ICB No: KSCCL/Smart Street-1/2017

Project Name: **Implementation of Smart City Projects under Smart City Mission in Kakinada.**

Name of Work: **Request for Proposal (RFP) for Procurement of Implementing Agency for "Urban Street Scaping of main road from Sarpavaram Junction to Balayogi Statue Junction" as Smart Street Under Smart City Mission**

Employer : Kakinada Smart City Corporation Limited (KSCCL)
City : Kakinada
State: : Andhra Pradesh
Country: : India

Bid Issued on: 22 Feb2017

Kakinada Smart City Corporation Limited (KSCCL)

Ref:KSCCL/Smart Street/1 /2017, dt: 22-02-2017

REQUESTFORPROPOSAL(RFP)

KSCCL desires to invite Request for Proposal (RFP) for Procurement of Implementing Agency for **"Urban Street Scaping of main road from Sarpavaram Junction to Balayogi Statue Junction" as Smart Street Under Smart City Mission**. The detailed RFP including EMD,TOR, Eligibility criteria etc., can be downloaded from website of www.apeprocurement.gov.in and available at www.kakinada.cdma.ap.gov.in from 25thFeb' 2017 onwards. ***The last date for online submission of bids is 22nd March 2017 up to 5.00 Pm. The date of Pre-bid Conference on 08-03-2017 at 11:00 AM.***

For more details contact:

Kakinada Smart City Corporation Ltd.
Web : www.kakinada.cdma.ap.gov.in
Email:smartcityofficekkd@gmail.com, kakinadacorporation@gmail.com

Contract: 9849906506 & 9849906516

Sd/-S.Aleem Basha,

Managing Director & CEO,
KSCCL

Key Dates

S. No.	Activity	Start Date	Time
1	Release of RFP	23-Feb-2017	16:00 Hrs
2	Last date of receipt of queries on RFP	6-Mar-2017	17:00 Hrs
3	Pre-bid Meeting date Venue: Conference Hall, Municipal Corporation, Cinema road, Kakinada, AP, India	8-Mar-2017	11:00 Hrs
4	Posting of response to queries	10-Mar-2017	17:00 Hrs
5	Last date for submission of Bids - Electronically	22 -Mar-2017	17:00 Hrs
6	Physical Submission: Venue: o/o KSCCL, D.no 2-33-10, Pekevari street. Perraju Peta, Kakinada	24-Mar-2017	11:00 Hrs
7	Date of opening of technical bids	24-Mar-2017	11:30 Hrs
7	Date of opening of Commercial bids	Will be informed later	

For more details contact:

Kakinada Smart City Corporation Ltd.
Web : www.kakinada.cdma.ap.gov.in
Email:smartcityofficekkd@gmail.com
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Bidding Document

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DISCLAIMER

The information contained in this Request for Proposal document (the "RFP") or subsequently provided to Bidder(s), whether verbally or in documentary or any other form by or on behalf of the Employer or any of their employees or advisors, is provided to Bidder(s) on the terms and conditions set out in this RFP and such other terms and conditions subject to which such information is provided.

This RFP is not an agreement and is neither an offer nor invitation by the Employer to the prospective Bidders or any other person. The purpose of this RFP is to provide interested entities with information that may be useful to them in preparing their bids (the "Bid") including all the necessary submissions and the financial offers pursuant to this RFP. This RFP includes statements, which reflect various assumptions and assessments arrived at by the Employer in relation to the Project. Such assumptions, assessments and statements do not purport to contain all the information that each Bidder may require. This RFP may not be appropriate for all persons, and it is not possible for the Employer, its employees or advisors to consider the investment objectives, financial situation and particular needs of each party who reads or uses this RFP. The assumptions, assessments, statements and information contained in this RFP may not be complete, accurate, adequate or correct. Each Bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this RFP and obtain independent advice from appropriate sources.

Information provided in this RFP to the Bidder(s) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The Employer accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

The Employer, its employees and advisors make no representation or warranty and shall have no liability to any person, including any Bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this RFP or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the RFP and any assessment, assumption, statement or information contained therein or deemed to form part of this RFP or arising in any way during the Bidding Process.

The Employer also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this RFP.

The Employer may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this RFP.

The issue of this RFP does not imply that the Employer is bound to select a Bidder or to appoint the Selected Bidder for the Project and the Employer reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the Employer or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and the Employer shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation or submission of the Bid, regardless of the conduct or outcome of the Bidding Process.

PART 1 – Bidding Procedures

Section I- Instructions to Bidders

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Section I - Instructions to Bidders

A. General	
1. Scope of Bid	1.1 In connection with the Invitation for Bids **specified in the Bid Data Sheet (BDS)**, the Employer, as **specified in the BDS**, issues this Request for proposal (the **"RFP"**) (Bidding Documents) for the procurement of the Works as specified in Section VII, Employer's Works Requirements. The name, identification of this bidding are **specified in the BDS**.
	1.2 Throughout this Bidding Document: (a) the term "in writing" means communicated in written form and delivered against receipt or electronically; (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and (c) "day" means calendar day.
2. Source of Funds	2.1 Employer has received financing (hereinafter called "funds") from the Government of India (GoI) and Government of Andhra Pradesh (GoAP)toward the project named in the BDS. The Employer intends to apply a portion of the funds to eligible payments under the contract(s) for which these Bidding Documents are issued.
3. Corrupt and Fraudulent Practices	3.1 It requires that employer, as well bidders, suppliers, contractors and their agents (whether declared or not), observe the highest standard of ethics during the procurement and implementation/execution of such contracts. In pursuance of this Act, The Employer requires compliance to corrupt and fraudulent practices as set forth in Section VI. 3.2 In further pursuance of this policy, Bidders shall permit and shall cause its agents (whether declared or not), sub-Contractors, sub-consultants, service providers, or suppliers and any personnel thereof, to permit the Employer to inspect all accounts, records and other documents relating to any prequalification process, bid submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Employer.

4. Eligible Bidders	4.1	A Bidder may be a firm that is a private entity, or a government-owned entity—subject to ITB 4.5—or any combination of them in the form of a joint venture (JV), under an existing agreement, or with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture or consortium, all members shall be jointly and severally liable for the execution and implementation of the Contract in accordance with the Contract terms.The JV shall nominate a Representative (lead bidder) who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution. The limit on the number of members in a JV. **isspecified in the BDS**.
	4.2	A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder: (a) directly or indirectly controls, is controlled by or is under common control with another Bidder; or (b) receives or has received any direct or indirect subsidy from another Bidder; or (c) has the same legal representative as another Bidder; or (d) has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or (e) participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which such Bidder is involved. However, this does not limit the inclusion of the same subImplementing Agency in more than one bid; or (f) or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the bid; or (g) or any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the Contract

	implementation; (h) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; (i) has a close business or family relationship with a professional staff of the Employer (or of the Project Management Consultant of the Employer) who: (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the contract, and/or the bid evaluation process of such contract; or (ii) would be involved in the implementation or supervision of such contract unlessthe conflict stemming from such relationship has been resolved in a manner acceptable to the Financing Agency (GoI and GoAP) throughout the procurement process and execution of the contract.
	4.3 A Bidder may have the nationality of any country, subject to the restrictions pursuant to ITB 4.7. A Bidder shall be deemed to have the nationality of a country if the Bidder is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed sub-Implementing Agencies or sub-consultants for any part of the Contract including related Services.
	4.4 A Bidder that has been sanctioned by Employerin accordance with the above ITB 3.1, including in accordance with the Prevention of Corruption Act 1988 (INDIA) and its subsequent amendments on Preventing and Combating Corruption shall be ineligible to be prequalified for, bid for, or benefit from a Employer's contract, financially or otherwise and as **specified in the BDS.**

	4.5 Bidders that are Government-owned enterprises or institutions in the India may participate only if they can establish that they : (i) are legally and financially autonomous (ii) operate under commercial law, and (iii) are not dependent agencies of the Employer. To be eligible, a government-owned enterprise or institution shall establish to the Employer's satisfaction, through all relevant documents, including its Charter and other information the Employer may request, that it: (i) is a legal entity separate from the government (ii) does not currently receive substantial subsidies or budget support; (iii) operates like any commercial enterprise, and, inter alia, is not obliged to pass on its surplus to the government (GoI or State Govt.(s)), can acquire rights and liabilities, borrow funds and be liable for repayment of its debts, and can be declared bankrupt; and (iv) is not bidding for a contract to be awarded by the department or agency of the government(GoI or State Govt.) which under their applicable laws or regulations is the reporting or supervisory authority of the enterprise or has the ability to exercise influence or control over the enterprise or institution.
	4.6 4.6.1 The sole bidder or lead bidder and each member of the consortium should never be under suspension/ debar/ block listing from bidding by GoI or State Govt.(s)/ public sector units as on bid submission date and necessary notarized declaration on Rs 100/- stamp paper should be enclosed as per the enclosed proforma.
	4.6.2 The sole bidder or lead bidder and each member of the consortium who have not applied/ availed CDR nor have been subjected to SDR during last five financial years are eligible to participate in the Bid. A certificate to that affect from a registered Chartered Accountant shall be uploaded by the bidder.
	4.7 Firms and individuals may be ineligible if so indicated in Section V and (a) as a matter of law or official regulations, the Employer's country prohibits commercial relations with that country, provided that the Employer is satisfied that such exclusion does not preclude effective competition for the supply of goods or the contracting of works or services required; or the Employer's country prohibits any import of goods or contracting of works or

	services from that country, or any payments to any country, person, or entity in that country. 4.8 A Bidder shall provide such evidence of eligibility satisfactory to the Employer, as the Employer shall reasonably request.
5. Eligible Materials, Equipment and Services	5.1 The materials, equipment and services to be supplied under the Contract may have their origin in any country subject to the restrictions specified in Section V, Eligible Countries, and all expenditures under the Contract will not contravene such restrictions. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment and services. 5.2 For purposes of ITB 5.1 above, "origin" means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.
B. Contents of Bidding Document	
6. Sections of Bidding Document	6.1 The Bidding Document consist of Parts 1, 2, and3, which include all the Sections specified below, and which should be read in conjunction with any Addendaor corrigendaissued in accordance with ITB 8. **PART 1 Bidding Procedures** Section I - Instructions to Bidders (ITB) Section II - Bid Data Sheet (BDS) Section III - Evaluation and Qualification Criteria Section IV - Bidding Forms Section V - Eligible Countries Section VI –Corrupt and Fraudulent Practices **PART 2 Works Requirements** Section VII - Works Requirements **PART 3 Conditions of Contract and Contract Forms** Section VIII - General Conditions of Contract (GCC) Section IX - Particular Conditions of Contract (PCC) Section X - Contract Forms
	6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Document.

	6.3 Unless obtained directly from the Employer web portal, the Employer is not responsible for the completeness of the Bidding Documents, responses to requests for clarification, the minutes of the pre-Bid meeting (if any), or Addenda to the Bidding Documents in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Employer's website shall prevail.
	6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Documentsand to furnish with its bid all information and documentation as is required by the Bidding Documents.
7. Clarification of Bidding Document, Pre-Bid Meeting	7.1 A Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address **specified in the BDS** or raise its inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is receivedprior to the deadline for submission of bids within a period **specified in the BDS**. The Employerupload its response on employer's website, including a description of the inquiry but without identifying its source. **If so specified in the BDS**, the Employer shall also promptly publish its response at the web page identified in the BDS. Should the clarification result in changes to the essential elements of the Bidding Documents, the Employer shall amend the Bidding Documents following the procedure under ITB 8 and ITB 22.2.
	7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction and/or implementation of the Works. The costs of visiting the Site shall be at the Bidder's own expense.
	7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose (upon a written request from bidder) of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
	7.4 **If so specified in the BDS**, the Bidder's designated representative is invited to attend a pre-bid meeting. The purpose of the meeting will be to clarify issues and to answer questions

	on any matter that may be raised at that stage.
	7.5 The Bidder is requested, to submit any questions in writing, to reach the Employer not later than period specified in BDS before the meeting.
	7.6 Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by Bidders and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3. Any modification to the Bidding Documents that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting. Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
8. Amendment of Bidding Document	8.1 At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Documents by issuing addenda.
	8.2 Any addendum issued shall be part of the Bidding Documents and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.The Employer shall also promptly publish the addendum on the Employer's web page in accordance with ITB 7.1.
	8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB 22.2.
C. Preparation of Bids	
9. Cost of Bidding	9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process. 9.2 The RFP can be downloaded from the website and necessary at the cost specified in the BDS shall be paid in the form of DD and shall be enclosed along with physical submission of bid.
10. Language of Bid	10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language **specified in the BDS**. Supporting

	documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language **specified in the BDS**, in which case, for purposes of interpretation of the Bid, such translation shall govern. The translation shall be made by approved/authorized/licensed translator as **specified in the BDS**
11. Documents Comprising the Bid	11.1 The Bid shall comprise the following: (i) Letter of Bid in accordance with ITB 12; (ii) Completed Schedules,in accordance with ITB 12 and 14:**as specified in the BDS**; (iii)Bid Security in accordance with ITB 19.1; (iv)Alternative bids, if permissible, in accordance with ITB 13; (v) Written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2; (vi)Documentary evidence in accordance with ITB 17 establishing the Bidder's qualifications to perform the contractif its Bid is accepted; (vii) Technical Proposal in accordance with ITB 16; and (viii) Any other document **required in the BDS**. 11.2 In addition to the requirements under ITB 11.1, bids submitted by a Joint Venture (JV) shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all members and submitted with the bid, together with a copy of the proposed Agreement. 11.3 The Bidder shall furnish in the Letter of Bid information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid.
12. Letter of Bid and Schedules	12.1 The Letter of Bid and Schedules shall be prepared using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 20.2. All blank spaces shall be filled in with the information requested.

13. Alternative Bids	13.1 Unless otherwise **specified in the BDS**, alternative bids shall not be considered.
	13.2 When alternative times for completion are explicitly invited, a statement to that effect will be **included in the BDS**, as will the method of evaluating different times for completion.
	13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding Document must first price the Employer's design as described in the Bidding Document and shall further provide all information necessary for a complete evaluation of the alternative by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.
	13.4 When **specified in the BDS**, Bidders are permitted to submit alternative technical solutions for specified parts of the Works.Such parts will be **identified in the BDS** and described in Section VII.*Employer's*Works Requirements. The method for their evaluation will be stipulated in Section III.Evaluation and Qualification Criteria.
14. Bid Prices and Discounts	14.1 The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Financial Bid and in the Schedules shall conform to the requirements specified below.
	14.2 The Bidder shall submit a bid for the whole of the works described in ITB 1.1 by filling in prices for all items of the Works, as identified in Section IV. Bidding Forms. In case of admeasurement contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities.
	14.3 The price to be quoted in the Letter of Financial Price Bid,in accordance with ITB 12.1, shall be the total price of the bid, excluding any discounts offered.
	14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Bid, in accordance with ITB 12.1.

	14.5 **Unless otherwise provided in the BDS** and the Conditions of Contract, the prices quoted by the Bidder shall be fixed. If the prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data in Section IV- Bidding Forms and the Employer may require the Bidder to justify its proposed indices and weightings. 14.6 If so specified in ITB 1.1, bids are invited for individual lots (contracts)or for any combination of lots (packages). Bidders wishing to offer discounts for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITB 14.4, provided the bids for all lots (contracts) are opened at the same time.
	14.7 All duties, insurances, taxes, and other levies payable by the Implementing Agency under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the total bid price submitted by the Bidder.
15. Currencies of Bid and Payment	15.1 The currency(ies) of the bid and the currency(ies) of payments shall be as **specified in the BDS**.
16. Documents Comprising the Technical Proposal	16.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV, Bidding Forms, in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.
17. Documents Establishing the Qualifications of the Bidder	17.1 In accordance with Section III, Evaluation and Qualification Criteria, to establish its qualifications to perform the Contract, the Bidder shall provide the information requested in the corresponding information sheets included in Section IV, Bidding Forms.
	17.2 If a margin of preference applies as specified in accordance with ITB 33.1, domestic Bidders, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITB 33.1.

18. Period of Validity of Bids	18.1 Bids shall remain valid for the period **specified in the BDS** after the bid submission deadline date prescribed by the Employerin accordance with ITB 22.1. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.
	18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended forforty five(45) days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid.Further processing of bids will be done for those bidders who extended their bid validity.
19. Bid Security	19.1 The Bidder shall furnish as part of its bid, a bid security **as specified in the BDS**, in original form in the amount and currency **specified in the BDS**.
	19.2 A Bid Securing Declaration is not applicable.
	19.3 If a bid security is specified pursuant to ITB 19.1, the bid security shall be a demand guarantee in any of the following forms at the Bidder's option: (a) an unconditional guarantee issued by a bank (scheduled commercial bank) or (b) Demand Draft – deleted. from an eligible country on the name of the Employer as **specified in the BDS**. If the unconditional guarantee is issued by a bank located outside the Employer's Country, the issuing bank shall have a correspondent bank located in the Employer's Country to make it enforceable. The bid security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms, or in another substantially similar format approved by the Employer prior to bid submission. The bid security shall be valid for forty five (45) days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.
	19.4 If a bid securityis specified pursuant to ITB 19.1, any bid not accompanied by a substantially responsive bid security shall be rejected by the Employer as non responsive.

	19.5 If a bid security is specified pursuant to ITB 19.1, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the Contract and furnishing the performance security pursuant to ITB 42, bid not later than 30 days upon submission of the performance security by the Successful Bidder.
	19.6 The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.
	19.7 The bid security may be forfeited or the Bid Securing Declaration executed: (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, , or any extension thereto provided by the Bidder; or (b) if the successful Bidder fails to: (i) sign the Contract in accordance with ITB 41; or (ii) furnish a performance security in accordance with ITB 42. (iii) accept arithmetical corrections in accordance with ITB 31
	19.8 The bid security of a JVshall be in the name of the JVthat submits the bid. If the JVhas not been constituted into a legally-enforceable JV, at the time of bidding, the Bid Security shall be in the names of all future members as named in the letter of intent mentioned in ITB 4.1 and ITB 11.2.
	19.9 If a bid security is **not required in the BDS**, and (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, or (b) if the successful Bidder fails to: sign the Contract in accordance with ITB 41; or furnish a performance security in accordance with ITB 42; the Employer may**, if provided for in the BDS,** declare the Bidder ineligible to be awarded a contract for a period of time **as stated in the BDS**.
20. Format and Signing of Bid	20.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 11 and clearly mark it "ORIGINAL TECHNICAL BID". Alternative bids, if permitted in

	accordance with ITB 13, shall be clearly marked "ALTERNATIVE". In addition, the Bidder shall submit copies of the bid in the number **specified in the BDS,** and clearly mark each of them "COPY." In the event of any discrepancy between the online submission, physical submission (original and the copies as the case may be), the online submission shall prevail.
	20.2 The original and all copies of the bid shall be typed or written in indelible ink and scanned copy of the original and shall be signed (physically or digitally as the case may be) by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as **specified in the BDS** and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid where entries or amendments have been made shall be signed or initialed by the person signing the bid.
	20.3 In case the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives. 20.4 Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.
D. Submission and Opening of Bids	
21. Sealing and Marking of Bids	21.1 The Bidder shall enclose the online submission, original and all copies of the bid, including alternative bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL", "ALTERNATIVE" and "COPY." These envelopes containing the online submission and original &the copies shall then be enclosed in one single envelope (Physically and/or digitally as the case may be). Part A: **Qualification documents (Envelop A)** a. Registration: Company or firm registration b. Latest income tax returns along with PAN details. c. Bid security d. Bid document fee e. JV/consortium agreement (if applicable)

	f. Lead member or authorized signatory Part B: **Financial eligibility** a). Minimum average annual turnover Rs INR 80 Crores b). In case of JV/ consortium member refer page section-III clause 3.1 Subject to satisfying the above clause Part C: **Technical Eligibility** a). The bidder shall over the past Ten (10) financial years preceding the bid submission date should have the following experience. **"Design & execution or execution of 4 lane road in urban area with central median or foot path or other services for a length of 4.00 km"**
	21.2 All the envelopes (physically and digitally as the case may be) shall: (a) bear the name and address of the Bidder; (b) be addressed to the Employer as **provided in the BDS** pursuant to ITB 22.1; (c) bear the specific identification of this bidding process specified in accordance with BDS 1.1; and (d) bear a warning (on physically submission envelop) not to open before the time and date for bid opening.
	21.3 If all envelopes are not sealed and marked (Physically and digitally) as required, the Employer will assume no responsibility for the misplacement or premature opening of the bid.
	21.4 The bidder would be required to register on the e-procurement market placewww.apeprocurement.gov.inand submit their bids online.
	21.5 It is mandatory for all the participating bidders to pay electronically the Transaction fee to M/s Vupadi Technologies through "Payment Gateway Service on E-Procurement platform". The Electronic Payment Gateway accepts all Master and Visa cards issued by any bank and Direct Debit facility / Net Banking of ICICI Bank, HDFC to facilitate the transaction. This is in compliance as per G.O Ms No 13 IT & C Dept, dated 5-7-2006. A service tax of 15 % + Bank Charges for Credit Card Transaction of 1.85% on the transaction Amount payable to

	Vupadi Technologies Shall be applicable.
22. Deadline for Submission of Bids	22.1 Bids must be received by the Employer at the address and no later than the date and time **specified in the Key dates at page # 3**. When so **specified in the BDS**, bidders shall submit the bids physically and electronically (scanned copy of the original). Bidders submitting bids electronically in addition to physically submission shall follow the electronic bid submission proceduresspecified in 21.4 and 21.5 above.
	22.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
23. Late Bids	23.1 The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.
24. Withdrawal, Substitution, and Modification of Bids	24.1 A Bidder may withdraw, substitute, or modify its bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be: (a) Prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and (b) Received by the Employer prior to the deadline prescribed for submission of bids, in accordance with ITB 22.
	24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened (physically submitted) to the Bidders and electronically submitted bids shall not be opened of those bidders.
	24.3 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

25. Bid Opening	25.1 Except in the cases specified in ITB 23 and 24, the Employer shall publicly open and read out in accordance with ITB 25.3 all bids received by the deadline, at the date, time and place **specified in the BDS**, in the presence of Bidders` designated representatives who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 22.1, shall be **asspecified in the BDS**.
	25.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening. Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding bid being substituted, and the substituted bid shall not be opened, but returned to the Bidder. No bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening. Envelopes marked "MODIFICATION" shall be opened and read out with the corresponding bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only envelopes (physical and electronic) that are opened and read out at bid opening shall be considered further.
	25.3 All other envelopes holding Technical Bids (envelop A) shall be opened one at a time, reading out: the name of the Bidder and whether there is a modification; the presence or absence of a bid security, or Bid Securing Declaration, asrequired; and any other details as the Employer may consider appropriate. The Letter of Bid is to be initialed by representatives of the Employer attending bid opening in the manner **specified in the BDS**. The Employer shall neither discuss the merits of any bid nor reject any bid (except for late bids, in accordance with ITB 23.1).
	25.4 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, if applicable, including any discounts and alternative bids; and the presence or absence of a bid security. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the

	record shall be distributed to all Bidders. 25.4.2 The bidders whosoever qualified in pre-qualification criteria such as general, financial eligibility and Technical eligibility as per clause 21.1, full technical proposals will be further evaluated.
	25.5 The bidders whosoever qualify in the Technical bids, their financial bid shall be opened online.
	25.6 The Employer shall prepare a record of the online Financial bid opening that shall include, as a minimum: the name of the Bidder and the Bid Price, as per contract, including any discounts offered in the financial bids. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be published on the Employer's web portal.
E. Evaluation and Comparison of Bids	
26. Confidentiality	26.1 Information relating to the evaluation, comparison of bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with the bidding process.
	26.2 Any attempt by a Bidder to influence the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid.
	26.3 Notwithstanding ITB 26.2, from the time of bid opening to the time of Contract award, if a Bidder wishes to contact the Employer on any matter related to the bidding process, it shall do so in writing.
27. Clarification of Bids	27.1 To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its bid given a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids, in accordance with ITB 31.

