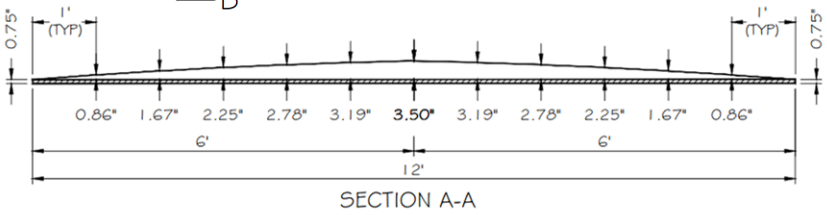
NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

SPECIFICATION

SPEED BREAKERS/HUMPS/CUSHIONS

a	**Function, Sizing & Design**	• Speed humps are to be constructed between 3" and 3-1/2" in height. If constructed outside of this range, contractors will be required to make corrections. Because some settlement is normal, it is preferable initial height be mid-range • The contractor shall provide verification of cross section dimensions. • Speed humps must be placed at locations approved by the Street Transportation Department SMC. • Speed humps shall not be placed over manholes, Watergates, junction chambers, or other irregularities in the roadway. • Contractor must properly compact humps to preclude excessive settlement.
b	**Materials**	• Speed humps shall be constructed with 3/8 " hot mix, with no less t11an 5.5% and not more than 6.0% AC-20. A tack coat shall be applied prior to application of asphalt.
c	**Maintenance**	• The contractor shall provide maintenance of the same for a period of the warranty minimum of 24 months. • Any damage done by any means is the contractor's responsibility to repair the same immediately. • Regular checking condition of the speed cushions/breakers, identification of the damage and replacement/maintenance of the same is contractors responsibility.
d	**Vandalism-proof**	• The cushions shall not be fragile and safely secured to its foundation
e	**Security & Safety parameter**	• Speed humps and speed cushions must be visible to drivers at all times. Signage standards to be adopted for speed humps. The primary elements is Markings on speed humps on the bevelled portion. • Marking to be done in thermoplastic white paint similar to road surface paints.
f	**Durability parameter**	• The contractor shall provide a two year warranty on labour and material. • Contractor to warrant height to be at least 3" tall after 24 months.
g	**Design parameter**	• The optimal width for speed cushions is approximately 1.8 m, which is narrow enough to allow emergency vehicles to pass unaffected but wide enough to maintain the desired slowing effect for passenger vehicles. The space between the cushions and the curb should be approximately 0.6 m, which is narrow enough so that drivers cannot avoid the cushions but wide enough for the tires of emergency vehicles to pass. If only two cushions are installed, one in each direction, the distance between them must be at least 1 m so that heavy vehicles do not pass too close to one another.
h	**Modular**	• Modular design is recommended for Street Furniture
i	**Environment parameter**	• As far as possible recyclable materials shall be used for Street Furniture
j	**Universal design**	• The speed breaker should also cater to differently abled users. Design and manufacture should comply with ISO requirements.
k	**Innovation parameter**	• The design should be innovative in terms of design & material & should also fit in the Smart City Theme for the ABD





SECTION A-A

SECTION B-B

SPEED HUMPS AND SPEED CUSHIONS

	VISUAL IMPROVEMENT FOR AREA BASED DEVELOPMENT- SURAT
	TECHNICAL SPECIFICATIONS AND DETAILS OF STREET FURNITURE (SF) – SPEED BREAKERS/HUMPS/CUSHIONS
SF- 11	Drawings not to scale. All dimensions in mm unless until specified.

NOTE: The Alternatives are indicative and for reference purpose only and shall act as minimum set benchmark. The bidders shall submit better design in the BID and the SF SPECS proposed by the bidder shall fulfil minimum SPECS mentioned in the adjoining Table. The above SF designs are for reference only, final designs shall be provided by the bidder as per the directions, requirements & satisfaction of SMC & the Engineer in charge, and same shall be executed on site.

VOLUME IV TENDER DRAWINGS: PLEASE DOWNLOAD FROM THE LINK ： https://drive.google.com/drive/folders/0B3VSc8MFtRRNWk5YWE5UR1VlbVU

Visual Improvement of Roads consisting of Up gradation, Augmentation, Foot path and Cycle track works, Utility Duct, Road Markings, Street Furniture, Traffic signage, Bus Shelter, Vending Kiosk, Street Landscaping works and other Miscellaneous works along with Operation and Maintenance of Tendered works for Period of Five Years on Prepartion of Working Drawings. Procurement and Construction Basis

GRAND SUMMARY SHEET

Sr No.	Item Description	Amount (In Rs.)
1	Total for Schedule A- Survey, Soil Investigation, Working Drawing, Design, Good for Construction Drawings	
2	Total for Schedule B1- Road R1-Ring Road	
3	Total for Schedule B2- Road R2- Surat Bardoli Road (60 m Wide)	
4	Total for Schedule B3- Road R3- Canal road	
5	Total for Schedule B4- Road R4- Surat Bardoli Road (45 M wide)	
6	Total for Schedule B5- Road R5- Middle Ring Road	
7	Total for Schedule B6- Road R6- Aai Mata Road	
8	Total for Schedule B7- Road R7- Lambe Hanuman Road	
9	Total for Schudule B8- Road R8 – Bombay Market Road	
10	Total for Schudule B9- Road-R9 – Sports Complex Road	
11	Total for Schudule B10- RoadR10 — Puna Gam Road	
12	Total for Schudule B11- RoadR11 – Kamela Darwaja Road	
13	Total for Schudule B12- Road R12 –Kinnari Bhathena Road	
14	Total for Schudule B13- Road R13 – Bombay Market Puna Gam Road	
15	Total for Schudule B14- Road R14 – Archana School Road	
16	Total for Schudule B15- Road R15 – Puna Patiya Kumbharia Gam Road	
17	Total for Schudule B16- RoadR16 – Salasar Hanuman Road (NVZ)	
18	Total for Schedule B18- Recharge Pit	
19	Total for Schedule C- Operation and Maintenance for Period of Five Years	
	TOTAL	

Schedule A- Survey, Soil Investigation, Working Drawings , Design					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Submission and approval of Surveys, Soil Investigations ,Designs, Working Drawings including all layout, sections, typical details, Shop Drawings, as Built drawings ..etc complete for all components of works like Roads,Junctions,Pavements,Traffic Signals,Road Furniture, Signages,Utility Duct and all miscellaneous items as mentioned in Tender document. Contractor shall submit working Drawing and Implementation schedule as per Priority given by Engineer-In-Charge for approval. Payment shall be released on Prorata basis only after approval of working Drawings as per implementation schedule	Lumpsum / Complete Job			

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	12120.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	8080.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	1212.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1414.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	101.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	17541.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	17541.00		

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	17541.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	17541.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	3898.00		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	1947.00		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	86.71		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	2176.30		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	2176.30		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	17539.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	17541.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	17541.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	101.00		

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	101.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	17541.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	2830.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	400.00		
4.3	For Side Median - Providing and laying of 0.15X0.30X0.48 mm high M-20 grade cast in situ kerbs for median,as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	4040.00		
4.4	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	4356.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	22		

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	36		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	56		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	2		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	20		

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	7		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	20		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	10		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	208		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	20		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	4040		

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	10		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	20		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	7		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	337		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8ft-10ft above bags/pots). Soil mounts 4inches-6inches in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up	Nos	370		

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	4840		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	18		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	60		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	337		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	3547.27		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	609.79		

Schedule B1- Road R1-Ring Road- 60m wide - and Length - 2.02 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	4646.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	2760.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	283.90		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	400.00		
	Total for Item 1 to Item 7				

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Shifting and laying of Utilites Excavation of metalled road	Sqm	17,100		
2.2	**Excavation** for pipe line trenches incl. all safety provisions using site rails and stacking excavated stuff up to a lead of 90 mts. cleaning the site etc. complete for lifts and strata as specified.(a) Up to 1.50 m depth	CM	19,950		
b	1.50 m to 3.00 m depth	CM	19,950		
c	3.00 m to 4.50 m depth	CM	19,950		
2.3	STORM Providing constructing brick masonry inlet chamber of 750 x 600 x 1500 mm internal dimension with necessary excavation refilling 350 mm thick brick masonary in CM 1-4, 150 mm thick PCC and bencing in CC 1-2-4, 12 mm thick plaster in CM 1-3 for inside and cement pointing in CM 1-3 for outside, providing and fixing pre-cast RCC frame and cover of M-30 grade as per drawing and specifications - Rate for 1.5 m depth.	No.	46		
b	Add. or ded. per every 10 cm increase or decrease in depth	No.	46		
2.4	Providing and carting, conveying stacking, lowering, laying and jointing NP3 class R.C.C.pipes in standard length for either collar joint, spigot and socket rubber ring roll on joint or rubber ring flush confined joints in the trenches in line and gradient, making use of levelling instruments only. Incase of collar joint pipes and using required to use jute, bitumine and joint to be filled with cement mortar 1-1 (1 cement - 1 fine sand) making 45 degree fillet outside the end of collars and specials to be closed and water tight including satisfactory flow testing after laying etc. complete. In case of rubber ring joint pipe, the pipe shall be laid in such a way than it should be pushed in systematic manner so as to achieve the leak proof joint by using rubber ring as per relevant IS. (a)	Rm	50		
b	**600 mm dia (NP3 Class)**	Rm	50		
c	**800 mm dia (NP3 Class)**	Rm	50		
d	**900 mm dia (NP3 Class)**	Rm	286		
e	**1000 mm dia (NP3 Class)**	Rm	286		
f	**1200 mm dia (NP3 Class)**	Rm	286		
g	**1400 mm dia (NP3 Class)**	Rm	286		
h	**1600 mm dia (NP3 Class)**	Rm	286		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
2.5	Providing and constructing manhole as per the type and design with necessary excavation, P.C.C. 1-4-8, Providing and constructing manhole as per the type and design with necessary excavation, P.C.C. 1-4-8, benching in 1-2-4, Flyash lime brick masonary in CM 1-4, 12 mm thick inside cement plaster in CM 1-3, 150 mm thick R.C.C. Slab 1-1.5-3, providing and fixing polyproplene steps, providing heavy duty RCC pre-cast (M-20 grade) MH frame and cover and fixing in CC 1-2-4 refilling trenches, curing etc. complete.(a) B1 TYPE MANHOLE- For Sewer size - up to 1000 mm dia. ,Chamber Size - 1500 mm x 1000 mm, For Depth upto 2.5 m	No.	12		
b	Add. or ded. per every 10 cm increase or decrease in depth	No.	12		
c	B2 TYPE MANHOLE - Sewer size - up to 1000 mm dia., Chamber Size - 1500 mm x 1000 mm, Deep manhole with access shaft depth 2.5 mt to 4.0 mt, Access Shaft Size - 850 mm x 850 mm. For Depth of 4.0 M	No.	12		
d	Add. or ded. per every 10 cm increase or decrease in depth	No.	12		
e	C2 TYPE MANHOLE - for Sewer size - 1100mm to 1400 mm dia., Chamber Size - 2400 mm x 1000 mm,Deep manhole with access shaft depth 2.5 mt to 4.0 mt, Access Shaft Size - 850 mm x 850 mm. For Depth upto 4.0 M	No.	12		
f	Add. or ded. per every 10 cm increase or decrease in depth	No.	12		
g	D1 TYPE MANHOLE - Sewer size - 1600 mm to 1800 mm dia. , Chamber Size - 2200 mm x 1000 mm, Shallow manhole depth up to 2.5 mt. For Depth upto 2.5 M	No.	12		
h	Add. or ded. per every 10 cm increase or decrease in depth	No.	12		
2.6	**WATER SUPPLY** **Laying and Jointing of C.I./D.I. pipe. All the Material including Fittings..etc will be Provided by The Employer - SSCDL.Transportation of same to the Workplace shall be Scope of Contractor** **(C) 200 mm dia**	Rm	93		
	(D) 250 mm dia	Rm	101		
	(F) 350 mm dia	Rm	101		
	(H) 450 mm dia	Rm	310		
	(I) 500 mm dia	Rm	101		
	(J) 600 mm dia	Rm	56		
2.7	Fixing of Butter fly valve. **Material shall be Provided by the Employer-SSCDL.Transportation of same to the Workplace shall be Scope of Contractor** (C) 200 mm dia	No.	1		
	(D) 250 mm dia	No.	1		
	(F) 350 mm dia	No.	1		
	(H) 450 mm dia	No.	2		
	(I) 500 mm dia	No.	1		
	(J) 600 mm dia	No.	1		
2.8	Making lead joint perfectly water tight (C) 200 mm dia	No.	17		
	(D) 250 mm dia	No.	18		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
	(F) 350 mm dia	No.	18		
	(H) 450 mm dia	No.	56		
	(I) 500 mm dia	No.	18		
	(J) 600 mm dia	No.	10		
2.9	Tighten Rubber Gasket Joint (C) 200 mm dia	No.	17		
	(D) 250 mm dia	No.	18		
	(F) 350 mm dia	No.	18		
	(H) 450 mm dia	No.	56		
	(I) 500 mm dia	No.	18		
	(J) 600 mm dia	No.	**10**		
2.10	Cutting the C.I./D.I. Pipe (C) Pipe thickness 21 mm to 30 mm	No.	138		
2.11	Chamfering D.I. Pipes (D) 250 mm dia	No.	17		
	(E) 300 mm dia	No.	18		
	(G) 400 mm dia	No.	18		
	(I) 500 mm dia	No.	56		
	(J) 600 mm dia	No.	18		
	(k) 750 mm dia	No.	10		
2.12	**Making connection for with Existing line** **(D) 250 mm dia**	No.	17		
	(E) 300 mm dia	No.	18		
	(G) 400 mm dia	No.	18		
	(I) 500 mm dia	No.	56		
	(J) 600 mm dia	No.	18		
	(k) 750 mm dia	No.	10		
2.13	Flushing work of laid line (A) Dia of pipe up to 300mm	Nos	2		
	(B) Dia of pipe from 350 up to 600 mm	Nos	2		
2.14	**Sewer Lines**				
	Providing and laying of sewer lines (a) 250 mm Dia	Rm	356.25		
b	300mm dia	Rm	356.25		
c	350mm dia	Rm	356.25		
d	500mm dia	Rm	142.5		
e	600mm dia	Rm	142.5		
f	700mm dia	Rm	71.25		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
2.15	Providing and constructing Sewer manholes, scraper manholes and unit house connection chamber, as per the type design in brick masonary in C.M. 1-3 and outside plastering in C.M. 1-3 necessary coping in R.C.C.M. 200 fixing C.I. steps and fixing manhole frame.Manhole type B circular type having inside diameter of minimum 1500mm and for depth from 1.5 M to 4.0 M (for 150mm to 600mm dia sewers). Manhole type B as above but upto 2.1 M depth	No.	46		
b	Add. or ded. per every 10 cm increase or decrease in depth	No.	46		
c	**Manhole type C circular type having inside diameter of minimum 1500mm and for depth beyond 4.0 m to 6.0 m (for 150mm to 1800mm dia sewers).Manhole type C as above but upto 4.0 M depth**	No.	46		
d	Add. or ded. per every 10 cm increase or decrease in depth	No.	46		
3.1	**Utility Duct** Excavation for Utility Duct incl. all safety provisions using site rails and stacking excavated stuffs at designated location, cleaning the site etc. complete for all lifts and strata as specified, including Filling in foundation and plinth with murrum or selected soil in layers of 20cm thickness including watering, ramming and consoldiating etc complete (upto 10ton).	Cum	104,538.00		
3.2	Providing and laying cement concrete 1-2-4 (1cement -2 coarse -4 stone aggregate 20mm nominal size) and curing complete excluding formwork	Cum	2,815.80		
3.3	Providing and cast in situ C.C. in grade M-25 proportions of ingredients as per mix design by weigh batching using granite, quartzite trap metal of size 12 mm to 20 mm and or 6 mm to 12 mm including scaffolding, centring, formwork, needle vibrated consolidation, curing and hydraulic testing etc. complete up to 6 meter height /depth Av. G.L.for all water retaining structures including Bottom Slab, Vertical Walls and Top Slab including cost of Reinforcement which includes Supplying, cutting, binding and placing in position steel as per plan and design and as Per ISS 2502 including cost of steel and bending wire for reservoir/structure only including lift up to 6 meter height or depth below G.L. for all diameters, Do TMT Steel all diameter Fe 500 grade confirming to relevant IS code. Item shall also include Providing, Laying, Fixing in position of TMT Steel - FE 500 confirming to relevant IS Code at all depths. **Reinforcement Steel shall be designed considering requirement of 80 Kg of Steel per Cum of Concrete (80 Kg/Cum of Concrete) - For Furthur Details Refer Tender Purpose Drawing - Drawing No. TCE-10196A-AC-1000-SI-11016 - DETAIL-D FOR UTILITY TRENCH-CIVIL PART**	M	5,700.00		
3.4	Miscellaneous Works Like - Providing and fixing factory made precast RCC perforated drain covers having concrete of strength not less than M-25 of size 600x600- at 100 M c/c , RCC perforated drain covers having concrete of strength not less than M-25, of size 2000x1000 at 500 mm c/c, Providing and laying of High Strength Aluminium Ladder at 500mm c/c,Providing and laying of polypropylene steps at every 100 mm C/c to be embeded in RCC Wall,Screed Concrete (IPS) of 50 mm Thk , Cement plaster 20mm thick in C-M 1-2 using water proofing compound approved quality including finishing ,Providing and fixing at site of work M.S. iron ladder with Rly. freight, loading, unloading,carting and all taxes etc, as directed including paints 2 coats etc comp.	M	5,700.00		
3.5	Providing and laying Readymade 2500mm standard length, prefabricated, Ladder type cable tray from 14 SWG MS sheet and then hot dip galvanised (Min. 100 microns thickness) of 1000 mm wide and associated accessories such as coupler plates, tees, elbow etc. 75 MM side flanges shall be provided.	M	17,100.00		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.6	Providing and laying Readymade 2500mm standard length, prefabricated, Perforated type cable tray from 14 SWG MS sheet and then hot dip galvanised (Min. 100 microns thickness) of 300 mm wide and associated accessories such as coupler plates, tees, elbow etc. 75 MM side flanges shall be provided.	M	5,700.00		
3.7	Providing and Fixing 70W bulk head luminaires with junction boxes	Nos.	570.00		
3.8	Providing and laying 4C x 2.5 Sq. mm 2YWY, cables for lighting	M	5,700.00		
4.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	14,250.00		
4.2	Kerb - Providing and laying of 100mm thick readymade Cement Concrete Kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	Rm	12,635.00		
4.3	Tactile for footpath - Providing and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation complete as per drawing and techincal specification and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.	Sqm	1,710.00		
4.4	Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	2,211.00		
4.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	143.00		
5.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	31,560.00		
5.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	31,560.00		
5.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	31,560.00		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting the same within city limit as directed by Engineer in charge.	Sqm	31,560.00		
5.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	7,013.33		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	3,502.77		
5.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	157.80		
5.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	2,176.30		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	2,176.30		
5.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	31,560.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	31,560.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	31,560.00		
5.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	143.00		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	143.00		
5.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	31,560.00		
6.1	Visual Improvement- Other Civil Works For Junctions - Shared zone paving - Supply and laying Modular Paving Stones with Premier Shield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation complete as per drawing and techincal specification and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete,	Sqm	12,635.00		
6.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	M	2,850.00		
6.3	**For Side Median** - Providing and laying of 0.15X0.30X0.48 mm high M-20 grade cast in situ kerbs for median,as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	M	9,800.00		
6.4	Median Paint - Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	13,950.00		
7.1	Visual Improvement- Signages and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet of size 90 x 90 x 90 cms, Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	33.00		
7.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	60.00		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	87.00		
7.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	8.00		
7.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	No	29.00		
7.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	No	15.00		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	No	29.00		
7.8	Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02	No	14.00		
7.9	Concrete Bollards- Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	164.00		
7.10	Bicycle Stand hoops- Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	No	29.00		
7.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Technical specification as per SF-10	Rm	5,700.00		
7.12	**Bus Shelter- Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.Bus stop is consist of 2 type os advertisement one static back lit panel and one digital panel and 1 panel showing bus status update as per traffic department GPS sysytem. Space provision for all 3 will be marked in respective technical specification sheet no. SF-08**	no	14.00		
7.13	**Vending Kiosk- Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment.Design is as per SF-06 of technical specification**	no	29.00		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.14	**Drinking Water Fountain- S Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives.**	no	10.00		
8.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	475.00		
8.2	Tree Plantation- Planting of Trees and (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm and to have tar coat. Work shall be done as shown in the drawing or as directed and approved by Engineer-In-Charge.	Nos	712.00		
8.3	Shrub Plantation- Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	11,799.00		
8.4	Planter Box- Providing and installation of Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	35.00		
8.5	Bollard Lights- Supply and Installation of Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps.	No	216.00		
8.6	Up- Lighter- Supply and Installation of Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection- IP 65.	No	475.00		