	27.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Employer's request for clarification, its bid may be rejected.
28. Deviations, Reservations, and Omissions	28.1 During the evaluation of bids, the following definitions apply: (a) "Deviation" is a departure from the requirements specified in the Bidding Document; (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.
29. Determination of Responsiveness	29.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself, as defined in ITB11.
	29.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, (a) if accepted, would: (i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or (ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids.
	29.3 The Employer shall examine the technical aspects of the bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of Section VII (Employer's Works Requirements) have been met without any material deviation, reservation or omission.
	29.4 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
30. Nonconformities	30.1 Provided that a bid is substantially responsive, the Employer may

, Errors, and Omissions	waive any nonconformities in the bid which do not constitute a material deviation, reservation, or omission.
	30.2 Provided that a Technical bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Technical bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
	30.3 Provided that a Technical bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shallbe adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the methods specified in Section III (Evaluation and Qualification Criteria).
31. Correction of Arithmetical Errors	31.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis: (a) only for admeasurement contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected; (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and (c) if there is a discrepancy in the bid price between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
	31.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB 31.1, shall result in the rejection of the Bid.
32. Conversion to Single Currency	32.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as **specified in the**

	BDS.
33. Margin of Preference	33.1 **Unless otherwise specified in theBDS,** a margin of preference for domestic biddersshall not apply.
34. Sub Contractor, Implementing Agency's	34.1 Unless otherwise **specifiedin the BDS**, the Employer does not intend to execute any specific elements of the Works by sub-Implementing Agency's selected in advance by the Employer. 34.2 The Employer may permit subcontracting for certain specialized works as indicated in Section III. When subcontracting is permitted by the Employer, the specialized sub-Implementing Agency's experience shall be considered for evaluation. Section III describes the qualification criteria for sub-Implementing Agency's. 34.3 Bidders may propose subcontracting up to the percentage of total value of contracts or the volume of works as **specified in theBDS.**
35. Evaluation of Bids	35.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.
	35.2 To evaluate a bid, the Employershall consider the following: (a) The selection is based on Quality Cum Least Cost Based selection (QCLBS) as **specified in BDS** (b) The evaluation committee shall evaluate the stage-1 qualification criteria such as preliminary qualifications, financial eligibility, Technical eligibility. The bidder who satisfies these requirements will be made eligible for further evaluation of full technical proposals (stage-II) on the basis of their responsiveness to the Terms of Reference, applying the evaluation criteria, sub-criteria, and point system **specified in BDS**. Each responsive Proposal will be given a technical score (St). A Proposal shall be rejected at this stage if it does not respond to important aspects of the RFP, and particularly the Terms of Reference or if it fails to achieve the minimum technical score **specified in the BDS**. (c) The bidders who score minimum qualifying score or more as **specified in the BDS** shall be treated at par and be considered technically qualified are eligible for opening of financial bid ie stage-3. Their financial bids only be evaluated. (d) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill

	of Quantities (BoQ), Activity Schedule, but including all works items, where priced competitively; (e) price adjustment for correction of arithmetic errors in accordance with ITB 31.1; (f) the additional evaluation factors are specified in Section III (Evaluation and Qualification Criteria);
	35.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
	35.4 If this Bidding Document allows Bidders to quote separate prices for different items under the contract, the methodology to determine the lowest evaluated price of the contract combinations.
	35.5 If the bid for an admeasurement contract, which results in the lowest Evaluated Bid Price, is seriously unbalanced or, front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract. If the increased amount of the performance security is not acceptable to the successful bidder, the Employer may in writing reject the bid of the successful bidder and in such case the next ranked bidder may be called for the negotiations and if such situation still persists the next placed bidder may be called for negotiations and so on till the finalization of the contract or the Employer may cancel the bidding process and recall the RfPs. If the bid price for a particular BoQ is seriously unbalanced ie more than 15% less, the bidder should deposit an additional security deposit for an equivalent amount of deference between the 15% and quoted price after finalization of BOQ and for issuing GFC (Good for Construction drawing).
36. Comparison of Bids	36.1 After finalizing the technically qualified bidders the financial bid will be opened online. The system will arrange the bidders in ascending order (automatic selection will be done in online tenders). For all purposes, lowest bidder will be declared as successful bidder. After finalization of BoQ and for issuing the GFC (good for construction) drawings

37. Qualification of the Bidder	37.1 The Employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the substantially responsive bid meets the qualifying criteria specified in Section III. Evaluation and Qualification Criteria.
	37.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17.1.
	37.3 An affirmative determination of qualification shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the Employer shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder's qualifications to perform satisfactorily.
38. Employer**'s Right to Accept Any Bid, and to Reject Any or All Bids**	38.1 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 contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.
F. Award of Contract	
39. Award Criteria	39.1 Subject to ITB 37.1, the Employer shall award the Contract to the Bidder whose bid has been ranked first (L1) evaluated bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily. 39.2 If more than one bidder quoted the same lowest price, The Employer has the right to declare the successful bidder whose technical score is highest without any prejudice.
40. Notification of Award	40.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, via the Letter of Acceptance included in the Contract Forms, that its bid has been accepted
	40.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.
	40.3 The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with ITB 40.1, requests in writing the grounds on which its bid was not selected.

41. Signing of Contract	41.1 Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.
	41.2 Within fourteen (14) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.
42. Performance Security	42.1 Within twenty-one (21) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the conditions of contract. The performance security shall be the percentage of the contract amount as **specified in the BDS.**The performance security shall be furnished in the form of an **unconditional guarantee issued by a bank (scheduled commercial bank)**from an eligible country on the name of the Employer as **specified in the BDS**. If the unconditional guarantee is issued by a bank located outside the Employer's Country, the issuing bank shall have a correspondent bank located in the Employer's Country to make it enforceable. The performance security shall be submitted either using the Performance Security Form included in Section X. Contract Forms, or in another substantially similar format approved by the Employer prior to bid submission. The performance security shall be valid for sixty (60) days beyond the validity period of the contract, or beyond any period of extension under the contract, if agreed including defect liability period.
	42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security. In that event the Employer may award the Contract to the next ranked evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.
43. Adjudicator	43.1 The Employer proposes the person **named in the BDS** to be appointed as Adjudicator under the Contract, at the hourly fee **specified in the BDS**, plus reimbursable expenses. If the Bidder disagrees with this proposal, the Bidder should so state in his Bid. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the Particular Conditions of Contract (PCC) pursuant to Clause 23.1 of the General Conditions of Contract (GCC), to appoint the Adjudicator.

Section II - Bid Data Sheet (BDS)

A. Introduction

ITB 1.1	The Employeris: Kakinada Smart City Corporation Limited (KSCCL)
ITB 1.1	The name of the bidding process is: Procurement of Implementing Agency for **"Urban Street Scaping of main road from Sarpavaram Junction to Balayogi Statue Junction" as Smart Street Under Smart City Mission**
ITB 2.1	The name of the Project is:Implementation of Smart City Projects under Smart City Mission (SCM) Kakinada
	Maximum number of members in the JV shall be: ***Three (03)***
ITB 4.3	Submission of incorporation or registration certificate of the bidder (all entities in case of JV or proposed sub-Implementing Agencies or sub-consultants) is mandatory

B. Bidding Documents

ITB 7.1	For **clarification purposes** only, the Employer's address is: Attention: Managing Director, Kakinada Smart City Corporation Ltd. Electronic mail addresskakinadacorporation@gmail.com with a copy to smartcitysekmc@gmail.com ; and vvenkatasurya99@yahoo.com Web : www.kakinada.cdma.ap.gov.in Sri C. Vijaykumar, Superintending Engineer email: smartcitysekmc@gmail.comM;9849906506 Sri M.V Suryanarayana Executive Engineer, email: vvenkatasurya99@yahoo.com M: 9849906516 Requests for clarification should be received by the Employer no later than: ***Refer Key dates.***
ITB 7.1	Web page: www.apeprocurement.gov.in www.kakinada.cdma.ap.gov.in
ITB 7.4	A Pre-Bid meeting ***shall*** take place. It will be at the following date, time and place: ***Refer Key dates*** mentioned at page 3 of the document**.** The bidder may intimae the employer for site visit through electronic mail at least two days in advance

ITB 9.2	The cost of Bid documents is INR 50,000/- (Rupees fifty Thousand Only) in the form of demand draft drawn on Kakinada Smart City Corporation Limited payable at Kakinada.

C. Preparation of Bids

ITB 10.1	The language of the bid is: ***English*** All correspondence exchange shall be in **English**language. Language for translation of supporting documents and printed literature is **English** Approved/authorized/licensed translator means certified by Government for document translation. The registration/certification number of the translator is mandatory to mention on the translated document along with full address, Phone number and mail-id.
ITB 11.1 (b)	The following schedules shall be submitted with the bid: (i) Bid Security (ii) Power of Attorney for signing of the Bid (iii) If JV, JV Agreement or Letter of Intent (iv) Bid–Securing Declaration :not be under suspension from bidding by GoI or State Govt.(s) or the Employer or Multilateral Funding Agencies (v) Unconditional Technical Proposal including all forms (vi) Unconditional Financial Proposal **(electronically submission only)** (vii) Bid document fee of Rs 50,000/- (viii) Audited financial statements for the past five years (ix) Certificate from the chartered accountant that they have not availed the CDR (x) Proof of experience certificates issued by the clients **Note: If the conditional technical and financial proposal submitted, the bid shall be considered as non-responsive.**
ITB 13.1	Alternative bids ***not***permitted.

ITB 13.2	Alternative times for completion ***shall not be***permitted.
ITB 13.4	Alternative technical solutions **shall not be** permitted.
ITB 14.5	The prices quoted by the Bidder ***shall not be*** *subject* to adjustment during the performance of the Contract.
ITB 15.1	The prices shall be quoted by the bidder in:***Indian Rupees (INR).***
ITB 18.1	The bid validity period shall be: One Hundred Twenty (120) Days from the date of on line submission of Bids on the Employer's web portal.
ITB 19.1	Bid Security ***is*** required, amount and currency of the bid security shall be: Indian Rupees eight (8.00) Lakhs ***Note: Total amount indicated for which Bids have been submitted, however if the amount of Bid Security is less than the total required amount, the bidder shall be considered as non-responsive and the bid security (for lesser amount) submitted shall be forfeited by the Employer.***
ITB 19.3	The Bid Security shall be drawn in favour of **Kakinada Smart City Corporation Limited** and payable at Kakinada (Andhra Pradesh-India).
ITB 19.9	Not Applicable
ITB 20.1	In addition to the original of the Technical bid, the number of copies are: ***Two (02)*** The bidder shall submit the bids as follow: Physical Submission : One Original and two photo copies of the Technical bid Online submission : (i) Scanned copy of the original Technical Bid (ii) Financial Bid ***Note:*** ***(i) If any discrepancy found between the online submission and the physical submission, the bid submitted online shall prevail and be considered as final.*** ***(j) Both Physical and online Technical bid submission are mandatory, if anyone is not submitted, the bid shall be considered as <u>non-responsive bid</u>.*** ***(k)*** Financial Bid shall be submitted online only.

ITB 20.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of Power of Attorney (PoA) on a Notarized Non Judicial paper of minimum value of Indian Rupees 100/- (Rupees One Hundred).

D. Submission and Opening of Bids

ITB 21.1	Financial Bid submission only electronically
ITB 22.1	For **bid submission (*physical Submission) purposes**only, the Employer's address is: ***[insert all required and applicable information]*** Attention: The Managing Director Address: KSCCL, **D.no 2-33-10, Pekevari street, Perraju peta,, Kakinada**, 533001, Andhra Pradesh, India For online Submission : *www.apeprocurement.gov.in* The deadline for bid submission is: As stated in Key Dates in page 3 of bid document.
ITB 25.1	The bid opening (Electronically and physically) shall take place at: Office of the Commissioner**, Municipal Corporation, Cinema road Kakinada**, 533001, Andhra Pradesh, India
ITB 25.3	The Letter of Bid shall be initialed by all the representatives of the Employer conducting Bid opening.

E. Evaluation and Comparison of Bids

ITB 32.1	The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is:***Indian Rupees (INR)*** The source of official selling rates is: State Bank of India [SBI] (New Delhi) BC Selling rate of Exchange. The date of exchange rates is: **Deadline/Last date for submission of proposals (electronically)**
ITB 33.1	A margin of preference***shall not***apply.
ITB 34.2	Not Applicable

ITB 34.3	Not Applicable
ITB 35.2 (b)	(Quality Based Least Cost Selection (QBLCS) Technical Qualification : Quality Based Minimum Qualifying Score in Technical Proposal: 70 points Financial : Least Cost Selection:

F. Award of Contract

ITB 42.1	The performance security shall be 5% of the accepted contract amount. On receipt of the performance security by the employer, the bid security of the successful bidder shall be returned.
ITB 43.1	The Adjudicator proposed by the Employer is***: Chairman Institution of Engineer (India) Kakinada***. The hourly fee for this proposed Adjudicator shall be:Rs 1000/-. The biographical data of the proposed Adjudicator is as follows: Engineering professional, with more than 20 years experience with post graduate degree in Engineering _____ ***[provide relevant information, such as education, experience, age, nationality, and present position; attach additional pages as necessary]***

Section III - Evaluation and Qualification Criteria

1. Margin of Preference :

Margin of Preference to domestic Implementing Agencies shall not Apply.

2. Evaluation

The Bidders shall be evaluated on Quality Based Least Cost Selection (QBLCS)

- Quality Based Least Cost Selection (QBLCS)
- Stage-1: Technical and Financial eligibility: Bidders satisfying the financial and technical eligibility will be considered for further evaluation of technical proposal (stage-2).
- Stage-2: Technical Qualification : Quality Based

2.1 Stage-2: Adequacy of Technical Proposal

- Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section VII (Employer's Works Requirements

Minimum Qualifying Score in Technical Proposal: Seventy (70) points out of total One Hundred (100) points

Stage-3: Financial : Least Cost Selection (L1)

Non-compliance with equipment and personnel requirements described in Section VII (Employer's Works Requirements) shall not normally be a ground for bid rejection, and such noncompliance will be subject to clarification during bid evaluation and rectification prior to contract award.

2.2 Quantifiable Nonconformities and Omissions

Pursuant to ITB 30.3, the cost of all quantifiable nonmaterial nonconformities shall be evaluated, including omissions where competitively priced but excluding omission of prices in the Bill of Quantities. The Employer will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of bids.

1. Qualification

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Lead Member	Other Members	
1. Eligibility							
1.1	**Nationality**	Nationality in accordance with ITB 4.3	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement	Forms ELI – 1.1 and 1.2, with attachments
1.2	**Conflict of Interest**	No conflicts of interest in accordance with ITB 4.2	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement	Letter of Bid
1.3	**Eligibility**	Not having been declared, as described in ITB 4.4, 4.5, 4.6 and 4.7	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement	Letter of Bid
1.4	**Government Owned Entity of the Borrower country**	Meets conditions of ITB 4.5	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement	Forms ELI – 1.1 and 1.2, with attachments

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Lead Member	Other Members	
2. Historical Contract Non-Performance							
2.1	**History of Non-Performing Contracts**	Non-performance of a contract did not occur as a result of Implementing agency.	Must meet requirement[12]	Must meet requirements	Must meet requirement[1]	Must meet requirement[2]	Form CON-2
2.3	**Pending Litigation**	Bidder's financial position and prospective long term profitability sound according to criteria established in 3.1 below and assuming that all pending litigation will be resolved against the Bidder	Must meet requirement	N/A	Must meet requirement	Must meet requirement[3]	Form CON – 2
2.4	**Litigation History**	No consistent history of court/arbitral award decisions against the Bidder[4]	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement[5]	Form CON – 2

[1] This requirement also applies to contracts executed by the Bidder as JV member.
[2] This requirement also applies to contracts executed by the Bidder as JV member.
[3] This requirement also applies to contracts executed by the Bidder as JV member.
[4]The Bidder shall provide accurate information on the letter of Bid about any litigation or arbitration resulting from contracts completed or ongoing under its execution over the last five years. A consistent history of court/arbitral awards against the Bidder or any member of a joint venture may result in disqualifying the Bidder.
[5] This requirement also applies to contracts executed by the Bidder as JV member.

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Lead Member	Other Members	
3. Financial Situation and Performance							
3.1	**Annual Turnover (ATo)**	Minimum Annual Turnover (ATo) calculated on total certified payments received for contracts in progress and/or completed during each of the last three (03) financial years (2013-14, 2014-15 and 15-16): INR eighty (80.00) Crores .	Must meet requirement	Must meet requirement	Must meet minimum 50%, of the requirement	Must meet minimum 20%, of the requirement	Form FIN – 3.2
3.2	**Net Worth**	Net worth as on 31st March 2016 shall Positive	Must meet requirement	Must meet requirement	Must meet the requirement	Must meet the requirement	Form FIN – 3.1

2. Technical evaluation:

4.1 The Technical evaluation criteria is specified below:

No.	Description	Maximum Points/ Marks
1.	**Contracts of Similar Size and Nature**	
2.	Participation in at least one contract that has been successfully or substantially completed (75% financially completed works) within the last 10yearsand that is similar to Design and Execution / Execution of Urban Roads projects	20
a.	Min. 1 project of Min. 8 km stretch with min. RoW. – 15M - 1 project = 5 Marks - 2 projects = 10 Marks - 3 Projects = 15 Marks - > 4 Projects = 20 Marks	
	OR	
b.	Min. 2 projects of each Min.4.0 km stretch with min. RoW. – 15M - 2 project = 5 Marks	

No.	Description	Maximum Points/ Marks
	- 4 projects = 10 Marks - 6 projects = 15 Marks - >8 Projects = 20 Marks	
3.	**Laying of Under Ground Utilities** At least 1 project with similar works experience of 16 KM length. 1. Water Supply 2. Storm Water Drainage 3. Duct for utilities 4. Sewerage Network 5. Undergrounding overhead power cables - 1 project per sector = 5 Marks	25
4.	**Construction Experience in Key Activities** - For the above or other contracts executed during the period stipulated in 4.1(a) above, a minimum construction experience in Urban Streetscapes (Landscape & street Beautification-minimum length of 1.00km) - At least 1 project of landscape works, including but not limited to: - Design and execution / execution of Cycle	20

No.	Description		Maximum Points/ Marks
	Track - Design and execution / execution Landscape and street beautification works - Design and execution / execution Footpath and Hardscape works - A combination of the above - 1 project = 5 Marks - 2 projects = 10 Marks - 3 Projects = 15 Marks - => 4 Projects = 20 Marks		
5.	**Resource deployment (maximum 20 marks)** **The CVs of the Following personnel'sshall be provided in the Technical proposal.**		**10**
	rsonnel	**Minimum Qualification**	
a.	Project Manager -1 No.	Graduate in Civil Engineering, minimum 10 Year experience in implementation of projects	4
b.	Site engineer -1 No.	Graduate in Civil	2

No.	Description		Maximum Points/ Marks
		Engineering B.E. Civil + 5 years of experience	
c.	Senior Architect / Landscape Architect -1 No.	Bachelor Graduate in Architecture/ Landscape Architecture + 7 years of experience	3
d.	Quality Assurance Engineer- 1 No.	Graduate in Civil Engineering + 7 years' experience in QA/QC	1
	In order to complete the job (task/assignment/solution) in stipulated time period, the successful bidder may deploy additional resources (personnel/ experts/ support staff etc.,) for which additional payment shall not be paid. It is deemed that the payment for the same has already been included in the total contract amount.		
6.	**Approach and Methodology (maximum 15 marks)**		**15**
7.	**Presentation of similar works executed**		**5**
a.	Demonstration of projects in terms of implementation, time, adequacy of the		4

No.	Description	Maximum Points/ Marks
	implemented projects w.r.t. stakeholder/citizen consultations	
b.	Site Coordination experience where at least 2 activity listed in scope of work required alignment	2
c.	Approach & Methodology with focus on sequencing of activities in design/ construction, implementation	4
	Total	100
	The minimum qualifying marks – Seventy (70) **The Financial bids of those bidders would be opened whosoever secure at least 70 points/marks in their technical Qualification Proposal as per the criteria specified above.**	

8. Financial Bid Evaluation:

The Financial Proposal of the bidders shall be opened online and shall be evaluated as specified in the respective clauses of the ITB.