Schedule B2 - Road R2 -Surat Bardoli Road- 60m wide - and Length - 2.85 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
9.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 15cm width, center line marking of 10cm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 15cm width.	Sqm	5,490.00		
9.2	Bus stop marking-Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete.	Sqm	860.00		
9.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete.	Sqm	6,555.00		
9.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band) -	No	6,555.00		
9.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens.**	No	608.00		
9.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	560.00		
	Total for Item 1 to Item 9				

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	19650.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	15720.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	2358.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	2751.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	197.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	36131.70		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	36131.70		

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	36131.70		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	36131.70		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	8029.27		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	4010.18		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	180.66		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	4482.84		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	4482.84		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	36131.70		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	36131.70		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	36131.70		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	197.00		

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	197.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	36131.70		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	12687.00		
4.2	For Side Median - Providing and laying of 0.15X0.30X0.48 mm high M-20 grade cast in situ kerbs for median,as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	15720.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	14148.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	42		

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	80		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	119		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	10		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	39		

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	20		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	39		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	20		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	389		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	39		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	7860		

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	20		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	39		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	13		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	655		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	1310		

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	7860		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	46		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	144		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	655		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	8001.51		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	1186.37		

Schedule B3- for Road R3 -Canal Road- 60m wide - and Length - 3.93 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	9039.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	7774.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	488.50		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	560.00		
	Total for Item 1 to Item 7				

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	4500.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	1800.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	540.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	315.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	45.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	3240.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	3240.00		

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	3240.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	3240.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	720.00		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	359.60		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	15.20		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	401.99		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	401.99		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	3240.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	3240.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	3240.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	45.00		

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	45.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	3240.00		
4.1	Visual Improvement- Other Civil Works Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	900.00		
4.2	For Side Median - Providing and laying of 0.15X0.30X0.48 mm high M-20 grade cast in situ kerbs for median,as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	1800.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	3240.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	6		
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	8		

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	29		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	0		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	9		

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	2		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	9		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	5		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	71		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	9		

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.11	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	5		
5.12	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	9		
5.13	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	3		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	150		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	225		

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	3600		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	6		
6.5	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	150		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	819.38		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	271.69		

Schedule B4- For Road R4 -Surat Bardoli Road- 45m wide - and Length - 0.9 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	1035.00		
7.4	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	160.00		
	Total for Item 1 to Item 7				

Schedule B5- For Road R5 -Middle Ring Road- 45m wide - and Length - 1.83 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	5490.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	10980.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	1098.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1921.50		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	92.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	18180.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	18180.00		

Schedule B5- For Road R5 -Middle Ring Road- 45m wide - and Length - 1.83 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	18180.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	18180.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	4040.00		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	2017.76		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	90.90		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	2255.58		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	2255.58		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	18180.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	18180.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	18180.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	92.00		

Schedule B5- For Road R5 -Middle Ring Road- 45m wide - and Length - 1.83 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	92.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	18180.00		
4.1	Visual Improvement- Other Civil Works Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	1130.00		
4.2	For Side Median - Providing and laying of 0.15X0.30X0.48 mm high M-20 grade cast in situ kerbs for median,as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	2260.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	4068.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	10		
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	14		

Schedule B5- For Road R5 -Middle Ring Road- 45m wide - and Length - 1.83 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	54		
5.4	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	18		
5.5	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	5		
5.6	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	18		

Schedule B5- For Road R5 -Middle Ring Road- 45m wide - and Length - 1.83 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.7	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	9		
5.8	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	156		
5.9	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	18		
5.10	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	7320		
5.11	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	9		
5.12	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	18		
5.13	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	6		

Schedule B5- For Road R5 -Middle Ring Road- 45m wide - and Length - 1.83 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	305		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	399		
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	4520		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	12		
6.5	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	305		

Schedule B5- For Road R5 -Middle Ring Road- 45m wide - and Length - 1.83 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	2437.90		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	552.43		
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	4209.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	3404.00		
7.5	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	160.00		
	Total for Item 1 to Item 7				

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	5700.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	5700.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	1140.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	997.50		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	95.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	17100.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	17100.00		

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	17100.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	17100.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	2845.26		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	1897.89		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	85.50		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	2121.59		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	1696.43		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	17100.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	17100.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	17100.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	95.00		

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	95.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	17100.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	5239.00		
4.3	For Side Median - Providing and laying of 0.15X0.30X0.48 mm high M-20 grade cast in situ kerbs for median,as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	1900.00		
4.4	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	3800.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	36		

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	81		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	60		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	6		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	19		

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	17		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	19		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	10		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	224		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	19		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	3800		

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	10		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	19		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	6		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	317		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	792		

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	7600		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	37		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	136		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	317		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	3588.96		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	573.56		

Schedule B6- Road R6 -Aai Mata Road- 36m wide - and Length -1.90 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	2185.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	4370.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	352.00		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	240.00		
	Total for Item 1 to Item 7				

Schedule B7- For Road R7 - Lambe Hanuman Road 24m wide - and Length - 0.8Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	4000.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	3200.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction above	Sqm	480.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	560.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	40.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	4320.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	4320.00		
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	4320.00		

Schedule B7- For Road R7 - Lambe Hanuman Road 24m wide - and Length - 0.8Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting the	Sqm	4320.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	718.80		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	479.47		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	21.60		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	535.98		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	428.57		
3.8	Provding and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	4320.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	4320.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	4320.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	40.00		
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	40.00		

Schedule B7- For Road R7 - Lambe Hanuman Road 24m wide - and Length - 0.8Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	4320.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	275.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	800.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1440.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	10		
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	33		

Schedule B7- For Road R7 - Lambe Hanuman Road 24m wide - and Length - 0.8Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	25		
5.4	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	8		
5.5	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	4		
5.6	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	8		
5.7	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	4		

Schedule B7- For Road R7 - Lambe Hanuman Road 24m wide - and Length - 0.8Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.8	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	60		
5.9	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	8		
5.10	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	1600		
5.11	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	4		
5.12	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	8		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	317		

Schedule B7- For Road R7 - Lambe Hanuman Road 24m wide - and Length - 0.8Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	133		
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	800		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	9		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	20		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	133		

Schedule B7- For Road R7 - Lambe Hanuman Road 24m wide - and Length - 0.8Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	685.21		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	241.50		
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	1840.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	920.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	39.00		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	160.00		
	Total for Item 1 to Item 7				

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	SqM	7300.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	5840.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	876.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1022.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	73.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	7884.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	7884.00		

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	7884.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	7884.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	1311.81		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	875.03		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	39.42		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	978.16		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	782.14		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	7884.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	7884.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	7884.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	73.00		

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	73.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	7884.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	6985.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	1460.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	2628.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	33		

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	76		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	46		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	3		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	15		

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	16		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	15		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	7		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	85		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	15		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	2920		

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	7		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	15		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	2		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	243		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	243		

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	1460		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	34		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	156		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	243		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	1612.40		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	440.74		

Schedule B8-Road R8-Bombay Market Road- 24m wide - and Length - 1.46Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	3358.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	1679.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	464.50		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	160.00		
	Total for Item 1 to Item 7				

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	2100.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	1680.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	252.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	294.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	21.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	2268.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	2268.00		

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	2268.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	2268.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	377.37		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	251.72		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	11.34		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	281.39		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	225.00		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	2268.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	2268.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	2268.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	21.00		

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	21.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	2268.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	254.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	420.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	756.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	6		

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	13		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	13		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	1		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	4		

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	3		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	4		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	2		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	37		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	4		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	840		

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	2		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	4		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	0		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	70		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	70		

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	420		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	7		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	20		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	70		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	408.25		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	126.79		

Schedule B9 - Road R9 -Sports Complex Road- 24m wide - and Length - 0.42Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	966.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	483.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	28.50		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	80.00		
	Total for Item 1 to Item 7				

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	1500.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	1200.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	180.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	210.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	15.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	1620.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	1620.00		

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	1620.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	1620.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	269.55		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	179.80		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	8.10		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	200.99		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	160.71		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	1620.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	1620.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	1620.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	15.00		

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	15.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	1620.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	283.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	300.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	540.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	6		

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	12		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	10		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	1		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	3		

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	3		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	3		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	2		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	34		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	3		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	600		

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	2		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	3		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	0		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	50		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8'-10' above bags/pots). Soil mounts 4"-6" in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm	Nos	50		

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	300		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	6		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	20		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	50		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	301.88		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	90.56		

Schedule B10- for Road R10 - Puna Gam Road- 24m wide - and Length - 0.3 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	690.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	345.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	33.00		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	40.00		
	Total for Item 1 to Item 7				

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works-Work includes removal of existing street furniture,foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block-Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	7750.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMCs approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	6200.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	930.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1085.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	78.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	8370.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	8370.00		

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	8370.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	8370.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	1392.68		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	928.97		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	41.85		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	1038.46		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	830.36		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	8370.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	8370.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	8370.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	78.00		

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	78.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	8370.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	2436.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	1550.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	2790.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	28		

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	60		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	49		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	2		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	16		

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	14		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	16		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	8		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	56		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	16		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	3100		

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	8		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	16		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	0		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	258		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8ft-10ft above bags/pots). Soil mounts 4inches-6inches in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up	Nos	258		

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	1550		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	30		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	68		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	258		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	1487.33		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	467.91		

Schedule B11 -for Road R11 -Kamela Darwaja Road- 24m wide - and Length - 1.55 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	3565.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	1782.50		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	218.00		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	160.00		
	Total for Item 1 to Item 7				

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Shifting and laying of Utilites Excavation of metalled road	Sqm	9,120		
2.2	**Excavation** for pipe line trenches incl. all safety provisions using site rails and stacking excavated stuff up to a lead of 90 mts. cleaning the site etc. complete for lifts and strata as specified.(a) Up to 1.50 m depth	CM	10,640		
b	1.50 m to 3.00 m depth	CM	10,640		
c	3.00 m to 4.50 m depth	CM	10,640		
2.3	Providing constructing brick masonry inlet chamber of 750 x 600 x 1500 mm internal dimension with necessary excavation refilling 350 mm thick brick masonary in CM 1-4, 150 mm thick PCC and bencing in CC 1-2-4, 12 mm thick plaster in CM 1-3 for inside and cement pointing in CM 1-3 for outside, providing and fixing pre-cast RCC frame and cover of M-30 grade as per drawing and specifications - for 1.5 m depth.	No.	25		
b	Add. or ded. per every 10 cm increase or decrease in depth	No.	25		
2.4	Providing and carting, conveying stacking, lowering, laying and jointing NP3 class R.C.C.pipes in standard length for either collar joint, spigot and socket rubber ring roll on joint or rubber ring flush confined joints in the trenches in line and gradient, making use of levelling instruments only. Incase of collar joint pipes and using required to use jute, bitumine and joint to be filled with cement mortar 1-1 (1 cement - 1 fine sand) making 45 degree fillet outside the end of collars and specials to be closed and water tight including satisfactory flow testing after laying etc. complete. In case of rubber ring joint pipe, the pipe shall be laid in such a way than it should be pushed in systematic manner so as to achieve the leak proof joint by using rubber ring as per relevant IS. (a)450 mm dia (NP3 Class)	Rm	50		
a	**600 mm dia (NP3 Class)**	Rm	304		
b	**900 mm dia (NP3 Class)**	Rm	304		
2.5	Providing and constructing manhole as per the type and design with necessary excavation, P.C.C. 1-4-8, Providing and constructing manhole as per the type and design with necessary excavation, P.C.C. 1-4-8, benching in 1-2-4, Flyash lime brick masonary in CM 1-4, 12 mm thick inside cement plaster in CM 1-3, 150 mm thick R.C.C. Slab 1-1.5-3, providing and fixing polyproplene steps, providing heavy duty RCC pre-cast (M-20 grade) MH frame and cover and fixing in CC 1-2-4 refilling trenches, curing etc. complete. (a) B2 TYPE MANHOLE - Sewer size - up to 1000 mm dia., Chamber Size - 1500 mm x 1000 mm, Deep manhole with access shaft depth 2.5 mt to 4.0 mt, Access Shaft Size - 850 mm x 850 mm. For Depth of 4.0 M	No.	25		
a	Add. or ded. per every 10 cm increase or decrease in depth	No.	25		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
2.6	**WATER SUPPLY** **Laying and Jointing of C.I./D.I. pipe. All the Material including Fittings..etc will be Provided by The Employer - SSCDL.Transportation of same to the Workplace shall be Scope of Contractor** **(a) 200 mm dia**	Rm	51		
	(b) 250 mm dia	Rm	54		
	(c) 350 mm dia	Rm	54		
	(d) 450 mm dia	Rm	165		
	(e) 500 mm dia	Rm	54		
	(f) 600 mm dia	Rm	30		
2.7	Fixing of Butter fly valve. **Material shall be Provided by the Employer-SSCDL.Transportation of same to the Workplace shall be Scope of Contractor** (a) 200 mm dia	No.	1		
	(b) 250 mm dia	No.	1		
	(c) 350 mm dia	No.	1		
	(d) 450 mm dia	No.	2		
	(e) 500 mm dia	No.	1		
	(f) 600 mm dia	No.	1		
2.8	Making lead joint perfectly water tight (a) 200 mm dia	No.	9		
	(b) 250 mm dia	No.	10		
	(c) 350 mm dia	No.	10		
	(d) 450 mm dia	No.	30		
	(e) 500 mm dia	No.	10		
	(f) 600 mm dia	No.	5		
2.9	Tighten Rubber Gasket Joint (a) 200 mm dia	No.	9		
	(b) 250 mm dia	No.	10		
	(c) 350 mm dia	No.	10		
	(d) 450 mm dia	No.	30		
	(e) 500 mm dia	No.	10		
	(f) 600 mm dia	No.	**5**		
2.10	Cutting the C.I./D.I. Pipe (a) Pipe thickness 21 mm to 30 mm	No.	73		
2.11	Chamfering D.I. Pipes (a) 250 mm dia	No.	9		
	(b) 300 mm dia	No.	10		
	(c) 400 mm dia	No.	10		
	(d) 500 mm dia	No.	30		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
	(e) 600 mm dia	No.	10		
	(f) 750 mm dia	No.	5		
2.12	**Making connection for with Existing line** **(a) 250 mm dia**	No.	9		
	(b) 300 mm dia	No.	10		
	(c) 400 mm dia	No.	10		
	(d) 500 mm dia	No.	30		
	e) 600 mm dia	No.	10		
	(f) 750 mm dia	No.	5		
2.13	Flushing work of laid line (A) Dia of pipe up to 300mm	No	2		
	(B) Dia of pipe from 350 up to 600 mm	No	2		
2.14	Sewer Lines - Providing and laying of sewer lines (a) 250 mm Dia	Rm	190		
a	300mm dia	Rm	190		
b	350mm dia	Rm	190		
c	500mm dia	Rm	76		
d	600mm dia	Rm	76		
e	700mm dia	Rm	76		
2.15	Providing and constructing Sewer manholes, scraper manholes and unit house connection chamber, as per the type design in brick masonary in C.M. 1-3 and outside plastering in C.M. 1-3 necessary coping in R.C.C.M. 200 fixing C.I. steps and fixing manhole frame. Manhole type B circular type having inside diameter of minimum 1500mm and for depth from 1.5 M to 4.0 M (for 150mm to 600mm dia sewers), (a) Manhole type B as above but upto 2.1 M depth	No.	25		
a	Add. or ded. per every 10 cm increase or decrease in depth	No.	25		
b	Manhole type **C** circular type having inside diameter of minimum 1500mm and for depth beyond 4.0 m to 6.0 m (for 150mm to 1800mm dia sewers).	No.	25		
c	Add. or ded. per every 10 cm increase or decrease in depth	No.	25		
3	**Utility Duct**				
3.1	Excavation for Utility Duct incl. all safety provisions using site rails and stacking excavated stuffs at designated location, cleaning the site etc. complete for all lifts and strata as specified, including Filling in foundation and plinth with murrum or selected soil in layers of 20cm thickness including watering, ramming and consoldiating etc complete (upto 10ton).	Cum	55,753.60		
3.2	Providing and laying cement concrete 1-2-4 (1cement -2 coarse -4 stone aggregate 20mm nominal size) and curing complete excluding formwork	Cum	1,501.76		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	Providing and cast in situ C.C. in grade M-25 proportions of ingredients as per mix design by weigh batching using granite, quartzite trap metal of size 12 mm to 20 mm and or 6 mm to 12 mm including scaffolding, centring, formwork, needle vibrated consolidation, curing and hydraulic testing etc. complete up to 6 meter height /depth Av. G.L.for all water retaining structures including Bottom Slab, Vertical Walls and Top Slab including cost of Reinforcement which includes Supplying, cutting, binding and placing in position steel as per plan and design and as Per ISS 2502 including cost of steel and bending wire for reservoir/structure only including lift up to 6 meter height or depth below G.L. for all diameters, Do TMT Steel all diameter Fe 500 grade confirming to relevant IS code. Item shall also include Providing, Laying, Fixing in position of TMT Steel - FE 500 confirming to relevant IS Code at all depths. **Reinforcement Steel shall be designed considering requirement of 80 Kg of Steel per Cum of Concrete (80 Kg/Cum of Concrete) - For Furthur Details Refer Tender Purpose Drawing - Drawing No. TCE-10196A-AC-1000-SI-11016 - DETAIL-D FOR UTILITY TRENCH-CIVIL PART**	M	3,040.00		
3.4	Miscellaneous Works Like - Providing and fixing factory made precast RCC perforated drain covers having concrete of strength not less than M-25 of size 600x600- at 100 M c/c , RCC perforated drain covers having concrete of strength not less than M-25, of size 2000x1000 at 500 mm c/c, Providing and laying of High Strength Aluminium Ladder at 500mm c/c,Providing and laying of polypropylene steps at every 100 mm C/c to be embeded in RCC Wall,Screed Concrete (IPS) of 50 mm Thk , Cement plaster 20mm thick in C-M 1-2 using water proofing compound approved quality including finishing ,Providing and fixing at site of work M.S. iron ladder with Rly. freight, loading, unloading,carting and all taxes etc, as directed including paints 2 coats etc comp.	M	3,040.00		
3.5	Providing and laying Readymade 2500mm standard length, prefabricated, Ladder type cable tray from 14 SWG MS sheet and then hot dip galvanised (Min. 100 microns thickness) of 1000 mm wide and associated accessories such as coupler plates, tees, elbow etc. 75 MM side flanges shall be provided.	M	9,120.00		
3.6	Providing and laying Readymade 2500mm standard length, prefabricated, Perforated type cable tray from 14 SWG MS sheet and then hot dip galvanised (Min. 100 microns thickness) of 300 mm wide and associated accessories such as coupler plates, tees, elbow etc. 75 MM side flanges shall be provided.	M	3,040.00		
3.7	Providing and Fixing 70W bulk head luminaires with junction boxes	Nos.	304.00		
3.8	Providing and laying 4C x 2.5 Sq. mm 2YWY, cables for lighting	M	3,040.00		
4.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	7,600.00		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
4.2	Kerb - Providing and laying of 100mm thick readymade Cement Concrete Kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	Rm	6,080.00		
4.3	Tactile for footpath - Providing and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation complete as per drawing and techincal specification and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.	Sqm	912.00		
4.4	Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1,064.00		
4.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	76.00		
5.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	8,208.00		
5.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	8,208.00		
5.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	8,208.00		
5.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting the same within city limit as directed by Engineer in charge.	Sqm	8,208.00		
5.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	1,365.72		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	910.99		
5.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	41.04		
5.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	1,018.36		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	814.29		
5.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	8,208.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	8,208.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	8,208.00		
5.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	76.00		
5.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	76.00		
5.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	8,208.00		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	1,983.00		
6.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	M	1,520.00		
6.3	Median Paint - Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	2,736.00		
7.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	28		
7.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	60		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	48		
7.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	2		
7.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	No	15		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	No	14		
7.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	No	15		
7.8	Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02	No	8		
7.9	Concrete Bollards- Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	104		
7.10	Bicycle Stand hoops- Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	No	15		
7.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Technical specification as per SF-10	Rm	3,040.00		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.12	**Bus Shelter- Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.Bus stop is consist of 2 type os advertisement one static back lit panel and one digital panel and 1 panel showing bus status update as per traffic department GPS sysytem. Space provision for all 3 will be marked in respective technical specification sheet no. SF-08**	no	8		
7.13	**Vending Kiosk- Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment.Design is as per SF-06 of technical specification**	no	15		
7.14	**Drinking Water Fountain- S Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives.**	no	2		
8.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	253		
8.2	Tree Plantation- Planting of Trees and (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8ft-10ft above bags/pots). Soil mounts 4inches-6inches in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm and to have tar coat. Work shall be done as shown in the drawing or as directed and	Nos	253		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
8.3	Shrub Plantation- Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	1,520.00		
8.4	Planter Box- Providing and installation of Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	30.13		
8.5	Bollard Lights- Supply and Installation of Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps.	No	96.00		
8.6	Up- Lighter- Supply and Installation of Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection- IP 65.	No	253.33		
9.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	1,442.77		
9.2	Bus stop marking-Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete.	Sqm	458.85		