Section IV - Bidding Forms

Table of Forms

Letter of Bid

The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and address.

Note: All italicized text is for use in preparing these form and shall be deleted from the final products.

Date: ***[insert date (as day, month and year) of Bid Submission]***
ICB No.: **[*insert number of bidding process*]**
Invitation for Bid No.: ***[insert identification]***

To:

Managing Director
Kakinada Smart City Corporation Limited,
C/o Municipal Corporation Office,
Cinema road, Kakinada, 533001, Andhra Pradesh, India

Dear Sir,
We the undersigned declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB 8)___;

(b) We meet the eligibility requirements and have no conflict of interest in accordance with ITB 4;

(c) We havenot been suspended nor declared ineligible by the Employer based on execution of a Bid Securing Declaration in the Employer's country in accordance with ITB 4.6

(d) We offer to execute in conformity with the Bidding Documents the following Works as per section VII (works requirement);

(e) Our Bid consisting of the Technical Bid and the Price Bid be valid for a period of **120 *calendar days*** from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;

(g) Weare not participating, as a Bidder or as a sub-contractor/ sub-Implementing Agency, in more than one bid in this bidding process in accordance with ITB 4.2(e).

(h) We, along with any of our sub contractors, sub-Implementing Agencys, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by GoI or State Govt.(s) or the Employer or Multilateral Funding Agencies in accordance with the RfP. Further, we are not ineligible under the Employer's country laws or official regulations;

(i) We are not a government owned entity/ We are a government owned entity but meet the requirements of ITB 4.5;[6]

(j) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: ***[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity]***

Name of Recipient	Address	Reason	Amount
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(If none has been paid or is to be paid, indicate "none.")

(k) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and

(l) We understand that you are not bound to accept the highest ranked (L1) evaluated bid or any other bid that you may receive.

(m) We agree to permit GOI/GOAP/KMC or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by GOI/GOAP/KMC.

(n) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption

(o) If our Bid is accepted, we commit to mobilizing key equipment and personnel in accordance with the requirements set forth in Section 7(Employer's Requirements) and our technical proposal, or as otherwise agreed with the Employer

Name of the Bidder* ***[insert complete name of person signing the Bid]***

Name of the person duly authorized to sign the Bid on behalf of the Bidder** ***[insert complete name of person duly authorized to sign the Bid]***

6

Title of the person signing the Bid ***[insert complete title of the person signing the Bid]***

Signature of the person named above ***[insert signature of person whose name and capacity are shown above]***

Duly authorized to sign the Bid for and on behalf of_____

Date signed ***[insert date of signing]***day of ***[insert month]***, ***[insert year]***

*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

**: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid Schedules.

Form of Bid Security (Bank Guarantee)

[Guarantor letterhead or SWIFT identifier code]

Beneficiary:

[Insert name and address of the Employer*]*

Invitation for Bids No: *_[Insert reference number for the Invitation for Bids]*

Date:*[Insert date of issue]*

BID GUARANTEE No.:*[Insert guarantee reference number]*

Guarantor: *_[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof]* (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its bid (hereinafter called "the Bid") for the execution of *[insert description of contract]* under Invitation for Bids No. [*insert number*] ("the IFB").

Furthermore, we understand that, according to the Beneficiary's conditions, bids must be supported by a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *five (05) lakh* Indian rupees upon receipt by us of the Beneficiary's complying supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating either that the Applicant:

(a) has withdrawn its Bid during the period of bid validity specified by the Applicant in the Letter of Bid, or any extension thereto provided by the Applicant; or

(b) having been notified of the acceptance of its Bid by the Beneficiary during the period of bid validity, (i) fails to execute the Contract Agreement or (ii) fails to furnish the performance security, in accordance with the Instructions to Bidders ("ITB") of the Beneficiary's bidding document.

This guarantee will expire: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the performance security issued to the Beneficiary upon the instruction of the Applicant; and (b) if the Applicantis not the

successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the bidding process; or (ii) twenty-eight days after the Validity Period, which date shall be established by presentation to us of copies of the Letter of Bid and any extension(s) thereto, accompanied by the bidding document.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

_____

[signature(s)]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

Technical Proposal

Technical Proposal Forms

Forms for Personnel

Form PER – 1: Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions listed in Section III (Evaluation and Qualification Criteria). The data on their experience should be supplied using the Form below for each candidate.

1.	**Title of position**
	Name
2.	**Title of position**
	Name
3.	**Title of position**
	Name
4.	**Title of position**
	Name
5.	**Title of position**
	Name
6.	**Title of position**
	Name
etc.	**Title of position**
	Name

Form PER – 2: Resume of Proposed Personnel

The Bidder shall provide all the information requested below. Fields with asterisk (*) shall be used for evaluation.

Position*		
Personnel information	**Name ***	**Date of birth**
	Professional qualifications	
Present employment	**Name of** Employer	
	Address of Employer	
	Telephone	**Contact (manager / personnel officer)**
	Fax	**E-mail**
	Job title	**Years with present** Employer

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From*	To*	Company, Project , Position, and Relevant Technical and Management Experience*

Equipment

Form EQU: Equipment

The Bidder shall provide adequate information and details to demonstrate clearly that it has the capability to meet the equipment requirements indicated in Section 6 (Employer's Requirements), using the Forms below. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

Item of Equipment		
Equipment Information	**Name of manufacturer**	**Model and power rating**
	Capacity	**Year of manufacture**
Current Status	**Current location**	
	Details of current commitments	
Source	**Indicate source of the equipment** ☐ **Owned** ☐ **Rented** ☐ **Leased** ☐ **Specially manufactured**	

Omit the following information for equipment owned by the Bidder.

Owner	**Name of owner**	
	Address of owner	
	Telephone	**Contact name and title**
	Fax	**Telex**
Agreements	**Details of rental / lease / manufacture agreements specific to the project**	

Site Organization

Method Statement

Mobilization Schedule

Others

Bidder's Qualification

To establish its qualifications to perform the contract in accordance with Section III (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder

Form ELI -1.1: Bidder Information Form

Date: _____
ICB No. and title: _____
Page_____of _____pages

Bidder's name	
In case of Joint Venture (JV), name of each member:	
Bidder's actual or intended country of registration: *[indicate country of Constitution]*	
Bidder's actual or intended year of incorporation:	
Bidder's legal address [in country of registration]:	
Bidder's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____	

1. Attached are copies of original documents of

☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITB 4.3.

☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1.

☐ In case of Government-owned enterprise or institution, in accordance with ITB 4.5 documents establishing:

- Legal and financial autonomy
- Operation under commercial law
- Establishing that the Bidder is not dependent agency of the Employer

2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Form ELI -1.2: Information Form for JV Bidders

(to be completed for each member of Joint Venture)

Date: _____

ICB No. and title: _____

Bidder's Joint Venture name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITB 4.3. ☐ In case of a Government-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and absence of dependent status, in accordance with ITB 4.5. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Form CON – 2: Historical Contract Non-Performance, Pending Litigation and Litigation History

Bidder's Name: _____
Date: _____
Joint Venture Member's Name_____
ICB No. and title: _____
Page _____of _____pages

Non-Performed Contracts in accordance with Section III, Evaluation Criteria and Qualifications			
☐ Contract non-performance did not occur since 1st December 2011specified in Section III, Evaluation Criteria and Qualifications, Sub-Factor 2.1. ☐ Contract(s) not performed since 1st December 2011 specified in Section III, Evaluation Criteria and Qualifications, requirement 2.1			
Year	**Non-performed portion of contract**	**Contract Identification**	**Total Contract Amount in INR (current value, currency, exchange rate and US$ equivalent)**
		Contract Identification: Name of Employer: Address of Employer: Reason(s) for non performance:	
Pending Litigation, in accordance with Section III, Evaluation Criteria and Qualifications			
☐ No pending litigation in accordance with Section III, Evaluation Criteria and Qualifications, Sub-Factor 2.3. ☐ Pending litigation in accordance with Section III, Evaluation Criteria and Qualifications, Sub-Factor 2.3 as indicated below.			

Form FIN – 3.1: Financial Situation and Performance

Financial Capacity of the Applicant

An Applicant consisting of a single entity should fill in details as per the row titled Single entity Applicant and ignore the rows titled Consortium Members. In case of a Consortium, row titled Single entity Applicant may be ignored.

€For conversion of other currencies into rupees, kindly refer to web site of Reserve Bank of India Website. The rates shall be applicable as on the last date of the respective financial year

(In INR. crore)

Applicant Type	**Member Name**	**Net Worth (Unconsolidated) as on 31st March 2016**
Single entity		
Applicant		
JV		
Member 1		
TOTAL		

Nameof theauditorissuing thecertificate

Nameof theauditor's Firm:

Seal of auditor's Firm:

Date:

(Signature,name anddesignation of theauthorizedsignatoryfortheAuditor'sFirm)

Form FIN - 3.2: Average Annual Turnover

(In case of Jv, all the membersshall fill and submit this form)

Bidder's Name: _____
Date: _____
Joint Venture Member's Name_____
ICB No. and title: _____
Page _____of _____pages

Financial Capacity of the Applicant

S.No.	Financial Year	Annual Turnover (ATo)		
		Amount Currency	Exchange Rate	INR Equivalent
1	Financial Year 2013-14			
2	Financial Year 2014-15			
3	Financial Year 2015-16			

Note:Theaudited Financial Statements for thecorrespondingyearhasto beattached.

Nameof theauditorissuing thecertificate

Nameof theauditor's Firm:

Seal of auditor's Firm:
Date:

Form EXP - 4.1: General Construction Experience

Bidder's Name: _____
Date: _____
Joint Venture Member's Name_____
ICB No. and title: _____
Page _____of _____pages

Starting Year	Ending Year	Contract Identification	Type of Supporting document attached
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ *Date of commencement of the contract*_____ *Date of completion of the Contract*_____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ *Date of commencement of the contract*_____ *Date of completion of the Contract*_____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ *Date of commencement of the contract*_____ *Date of completion of the Contract*_____ Name of Employer: _____ Address: _____	
		------ ------- ---------	
		------ ------- ---------	
		n^{th}	

Note: The experience certificate issued by the client only be considered for either completed works or 75% financial completed works.

Activity Schedule

The Employer shall indicate the list of major activities comprising the works and the number of measurement units consistent with the description of works, drawings, and specifications in Section 6 (Employer's Requirements). Each work item shall be described in sufficient detail to provide clear guidance to Bidders with respect to the type of works, their scope and complexity, and compliance with the required standards.

Bidders are required to enter the prices against each work item on a lump sum basis in line with the estimated BOQ quantities . Work items against which no lump sum price is entered by the Bidder will not be paid by the Employer when executed and shall be deemed covered by other work items against which the lump sum prices were entered. The sum of prices entered against each work item will represent the total bid price.

The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the Activity Schedule, and where no Items are provided, the cost shall be deemed to be distributed among the Amounts for the related Items of Work.

Financial Proposal- Fin-1

(To be submitted online Only)

Description of Work	Unit	Quantity	Total Amount in INR inclusive of all applicable Taxes in Figure	Total Amount in INR inclusive of all applicable Taxes in Words
Implementation of Urban Street scaping of main road from Sarpavaram Jn. To Balayogi Statue Jn - Smart Streets under Smart City Mission (SCM) in Kakinada Estimated Length of the Smart Street- 8.0 Kms.	Kilometer	8.00		
Smart Street include				
(1) Road work, road markings, signs, street furniture, foot path, parking, land scaping under ground cable duct.				
(2) shifting and relocation of water supply network, road dividers, foot path railing, kerb stones etc.				
The Bidders shall Quote the Lumpsum rate				
Total Cost of Contract inclusive of All Applicable Taxes**.**				

Signature

(Authorized Signatory)

Note: The Bidders should refer to the detailed scope of work given at page 98, “Employer’s Work Requirement / Scope of work / Terms of Reference”

Financial Proposal- Fin 2

(To be submitted online Only)

Estimated Bill of Quantities

Note: Information to be provided in this Form (Fin-2) shall only be used to demonstrate the basis for the calculation of the Contract's ceiling amount; and, if needed, to establish payments to the Contractors for possible variations requested by the Implementing Agency/Contractor and/or Employer.

Sl No	Description Of work	Estimated Qty	Unit	Rate	Amount
	ROAD WORKS				
	General Conditions				
1	The Contractor shall inspect the drawings, visit the site and fully ascertain the nature and extent of the Works, and limitations and restrictions as to means of access, working and storage space and any other relevant factors prior to tendering as no claim of any kind shall be entertained for want of knowledge or ignorance of the conditions under which the Works will be executed.		Note		
2	The Contractor shall provide all necessary labour, plant and tools for proper and efficient execution of the Works.		Note		
3	The Contractor shall provide for all transport for labour and for the movement of plant and equipment to and from site, erection, dismantling, moving about site as necessary and including allowance for all idle time.		Note		
4	Temporary water and electricity for the works shall be under contractor scope		Note		

5	All excavated material shall be carted away from work location. Excavated earth for back filling have to be carted away, stockpiled at desiginated place away from work location and brought back for filling ,as instructed and as directed by Engineer incharge.		Note		
6	The rate for all demolishing and dismantling to include carting, disposal of the debris , Royalty and Seigniorage charges.		Note		
7	The rate for all dismantling & removing , due consideration should be given for those which has got scrap value		Note		
8	Necessary propping, shoring and / or underpinning shall be provided for the safety of the adjoining work or property, which is to left in tact, before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property		Note		
9	Serviceable material after dismantling shall be the property of Kakinada Municipal Corporation and the same has to be disposed/ transferred outside the premises as per the direction of Engineer-in-Charge. Rate shall be for all heights, floors, levels, depths and lead.		Note		
10	Contractor to ensure necessary measures for Safety and minimise Hindrance during work and up to handing over		Note		
11	Contractor to protection of works up to handing over		Note		
12	Obtain all permits required for works as described in the RFP. Liaison with authorities prior to commencing any site works.		Note		
13	Undertake on site identification of all services, location and type. Identify all service corridors in conjunction with relevant authorities and prepare a site plan indicating location and type of utility.		Note		

14	Clearing malba, debris and any other unwanted material and disposal of all superfluous material within the Project Site.		Note		
15	To protect against damage and reconditioning the existing STATUE'S & SCULPTURE'S and other ANTIQUE'S.		Note		
A	**DISMANTLING, DEMOLITION AND DISPOSAL OF EXISTING STRUCTURE**				
1	Demolishing in brick / Block work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable materials, The rate shall be including of all labour, machineries, lift, lead and other related works etc., to complete as per direction of Engineer-in-charge. **(Center median Kerbs including plastering)**		Cum		
2	Removal of unsuitable / Unserviceable soil including excavation, loading and disposal up to 10Km lead but excluding compaction ground supporting embankment subgrade replacement by suitable soil, which shall be paid separately as per Clause 303.5.2 as per Technical Specification Clause 302.3.11 MORD / 301 MORTH **(At Centre median)**		Cum		
3	Demolishingcement concrete manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable materials, The rate shall be including of all labour, machineries, lift, lead and other related works etc., to complete as per direction of Engineer-in-charge. **(Cast in situ light pole foundations / Base PCC for kerb walls & Light Pole foundations)**		Cum		
4	Dismantlingcement concrete manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable materials,The rate shall be including of all labour, machineries, lift, lead and other related works etc., to complete as per direction of Engineer-in-charge. **(Pre cast Center median including PCC Base, and handing over to KMC)**		Rmt		

5	**Demolishing Cast in situ CC kerb walls-** cement concrete manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable materials, The rate shall be including of all labour, machineries, lift, lead and other related works etc., to complete as per direction of Engineer-in-charge.**(Including Roundabout kerbs and PCC base)**		Cum		
6	Demolishing cement concrete manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable materials, The rate shall be including of all labour, machineries, lift, lead and other related works etc., to complete as per direction of Engineer-in-charge. (**Pavement including base mortar and base concrete PCC, concrete utility duct etc..)**		Cum		
7	Scarifying the existing bituminous road surface to a depth of 70 mm and disposal of scarified material with in all lifts and lead up to 10 Km. **Demolition / cutting of existing Bituminous concrete road** to max 100 mm thick with required plant and equipment's, tools and tackles including demolition of existing structures all complete including levelling and making the surface to required level and disposal of unserviceable material and stacking the serviceable material. Complete including all lead and lifts and as per the directions of Engineer In Charge. **(Stacking of serviceable material for reuse)**		Cum		
B	**EXCAVATION**				
1	Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross-sections, and transporting to the embankment location with all lifts and lead up to 10 Km as per Technical Specification Clause 302.3 MORD / 301 MORTH **(Excavation of existing Carriage way & Pedestrian way)**		Cum		
2	Earthwork excavation soil by mechanical means including cutting and loading in tippers trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections and transporting to the embankment location or disposal of unserviceable soil with all leads and lifts etc., complete for finished item of work for trench cutting as per MORT&H specification No.301 and as directed by the Engineer-in-Charge **(Excavation for Storm water drain)**		Cum		

3	Back Filling in foundation trenches as per drawing and technical specification Clause 305.3.9 MORD & 304.3.7 MORTH. (Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m)		Cum		
C	**ROAD WORKS**				
1	Cleaning the existing Black Topped surface with brooms, soft brushes and finally dusting with old gunny bags and / or compressed air, to receive bituminous treatment including cost of all materials, labour, HOM of machineries complete as per specifications, with all lead, lift, loading and unloading complete as per the direction of Engineer incharge		Sqm		
2	Milling of existing bituminous layers at identified distressed locations on the pavement with milling machine reclaiming excavated material including hauling and stock piling and adding rejuvenators as required, mixing in a hot mix plant, transporting and laying at site and compacting to the required grade, level and thickness, with all lead, lift, loading and unloading complete as per the direction of Engineer incharge		Sqm		
3	Providing and applying tack coat on the prepared black topped surfaces at 2.5 kg per 10 sqm, heating bitumen in boiler fitted with spray set (excluding cleaning of road surface) including cost of all materials, labour, complete as per specifications. 20% for milled portion Complete including all lead and lifts and as per the directyions of engineer in charge 20% for milled portion		Sqm		
4	Construction of granular sub-base by providing close graded material, mixing in a mechanical mix plant at OMC, carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per specifications		Sqm		
5	Providing, laying, spreading and compacting graded stones aggregate to wet mix macadam specifications including pre mixing the material with water at OMC in mechanical mix plant carriage of mixed method of tipper to site, laying in uniform layers with paver in sub-base/base course on well prepared surface and compacting with vibratory roller to achieve the desired density complete as per specifications		Cum		

6	For Profile Correction with BM. Providing and laying bituminous macadam on prepared surface with crushed coarse aggregates as per design mix formula for base / binding course including loading of aggregates with F.E. loader, hot mixing of stone aggregates and bitumen in hot mix plant 40 tonne capacity, transporting the mixed material in tipper to paver and laying mixed materials with paver finisher to the required level and grade, rolling by power roller to achieve the desired density, 50 /75mm compacted thickness with 3.3% bitumen but excluding cost of primer / tack coat with lead upto 1km including cost of all materials, labour, HOM of machineries complete as per specifications. including all lead and lifts and as per the directions of engineer in charge Considering 20%		Cum		
7	Providing and laying dense bituminous macadam 50-75mm compacted thickness with 4.5% bitumen 60/70 grade, contents on prepared surface with specified graded crushed aggregates for base / binder course including loading of material with F.E. loader, heating of binder aggregates and filter in hot mix plant 40-60 TPH, transporting the mixed material by tipper and laying with paver finisher to the required level and grade, rolling by power roller to achieve the desired density (but excluding primer / tack coat) to a lead upto 20km including cost of all materials, labour, HOM of machineries complete as per specifications,with all lead, lift, loading and unloading complete as per the direction of Engineer incharge		Cum		
8	Providing and laying bituminous concrete with 60/70 grade using 40-60 HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder at6% of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per complete in all respects as per specifications 30-45 mm compacted thickness. including all lead and lifts and as per the directions of engineer in charge.30-45 mm compacted thickness (Grading II) with 5% Bitumen 60/70 grade using 40-60 HMP		Cum		
D	**ROAD MARKINGS SIGNS STREET FURNITURE**				

1	Road Marking with Hot Applied Thermoplastic Compound with Reflectrising Glass Beads on Bituminous Surface:- Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads at 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35. The finished surface to be level, uniform and free from streaks and holes complete as per specifications. with all lead, lift, loading and unloading complete as per the direction of Engineer incharge. MORTH Specification No. 803		Sqm		
2	Specification for Raised Pavement Marker (Road Studs): Providing and fixing of Reflective Raised Pavement marker (RPM's) / Cat eyes / Road studs confirming to ASTM D4280 type H, having reflective panels made of prismatic lens of total internal reflection, the prismatic lens should be electronically fixed (welded) to the body made of polycarbonate mould, with a height of 20mm, size of 130mm X 105mm and reflecting area of 13Sqcm with the slope of retro reflective surface within the limit of 35+ 5 degree to the base on either side. The marker shape ll display an initial minimum luminous intensity of 279 mcd/lux at an entrance angle of zero degree and observation angle of 0.2degree. The corresponding values for 20 degree entrance and 0.2 degree observation angle shall be 112 mcd/lux with color multiplying factor on either cases for white, yellow and red markers being 1.0, 0.6 and 0.25 respectively" The RPM's should be fixed by using two numbers of polymer shanks using appropriate adhesive as recommended and certified by the RPM manufacturer. The raised pavement marker should support a sufficient minimum load 13635 Kg in accordance with ministry specification. including all lead and lifts and as per the directions of engineer in charge		Nos		
3	Providing and Fixing of Retro Reflectorised 900mm Cautionary sign boards with 10 years warranty & supported by 3 years outdoor weathering test report as per IRC:67 2010, made out of retro reflective sheeting of Wide Angle Cube Corner Micro prismatic grade conforming to IRC-67: 2010 & Type XI standards, fixed over 4 mm thick ACP sheet supported with Back support frame of 1 No. 25x25x3mm mild steel angle as approved , supported on a mild steel angle iron post 75 mm X 75 mm X 6 mm firmly fixed to the ground by means of properly designed foundation with M20 grade cement concrete 45 cm X 45 cm X 60 cm , 60 cm below ground level as per approved drawing. 900 mm equilateral triangle		Sqm		