Schedule B12- for Road R12- Kinnari Bhathena Road- 24m wide - and Length -1.52 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
9.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete.	Sqm	3,496.00		
9.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band) -	No	1,748.00		
9.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens.**	No	192.50		
9.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	320.00		
	Total for Item 1 to Item 9				

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	SqM	1200.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	800.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	240.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	140.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	20.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	2160.00		

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	2160.00		
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	2160.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting the same within city limit as directed by Engineer in charge.	Sqm	2160.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	359.40		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	239.73		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	10.80		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	267.99		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	214.29		

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	2160.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	2160.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	2160.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	20.00		
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	20.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	2160.00		
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	1030.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	400.00		
4.4	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	720.00		

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	6		
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	15		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	13		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	1		

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	4		
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	3		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	4		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	2		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	32		

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	4		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	0		
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	2		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	4		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	0		
6	**Visual Improvement- Landscape Works**				
6.1	Visual Improvement- Landscape Works Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	400		

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.2	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	7		
6.3	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	32		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	383.81		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	120.75		
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	0.00		

Schedule B13- for Road R13 -Bombay Market- Puna Gam Road- 24m wide - and Length - 0.4Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	460.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	97.00		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	80.00		
	Total for Item 1 to Item 7				

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Shifting and laying of Utilites Excavation of metalled road	Sqm	9,120		
2.2	**Excavation** for pipe line trenches incl. all safety provisions using site rails and stacking excavated stuff up to a lead of 90 mts. cleaning the site etc. complete for lifts and strata as specified.**(a) Upto 1.50 M Depth**	CM	10,640		
a	1.50 m to 3.00 m depth	CM	10,640		
b	3.00 m to 4.50 m depth	CM	10,640		
2.3	Providing constructing brick masonry inlet chamber of 750 x 600 x 1500 mm internal dimension with necessary excavation refilling 350 mm thick brick masonary in CM 1-4, 150 mm thick PCC and bencing in CC 1-2-4, 12 mm thick plaster in CM 1-3 for inside and cement pointing in CM 1-3 for outside, providing and fixing pre-cast RCC frame and cover of M-30 grade as per drawing and specifications - Upto for 1.5 m depth.	No.	25		
a	Add. or ded. per every 10 cm increase or decrease in depth	No.	25		
2.4	Providing and carting, conveying stacking, lowering, laying and jointing NP3 class R.C.C.pipes in standard length for either collar joint, spigot and socket rubber ring roll on joint or rubber ring flush confined joints in the trenches in line and gradient, making use of levelling instruments only. Incase of collar joint pipes and using required to use jute, bitumine and joint to be filled with cement mortar 1-1 (1 cement - 1 fine sand) making 45 degree fillet outside the end of collars and specials to be closed and water tight including satisfactory flow testing after laying etc. complete. In case of rubber ring joint pipe, the pipe shall be laid in such a way than it should be pushed in systematic manner so as to achieve the leak proof joint by using rubber ring as per relevant IS. (a) 450 mm dia (NP3 Class)	Rm	50		
a	**600 mm dia (NP3 Class)**	Rm	203		
b	**900 mm dia (NP3 Class)**	Rm	203		
2.5	Providing and constructing manhole as per the type and design with necessary excavation, P.C.C. 1-4-8, Providing and constructing manhole as per the type and design with necessary excavation, P.C.C. 1-4-8, benching in 1-2-4, Flyash lime brick masonary in CM 1-4, 12 mm thick inside cement plaster in CM 1-3, 150 mm thick R.C.C. Slab 1-1.5-3, providing and fixing polyproplene steps, providing heavy duty RCC pre-cast (M-20 grade) MH frame and cover and fixing in CC 1-2-4 refilling trenches, curing etc. complete.B2 TYPE MANHOLE - Sewer size - up to 1000 mm dia., Chamber Size - 1500 mm x 1000 mm, Deep manhole with access shaft depth 2.5 mt to 4.0 mt, Access Shaft Size - 850 mm x 850 mm. For Depth of 4.0 M	No.	14		
b	Add. or ded. per every 10 cm increase or decrease in depth	No.	14		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
c	D1 TYPE MANHOLE - Sewer size - 1600 mm to 1800 mm dia. , Chamber Size - 2200 mm x 1000 mm, Shallow manhole depth up to 2.5 mt. For Depth upto 2.5 M	No.	14		
d	Add. or ded. per every 10 cm increase or decrease in depth	No.	14		
		No.	14		
2.6	**WATER SUPPLY** **Laying and Jointing of C.I./D.I. pipe. All the Material including Fittings..etc will be Provided by The Employer - SSCDL.Transportation of same to the Workplace shall be Scope of Contractor** **(a) 200 mm dia**	Rm	51		
	(b) 250 mm dia	Rm	54		
	(c) 350 mm dia	Rm	54		
	(d) 450 mm dia	Rm	165		
	e) 500 mm dia	Rm	54		
	(f) 600 mm dia	Rm	30		
2.7	Fixing of Butter fly valve. **Material shall be Provided by the Employer-SSCDL.Transportation of same to the Workplace shall be Scope of Contractor** (a) 200 mm dia	No.	1		
	(b) 250 mm dia	No.	1		
	c) 350 mm dia	No.	1		
	(d) 450 mm dia	No.	2		
	(e) 500 mm dia	No.	1		
	(f) 600 mm dia	No.	1		
2.8	Making lead joint perfectly water tight (a) 200 mm dia	No.	9		
	(b) 250 mm dia	No.	10		
	(c) 350 mm dia	No.	10		
	(d) 450 mm dia	No.	30		
	(e) 500 mm dia	No.	10		
	(f) 600 mm dia	No.	5		
2.9	Tighten Rubber Gasket Joint (a) 200 mm dia	No.	9		
	(b) 250 mm dia	No.	10		
	(c) 350 mm dia	No.	10		
	(d) 450 mm dia	No.	30		
	(e) 500 mm dia	No.	10		
	(f) 600 mm dia	No.	**5**		
2.10	Cutting the C.I./D.I. Pipe (a) Pipe thickness 21 mm to 30 mm	No.	73		
2.11	Chamfering D.I. Pipes (a) 250 mm dia	No.	9		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
	(b) 300 mm dia	No.	10		
	(c) 400 mm dia	No.	10		
	(d) 500 mm dia	No.	30		
	(e) 600 mm dia	No.	10		
	(f) 750 mm dia	No.	5		
2.12	**Making connection for with Existing line** **(a) 250 mm dia**	No.	9		
	(b) 300 mm dia	No.	10		
	(c) 400 mm dia	No.	10		
	(d) 500 mm dia	No.	30		
	(e) 600 mm dia	No.	10		
	(f) 750 mm dia	No.	5		
2.13	Flushing work of laid line (A) Dia of pipe up to 300mm	No	2		
	(B) Dia of pipe from 350 up to 600 mm	No	2		
2.14	Sewer lines - Providing and laying of sewer lines (a) 250 mm Dia	Rm	85		
a	300mm dia	Rm	85		
b	350mm dia	Rm	85		
c	500mm dia	Rm	34		
d	600mm dia	Rm	34		
e	700mm dia	Rm	34		
2.15	Providing and constructing Sewer manholes, scraper manholes and unit house connection chamber, as per the type design in brick masonary in C.M. 1-3 and outside plastering in C.M. 1-3 necessary coping in R.C.C.M. 200 fixing C.I. steps and fixing manhole frame. Manhole type B circular type having inside diameter of minimum 1500mm and for depth from 1.5 M to 4.0 M (for 150mm to 600mm dia sewers)Manhole type B as above but upto 2.1 M depth	No.	25		
a	Add. or ded. per every 10 cm increase or decrease in depth	No.	25		
c	Manhole type **C** circular type having inside diameter of minimum 1500mm and for depth beyond 4.0 m to 6.0 m (for 150mm to 1800mm dia sewers)				
	1. Manhole type C as above but upto 4.0 M depth	No.	25		
	2. Extra depth beyond 4.0 M and up to 6.0 M depth for type C manhole above.	Rmt.			
d	Add. or ded. per every 10 cm increase or decrease in depth	No.	25		
3	**Utility Duct**				

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.1	Excavation for Utility Duct incl. all safety provisions using site rails and stacking excavated stuffs at designated location, cleaning the site etc. complete for all lifts and strata as specified, including Filling in foundation and plinth with murrum or selected soil in layers of 20cm thickness including watering, ramming and consoldiating etc complete (upto 10ton).Manhole type B circular type having inside diameter of minimum 1500mm and for depth from 1.5 M to 4.0 M (for 150mm to 600mm dia sewers)	Cum	24,942.40		
3.2	Providing and laying cement concrete 1-2-4 (1cement -2 coarse -4 stone aggregate 20mm nominal size) and curing complete excluding formwork	Cum	671.84		
3.3	Providing and cast in situ C.C. in grade M-25 proportions of ingredients as per mix design by weigh batching using granite, quartzite trap metal of size 12 mm to 20 mm and or 6 mm to 12 mm including scaffolding, centring, formwork, needle vibrated consolidation, curing and hydraulic testing etc. complete up to 6 meter height /depth Av. G.L.for all water retaining structures including Bottom Slab, Vertical Walls and Top Slab including cost of Reinforcement which includes Supplying, cutting, binding and placing in position steel as per plan and design and as Per ISS 2502 including cost of steel and bending wire for reservoir/structure only including lift up to 6 meter height or depth below G.L. for all diameters, Do TMT Steel all diameter Fe 500 grade confirming to relevant IS code. Item shall also include Providing, Laying, Fixing in position of TMT Steel - FE 500 confirming to relevant IS Code at all depths. **Reinforcement Steel shall be designed considering requirement of 80 Kg of Steel per Cum of Concrete (80 Kg/Cum of Concrete) - For Furthur Details Refer Tender Purpose Drawing - Drawing No. TCE-10196A-AC-1000-SI-11016 - DETAIL-D FOR UTILITY TRENCH-CIVIL PART**	M	1,360.00		
3.4	Miscellaneous Works Like - Providing and fixing factory made precast RCC perforated drain covers having concrete of strength not less than M-25 of size 600x600- at 100 M c/c , RCC perforated drain covers having concrete of strength not less than M-25, of size 2000x1000 at 500 mm c/c, Providing and laying of High Strength Aluminium Ladder at 500mm c/c,Providing and laying of polypropylene steps at every 100 mm C/c to be embeded in RCC Wall,Screed Concrete (IPS) of 50 mm Thk , Cement plaster 20mm thick in C-M 1-2 using water proofing compound approved quality including finishing ,Providing and fixing at site of work M.S. iron ladder with Rly. freight, loading, unloading,carting and all taxes etc, as directed including paints 2 coats etc comp.	M	1,360.00		
3.5	Providing and laying Readymade 2500mm standard length, prefabricated, Ladder type cable tray from 14 SWG MS sheet and then hot dip galvanised (Min. 100 microns thickness) of 1000 mm wide and associated accessories such as coupler plates, tees, elbow etc. 75 MM side flanges shall be provided.	M	4,080.00		
3.6	Providing and laying Readymade 2500mm standard length, prefabricated, Perforated type cable tray from 14 SWG MS sheet and then hot dip galvanised (Min. 100 microns thickness) of 300 mm wide and associated accessories such as coupler plates, tees, elbow etc. 75 MM side flanges shall be provided.	M	1,360.00		
3.7	Providing and Fixing 70W bulk head luminaires with junction boxes	Nos.	136.00		
3.8	Providing and laying 4C x 2.5 Sq. mm 2YWY, cables for lighting	M	1,360.00		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
4.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	7,600.00		
4.2	Kerb - Providing and laying of 100mm thick readymade Cement Concrete Kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	Rm	6,080.00		
4.3	Tactile for footpath - Providing and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation complete as per drawing and techincal specification and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.	Sqm	912.00		
4.4	Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1,064.00		
4.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	76.00		
5.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	8,208.00		
5.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	8,208.00		
5.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	8,208.00		
5.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting the same within city limit as directed by Engineer in charge.	Sqm	8,208.00		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	1,365.72		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	910.99		
5.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	41.04		
5.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	1,018.36		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	814.29		
5.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	8,208.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	8,208.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	8,208.00		
5.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	76.00		
5.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	76.00		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	8,208.00		
6.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	1,983.00		
6.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	M	1,520.00		
6.3	Median Paint - Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	2,736.00		
7.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	28		
7.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	60		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	No	48		
7.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	2		
7.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	No	15		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	No	14		
7.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	No	15		
7.8	Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02	No	8		
7.9	Concrete Bollards- Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	104		
7.10	Bicycle Stand hoops- Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	No	15		
7.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Technical specification as per SF-10	Rm	3,040.00		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.12	**Bus Shelter- Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. It shall be made of MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.Bus stop is consist of 2 type os advertisement one static back lit panel and one digital panel and 1 panel showing bus status update as per traffic department GPS sysytem. Space provision for all 3 will be marked in respective technical specification sheet no. SF-08**	no	8		
7.13	**Vending Kiosk- Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment.Design is as per SF-06 of technical specification**	no	15		
7.14	**Drinking Water Fountain- S Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters Laboratories to U.S. and Canadian standards and conform to European Union Directives.**	no	2		
8	**Land Scaping Works**				
8.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	253		
8.2	Tree Plantation- Planting of Trees and (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8ft-10ft above bags/pots). Soil mounts 4inches-6inches in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up to 300mm and to have tar coat. Work shall be done as shown in the drawing or as directed and	Nos	253		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
8.3	Shrub Plantation- Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	1,520.00		
8.4	Planter Box- Providing and installation of Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	No	30.13		
8.5	Bollard Lights- Supply and Installation of Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps.	No	96.00		
8.6	Up- Lighter- Supply and Installation of Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection- IP 65.	No	253.33		
9.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	1,442.77		
9.2	Bus stop marking-Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete.	Sqm	458.85		
9.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete.	Sqm	3,496.00		

Schedule B14- for Road R14- Archana School Road- 24m wide - and Length -0.68 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
9.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer s recommendation and complete as directed by the engineer. (3M or equivelant Band) -	No	1,748.00		
9.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens.**	No	192.50		
9.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	320.00		
	Total for Item 1 to Item 9				

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	5000.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	4000.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction	Sqm	600.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	700.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	50.00		
3.1	**Visual Improvement- Carpeting / Re-Carpeting of Roads-** Collecting, carting and stacking STONE DUST on road side as directed and flushing the same on Bituminous surfaces at the rate of 0.030 cmt. Per 10 smt. As directed by Engineer in charge.	Sqm	5400.00		
3.2	Preparing surfaces by excavating with spades,scraping with shovels, brushing with wire brushes for removing caked mud up to 150 mm thick etc. Sweeping with brooms and finally fanning the cleaned surface with gunny bags to remove all loose dirt etc. including carting of excavated stuff from site	Sqm	5400.00		

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.3	PICKING of the bituminous surface using JCB excavator or by any mechanical means, cleaning and removal of loose and unsuitable material on the road surface including cost of fuel, oil, lubricant, labour charges and disposal of loose unsuitable material from site to the disposal site as directed by Engineer in charge.	Sqm	5400.00		
3.4	SCARIFYING the graveled macadam, bituminous macadam surface 6 cm. To 10 cm. Deep including cleaning and removal of loose and unsuitable material on the road surface,stacking the useful materials and disposing remaining stuff including loading and unloading and carting	Sqm	5400.00		
3.5	Providing and Laying 50 to 100mmthick compacted DENSE GRADED BITUMINOUS MACADAM using B.T. chips as per gradation and bitumen for mixing shall be as arrived from mix design, provided in no case it shall be less than 4.5percentage by wt. of total mix as binder by drum mix type hotmix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil lubricant and labour charges including cost of aggregate and filler (if required as per mix design) etc complete Bitumen is provided by Contractor (i) Carpeting 75 to 100mm thick (Compacted)	MT	898.50		
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	599.33		
3.6	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete Bitumen is provided by Contractor	MT	27.00		
3.7	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete Bitumen is provided by Contractor (i) Carpeting 50 mm thick (Compacted)	MT	669.98		
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	535.71		
3.8	Providing and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same Bitumen is provided by Contractor (A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	5400.00		
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	5400.00		
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	5400.00		
3.9	Providing and supplying heavy duty I.S.I mark RCC precast manhole frame with cover at site as per design for circular manhole complete.	No	50.00		

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
3.10	Providing and laying PLAIN CEMENT CONCERETE M-200-(1-1.5-3) (1cement, 1.5 coarse sand, 3 stone Aggregate of 20mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and/or chambers of any utility services upto the newly carpeted/re-carpeted road surface including in C.M. 1-3 on both side etc. complete.	No	50.00		
3.11	Providing and laying premix seal coat 15 mm thick for sealing the voids in the bituminous surface laid to specified levels, grade and cross fall using type B seal coat with bitumen grade 80/100 (VG-10) at 1.5 Kg/Sq.M.. and spreading grit, brushing, rolling, etc. complete as per clause No 513 of MoRTH specifications and as directed by Engineer In Charge.	Sqm	5400.00		
4	**Visual Improvement- Other Civil Works**				
4.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	2665.00		
4.2	Median work - Construction of median, including providing and laying of cement concrete cast-in-situ/ Precast kerb - 775 mm high in M-20 grade as per drawing and as directed by Engineer with all leads, lifts etc. Complete,	Rm	1000.00		
4.3	Median Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	1800.00		
5.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet-size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	17		

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	36		
5.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	32		
5.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	1		
5.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	10		

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	9		
5.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	10		
5.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	5		
5.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMC's approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	131		
5.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	10		
5.11	Railing/ gaurd rail- Manufacturing, supply and fixing M.S. railing for traffic islands/ median/horizontal curves on high embankments with Concrete base, and painting with approved paint etc. all complete as per drawing and Technical Specifications. Installation of work as directed by Engineer In-charge. Technical specification as per SF-10	Rm	2000		

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.12	**Bus Shelter- Recommended distance between two bus stops to be max 400m, final location of Bus shelter shall be as directed and coordinated with SMC Traffic/ Road Dept.Bus Shelter – Supply and install Bus Shelter that shall serve as a all weather shade for the bus commuters and the display area per shelter shall not exceed 20 sqmt. • It shall be made of SS/MS frame work, powder coated metal roofing, metal seating, toughened glass/ acrylic and electronic circuit to control its lighting. The structure shall be designed to withstand wind load according to regulations and as per IRC codes.**	Nos	5		
5.13	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	10		
5.14	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters' Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	0		
6.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	167		
6.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8ft-10ftabove bags/pots). Soil mounts 4inches-6inches in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up	Nos	167		

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	1000		
6.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	19		
6.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	68		
6.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	167		
7.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	1021.10		
7.2	Bus stop marking- Marking dimensions 3,5m(W)x15m(L)Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Bus stop and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	301.88		

Schedule B15 for Road R15 -Puna Patiya Kumbharia Gam Road- 24m wide - and Length - 1.0 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
7.3	Cycle track marking-2m(W)x 5m(L) 10m apart, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Cycle track and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge.	Sqm	2300.00		
7.4	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	1150.00		
7.5	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	156.00		
7.6	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	160.00		
	Total for Item 1 to Item 7				

Schedule B16- for Road R16-Salasar Hanuman Road (NVZ) - 18m wide - and Length - 0.66 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
1	Demolition and other works- Work includes removal of existing street furniture, foot path, manhole covers, existing median, exiting signages, trees if any way as per revised ROW, existing structures that obstruct the revised ROW. Item also includes all materials, labour, equipments, dismantaling, transportation and disposing where required etc. complete.	Lumpsum / Complete Job			
2.1	Visual Improvement- Footpath Works Paver Block- Providing and laying 60mm thick factory made cement concrete paver block (shot blasted finish) of M -30 grade in Footpath made by block making machine with strong vibratory compaction, of approved size, design and shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong	SqM	5660.00		
2.2	Kerb- Providing 100mm thick readymade c.c. kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved paverblock manufacturer and setting in line, level and in truly vertical position, including filling joints in C.M. 1-1 (1 part of cement - 1 part of stone dust) smooth pointing in C.M. 1-1 (1 part of cement - 1 part of coarse sand) including watering etc. complete and as directed by engineer in charge.	RM	1320.00		
2.3	Tactile for footpath- Supply and laying of Cement Concrete Wet Cast Chequered Tiles 300 x 300 x 30mm, Colour as approved by SMC and to be UV light resistant. Chequered Tiles must confirm to IS 13801-1993. Installation includes 150mm GSB base with 50 mm 1-2-4 PCC base and 1-5 mortar mix for fixing of tiles with level to match with footpath concrete paver blocks and as directed by Engineer in charge. Item also includes all materials, labour, equipments, tools, watering, cleaning etc. complete.Scope of work also includes strong vibratory compaction above	Sqm	396.00		
2.4	Kerb Paint- Painting two coats with Synthetic Enanel paint over a coat of enamel primer on concrete surface including cost, conveyance,taxes, of all materials, TandP,labour etc.complete as per technical Specification in clause 803 of MoRTH (Vth Revision) and as per direction of Engineer-In-Charge.	Sqm	231.00		
2.5	**Manhole Cover- Providing and Fixing RCC Precast manhole frame with cover as per specifications and drawings. Manhole cover shall be as per ISI mark**	No.	33.00		
3.1	Visual Improvement- Other Civil Works Shared zone paving- Provision at junctions, raised pedestrian crossing and No- vehicle zone. Supply and laying of 60 mm thick M-30,Modular Paving Stones with PremierShield protection size as per product description. Water absorption- not over 4.5percentage, Compressive strength- 500kg/cu cm, Colours- UV light resistant and as approved by SMC. Installation including 50mm thick compacted bed of coarse sand(pana) with base of 150 mm compacted GSB, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.complete as per clause 410 of MoRTH Specification (Vth Revision) complete including cost, conveyance, of all materials, TandP, labor etc., Scope of work also includes strong vibratory compaction above paver blocks	Sqm	3500.00		