4	Providing and Fixing of Retro Reflectorised 600mm Mandatory sign boards with 10 years warranty & supported by 3 years outdoor weathering test report as per IRC:67 2010 , made out of retro reflective sheeting of Wide Angle Cube Corner Micro prismatic grade conforming to IRC-67: 2010 & Type XI standards, fixed over 3 mm thick ACP sheet supported with Back support frame of 25x25x3mm mild steel angle as approved , supported on a mild steel angle iron post 75 mm X 75 mm X 6 mm firmly fixed to the ground by means of properly designed foundation with M20 grade cement concrete 45 cm X 45 cm X 60 cm , 60 cm below ground level as per approved drawing.		Sqm		
5	Providing and Fixing of Retro Reflectorised 600 x 800mm Facility sign boards with 10 years warranty & supported by 3 years outdoor weathering test report as per IRC:67 2010 , made out of retro reflective sheeting of Wide Angle Cube Corner Micro prismatic grade conforming to IRC-67: 2010 & Type XI standards, fixed over 4 mm thick ACP sheet supported with Back support frame of 25x25x3mm mild steel angle as approved , supported on a mild steel angle iron post 75 mm X 75 mm X 6 mm firmly fixed to the ground by means of properly designed foundation with M20 grade cement concrete 45 cm X 45 cm X 60 cm , 60 cm below ground level as per approved drawing.		Sqm		
6	Manufacturing, Supply and Fixing of Retro Reflective Road Name Sign Board Single Arrow of size 1.2 x 0.6m made out of Wide Angle Cube Corner Micro prismatic grade sheeting conforming to IRC-67: 2010 & Type XI standards of ASTM D 4956 –09 specifications and fixed over 2mm thick Aluminium sheet & back support frame of 25x25x3mm MS Angle. Frame supported by 38 OD Stainless Steel pipe Grade 304 AISI with wall thickness of 1.5mm all around and 50 OD Pipe Vertical post with wall thickness of 2mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 30 cm X 30 cm X 45 cm etc complete. The information message shall be made out of cut out letters in Blue 1.00 Each 37422 color transparent overlay film as per IRC 67-2010 Guidelines. 7 years Warranty for Retro Reflective Sheeting from the original sheeting manufacturer & certified copy of three years outdoor exposure report from an independent test lab for the product offered shall be submitted by the contractor		Sqm		
E	**FOOTPATH PARKING AND LAND SCAPING**				

1	Providing and supplying fixing CI Grating of size 250mm x 500mm at gullytrap along kerb channel at interval as indicated in drawing and details and size as per approved drawing including transportation to site, all charges of labour, loading and unloading etc., complete, for fixing as indicated in the drawing with all lead and lifts as per detailed tender specifications and as directed by the Engineer, etc., complete		Sqm		
2	Providing and fixing pre cast solid cement concrete kerb stones made out of C.C. 1:2:4 with top and bottom width 114 and 165 mm respectively, 400mm high and 450mm in length finished with CM 1:3 plastering and finishing cutting, including formwork, curing, including cost of all materials, labour, hire charges of machinery, loading, unloading, lead and lift, transportation etc., complete., complete against Main CARRIAGEWAY, FOOTPATH/BICYCLE LANE , with all lead, lift, loading and unloading complete as per the direction of Engineer incharge		Nos		
3	Providing and fixing 7.5 cms to 15.00 cms dia NP grating 100 mm dia with all lead, lift, loading and unloading complete as per the direction of Engineer incharge		each		
4	Cast-in-Situ Cement Concrete M 20 Kerb with Channel. Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel laid with kerb laying machine, foundation concrete laid manually, all complete as per Clause 400.8 complete as per specifications. B. Using Concrete Batching and Mixing Plant with all lead, lift, loading and unloading complete as per the direction of Engineer incharge		mtr		
5	800-1. Painting two coats after filling the surface with synthetic enamel paint in approved shades on new plastered concrete surfaces, with materials, labour complete as per specifications.. Complete including all lead and lifts and as per the directions of engineer in charge...MORTH Chapter 8		Sqm		
6	Providing and laying heavy dutycobble stone 60mm thick YELLOW COLOUR FOR PARKING AND CYCLE LANE, GREY COLOUR FOR FOOTPATH interlocked pavers using cement and coarse sand for manufacture of block of approved size, shape and color with a minimum compressive strength of 281kg/sq.m over 50mm thick sand bed (average thickness) and compacting with plate vibrator having 3 tonnes compaction force there by forcing part of sand		Sqm		

	underneath to come-up in between joints final compaction of paver surface joints into its final level including cost of material labour and HOM of machineries complete as per specifications including lead, lift, loading & unloading complete as per the direction of engineer incharge...				
7	Supply and Installation of street lighting. Street light luminaire shall be equipped with the second generation LensoFlex2® photometric engine which offers a high-performance photometry. The luminaire shall have 48 LED driven at 700mA. The average power consumption shall be 113W. The LED's will be of neutral white. The luminaire shall have a minimal nominal flux of 9250 lumens & shall have IP 66 optical compartment sealed by thermally hardened extra-clear glass protector for an optimal luminous flux. The control gear compartment shall have IP 66 tightness level. The Optical compartment and control gear compartment shall be mechanically and thermally separated for heat management and optimum performance. The luminaire shall be made of sustainable and recyclable aluminium die cast materials. All hardware of luminaire shall be of stainless steel. The glass protector should have IK 08 impact resistance. Each LED is associated with a specific lens that generates the complete photometric distribution of the luminaire. Luminaire shall have 90% lifetime residual flux @ 60,000 hours. at Ta 25degree. The complete fixture(including driver) shall be guaranteed for 5years against any manufacturing defects and performance of light quality. Besides these the luminaires shall also have the following features. a. Direct access to gear and electronic compartment b. ThermiX®: large surface area for best possible heat extraction c. Surge protection up to 10kV d. Universal mounting piece: Inclination adjustment system on-site. Side-entry or vertical mounting. For primary roads light level of 23-25 lux average with overall uniformity 0.4 and for secondary roads light level of 15-20 lux average with overall uniformity 0.4 shall be achieved. Cycle track shall have 6-8 Avg lux with 0.2 uniformity and pedestrian foot paths shall have 4-6 Avg lux with 0.2 uni formity. The luminaire shall confirm to ENEC or equivalent European certification. The fixture shall be supplied with and installed on suitable pole of 8m height. The pole shall be		Nos		

	supplied with base plate and must be made of mid steel, galvanised, primed and PU painted. The pole shall be equipped with lockable flush door strengthened at cut out. Complete including all lead and lifts and as per the directions of engineer in charge				
8	Providing and fixing concrete grass paver tree grating to required sizes and shapes and installed in position with necessary hold fast and embedding in position with 1:2:4 cement concrete including all incidental operations and synthetic enamel paint, all incidental works complete as per drawings & directions of Engineer-in-charge.		Nos		
9	Horticultural work that includes ploughing or trenching of existing ground to a depth of 15-25cms and watering the same of all kind of soil, rough dressing of the trenched ground, supplying and stacking of good earth and read earth at site by mechanical transport, cowdung or sludge manure, river sand, uprooting weeds, fine dressing of ground, grassing and supply and applying of chemical fertilizer and including cost of planting Complete including all lead and lifts and as per the directions of engineer in charge		Rmt		
10	Supply and fixing/errection of stainless steel railing (SS 304) on either side of the road as protection for pedestrian walk way		Rmt		
F	**EXCAVATION AND UNDERGROUND CABLE DUCTS Etc.**				
1	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres complete as per specifications. iii) Dismantling Stone Masonry. B. Rubble Stone masonry in cement mortar. Complete including all lead and lifts and as per the directions of engineer in charge. MORTH Specification No. 202		Cum		
2	Removing BS Slab of Drain and Stacking as directed by the Engineer with all leads and lifts including charges for loading, unloading, labour charges, etc., complete. As per detailed tender specifications		Sqm		

3	Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work complete as per specifications. i) Ordinary soil - A. Manual Means (i) Depth upto 3 m. Complete including all lead and lifts and as per the directions of engineer in charge		Cum		
4	Removing and Resetting of paving stones including lead, lift, loading & unloading complete as per the direction of engineer incharge…		mts		
5	Removal of telephone/ electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal, with all lifts and stacking the serviceable material separately complete as per specification		Nos		
6	Compaction of original ground with maximum of 6 passes of 8 to 10 tonnes power roller including filling in depression occurring during rolling including cost of all labour, HOM of machinery complete as per specifications including lead, lift, loading & unloading complete as per the direction of engineer incharge..MORTH Chapter 3		Sqm		
7	Providing, Laying, Spreading and compacting graded HBG crushed stone aggregate to Wet Mix macadam specification (5th Revision) as per Table 400-13, including cost of all materials and including premixing the material with water at OMC in Mechanical mix plant carriage of mixed material by tipper to site , laying in uniform layers with paver in base courses on well prepared surface and compacting with Vibratory roller to achieve the desired density etc., as directed by the Engineer-in-Charge and as per MoRT&H specification.406 (5th revision) for finished item of work.		Cum		
8	Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per Table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10		Cum		

	tonnes vibratory roller, finishing and curing complete as per specifications including lead, lift, loading & unloading complete as per the direction of engineer incharge..				
9	Providing and laying reinforced cement concrete pipe NP3 600mm dia for culverts including pointing ends, and fixing collars with cement mortar 1:2 including cost of all materials, labour, curing complete as per specifications.Specifications including lead, lift, loading & unloading complete as per the direction of engineer incharge.. No. KSRB 1000, 2300 MOST Specification No.1000 / 2300				
10	Supplying HDPE pipes confirming to IS 4984:1995 with latest amendments and conveying to work site including loading and unloading at both destination and rolling, lowering into trenches, laying true to line and joining of pipes and specials including encasing the pipe around to a depth of not less than 15cm with soft gravel or selected earth available from the excavation etc., complete, giving hydraulic test as per relevant ISS with all lead and lift including testing and commissioning, The rate is exclusive of required specials and fittings etc., complete including lead, lift, loading & unloading complete as per the direction of engineer incharge. (Contractor will make his own arrangement for procuring water for testing)				
	a. 2*100mm dia for OFC/Telecom/Surveillance		mts		
	b. Double walled Corrugated HDPE - 3 * 200mm dia for Power		mts		
	c. HDPE Ducts for Gas (PE-80, PN-6 class of Dia 100mm		mts		
	d. Double walled Corrugated HDPE ducts for street lights		mts		
11	Laying of HDPE pipes confirming to IS 4984:1995 with latest amendments and conveying to work site including loading and unloading at both destination and rolling, lowering into trenches, laying true to line and joining of pipes and specials including encasing the pipe around to a depth of not less than 15cm with soft gravel or selected earth available from		mts		

	the excavation etc., complete, giving hydraulic test as per relevant ISS with all lead and lift including testing and commissioning, The rate is exclusive of required specials and fittings etc., complete (Contractor will make his own arrangement for procuring water for testing) Laying of OFC/Power/Gas ducts Complete including all lead and lifts and as per the directions of engineer in charge				
12	M20 Ready Mixed cement Concrete (P.No.19, sI.No.4.48 of PW & IWTD SR 2012-13) Access Chamber with Inner Dimension 1m X 1m, Depth 1.4m, side walls of 0.15m thick, top cover 0.2m thick, PCC bed of M15 concrete (pg 12 KSRB4-1.6 2012-2013) Complete including all lead and lifts and as per the directions of engineer in charge.				
	OFC		Cum		
	SWD		Cum		
	Power		Cum		
13	Filling available excavated earth (excluding rock) in sides of foundations upto plinth in layers not exceeding 20 cms. in depth, compacting each deposited layer by ramming after watering with lead upto 50 m. and lift upto 1.5 m. including cost of all labour complete as per specifications. Complete including all lead and lifts and as per the directions of engineer in charge		Cum		
14	Maintenance of Road for 2 years after Defect Liability Period of 1 years, the maintenance include (i) Filling of crack using slow – curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm complete as per specifications of MORTH specification No.3004.3.3, (ii) Filling pot holes with patch repairs with bituminous concrete, 40mm with Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 500.3, back filling the pot holes with hot bituminous material as per clause 500.4, compacting, trimming and finishing the surface to forma smooth continuous surface, all as per clause 3004.2 complete as per specifications of		km		

	MORTH specification No.3004.2 (iii) Restoration of pot holes caused due to BWSSB/BESCOM repairs etc., complete (The rate quoted for the item shall be maintenance of roads for 2 years per km 1. Cunningham Road				
15	Earthwork in excavation for structures as per drawing and technical specifications Clause 305.1 including setting out, construction of shoring and bracing, removal of stumps and other deleterious material and disposal upto a lead of 50 m, dressing of sides and bottom and backfilling in trenches with excavated suitable material as per Technical Specification 305 MORD / 304 MORTH Manual Means		Cum		
16	Sand filling with local sand including cost and conveyance of sand and all labour charges for sectioning, ramming, watering etc. complete		Cum		
17	Plain Cement concrete (1:4:8) using 40 mm metal with concrete mixture including all cost, conveyance and all labour charge etc. complete. All work up to plinth level.		Cum		
18	M20 design mix using 20 mm metal including all cost, conveyance and all labour charge etc. complete. All work up to plinth level.		Cum		
19	Reinforced Cement Concrete M 20 Nominal Mix (Cement, Fine Aggregate, Coarse aggregate) corresponding to table - 9 of IS - 456 using 20mm size graded machine crushed hard granite Chips (Coarse aggregate) from approved quarry including cost and conveyance of all materials like Cement, Fine Aggregate (Sand), Coarse Aggregate, Water etc., to site and including Seigniorage charges, sales and other taxes, on all materials including all operational, incidental and labour charges such as machine mixing, laying, concrete, curing etc., complete but excluding centering, Shuttering (Page No.664) BLD CSTN-2-13, S.No.21 CULVERT SLABS AND BED BLOCKS		Cum		

20	Providing High Yield Strength Deformed (HYSD) bars (Fe 415 grade as per IS 1786-1979) of different diameters for RCC works, including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire of 18 SWG, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all insidental, operational, labour charges such as cutting, bending, placing in position, tying including sales and other taxes on all materials etc. complete for finished item of work in all floors (APSS No:126)		Kg		
21	Plastering 12mm thick in cm1:4 including all cost, conveyance and all labour charge etc. complete. .		Sqm		
G	**Water Supply**				
1	Supply, delivery, laying, jointing, testing and commissioning including all costs specials, civil works etc., for execution of HDPE pipes PE-100, PN-6 class conforming to IS 4984:1995 with latest amendments and conveying to worksite including loading and unloading at both destination and rolling, lowering into trenches, laying true to line and jointing of pipes and specials (including cost of specials) giving hydraulic test as per relevant ISS to the all need & lift etc., as directed by the engineer – in charge for the following diameters.		Rmt		
	315 mm dia. HDPE PE 100 GRADE and PN 6		Rmt		
	250 mm OD. HDPE PE 100 GRADE and PN 6		Rmt		
	200 mm OD. HDPE PE 100 GRADE and PN 6		Rmt		
	160 mm OD HDPE PE 100 GRADE and PN 6		Rmt		
	110 mm OD HDPE PE 100 GRADE and PN 6		Rmt		

2	Supply, delivery, laying, jointing, testing and commissioning including all costs specials, DI valves of the following sizes including cost of all materials, DI specials, labour charges for jointing and testing. including construction new RCC valve chambers of 1.2 mts x 1.5mts as per the available depth. with all lead, lift, loading and unloading complete as per the direction of Engineer in charge				
	300 mm dia. DI valve of class PN 1.0 with necessary R.C.C. valve pit.		Each		
	250 mm dia. DI valve of class PN 1.0 with necessary R.C.C. valve pit.		Each		
	200 mm dia. DI valve of class PN 1.0 with necessary R.C.C. valve pit.		Each		
	150 mm dia. DI valve of class PN 1.0 with necessary R.C.C. valve pit.		Each		
	100 mm dia. DI valve of class PN 1.0 with necessary R.C.C. valve pit.		Each		
3	Supply, delivery, laying, jointing, and testing of S&S RCC spun pipes NP-3 class confirming to IS 458:1988 with latest amendments including all costs, specials, rubber rings, civil works etc., for encasing of HDPE pipes and conveying to worksite, rolling and lowering into trenches, laying true to line and level including loading and unloading at both destinations and jointing of pipe. with all lead, lift, loading and unloading complete as per the direction of Engineer in charge for the following sizes				
	450 mm dia. S&S RCC spun pipes NP-3 class		Rmt		
	400 mm dia. S&S RCC spun pipes NP-3 class		Rmt		
	350 mm dia. S&S RCC spun pipes NP-3 class		Rmt		
	300 mm dia. S&S RCC spun pipes NP-3 class		Rmt		
	250 mm dia. S&S RCC spun pipes NP-3 class		Rmt		
E	**Electric Cabling along the main road**				
1	Supply and laying/ erecting Electric cable in ready made trenches/ cable ducts with suitable arrangements for interconnections etc				
	For 33 kVA line		Rmt		

	For 11 kVA line		Rmt		
	For 415 V lines		Rmt		
F	Supply ,delivery ,errection of smart pole with all feature		Each		
H	Supply ,delivery, fabrication and erection of stainless steel of Grade SS 304 hand railing of 50 mm dia vertical pipe @ 1.50 mtrs interval, and top of the railing 25mm dia. 3 nos of horizontal pipes, for a total height of 0.90 mtrs including all costs etc., as directed by the officers incharge of the work.		Rmt		

Signature

(Authorized Signatory)

Section V - Eligible Countries

Eligibility for the Provision of Goods, Works and Services for Procurement

All countries are eligible

Section VI. Corrupt and Fraudulent Practices

(Section VI shall not be modified)

In accordance with the Prevention of Corruption Act 1988 (INDIA) and its subsequent amendments on Preventing and Combating Corruption

"**Fraud and Corruption:**

1. It isEmployer countryPrevention of Corruption Act 1988 to require that bidders, suppliers, Implementing Agency's and their agents (whether declared or not), sub-Implementing Agency's, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution . In pursuance of this Act, the Employer:

   (a) defines, for the purposes of this provision, the terms set forth below as follows:

      (i) "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

      (ii) "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

      (iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

      (iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

      (v) "obstructive practice" is

         (aa) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

(b) will reject a proposal for award if it determines that the bidder recommended for award, or any of its personnel, or its agents, or its sub-consultants, sub-Implementing Agencys, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question.

2. For more details, refer Prevention of Corruption Act 1988 (INDIA) and its subsequent amendments on Preventing and Combating Corruption

PART 2 – Employer's Works Requirements

Section VII –Employer's Works Requirements

Table of Contents

Employer's Work Requirement / Scope of work / Terms of Reference

1. GENERAL

1.1 BACKGROUND

With the India Smart Cities Challenge, the Government of India took the first step towards realising its vision of building 100 smart cities in the country. As part of the India Smart Cities Challenge, Kakinada is one of the cities that was selected amongst top 20, in a nationwide competition between 100 cities (ranked 14th).

Kakinada is now working on an implementation plan to convert the Smart City Proposal (SCP) ideas into reality, beginning with retrofitting a designated area within the city known as the Area Based Development (ABD) that will catalyse future scalability to entire city.

Kakinada the district headquarters and a seaport city on the Bay of Bengal is located in the East Godavari District of Andhra Pradesh State. It is located 65km from Rajahmundry. It is the headquarters and largest city of East Godavari district. Kakinada is part of a Special Economic zone and proposed petroleum, Chemical and Petrochemical Investment Region (PCPIR). The Kakinada Municipal Corporation (KMC) population 3,25,985,and administrative boundary spreads over the 30.15 sq.km area and divided into 50 wards, and total roads of 474 km.

Existing Transport System

The town of Kakinada is divided into two distinct parts of the Salt Creek. The northern part of the creek is an extension of Kakinada and South of creek is the Old Town, which is famously known as Jagannaickpur. There are two bridges across the Salt Creek, between the old and the new towns. The roads in the old town are narrow when compared to the roads on the north of the Salt Creek.

a) Existing Scenario:

Major Roads

Generally roads in the town are straight running from North to South all along the town. The major Arterial roads run through the length of the town and provide connectivity to major areas of the town. Major roads of Kakinada City include:

- Cinema Road
- Main Road
- Temple Street
- Rajaram Mohan Roy Road
- Wharf Road

The first three roads are North – South corridors. Cinema road is one way uptoKalpana Centre with traffic moving in North direction only. The number of lanes varies from 2 to 4 at various stretches.
Main Road is one way road towards South Direction from Two town P.S Junction to Munsub Junction. Major Junctions along this corridor include Jagannaickpur Junction, Masjid Junction, Two Town Police Station Junction and Bhanugudi Junction.
Temple street is one way towards north. Major Junctions along this corridor include Balji Tank Junction, BalatripuraSundari Temple Junction and Nookalamma Temple Junction.