Schedule B16- for Road R16-Salasar Hanuman Road (NVZ) - 18m wide - and Length - 0.66 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
4.1	Visual Improvement- Signage and Street Furniture CautionaryTraffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 90 x 90 x 90 cms. Equilateral triangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	3		
4.2	Mandatory Traffic Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 60 cms. diameter circle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mmas required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	8		
4.3	Facility/ Informatory Signage- Providing and fixing sign boards made out of 2 mm aluminium sheet- size 80 x 60 cms. Rectangle as per design of IRC 67-2012. Pre treated with phospheting process and acid etching- coated with one of best quality epoxy primer and two coats of best quality epoxy paint- reflectorised with retro reflectivesheeting as per latest M.O.S.T. Specifications- 3.1 m long stand post and frame fabricated from suitable size iron angle of 35 x 35 x 3 mm, 75 x 75 x 6 mm as required- painted with best quality epoxy coatings in black and white bends. The details of symbol for each board shall be as per the instruction of engineer in charge. The fixing as site shall be in 1-2-4 CC block of size 45 x 45 x 60 cms. for each leg. including excavation, curing etc. complete under the supervision of engineer in charge (B) High intensity grade.	Nos	5		
4.4	BR1- City Information Boards- Provision of 2nos at major junctions (placed diagonally opposite), and as directed by Engineer In-charge.Supply and install City Information Panel equipment with information area 600-900mm x 600-900mm double sided. It shall be made of Aluminium frame work, 8 mm toughened glass and electronic circuit to control its lighting, and the touch panel. It shall have 2 glazed doors, hinged on top of panel and kept in open position with gas struts. The structure shall be designed to withstand wind load according to regulations.The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. CIP shall be installed at major public spaces, and in the market areas, equipped with touch/ smart panels. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-04	Nos	2		

Schedule B16- for Road R16-Salasar Hanuman Road (NVZ) - 18m wide - and Length - 0.66 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
4.5	BR2- Advertisement Poles- Provision along footpath mininimum spacing 100m c/c, and as directed by Engineer In-charge. Supply and install Advertisement poles display equipment with information area showing 300-450mm x 750-1000mm double sided, made of Aluminium frame work, 8mm toughened glass/ acrylic and electronic circuit to control its lighting. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure as per the regulations. • Use of steel , aluminium and toughened glass for better durability. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-05	Nos	33		
4.6	BR3- Wayfinding Boards- Provision of 2nos at every junction (placed diagonally opposite), as directed by Engineer In-charge. Supply and install Information Panel of dimension 600-900mm x 900-1200mm, on two sides. The Furniture shall be composed of a panel assembled on a metallic base, display systems shall ensure that the posters are rightly envisioned for a good display quality. The display systems can have fixed or scrolling faces. The scrolling posters shall be driven by plastic belts in order to minimise the noise. The structure shall be safe to withstand wind pressure, and all other relevant regulations. The metal body, shall be powder coated and with graphic imprints that celebrate the Textile Market of Surat. It shall not hinder pedestrian movement. The Foundation slab shall be made in min M25 concrete. The cast iron , nuts bolts , shall be rust proof , deep galvanized , powder coated etc . The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-03	Nos	2		
4.7	Seating Bench- Provision along footpath mininimum spacing 200m c/c, or as directed by Engineer In-charge. Supply and install Seating of 1.75m L x 0.6m W manufactured of M-30 grade concrete using vibro compaction process and suitably reinforced for long use, treated with special anti-corrosive, water proof coating so as to make the surface glossy and water proof. To accomodate 3-4 persons. It shall be placed on footpath in a way that the pedestrians pass-by without disturbing the user. Installation as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.Detail technical specification sheet no. SF-01	Nos	7		
4.8	**Dual system Litter Bins- Provision at Bus stops and Kiosks minimum spacing 400m c/c, and as directed by Engineer In-charege. Supply and install Dual Bin system make SS SF 304, for a rust free life capacity of 50ltrs each. The Foundation slab shall be made in min M25 concrete. The cast iron nuts, bolts, shall be rust proof deep galvanized powder coated etc The stainless steel shall be treated to be resistant in all weathers.Detail technical specification sheet no. SF-02**	Nos	4		
4.9	Concrete Bollards- Provision of bollards at minor junctions, plot entry points and pedestrian crossing with a min spacing of 1.2m c/c or as directed by Engineer In-charge. Providing and fixing of Concrete Bollards of M-30 grade and size 950 mm (ht) x 150mm (dia), purchased from SMCs approved vendor, manufactured of reinforced concrete by vibro compaction method using FRP/ steel moulds as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	538		
4.10	Bicycle Stand hoops- Spacing 400m apart, with 2nos at each location. Supply and install customised cycle stand at bus stops, junctions, market area and near public buildings. The cycle stand shall be of mildsteel or cast iron with finished hot dip Galvanised as standard, can be powder coated as per proposed design, and as directed by Engineer in charge. Detail technical specification sheet no. SF-09	Nos	9		

Schedule B16- for Road R16-Salasar Hanuman Road (NVZ) - 18m wide - and Length - 0.66 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
4.11	**Vending Kiosk- Spacing 600m apart, with 3 Kiosks at each location. Supply and install Vending Kiosk near junctions, below flyovers, near public buildings, market area etc. The kiosk shall be have display racks, storage space and a back lit display panel. The kiosk shall have natural ventilation and extendable canopy to protect from sunlight and rain. The height of the kiosk between ground and canopy shall be at-least 2250mm, so that it doesn't hinder the pedestrian movement. Materials used shall be steel/aluminium with anti corrosion treatment. Installation as directed by Engineer In-charge.**	Nos	33		
4.12	**Drinking Water Fountain- Spacing 600m c/c. SS Cabinet finish shall be Sandstone powder coated paint on galvanized steel or brushed stainless steel. Cooling system shall use R-134a refrigerant. Shall be listed by Underwriters Laboratories to U.S. and Canadian standards and conform to European Union Directives. Installation as directed by Engineer In-charge.**	Nos	2		
5.1	Visual Improvement- Landscape Works Tree grate- Supply and fixing of Concrete Tree Gaurds 900 x 900 x 40 mm, manufactured with M30 grade make in shot blasted finish and colours as approved by SMC. Parameters and as per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job.	Nos	176		
5.2	Tree Plantation- Spacing 12m c/c. Planting of Trees and their Maintenance for five Years (a) Providing and making tree pit of size 800 mm dia. It includes excavation up to 1200 mm depth including removal of the debris, metal and achieving the natural earth level sufficient for the growth of the trees. First 600 mm depth of pit shall be filled with garden soil. RCC hume pipe of 700 mm dia. NP3 class of 500 mm height to be placed on the filled garden soil and outside area of the Hume pipe to be filled with the good quality earth. Pit shall be filled with the garden soil, farm yard manure and required pesticides. etc. completed as directed by Engineer-In-Charge. (b) Supplying and planting of trees of specified variety in ready tree pit (as per above item) upto required depth, termite treatment, and planting of plants (height 8ft-10ft above bags/pots). Soil mounts 4inches-6inches in size. Tree plantation should be carried on neatly accurately and with perfection as per drawing and instruction given by the EIC. Providing and fixing tripod made of wooden balli, height 1.50mtr. Top bracket to be 300mm x 300mm. leg embedded in ground up	Nos	176		
5.3	Shrub Plantation- For medians and separators. Making a Shrub—Pit, supply and Planting a Shrub - (a) Excavating the ground to a required depth of 300mm, removing and conveying unwanted stuff to a required distance as directed. (b)Application of anti—termite treatment in form of 15 ml of Chloropyriphos per plant on the walls and base of the pit. (c) Filling the pit with compost. (ratio 1 manure - 3 good earth - 1 sand by volume) (d)Flooding with water at least 15 ltr. Per plant , dressing including removal of rubbish and surplus earth, Maintenance of plants for a period of 36 months, replacement of any dead and sickly plants in this period, supply and spraying of insecticides as required. (e) Supply and planting of the shrub/climbers as per botanical name and specification mentioned.	Rm	660		

Schedule B16- for Road R16-Salasar Hanuman Road (NVZ) - 18m wide - and Length - 0.66 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
5.4	Planter Box- Providing Ribbed Planter Overall Height - 380 mm, Top Max Width = 508 mm, Bottom Max Width = 203mm • Colours Available -Natural Gray Concrete or Integral Pigment Colour as per client specifications Drainage Hole Options- No drainage hole (for interior applications) or approximate 1 inch hole. Manufactured from M-30 grade concrete using a combination of vibro-compaction and spinning processas per the direction of Engineer in charge, complete incl. all consumables , TandP and Labours required for the job. Plante box to be provided along the footpath with 600m c/c distance apart, and at major junctions, as directed by Engineer In-charge.	Nos	7		
5.5	Bollard Lights- Provision at major junctions 1.2m c/c. Integral IP 44 bollard, housing in die cast aluminium with UV stabilised polycarbonate diffuser suitable for 1x18 W and 1x26W CFL (TC-D) Lamps. Installation as directed by Engineer In-charge.	Nos	12		
5.6	Up- Lighter- Integral bush light luminaire, black powder coated housing. 3 x 3W warm white LED enclosed with glass cover in frame. Mounting bracket with aiming the objects. Ingress protection-IP 65. Installation as directed by Engineer In-charge.	Nos	176		
6.1	Visual Improvement- Road Works Road marking- Providing and applying 2.50mm thick hot applied thermoplastic road marking of white / yellow colour on bituminous / concrete / surface with fully automatic machines as per detailed drawings / engineers instructions for Lane markings, edge markings / arrows. this includes- edge line marking of 150mm width, center line marking of 100mm width, For pedestrian markings at junctions (zebra crossing), for pedestrian markings at junctions (stop line), letter markings at junctions, direction arrow markings at junctions and for lane markings of 150mm width. Execution of work as directed by Engineer In-charge.	Sqm	506.00		
6.2	Trolley lane marking-2m wide, Providing and Laying of PLASTITRAK, Roll-on Surfacing Material -A Solvent Free, High Build, Two pack, Seamless, Tough, skid resistant 1.0-1.5 mm thick red (or as required) based on Gloss and color retaining Acrylic Cross Linking Resin System for Trolley lane and similar applications including surface cleaning and cost of all material etc. complete. Execution of work as directed by Engineer In-charge. It also includes direction arrow markings at junctions and for lane markings of 150mm width.	Sqm	2640.00		
6.3	Raised pavement markers- supplying of moulded shank raised pavement markers made of poly carbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg space tested in accordance to ASTM D 4280 Type H and complining to specifications of category A of MORTH Circular numbers RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50mm, 100mmand 100mm respectively with minimum reflective area of 13Sqcm on each side and the slope to the base shall be 35plus minus 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 plus minus2mm and height not less than 30plus minus2mm) on the body is to be a minimum value of 500Kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer. (3M or equivelant Band). Spacing for RPM along the road length to be 4m c/c, as directed by Engineer In-charge.	No	759.00		
6.4	**Solar RPM- Providing and fixing of Solar RPM, made of highly engineered polycarbonate material, with superior battery performance and increased run time with the use of 2 LEDs and Retro Reflective Lens. Solar RPM to be provided at pedestrian crossings and at junctions (2m c/c) as directed by Engineer In-charge.**	No	12.00		

Schedule B16- for Road R16-Salasar Hanuman Road (NVZ) - 18m wide - and Length - 0.66 Km					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
6.5	Speed Breaker- Providing and Fixing of coloured Asphalt pre fabricated speed breakers with design is as per technical specification SF-11 and location is a s per approved by traffic police and SMC	sq.m	80.00		
	Total for Item 1 to Item 6				

Schedule B18 - Recharge Pit

Sr.No	item description	Unit	Tender Qty	Rate	Amount
1	Excavation for pipe line trenches incl. all safety provisions using site rails and stacking excavated stuff up to a lead of 90 mts. cleaning the site etc. complete for lifts and strata as specified. Dense and medium soil				
	(a) Depth 0.0 to 1.5 mt	Cum	1,658.00		
	(b) Depth 1.5 to 3.0 mt.	Cum	1,658.00		
	(c) Depth 3.0 to 5.0mt.	Cum	2,211.00		
	(c) Depth above 5. mt	Cum	1,603.00		
2	Filling in foundation and plinth with murrum or selected soil in layers of 20cm thickness including watering, ramming and consoldiating etc complete (upto 10ton)	Cum	3,916.00		
3	Providing and laying cement concrete 1-2-4 (1cement -2 coarse -4 stone aggregate 20mm nominal size) and curing complete excluding formwork	Cum	111.00		
4	Providing and cast in situ C.C. in grade M-25 proportions of ingredients as per mix design by weigh batching using granite, quartzite trap metal of size 12 mm to 20 mm and or 6 mm to 12 mm inducing scaffolding centring formwork, needle vibrated consolidation, curing and hydraulic testing etc. complete (excluding cost of reinforcement) up to 6 meter height /depth Av. G.L.for all water retaining structures				
	a) Bottom Slab	Cum	189.00		
	b) Vertical surfaces such as wall (Any thickness)	Cum	632.00		
	c) Slab	Cum	57.00		
5	Supplying, cutting, binding and placing in position steel as per plan and design and as Per ISS 2502 including cost of steel and bending wire forreservior/structure only including lift up to 6 meter height or depth below G.L. for all diameters Heigh yeild strength deformed (HYSD) BARS/COLD TWISTED deformed (CTD) bars comfirming to IS 1786 (latest) Fe415 grade	MT	66.00		
6	Providing and laying of polypropylene steps.	No.	2.00		
7	Providing and laying weep hole in RCC vertical wall of SWD by using 110 mm diameter PVC pipes of 6 kg/cm2 fixing as per drawing complete etc.at interval of 2.00 mt C/C in staged manner	Rmt	2.00		
8	Providing and Laying of Geotextile-Geotextile membrane, 120 GSM, Non Woven 100percentage polyster of thickness 1 to 1.25mm bonded to the membrane with intermittant touch by heating the membrane by butane torch as per manufacturer recommendations.	Sq. M	351.00		
9	Stone Boulders- Supplying, filling, spreading and levelling stone boulders of size range from 5cm to 20 cm, in recharge trench, in the required thickness, for all leads and lifts, all complete as per direction of Engineer-in-charge.	Cum.	263.00		

Schedule B18 - Recharge Pit					
Sr.No	**item description**	**Unit**	**Tender Qty**	**Rate**	**Amount**
10	Gravels- Supplying, filling, spreading and levelling Gravels of size range from 5mm to 10mm, in recharge Trench, over the existing layer of boulders, in the required thickness, for all leads and lifts, all complete as per direction of Engineer-in-charge.	Cum.	263.00		
11	Coarse Sand- Supplying, filling, spreading and levelling coarse sand of size range from 1.5mm to 2mm, in recharge trench, in the required thickness over gravel layer, for all leads and lifts, all complete as per direction of Engineer-in-charge.	Cum.	263.00		
12	Providing and carting, conveying stacking, lowering, laying and jointing NP3 class R.C.C.pipes in standard length for either collar joint, spigot and socket rubber ring roll on joint or rubber ring flush confined joints in the trenches in line and gradient, making use of levelling instruments only. Incase of collar joint pipes and using required to use jute, bitumine and joint to be filled with cement mortar 1-1 (1 cement - 1 fine sand) making 45 degree fillet outside the end of collars and specials to be closed and water tight including satisfactory flow testing after laying etc. complete. In case of rubber ring joint pipe, the pipe shall be laid in such a way than it should be pushed in systematic manner so as to achieve the leak proof joint by using rubber ring as per relevant IS.				
a	Avg 1000mm dia pipe	RM	32.00		
13	Supply and Installation of Flowmeter- Supply of IP-68, factory calibrated full bore electromagnetic flow meter with flanged connection, flow sensor, indicator, transmitter and totaliser with all accessories viz. Power and control cables, cabinets, hardwares, etc Flow Sensor- Neoprene/Polyurethene lining, DC pulsed, SS 316 electrods, CS/SS 316 flanges, Fully welded / SS304 sensor construction and housing. Flow transmitter / converter- Microprocessor based / Modular design/ HART type, 2 line back lit LCD for indication of actual flow rate, forward, reverse, sum totaliser display, one current (4-20 mA) / one scalable pulse / one status output, Dia cast alluminium with PU finish and glass window encloser, 10 meter length sensor cable.	No.	1.00		
14	Constructing Brick Masonry Flowmeter Chamber of 2.5 X2.5X2.5 M, internal dimension with necessary excavation refilling 350 mm th Br. masonary in C.M 1-5,150 mm th. p.c.c. and benching in c.c. 1-2-4,12mm th. plaster in C.M. 1-3 for inside and cement plasterng. Brick work using common burnt clay building bricks having crushing strength not less than 35 kg/sqcm in foundation and plinth in cement mortar 1-5	No.	1.00		
15	Providing and LayingInlet / outlet Pipe and Connection to Flowmeter Chamber	No.	1.00		
	Total for Item 1 to 15				

Schedule C - Maintenance of Tendered works for period of Five years

Maintenance of Tendered works for period of Five years

Item No	Description	Unit	QTY	Rate (In Rs.)	Amount (In Rs.)
1	Maintenance of all the works under schedule B1 to B18 during First year of Maintenance Period	Job			
2	Maintenance of all the works under schedule B1 to B18 during Second year of Maintenance Period	Job			
3	Maintenance of all the works under schedule B1 to B18 during Third year of Maintenance Period	Job			
4	Maintenance of all the works under schedule B1 to B18 during Fourth year of Maintenance Period	Job			
5	Maintenance of all the works under schedule B1 to B18 during Fifth year of Maintenance Period	Job			
	Total Amount (In Rs.) (1 +2				

SCHEDULE D - Base Rate (To be Quoted by Bidder)

#REF!	#REF!	#REF!	Rate
	Bidder shall quote the rate for various Items as mentioned in Schedule. The basis of payment will be the actual quantities of work carried out, as measured and verified by the Engineer-in-Charge.		
1	Bidder shall quote Rate considered by him under various items of Demolition. The Rate quoted shall be end rate i.e including demolition , Stacking into designated area with all leads and lifts,carting away of debris within City limits , etc complete. The rate quated shall be considered as a base rate for payment.		
1.1	Street Furniture	No	
1.2	Footpath	Sqm	
1.3	Manhole Covers	No	
1.4	Existing Medians	M	
1.5	Trees	No	
2	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete. Only Bitumen will be Provided by the Employer- SSCDL.Transportation of same to the Workplace shall be Scope of Contractor		
	(i) Carpeting 75 to 100mm thick (Compacted)	MT	
	(ii)Re-carpeting 50 to 75mm thick (Compacted)	MT	
3	Providing and Laying bitumen painting by mechanical sprayer on B.T. surface using bitumen at the rate5.0 Kg/10.0smt and spreding stone dust at the rate0.03 cumt./10.0smt on painted surface including operating cost of contractors own equipment, fuel, lubricants, carting of required materials. all labour and material cost preparing surface by brushing with mechanical broom/ compressed air and finally fanning the leaned surface with gunny bags to remove all loose dirtsetc. complete. Only Bitumen will be Provided by the Employer- SSCDL.Transportation of same to the Workplace shall be Scope of Contractor	MT	
4	Providing and Laying 25mm to 50mm thick compacted BITUMINOUS CONCRETE using aggregates as per gradation and percentage of bitumen for mixing shall be as arrived from mix design, provided in no case bitumen percentage shall be less than 5.5percentage by Wt. of total mix as binder by drum mix type hot mix plant and laying by sensor paver finisher including consolidation by rollers as specified including providing and operating plant, sensor paver and machinery, cost of fuel, oil, lubricant and labour charges including cost of aggragate and filler (if found required as per mix design) etc. complete. Only Bitumen will be Provided by the Employer- SSCDL.Transportation of same to the Workplace shall be Scope of Contractor		
	(i) Carpeting 50 mm thick (Compacted)	MT	
	(ii)Re-carpeting 40 to 50mm thick (Compacted)	MT	
5	Provding and Applying evenly TACK COAT on road surface with bitumen VG-30 grade at the rate as specified below including heating the bitumen and spraying the same. Only Bitumen will be Provided by the Employer- SSCDL.Transportation of same to the Workplace shall be Scope of Contractor		
	(A) at the rate 7.5 Kg./10 Sq.mt.	Sqm	
	(B) at the rate 5.0 Kg./10 Sq.mt.	Sqm	
	(C) at the rate 3.0 Kg./10 Sq.mt.	Sqm	