Rajaram Mohan Roy Road is a major street providing access to important facilities of the town. ZillaParishad Office, Government Hospital and Court buildings located on the street. This route also serves as bus route going to Samalkot.

Urban Street scaping

Kakinada Municipal Corporation has taken up the project of Urban Streetscaping of the Main road in Kakinada. The following points have been incorporated in this project.

1) Development and strengthening of carriageway with uniform lane widths.
2) Development of footpath with uniform footpath widths and pedestrian friendly ways.
3) Construction of utility duct all along the main road to run all utility services underground.
4) Construction of Storm water drain for easing out rain water with proper shoulders etc.
5) Development of Junctions across entire road.
6) Beautification and Landscaping of the footpath, Junctions, central median where ever possible.
7) Provision of street furniture (Signage's, Lane marking)
8) Development of Cycle track all along the proposed Urban Streetscaping project.
9) Provision for Bus bays ,Urinals and Public convenience, Dust Bins (S S), C.I. Tree grating, Auto stands ,Bycycle stations, Ornamental lighting for Foot paths.
10) Solid waste collection/transfer arrangement
11) Running of power cables in the ducts provided
12) Traffic signalling arrangement
13) Smart poles for enabling services
14) Sewer lines as required

In this project, the above said points have been considered for the standard development of the Main road. The objective of these Tender SURE standards is to make road for longer duration usage and to be free from zig-zag movement of vehicles, to ease out the pedestrian movement and for the safety of school children and old aged. Further, this project ensures avoiding of un-necessary road cuttings by various utility agencies.
Salient Features of Main Road to be developed, Kakinada

- Following drawings shows the typical Map of existing and proposed road stretches to be developed all along the Main road from Sarpavaram Junction to Balayogi Statue junction

Salient Features of Main Road to be developed, Kakinada

Length of the Road (Sarpavaram Junction – Balayogi Statue Junction)	8.0 Kms
No. of Lanes at various stretches and Carriageway available	Sarpavaram Junction to Boats Club – 14.5m average Carriageway (4 lanes)
	Boats Club to Asst. Salt Commissioner Bunglow – 16.5m average Carriageway (4 lanes)
	Asst. Salt Commissioner Bunglow to Bhanugudi Centre – 17.5 m average Carriageway (4 lanes)
	Bhanugudi Junction to Two town PS (flyover) – 7.6 m Carriageway (2 lanes)
	Two town PS to Masjid Centre – 20 m (4 lanes) Parking slots are marked on road at this stretch
	Masjid Centre to NunnaVari Street – 12m average Carriageway (3 lanes)
	NunnaVari Street to Munsub Junction – 6.0 m average Carriageway (2 lanes)
	Munsub junction to Balayogi Statue Junction – 11.5m average Carriageway (4 lanes)
Pedestrian footpath available	Near Ashram School – 1.3m to 3.5m
	Near Nagamallithota Junction - 1.3 m
	From JNTU to S.P Camp Office - 2.5m to 3.0m
	Bhanugudi Flyover – 1.5m
	Two town P.S to Masjid Centre – 1.5m to 3.0m
Parking Bays	Parking is done mainly on street all along the Main road, only some commercial establishments like Subhadra Arcade at Bhanugudi Junction and Café Coffee day commercial complex has their own Parking area in their premises.
Bus Bays	Saravaram Junction Cancer Hospital Ashram School Bhanugudi Junction
Street lighting	LED street lights are installed by the Municipal Corporation on the Main Road

2. PROJECT OBJECTIVE AND KEY COMPONENTS

2.1 Transforming roads into Smart Streets has been conceptualized by the Employer, to create 21st century public realm infrastructure for all strata of the society. This entails comprehensive upgrading of the public Right of Way (ROW) of the main road which includes (but is not limited to) – refurbishment of existing carriageway, laying of new footpaths and cycle tracks, shifting of select utilities from its current location to new location (under footpaths), external development works for landscape, hardscape, street furniture, lighting. Transforming existing bus stops as smart bus stops clustered with public toilets and ATM is to be carried out.

Smart Streets include **Four Broad Objectives,** namely:

- **ROAD DIET & SAFE STREETS:** Also known as lane-width reduction or road re-channelization, is a technique in transportation planning whereby the effective width of the carriageway is reduced in order to achieve systemic improvements. Streets with clearly demarcated spaces for vehicles, pedestrians, cyclists and dedicated on-street parking to minimize conflicts between vehicular and pedestrian traffic. Safe streets with shaded walkways promoting walking as a daily activity – encouraging healthy lifestyles
- **RESILIENT STREETS:** Streets with defined utility corridor including undergrounding overhead utilities where upgraded utilities can withstand severe natural and man-made disasters. Streets that provide infrastructure allowing safe walking experience in night through pedestrian lighting and clean public space through dustbins at regular intervals.
- **INCLUSIVE STREETS:** Streets that allow and provide multiple mobility options to its citizens including walking, cycling, driving private vehicles and commuting through public transport. Universal accessible design that allow safe walking experience to all citizens especially elderly and people with special needs.
- **STREETS AS PUBLIC SPACES:** Streets that provide spaces outside our homes for social, cultural or intellectual interactions, to walk or to just breathe fresh air. Streets that reduces congestion through replacement of encroachments on streets to its designated areas and achieving low carbon emission.

KEY COMPONENTS

The key components of

Smart Streets Include (but not limited to) are illustrated in figure below

3. SCOPE OF WORK

Scope of work to achieve the objectives is divided into 3 phases

1. Pre Construction Phase – 3 Months
2. Construction Phase – 12 Months
3. Post Construction Phase – 12 Months (Defect liability period or DLP)

The works under Contract comprises the construction of proposed improvement of main road in city area as per the RFP standards, Junction, drainage works, re cambering/resurfacing of the existing and adjacent roads, construction of new carriageway, construction of utility corridors, cross drains, culverts, foot path, cycle track, development of parking areas & bus bays, landscaping, Electrification of the road and all other structures required for the completion of the Works.

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

The works under Contract comprises the construction of proposed improvement of roads , Junction, drainage works, construction of new carriageway, laying of all utilities like water supply, cables, landscape irrigation pipeline, fixing street lights, construction of utility ducts for crossing, cross drains, culverts, foot path, cycle track, development of parking areas & bus bays, Street landscaping, Street

Furniture, Traffic Signage's, Bus Shelters, Vending Kiosks, Miscellaneous works and post construction works for Period of one year.

Details and drawings given in document is for information purpose only and successful bidder shall undertake confirmatory survey for accuracy and completeness of data. The drawings provided with this document are also available in Autocad and Bidders can collect the same, (if required) from Employer. 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 post construction period.

The successful bidder shall have to prepare and submit both 'Good for Construction Drawings' before execution and 'As Built Drawings' after execution 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.

3.1 Pre-Construction Phase (design & good for construction drawings)

This phase starts from the date of signing of the Agreement to the date of approval of GFC. The total timeline for this phase is 3 months w.e.f. from the date of signing of Agreement.

Applying the design principles, Objective and expected outcomes illustrated in the RFP as well as attached drawings/documents provided by the employer, the contractor must develop on the concept provided, to create a Good for construction (GFC) drawings package, which on approval, shall be followed by on-site implementation. During this process, the contractor shall review the concepts design and planning for betterments or improvements which may be incorporated to better achieve the Employer's goals and objectives. These betterments, if any, shall be submitted by the contractor to the Client representative/PMC for review and for the approval before the closure of the Good for construction drawings stage.

Key tasks/deliverables by the contractor during Good for Construction Stage will include:

- This contract involves the design (wherever required, including submission and obtaining of all necessary approvals from the relevant authorities). The contractor shall prepare GFC for the works included in the RFP in accordance with the concept design developed by Employer.
- The contractor should submit a complete timeline for scope of work to be carried out

- The Client Representative/PMC will supervise and monitor the progress of this phase and contractor shall provide necessary coordination.
- Contractor shall conduct traffic studies and road investigations , Inventory of roads, Geotech investigations minimum 3 m below the hard rock or as per the BIS standards and for its structural stability and propose any new pavement, junction improvements , if required
- Based on the revised cross section, traffic and other relevant parameters, contractor will have to design the geometry of road and pavement etc.and get it vetted and approved by 'Engineer'.
- Preparation and Submission of Complete Bill of Materials (BoM) along with detailed technical specifications, manufacturer's details and delivery schedule at the sites. Shall also provide the codification for all the items delivered.
- Preparation and submission of the details of the man power deployment for the project.
- Dispatch of materials as per the implementation accepted timelines / implementation schedule and phasing of the project by the employer.
- Preparation and submission of monthly progress report for all the stages.
- Employer will provide all the available information pertaining to these roads to the successful bidder. However contractor has to validate the information provided by carrying of field/site surveys/other relevant surveys as deemed necessary independently. The contractor shall conduct site survey and investigation of the road where design has to be implemented and prepare survey report highlighting the site feasibility, GFC drawings, and site specific requirements / dependencies for successful implementation.

a) Landscape, Hardscape and Cycle Tracks Works

a) The various components included (but not limited to) in this are – wide footpaths, cycle tracks, landscape corridor with trees, pedestrian street lighting, bus bays, on-street parking, road markings, median, hawker zone, improved junctions, table tops, universal accessible design by introduction of ramps, benches and planting beds, provision for future bus stops, public toilets and ATMS
b) Design and Construction of bus stops, public toilets and ATMs is not part of the contractor scope of work. Although the contractor is required to ensure site coordination and construction activity alignments when these works are being undertaken by other contractors.
c) General Arrangement Plans (Surface Finishes Layouts) including Materials, Site Furniture, cycle tracks etc.
d) Levels and Grading Layouts; Material/Lighting/Furniture Schedules; Hardscape Details (including ramps, cycle tracks, bus bays, on-street parking and benches); pedestrian Lighting details; planting schedule; planting and soil details

e) Design and preparation of GFC for items listed in Employers BoQ
f) Hard Landscape Specification including all details in Employers Bill of Quantities (BoQ) and Technical Specs
g) Softscape Specifications including all details in Employers BoQ and Technical Specs
h) Final Setting-Out Plan for hardscape, softscape, ; furniture, cycle tracks, footpaths, lighting etc
i) All detail construction drawings suitable for construction works to be undertaken by contractor and vetted by concerned field experts
j) All necessary coordinated services drawings (including but not limited to location of light fixtures, cycle tracks, footpaths, existing site services and any new added services etc.)
k) Shop drawings for all proprietary items/vendor items

The contractor must be aware of general and specific site conditions, topography and any existing landscape prior to commencement of any landscape works on site.

b) Utilities - Scope of Infrastructure for Contractor

a) Objectives for Infrastructure Layout: A sustainable approach to design and implementation of roads based on three basic principles outlined in the Tender i.e. Focus on pedestrians/cyclist movement for safety, Consistent traffic & travel lane widths and Intelligent relaying of all sub terrain utilities so that no more digging up of smart roads. Every effort to include parking spaces, street landscape, garbage pickup points, adequate lighting, clean signage's, ramped footpaths etc..in the smart streets.

b) The project of Smart Street has been considered under smart city for showcasing the pilot development to the rest of the city, which makes the area liveable and better eco friendly environment. The scope of work for infrastructure is explained in the following section.

1. Development and Strengthening of Carriage way with uniform lanewidths. This would require removal of existing median and relocating it at a new defined road center with Street lighting and landscape elements as shown in concept drawings
2. Development of footpath wider and Pedestrian friendlyways.
3. Reserving the space for utilities in a specified corridor
4. Reserving the Utility crossing Duct at every 500 m c/c along the Smart Street
5. Rehabilitation of Tertiary Storm Water road side drain for easing out of rain water with proper shouldersetc.

6. Development of junction across entireroad.
7. Construction Bus bays, Auto bays whereveressential.

In this project, the above said points have been considered/ incorporated for the standard development of roads. The objective of these standards is to make road for longer duration usage and to be free from zig-zag movement of vehicles, to ease out the pedestrian movement and for the safety of school children and elderly. Further, this project should ensure to avoid un-necessary road cuttings by various utility agencies.

c) Smart Streets - Infrastructure

Urban Streetscaping

Kakinada Municipal Corporation has taken up the project of Urban Streetscaping of the Main road in Kakinada. The following points have been incorporated in this project.

Development and strengthening of carriageway with uniform lane widths.

01. Development of footpath with uniform footpath widths and pedestrian friendly ways.
02. Construction of utility duct all along the main road to run all utility services underground.
03. Construction of Storm water drain for easing out rain water with proper shoulders etc.
04. Development of Junctions across entire road.
05. Beautification and Landscaping of the footpath, Junctions.
06. Provision of street furniture (Signage's, Lane marking)
07.Development of Cycle track all along the proposed Urban Streetscaping project.

Provision for Bus bays ,Urinals and Public convenience, Dust Bins (S S), C.I. Tree grating, Auto stands ,Bycycle stations, Ornamental lighting for Foot paths.

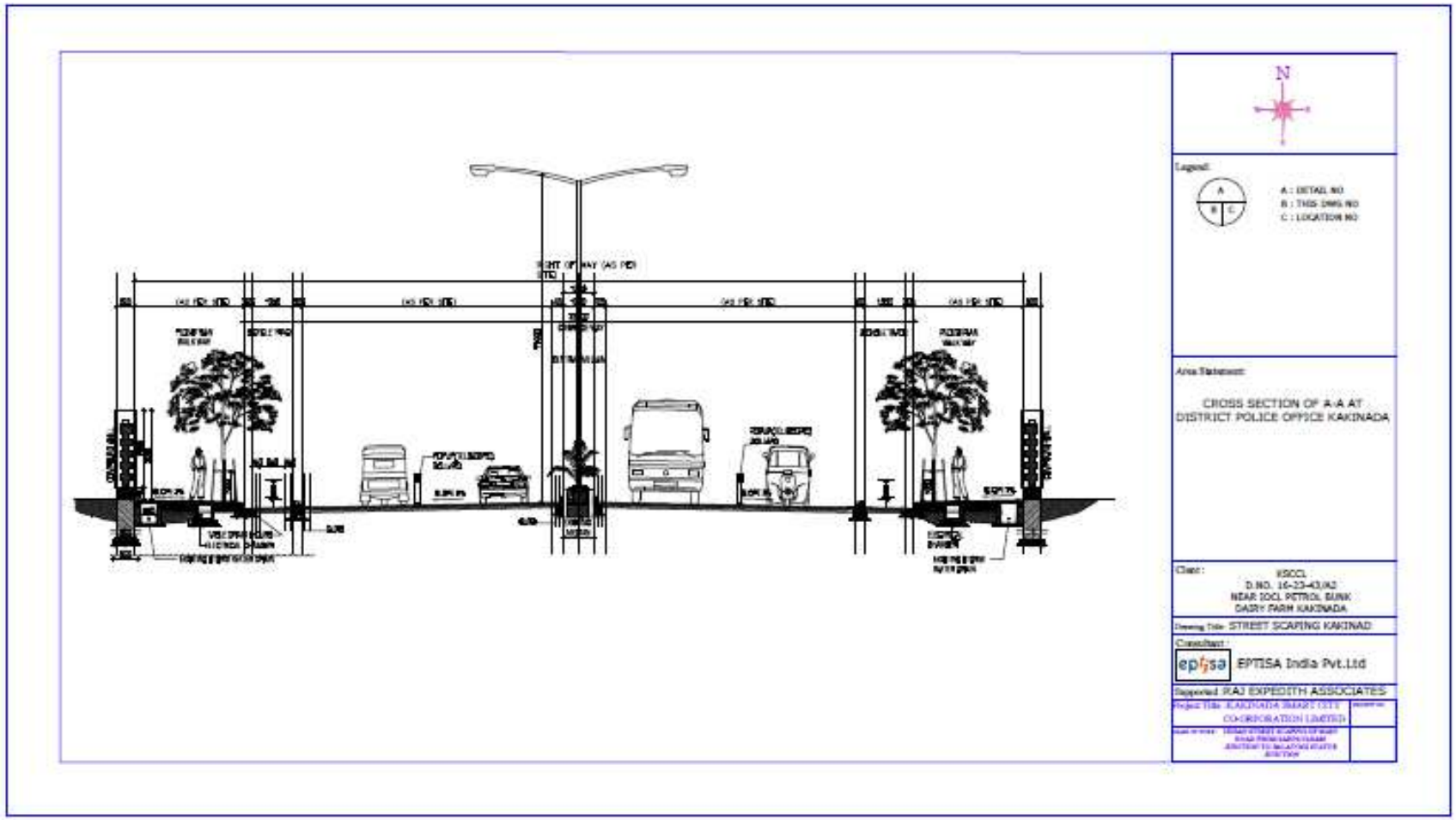
In this project, the above said points have been considered for the standard development of the Main road. The objective of these Tender SURE standards is to make road for longer duration usage and to be free from zig-zag movement of vehicles, to ease out the pedestrian movement and for the safety of school children and old aged. Further, this project ensures avoiding of un-necessary road cuttings by various utility agencies.

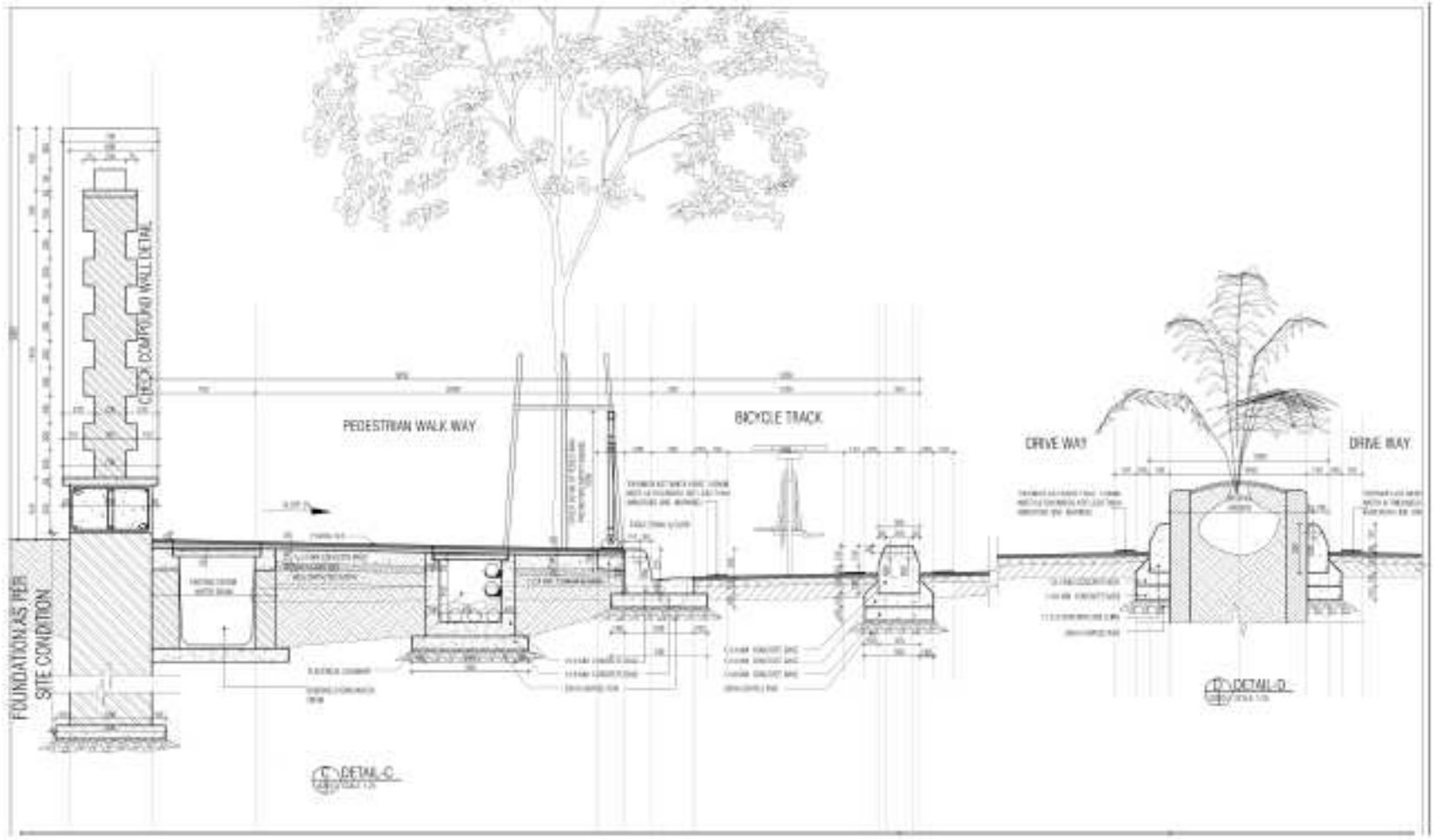
D. Smart poles. Smart poles are to be erected as per standard specifications

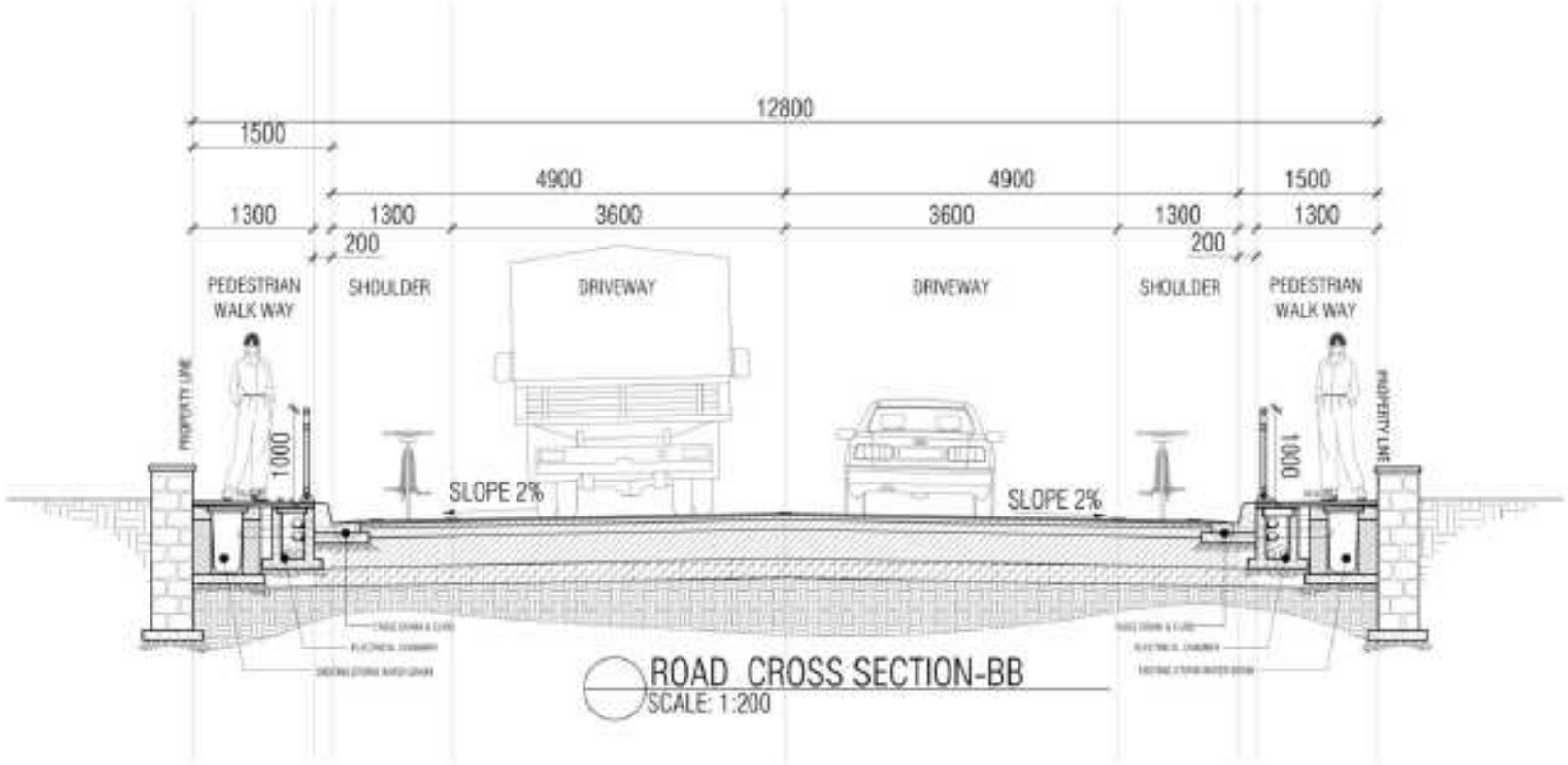
E. STAINLESS HAND RAILING

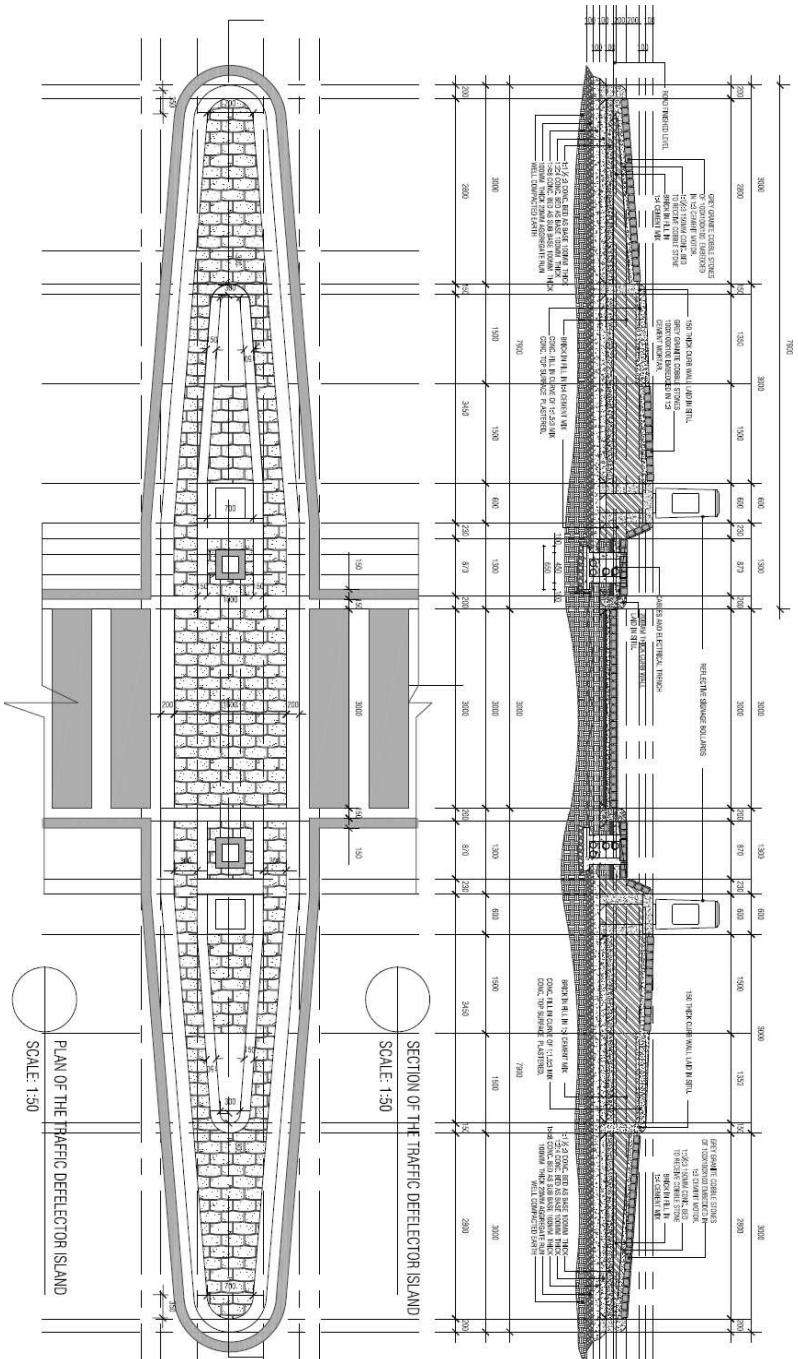
Stainless steel railing (SS 304) on either side of the road as protector for Pedestrian walkway.

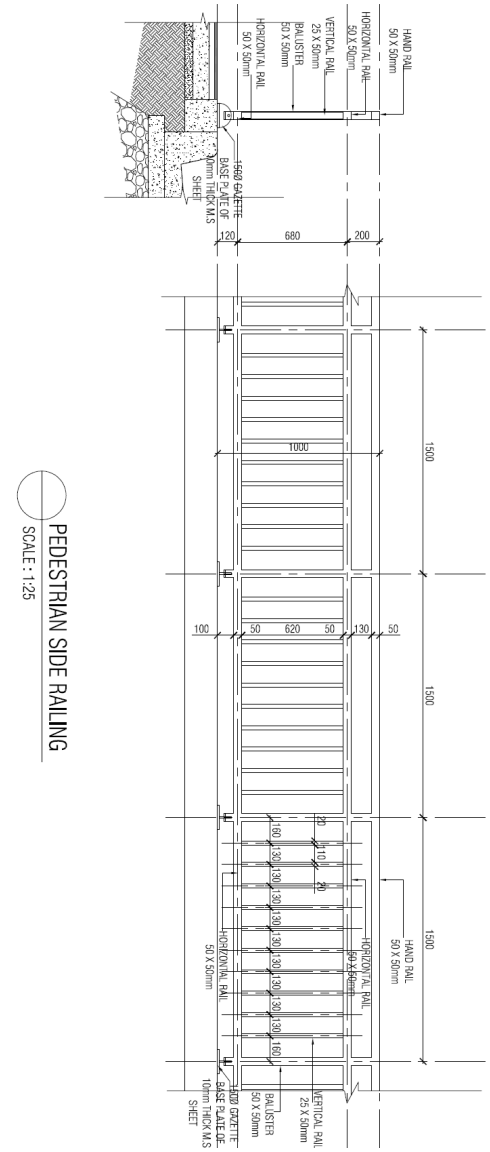
Following drawings shows the typical Map of existing and proposed road stretches to be developed all along the Main road from Sarpavaram Junction to Balayogi Statue junction


N
Legend:
A : DETAIL NO
B : THIS DWG NO
C : LOCATION NO
CROSS SECTION OF A-A AT
DISTRICT POLICE OFFICE KAKINADA
KSCCL
D.NO. 16-23-43/A2
NEAR IOCL PETROL BUNK
DAIRY FARM KAKINADA
STREET SCAPING KAKINAD
EPTISA India Pvt.Ltd
RAJ EXPEDITH ASSOCIATES
CO-ORPORATION LIMITED


CHECK COMPOUND WALL DETAIL
PEDESTRIAN WALK WAY
BICYCLE TRACK
DRIVE WAY
DRIVE WAY
FOUNDATION AS PER SITE CONDITION
DETAIL-C
DETAIL-D


12800
1500
4900
4900
1500
1300
1300
3600
3600
1300
1300
200
200
PEDESTRIAN WALK WAY
SHOULDER
DRIVEWAY
DRIVEWAY
SHOULDER
PEDESTRIAN WALK WAY
PROPERTY LINE
1000
SLOPE 2%
SLOPE 2%
1000
PROPERTY LINE
ROAD CROSS SECTION-BB
SCALE: 1:200


PLAN OF THE TRAFFIC DEFELECTOR ISLAND
SCALE: 1:50
SECTION OF THE TRAFFIC DEFELECTOR ISLAND
SCALE: 1:50



PEDESTRIAN SIDE RAILING

SCALE: 1:25

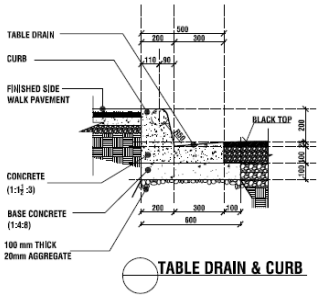
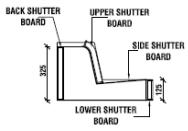
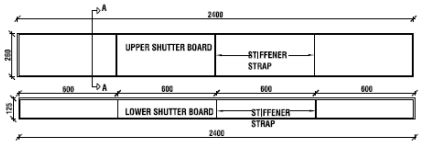
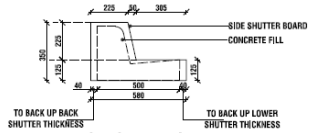


TABLE DRAIN & CURB

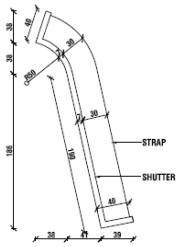


SECTION OF TABLE DRAIN





SIDE SHUTTER BOARD



A-A SECTION OF UPPER SHUTTER BOARD

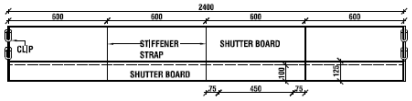
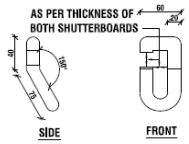


TABLE DRAIN FRAME FROM FRONT



RAILWAY CLIP

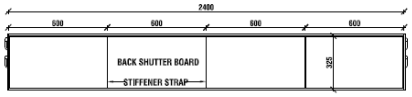
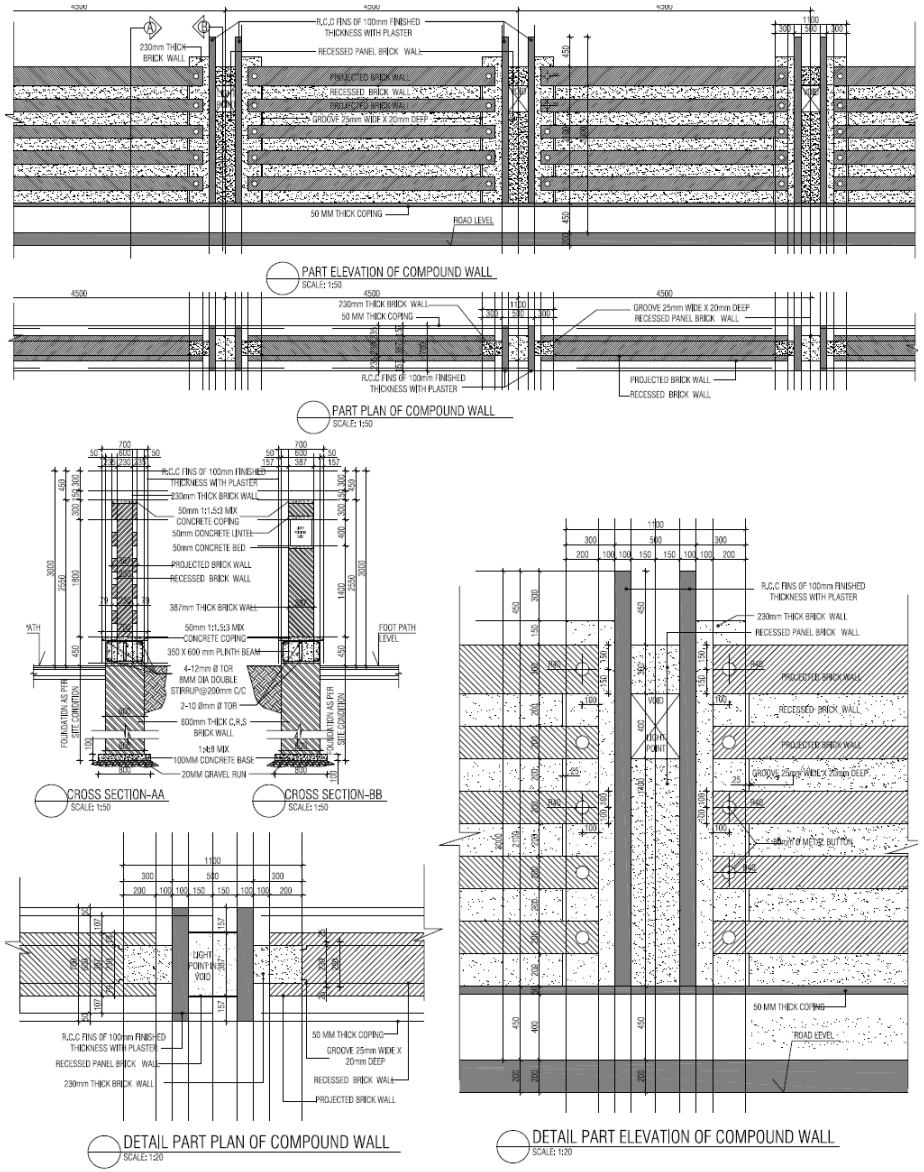
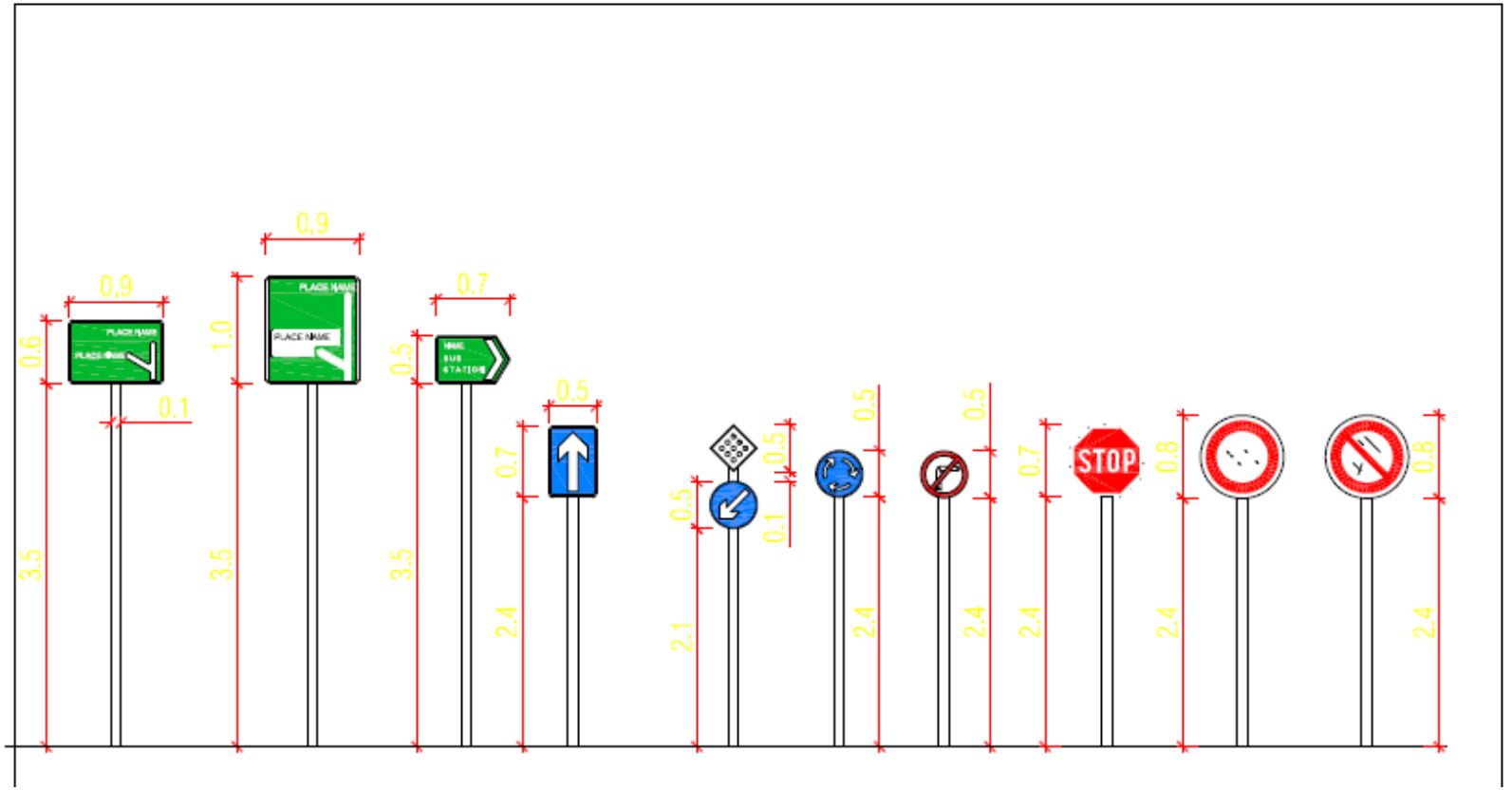


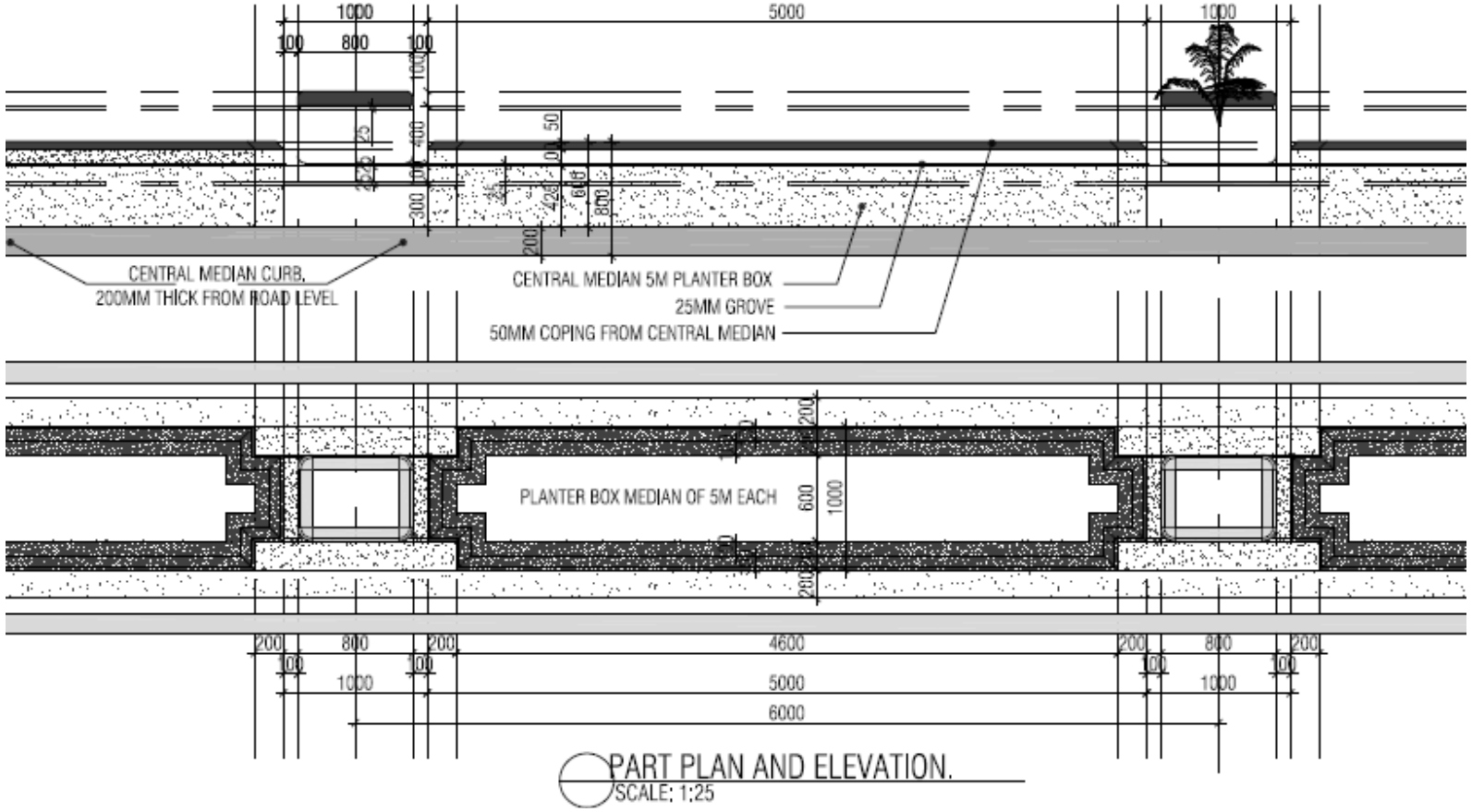
TABLE DRAIN FRAME FROM BACK

DETAIL OF TABLE DRAIN & SHUTTER FRAME FOR 2.4m LENGTH

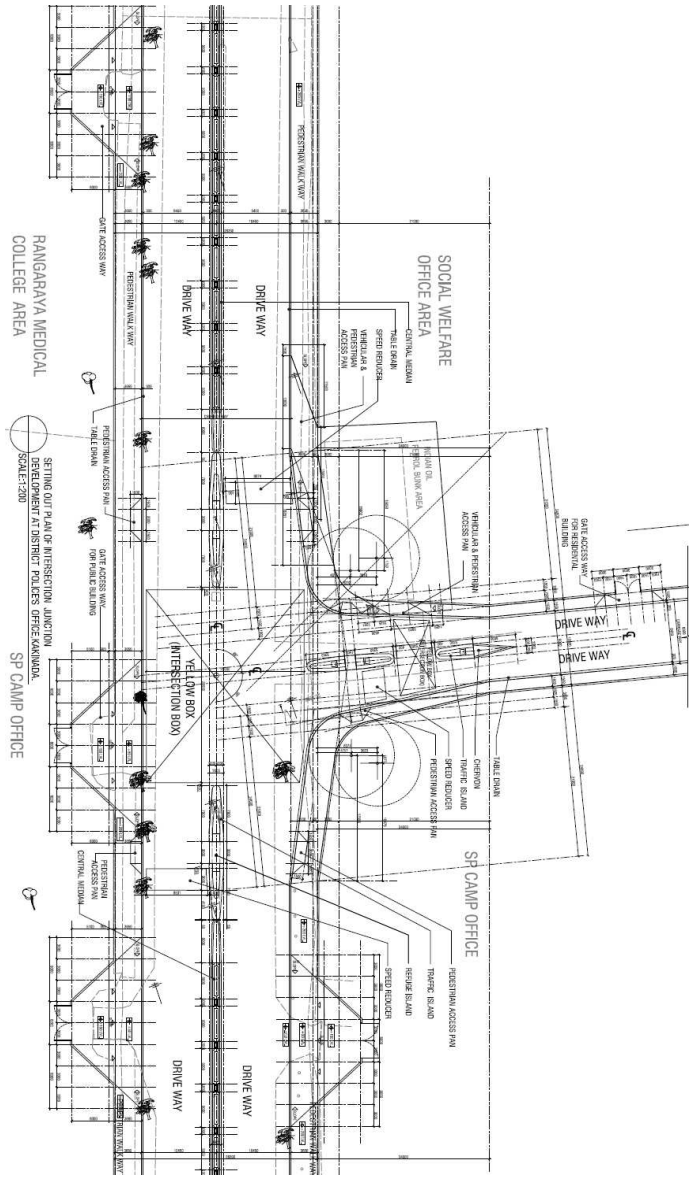
SCALE:1:20

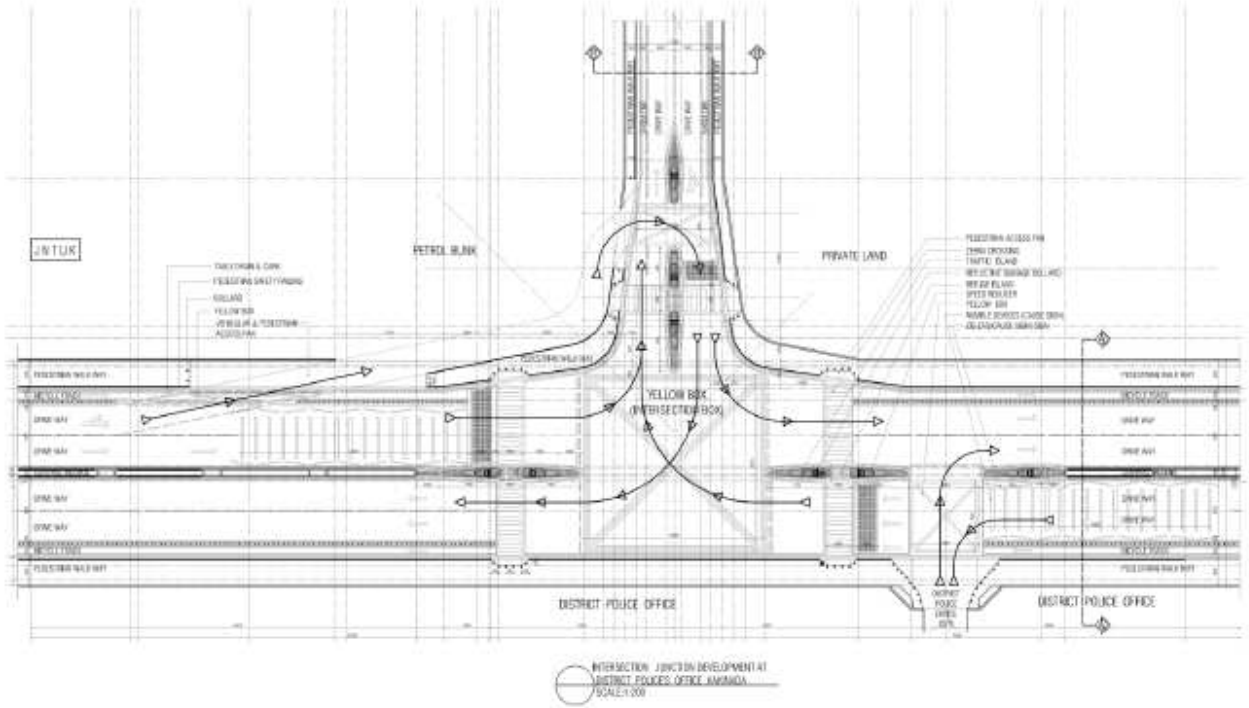

R.C.C FINS OF 100mm FINISHED THICKNESS WITH PLASTER
230mm THICK BRICK WALL
RECESSED PANEL BRICK WALL
PROJECTED BRICK WALL
RECESSED BRICK WALL
PROJECTED BRICK WALL
GROOVE 25mm WIDE X 20mm DEEP
50 MM THICK COPING
ROAD LEVEL
PART ELEVATION OF COMPOUND WALL
SCALE: 1:50
4500
230mm THICK BRICK WALL
50 MM THICK COPING
GROOVE 25mm WIDE X 20mm DEEP
RECESSED PANEL BRICK WALL
R.C.C FINS OF 100mm FINISHED THICKNESS WITH PLASTER
PROJECTED BRICK WALL
RECESSED BRICK WALL
PART PLAN OF COMPOUND WALL
SCALE: 1:50
700
R.C.C FINS OF 100mm FINISHED THICKNESS WITH PLASTER
230mm THICK BRICK WALL
50mm 1:1.5:3 MIX CONCRETE COPING
50mm CONCRETE LINTEL
50mm CONCRETE BED
PROJECTED BRICK WALL
RECESSED BRICK WALL
387mm THICK BRICK WALL
50mm 1:1.5:3 MIX CONCRETE COPING
350 X 600 mm PLINTH BEAM
4-12mm Ø TOR
8MM DIA DOUBLE STIRRUP@200mm C/C
2-10 Ø8mm Ø TOR
600mm THICK C.R.S BRICK WALL
1:4:8 MIX
100MM CONCRETE BASE
20MM GRAVEL RUN
FOOT PATH LEVEL
FOUNDATION AS PER SITE CONDITION
CROSS SECTION–AA
SCALE: 1:50
CROSS SECTION–BB
SCALE: 1:50
1100
300
500
200
100
150
LIGHT POINT IN VOID
R.C.C FINS OF 100mm FINISHED THICKNESS WITH PLASTER
RECESSED PANEL BRICK WALL
230mm THICK BRICK WALL
50 MM THICK COPING
GROOVE 25mm WIDE X 20mm DEEP
RECESSED BRICK WALL
PROJECTED BRICK WALL
DETAIL PART PLAN OF COMPOUND WALL
SCALE: 1:20
VOID
LIGHT POINT
50 MM THICK COPING
ROAD LEVEL
DETAIL PART ELEVATION OF COMPOUND WALL
SCALE: 1:20


0.9
0.6
0.1
3.5
0.9
1.0
PLACE NAME
3.5
0.7
0.5
3.5
0.5
0.7
2.4
0.5
0.5
0.1
2.1
0.5
2.4
0.5
2.4
0.7
STOP
2.4
0.8
2.4
0.8
2.4

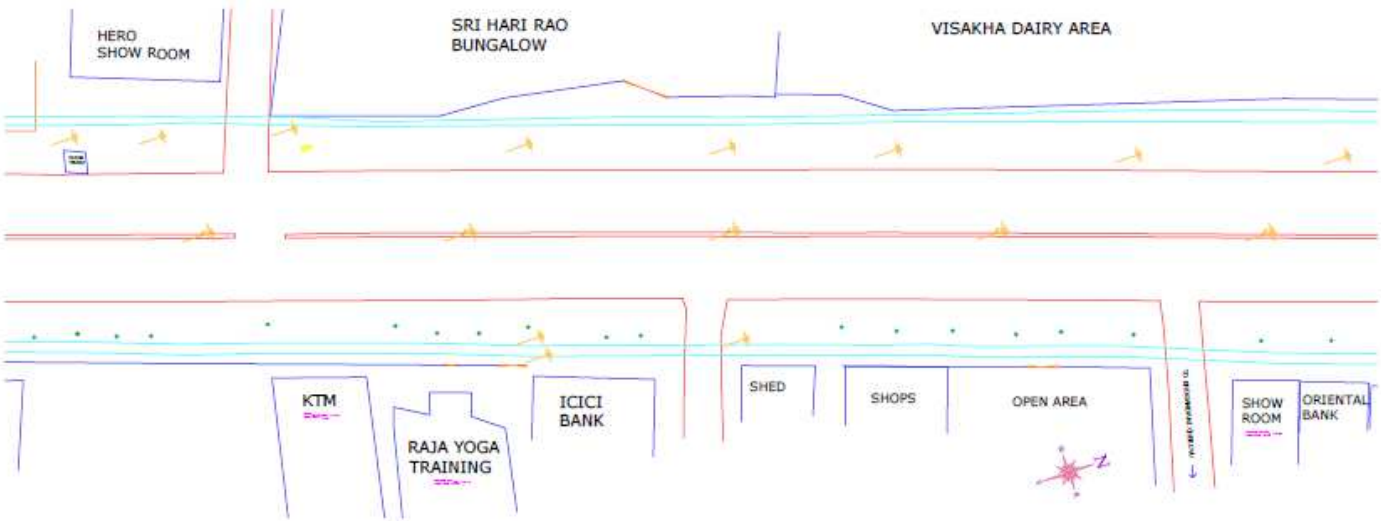


PART PLAN AND ELEVATION.
SCALE: 1:25


SOCIAL WELFARE OFFICE AREA
RANGARAYA MEDICAL COLLEGE AREA
SP CAMP OFFICE
DRIVE WAY
DRIVE WAY
DRIVE WAY
DRIVE WAY
DRIVE WAY
YELLOW BOX (INTERSECTION BOX)
PEDESTRIAN WALK WAY
GATE ACCESS WAY
PEDESTRIAN WALK WAY
PEDESTRIAN ACCESS PAN
TABLE DRAIN
GATE ACCESS WAY FOR POLICE BUILDING
CENTRAL MEDIAN
TABLE DRAIN
SPEED REDUCER
VEHICULAR & PEDESTRIAN ACCESS PAN
GATE ACCESS WAY FOR HEREDITAL BUILDING
VEHICULAR & PEDESTRIAN ACCESS PAN
CHEVRON
TRAFFIC ISLAND
SPEED REDUCER
PEDESTRIAN ACCESS PAN
TABLE DRAIN
PEDESTRIAN ACCESS PAN
CENTRAL MEDIAN
PEDESTRIAN ACCESS PAN
TRAFFIC ISLAND
REFUGE ISLAND
SPEED REDUCER
SETTING OUT PLAN OF INTERSECTION JUNCTION RELEVAPMENT AT DISTRICT POLICE'S OFFICE,KAKINADA.
SCALE:1:200



INTERSECTION JUNCTION DEVELOPMENT AT
DISTRICT POLICES OFFICE MARIMBA
SCALE 1:200



Existing Road near KTM Show room (Typical Road)

b) Proposals for the infrastructure:

The above information is given for a quick reference only for the contractor and it is the contractors responsibility to verify the same/ visit the site and submit the proposal/ bid to ensure the '*objectives of Infrastructure layout*' are met with. The contractors proposal should include all elements required to meet the objectives, even though it is not explicitly specified in the scope.

In the smart street, based on the availability of space/ RoW, specific corridor and pipe alignment is planned and provided in the drawings (Refer Annexures 3). The quantities and diameters are provided in the BOQ. Employer will provide all available information and data to successful contractor. However contractor has to validate the data on field using any suitable latest technology and modify the plans, if required and the same shall be submitted to the Engineer for approval before taking up any action of implementation on the ground.

Contractor of this project is like a master developer for Smart street and should coordinate with various other contractors/agencies/departments for phasing the different components of his work (like utility laying, Pavement, Footpaths, over ground facilities etc.) in such a way that repetition/ duplication and clashes shall be avoided and work is completed in optimum time period assigned as per the contact. Engineer / Employer will extend their cooperation in organizing the meetings and coordination.

Clash Analysis has to be done in BIM software before execution and the same shall be submitted for approval to engineer.

- New water supply lines of the same dia, with DI/HDPE material and class have to be laid in the proposed corridor and the house service connections shall be transferred to the proposed line. After transferring, earlier connections shall be disconnected from old lines and made defunct. It is not envisaged to removed old lines from the roads.
- Contractor should note that, In the above table, it is to be noted that AC pipes shall be replaced with HDPE pipes and CI pipes shall be replaced with DI pipes of same diameter.
- Contractor shall check any variation in the footpath depths will impact the SWD and modify accordingly without impacting final discharge point levels. No stagnation of water is envisaged in these roads in the past due to good slopes available in this area. However, Contractor shall verify the Adequacy and rehabilitate/provide side drainage to ensure free discharge.
- Power Supply: 33 KV / 11 KV and LT overhead lines are passing along the road, which will be shifted by the department on their own in the proposed corridor pf 1.2

m x 1.2 m on either side of the road (which shall be provided by contractor). Contractor has to coordinate with theAPEPDCLwhile laying the underground cabling.

- Street Lights/ Telephone Posts: Running in the center along with its cable. Since the center line of the road may be getting shifted, the poles also have to be shifted.

d) General Conditions of Work:

Prior to starting the works on site Appointed Contractor shall submit the following documentation for approvals:

a) Detailed Programme of Work for all Works:

i. Prepare a detailed programme showing the stages, sequence and timing of all parts of work in MS Project (including subcontractors involvement/items and itemised items from Outline Programme of Work); It should include the resources, men, material, equipment required with *clear critical path* to execute the work as per agreed implementation schedules by employer.

ii. Timelines should be clearly defined. They should include estimated completion date and number of working days;

iii. Programme should include detailed information on resources (manpower, equipment etc.), works by subcontractors etc.;

iv. Schedules are to be coordinated with the main contractor's program and subject to Client's approval;

v. Method statement for all works, including transport & delivery of materials, site works including earth works, hardworks installation, plant protection, temporary storage etc. should be clearly defined;

vi. Potential risks to programme should be summarised and mitigation methods provided (alternative programme of work if applicable);

vii. Special coordination requirements to be defined.

b) Procurement Plan:

i. Submit a Procurement Plan based on Client Representative's comments regarding the Procurement Schedule (as submitted with the tender document). The submitted Procurement Plan shall provide clear information on the following;

ii. Procurement schedule for all materials (including utility services, landscape elements, site furnishings, lighting, bus stops, public toilets ATMs etc..);

iii. Information of Supplier's

iv. Existing and future availability of materials;

v. Information of Supplier's and/or Contractor's Off- site;

vi. Existing and future availability of materials.

c) Material/Product samples:

i. All samples for material are to be submitted as required;

ii. Product certificates for manufactured products should be submitted;

iii. Type and number of samples as specified in relevant sections of this document;

iv. All samples need to be approved by Employer & PMC prior to commencement of works on site.

v. For material, re-submit list with source and quantity available for each representative materials.

vi. Landscape species should include tree, palm, shrub, climber, bamboo and ground cover species indicating height, spread, calliper and root ball size, for final approval by Client's Representative &PMC. Any agreed substitutions to plants species or specifications should be included here.

vii. Contractor to arrange for visit by Client's Representative and PMC staff to supplier or manufactures site location for a eye witness and material testing to approve selected materials prior to procurement at this own cost (including travel/perdiems/accommodation etc..to the employers representative and PMC staff).

d) Site Management Plan

Measures to be taken before commencement of works as well as during the works and maintenance period,

i. Site arrangement layout for temporary structures, storage, water and electricity supply etc.;

ii. **PHASING Plan** to be submitted for approval to Employer/PMC prior to commencement of site work. Contractor has to ensure that there is little or no disturbance to the traffic, while planning the implementation phasing. Commuters shall be provided with proper signages, warnings, alternative routing etc… after discussions and approvals of Employer/ Engineer. It is to be ensured that at no time during the construction phase, the functioning of

each of the roads is to be disturbed or stopped. Consultation will be required with the relevant authorities for construction phasing;

iii. Contractor has to show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earthwork operations. Submit before earth work begins.

e) Health and Safety Plan

i. Prior to commencing site works the following will be provided to the Client's representative:

ii. Method statements on how risks from hazards will be addressed;

iii. Details of management structure and responsibilities;

iv. Arrangements for issuing health and safety directions;

v. Procedures for informing other contractors and employees of health and safety hazards ;

vi. Procedures for communications between the project team, other contractors and site operatives;

vii. Arrangements for coordination and cooperation between contractors;

viii. Procedures for carrying out risk assessments and for managing and controlling the risks;

ix. Emergency procedures including those for fire prevention and escape;

x. Arrangements for ensuring that all accidents, illness and dangerous occurrences are recorded;

xi. Arrangements for welfare facilities;

xii. Procedures for ensuring that all persons on site have received relevant health and safety information and training;

xiii. Arrangements for consulting and taking the views of people on site;

xiv. Arrangements for preparing site rules and drawing them to the attention of those affected and ensuring their compliance;

xv. Monitoring procedures to ensure compliance with site rules, selection of management procedures, health and safety standards and statutory requirements;

f) Site Waste Management Plan

i. Plan should include details on type and quantities of the waste generated –

including demolition waste, day to day generated waste, disposal of the same safely considering the environmental and social consideration etc.;

ii. Detail description of the waste management methods and actions to minimise/reuse/recycle waste,

iii. Recourses required and detail plan of work for waste management team;

iv. Record keeping procedures;

v. Auditing protocols;

vi. All of the above should be approved by the Client/Client's representative prior to commencement of works on site. No works shall be executed without above mentioned approvals.

3.2 CONSTRUCTION PHASE

This phase starts from the date of approved good for construction drawings (GFC). The total timeline for this phase is 12 months w.e.f the date of approved GFC by client/PMC.

This contract involves the design (wherever required, including submission and obtaining of all necessary approvals from the relevant authorities), construction and completion of the following based on the design developed by the Employer and Contractor's good for construction drawings and handing over of the same in full accordance with the Employer's requirements. Key tasks include:

i. Site clearance, demolition works, earthworks, temporary works, Traffic diversion, Barricading the construction site, Utility shifting and all ancillary works as shown on the Drawings and deemed necessary for the carrying out of temporary and permanent construction works;

ii. Narrowing/re-cambering/raising/milling down and overlaying of existing carriageways, flexible/rigid pavement at at-grade road intersections and accesses to adjoining developments;

iii. Contractor has to ensure the safety and security of existing buildings adjacent to roads.

iv. Trees cutting (if any) as indicated in the Drawings;

v. Excavation of trenches; relocating of median, removal of existing poles / transformers, etc.. and other road related facilities as per standards / drawings

vi. Construction of Utility ducts, cross drains shall be proposed by contractor based on the site suitability and the should be approved by Engineers per the drawing.;

vii. Construction of footpath, cycle track, kerbs, vehicular impact guardrails, and other road-related facilities as per drawings;

viii. Supply and installation of new Electric poles and light fittings as shown in the Drawings;

ix. Temporary and permanent diversion and restoration of footpath, drains, roads and street furniture including the supply and painting of road/lane markings for all temporary and permanent carriageway in accordance with the Employer‘s requirements and to the satisfaction of the Engineer;

- The contractor should submit a complete implementation timeline
- The Client Representative/PMC will supervise and monitor the progress of the implementation and contractor shall provide necessary coordination.
- Technical Specifications for Various Civil Works to be followed in the project duration including works under post construction period, by the Selected Bidder (**Refer quality standards & control which includes)**
  - For Product and Execution – Hardscape Works
  - For Product and Execution – Softscape Works
  - For Product and Execution including list of standards
  - For works under post construction period

  Refer Annexure 5 for the quality standards & control which includes
  - For Product and Execution – Hardscape Works
  - For Product and Execution – Softscape Works
  - For Product and Execution including list of standards
  - For under post construction period
- Material/Product samples:
  - All materials/samples to be submitted to the Client representative & PMC for comments and approval prior to commencement of works;
  - Type and number of samples as specified in relevant sections of this document
  - Contractor shall arrange factory inspection to the client representative & PMC staff at his own cost for various equipment/ material that is being used by contractor.
- Sample panels:
  - Mock-ups All sample panel/mock-up to be presented to the Client/Client’s Representative for comments and approval prior to commencement of works;
  - Type and number of sample panels as specified in relevant sections of this document.
- Operations & Maintenance Manual:
  - This should include schedule and instructions for all activities to be undertaken for operations and maintenance of established works.
- As-built drawings:
  - The Contractor shall prepare As-Built drawings and certify on these drawings that the drawings reflect the actual works executed / installed.

- Three sets of these drawings (A1 hardcopy, printed to scale and softcopy in AutoCAD /GIS and also in PDF on a CD/harddisc) shall be submitted to the client post approval and record.
- The contractor shall ensure that this submission of As-Built drawings will not delay subsequent inspections and tests by the relevant authorities; otherwise he shall be fully responsible for any consequence due to his delay.

3.3 POST CONSTRUCTION

Post construction activities shall include Defect Liability (works specified under this RFP) and also maintenance of roads, landscape and also the utilities laid by the contractor in the smart roads. Any faults, repair and general maintenance, watering of landscape etc.. shall start from the date of practical completion for a period of 12 months and contractor shall undertake all responsibility for defects of the equipment and landscape materials during this period.

General scope provided in the section below, applies to both the phases i.e. pre-construction construction and post construction.

3.4 GENERAL SCOPE

a) The work in this RFP involves the design (wherever required, including submission and obtaining of all necessary approvals from the relevant authorities), supply, installation, construction and completion of all road works, utility works, landscape works and allied civil and services work. The Contractor shall furnish all labour, material, tools and equipment necessary to complete the works as indicated on the drawings. Any item not specifically shown in the drawings or specified but normally required to conform to such intent, should be considered part of the work unless raised by the Contractor prior to commencement of works. Contractor shall include and price for such item in the BOQ accordingly;
b) All works indicated in the Drawings by notes are to be provided for, whether or not mentioned in this specification. Any item not specified nor specifically shown in the drawings, but are normally required to conform to such intent, are considered part of the work and deemed to be included in this contract and their execution shall be covered by the contract price, in the same manner as if they have been expressly shown on the drawings and described in the specifications.
c) Contractor shall provide necessary office space at site with all required amenities to the employers representative and PMC staff during the construction and supervision of works.
d) Contractor shall also provide min four air conditioned cars with fuel and driver for the Employers representative at this own cost during the construction period at their disposal.

e) The works shall be completed within the scheduled time and shall be certified by the Client's Representative in consultation with the PMC upon Practical Completion;
f) The landscape planting shall be provided in the areas shown in the Drawings with plants in a healthy and vigorous growing condition.
g) The Contractor shall submit for approval, his proposed Work Programme based on the criteria of the overall programme showing the intended sequences, stages and order of proceeding with the works together with the period of time he has estimated for each and every stage of the progress upon notification of his successful tender price for the project;
h) Adjustments To Scope
   i. Client's Representative/PMC reserves the right to make field adjustments and reasonable substitutions to ensure implementation of the design concept in relation to field conditions.
   ii. If any material or installation specified is not available or achievable, the Contractor shall submit a written proposal to the client within two (2) weeks of award of the contract. This request may present an alternative material or process which fulfils the same design intent, with the proposed adjustment to the contract price for each item due to the change.
   iii. Substitution of materials is not permitted unless authorised in writing by the Client.
i) Timelines

The Contractor shall complete the works within or by the date of completion as set forth in the Contract.

j) Discrepancies

The Contractor to study the drawings at the time of the tender and notify Client's Representative of any discrepancy at the time of the tender submission.

k) Error And Omission
- The general description of the works mentioned above is only for the guidance of the Contractor and any error or omission shall not constitute ground for claim by the Contractor. The onus for investigating and ensuring the actual extent and nature of the works comprised in this Contract prior to the submission of the quotation is solely with the Contractor. Any doubts should be clarified with the Client's Representative before the quotation is submitted. No claim arising out of lack of clarity or availability of information will be entertained post Contract award. Allowance for any or all of these provisions shall be made in the tender BOQ.
- Contractor shall maintain skeleton staff for the works under post construction period and also maintenance

l) List Of Relevant Documents To Be Referred

This specification to be read in conjunction with:

- **Concept** Design Intent Drawing Package (roadworks, underground / over ground utilities, landscape with allied services, junction design etc) included in Annexures or most up to date revision issued thereafter;
- **Bills of Quantities (BoQ)** : Indicative list of BoQ, is included in the bid and most up to date revision issued thereafter;
  - Note: If work item is not included in Indian Standards, appointed contractor should refer to relevant international standard (BS or equivalent). This should be approved by Client's representative prior to commencing any works on site;
- Other documents – any documents not included above but relevant to the tender process. These should be provided/made available to Contractor by the Client/Client's representative if applicable.

The list of drawings are enclosed in Annexure 3

3.5 Services to be provided by the Contractor

The Contractor shall be responsible for all the testing and inspection to be conducted as specified.

1. Supply, erection as per manufacturers recommendations, inspection, testing, start up and running of the equipment during trial run / performance guarantee period at rated capacity and speed.
2. Furnishing all erection and commissioning supervision service. The Contractor shall also arrange for maintenance of equipment during performance guarantee and commissioning period.
3. The Contractor after complete erection and testing shall do application of the final paints of approved colour.
4. The Contractor shall arrange for onsite supervision of technical experts, of equipment's from proprietary supplier as and when necessary until the commissioning and guarantee-run of the plant are completed.

Contractor's Obligations

The Contractor should ensure technical feasibility of their tender offer, after inspecting the site. It must be understood that it is a turnkey project and the firm shall be required to execute every such items of work, which are considered necessary for satisfactory completion, even though such items are not specified in the tender documents.

All the works under the scope are to be designed and executed as per the technical specifications and requirements.

The Contractor can take up the works of site clearance and grading and other

mobilisation works with the permission of the Engineer after the award of the Contract.

However, before taking up the construction work, the Contractor shall be responsible for preparing and submitting for checking and approval of the following:

1. General arrangement drawings for each unit and showing existing and finished ground levels, necessary provision for civil/structural works and electrical/mechanical works separately.
2. Civil structural design calculations & drawings for each unit shall be submitted for approval and execution purposes.
3. Schedule for designs, drawings & execution, Bar Charts-CPM / PERT charts hall be prepared in Ms Project.
4. During the course of construction and its completion, the Contractor shall submit the following designs, drawings/ documents for Civil and Electrical works, which may be needed for utility shifting, telephone lines/ street light poles etc..

Contour plan of the site will be provided to the Contractor by the client/PMC.

3.6 Special conditions to be fulfilled by the Contractor

The Contractor is advised to note that the following special conditions are part of the Contract and he will not have any right to claim at any time for delays or for expenditure incurred by him caused by the following special conditions.

3.6.1 DESIGN DRAWINGS

The drawings issued with these Tender Documents are Design Drawings. These drawings if stands finalized at the time of executing the agreement, together with additional drawings and / or modified drawings, signed and made part of the contract will be called contract drawings. Tender Drawings are prepared in such detail as are necessary to give a comprehensive idea of the works. Any questions or alterations affecting the requirements or information on the Contract Drawings shall be submitted in writing to the **Engineer** and shall be reviewed by the **Engineer**.

The lines indicated on the Contract Drawings denoting locations of the existing and proposed utilities or services are approximate locations. The Contractor is not to assume that they are exact. He has to confirm

the exact location of the utilities in consultation with the relevant authorities.

3.6.2 WORKING DRAWINGS

The Design Drawings shall be supplemented by working drawings or shop drawings prepared by the Contractor which are required for the execution of the works. These working drawings shall include, electrical single line drawings, mechanical drawings, piping drawings setting out construction details, layouts, utility relocation and protection, and any other detail the **Engineer** may ask during construction.

All drawings shall be computerized and shall be submitted both in hard copy as well as digital data.

Existing ground levels shall be taken at intervals not exceeding 25m. Information related to all existing structures, obstructions and services should be located in the survey drawing.

Approval by the Engineer of the Contractor's working drawings shall not relieve the Contractor from responsibility for the accuracy of dimensions and details, nor shall such mutual agreement and compliance to his working drawings constitute an acceptance by the Employer of the correctness and adequacy of the drawings.

Working drawings as required or as directed by the Engineer shall be prepared and submitted by the Contractor sufficiently in advance. All working drawings shall be checked by the Engineer and work can commence only upon getting approval of the working drawing.

Delays to work by reason of lack of approvals of working drawings and shop drawings are deemed to be a risk the Contractor is taking with full knowledge and no compensation shall be claimed by the Contractor or none given by the Employer, on account of such delay.

The costs of furnishing working drawings shall be included in the rates for various paying items given in the Bill of Quantities.

In this respect the Contractor shall employ his Engineers and AutoCAD Draughtsmen specifically for planning and preparation of working drawings. The Contractor shall also provide as part of the mobilization to site a latest model Pentium Computer and software together with new colour printer, for the preparation of his working Drawings. The PMC Consultants shall have access to this Computer.

3.2.3 ADDITIONAL WORK

Any additional works, instructed during the Contract Period and within the Contract Amount, will be paid as per Bill of Quantity rates and it shall not be considered as a cause for the Contractor to claim for delay, incurred overhead, mobilization etc.

3.2.4 PROTECTION OF THE WORKS DURING CONTRACT PERIOD

It is clearly understood that any damage occurring to the Works (done or under execution) is the Contractors responsibility and no claims will be entertained by the Employer since the matter shall be covered by the relevant Insurances.

3.2.5 DISCREPANCIES IN ALIGNMENT

The Contractor at his own cost shall rectify discrepancies in alignment and levels etc., noticed during construction and/or on completion, Engineer's approval does not relieve the Contractor of his responsibilities.

3.3 Temporary Water Supply

All costs, both for temporary installations and water required for testing of pipelines and tanks, shall be borne by the Contractor.

3.4 Performance Bond and Insurances

Payments for Performance Bond (Security Deposit) and for the Insurances shall not be made directly but their costs shall be considered included in the various pay items of the Bill of Quantities.

3.5 Contractor's Facilities

3.5.1 SITE OFFICES OF THE CONTRACTOR

The successful tenderer is to provide and maintain site office(s) in Project Area as directed by the Engineer.

The Contractor shall submit to the Engineer his proposed layout of the site office for approval. The site office must be ready for use within 15 days from the date of work order or delivery of materials at site, which ever is earlier.

The contractor shall provide updated progress information at site office/s on a computer for the review of the Engineer.

Throughout the whole period as specified below during which the site office is being occupied and used by the contractor, he shall provide, pay for all

charges and maintain at his own expense electricity, water and telephone facilities for the site office.

The Contractor shall provide sufficient water tanks to ensure constant supply of potable water for the site office at all times.

The Contractor shall provide acceptable bio digestible septic tank for the staff / workers etc..so that the project area is free from any contamination. This shall be at a distance of more than 10m from any building.

The Contractor shall keep the site office clean and tidy.

The site office with all those provisions mentioned above shall be provided and maintained by the Contractor throughout the whole construction period until three months after the issuance of the Preliminary Handing Over Certificate or until all the work required under the Contract are in the opinion of the Engineer 100% (one hundred percent) completed, which ever period is the later one.

The office and its facilities will not, however, be removed from the site without prior written approval of the Engineer

3.5.2 SURVEYING EQUIPMENT

The Contractor shall provide, at his own expense one approved set of surveying and measuring equipment for the sole use of the Engineer's Representative. The set shall consist of (i) One Total Station, (ii) One pogo with reflector, (iii) One big tripod and (iv) One small tripod (v) Two fiber glass tape (cased 30 m) (vi) Four steel pocket tape 3 m long (vii) Two surveying umbrellas (viii) Ten ranging rods 2.5 m long (ix) Required numbers of level books and field books.

All accessories and assistance required for setting out, measuring etc. shall be supplied as and when required by the Engineer / Engineer's representative.

The contractor shall be solely responsible for the maintenance of all such instruments and equipment's and shall ensure that they are at all times in good condition.

All the surveying equipment's shall remain the property of the Contractor at the end of the Contract. The Contractor is obliged to replace any instrument or part thereof damaged during the Contract Period.

There will be no direct payment for surveying equipment. It is deemed to be included in the various paying items in the Bill of Quantities.

3.5.3 LABORATORY AND LABORATORY TESTING

The contractor shall establish full fledged field laboratory with all testing equipment for testing of the materials and finished products.

All materials shall be tested as per Indian Standards for. The rates quoted for concrete shall be inclusive of cost for establishing laboratory for testing.

3.5.4 NOTICE BOARDS

Three Notice Boards shall be provided and erected as directed by the Engineer. The boards shall be maintained and repainted if directed by the Engineer till the final handing over of project.

The Contractor shall submit for approval of the Employer and Engineer working drawing showing all details needed in the board and the location of the board. Cost of providing and installing the notice board is deemed to be included in various items of the bill of quantities.

3.5.6 PROGRESS PHOTOGRAPHS AND REPORTS

Contractor shall submit monthly 6 progress Photographs 12" x 8" size in five copies as part of his monthly progress report.

Each photograph shall be mounted on A4 size chart paper on which the following information shall be written:

Name of the project

Location

Type of Work

Serial Number of the Photographs

Date of photographs

At the end of the Project the Contractor shall deliver to the Handing over Committee two albums having the most significant Photographs taken during the Contract Period. The cost of photographs and album are deemed to be included in various items of the bill of quantities.

3.5.7 SAFETY ON SITE

Measures to ensure safety of workers and plant at site shall be taken by the contractor. Excavations shall be protected by barriers and lighting shall be provided at night to warn pedestrians and vehicles. Traffic diversions shall be arranged as per the Traffic management plans which will be issued before commencement of works. The Contractor shall designate a Safety Officer who will be in charge of all Safety Measures. The cost of all safety equipment's and the cost of providing a safety officer at site would be deemed to be included in various Items of the Bill of quantities.

3.5.8 AS BUILT DRAWINGS

The Contractor shall prepare As Built Drawings both in hard copy and in digital format.

The drawings shall be prepared for any given section of the work as soon as the work for that particular section is completed. Preparation of As built drawings shall keep pace with the work and shall not be left over towards the end of the project. 3 hard copies and one soft copy of all drawings shall be submitted.

No separate payment will be made for the preparation of As-Built Drawings; Cost of preparation of As Built Drawing is deemed to be included in all other priced bill items.

4. PIPEWORKS

SECTION A:

CLAUSE 1 WATER SUPPLY, TREATED SEWAGE EFFLUENT (TSE), CABLES SERVICES

4.1 Scope:

Providing Water Supply, TSE, Cable Services in the Service Corridor, parallel to the Roads and across country.

4.2 Excavation

4.2.1 The excavation for pipelines shall be in open cutting (with proper shoring and strutting arrangements without impacting other utilities) unless the permission of the engineer-in-charge, for the ground to be tunneled is given in writing.

4.2.2 Removal of water from trenches etc.: The contractor at all times during the progress of the work shall keep the trenches and the excavations free from the water which shall be disposed of by him in a manner as will neither cause injury to the public health nor public or private property nor to the work completed or in progress nor to the surface of any road.

4.2.3 Excavation in rectangular trenches for pipe laying will be as per details given below:

Bw = Bottom width of trench

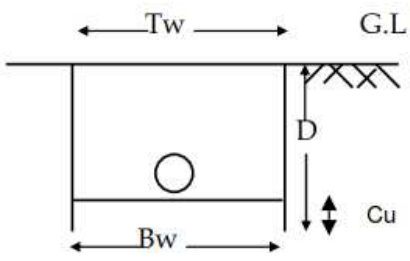
= (d+0.6)

Tw = Bw

D = Total depth of cutting D

= (d + Cu + b), m

Where d = diameter of pipe in m



Cu = Earth cushion over pipe line

= 1.2 m

b = bedding below pipe line

= 0.15 m (**incase of sandy soils b=0**)

In the case of multiple pipes, a minimum clearance of 300mm between the outside walls of the pipes shall be maintained and the dimension Bw shall be adjusted accordingly.

The excavated soil will be stacked not more than 3 meters from the edge of the excavation or as directed by the Engineer on site. The backfill will be compacted in 15 cm layers consolidating each deposited layer by ramming, watering and then disposing of the surplus excavated earth as directed by Engineer-in-charge with all leads and lifts in all kind of excavated material.

4.3 Backfilling:

4.3.1 After the pipeline or the other work has been executed and proved to be watertight, the trench and other excavation is to be refilled. The utmost care shall be taken in doing this so that no damage shall be caused to the pipeline and other permanent work.

4.3.2 The refilling will be done carefully in 15 cm layers with selected excavated material, each layer being watered to assist the consolidation and properly rammed to the satisfaction of the Engineer-in-charge. In service corridors along roads and roadway crossings, field density tests shall be carried out on the trench backfill to ensure 98% standard relative density has been achieved.

4.4 Disposal of surplus soil:

The contractor shall dispose of all the surplus material into the depressions or other suitable sites as approved by the Engineer-in-charge. The soil at the disposal point shall be dressed and trimmed as directed by the Engineer-in-charge. The surplus materials not used for restoration and shall be removed by the contractor before the final payment.

4.5 Pipe Material:

4.5.1 For water supply lines, the material of construction for the pipeline shall be Ductile Iron (DI) S/S with internal cement mortar lining (Class K9 as per IS 8329:1994 and IS 8329:2000 as nominated on the drawings & BOQ's) and HDPE pipe conduits of PN 6, PE 80/100 with Electro fusion butt joints.

Existing AC pipes shall be replaced with same dia HDPE pipes

Existing CI pipes shall be replaced with same dia DI pipes

Existing HDPE and DI pipes shall be replaced with same dia pipe and materials in the given corridor wherever necessary.

4.5.2 For TSE main lines, HDPE pipes with PN 8 & PE 100 shall be used. For TSE service connections, HDPE pipe of PN 8, PE 63 shall be used for plot service connections & Scouring pipe connections. All pipes shall be procured from approved manufacturers which shall be nominated in the tender.

Diameter and corresponding Hydraulic Test Pressure for DI K9 pipes:

Nominal Diameter (DN in MM)	Hydraulic test pressure at works (in Kg/Cm²)
80	96
100	96
150	96
200	79
250	70
300	64
350	59
400	59
450	56
500	53
600	51
700	4.0

Total mass (approximate) for one working length: The value adopted for the density of ductile iron is 7050.0 kgs per Cubic meter.

Mortar lining: Thickness of the mortar lining for various diameters is 3 mm Tensile test: The tensile strength of the pipe has be as follows

Nominal dia (DN) mm	Min Tensile strength (Mpa)	Min 2% proof test (Mpa)	Min elongation after fracture %
80 to 1000	420	300	10

4.5.3 The pipe diameters shall generally range from 25mm to 600mm.

4.5.4 Length of pipe:

The standard working length of S&S main pipes shall be 4.0, 5.0, 5.5 & 6.0 metres in case of DI pipes and 6.0 meters in case of HDPE pipes as approved by the Engineer-In-Charge.

4.5.5 Rubber gasket for DI Pipes:

The rubber gasket shall be of SBR type as per IS 12820 for Push on joints. Recommended allowable deflection at each push on joint.

Nominal dia. mm	Recommended bending angle in degrees
80 to 200	5
250 to 350	4
400 to 600	3
700 to 900	2.5

4.5.6 Ductile Iron fittings:

The DI Fittings shall be with push on joints and include

Standard	*IS 9523 (revised) and BS:EN:545/1994*
Range	DN 80 To DN 1000
Joints	Push on
Tensile strength (Min)	420 Mpa
Yield Strength	300 Mpa
Elongation	5 %
Hardness	HB 250
Hydrostatic Test Pressure	Nominal Dia(mm) Test Pressure (Kgf / Sq CM) 80 to 300 25 350 to 600 16 700 to 1000 10
Tolerance on lengths	Fittings for socketted joint ±20 mm
Coating and lining	Bitumen coating BS:EN:545/1994 Cement mortar lining BS:EN:545/1994 DN(mm) Cement lining thk (mm) 80 to 600 5 700 to 1000 6
Zinc coating	BS:EN:545/1994

double socket bends, all socket tees, double socket tapers, flanged spigot & flanged socket, Collars, Gibault joints etc. All DI Fittings shall confirm to IS 9523 &BS:EN:545/1994 respectively. All fittings shall be of an approved make and the manufacturer shall be nominated with the tender.

Standard for DI Fittings: The standard fittings for available for Ductile Iron Pipes shall have the following specifications as mentioned below in table:

SPECIFICATIONS FOR DI FITTINGS

4.5.7 HDPE fittings:

The HDPE Fittings shall be with electro fusion/butt joint and include bends, tees, tapers, flanged spigot & flanged socket, etc as per the site requirements. All HDPE Fittings shall confirm to relevant IS code. All fittings shall be of an approved make and the manufacturer shall be nominated with the tender.

4.6 Laying, Jointing & Testing of Pipelines:

4.6.1 Scope of work

For DI Pipes: Laying in trenches centrifugally cast (spun) ductile iron pressure pipes of class K9 as per IS: 8329: 2000 (Code of practice for use and laying of ductile iron pipes) including jointing (tyton push joint), bends of all degrees, tees, collars, tapers, crosses, flange sockets & spigots, branched pipes, chamfering where required. Testing of pipes should be done as per IS: 8329: 1994.

For HDPE Pipes: Laying in trenches high density polyethylene pressure pipes of class PN 8, PE 100 and PN 8, PE 63 as per IS: 14333, IS 4984 (High Density Polyethylene Pipes for Sewerage) including jointing (Electrofusion/Butt joint), bends of all degrees, tees, collars, tapers, crosses, branched pipes, where required. Testing of pipes should be done for hydraulic characteristics, reversion, density, MFR and carbon black content/dispersion requirements as per IS:14333.

4.6.2 Carting of pipes and fittings from factory to works site:

Each pipe / fittings consignment shall loaded with due care at factory using methods acceptable to the carrier appointed by the contractor and get inspected with care on arrival at site even though the pipes/ fittings. It is the responsibility of the contractor to deliver the goods in good condition without any loss or damage during transit from store to site. While unloading the pipes, the contractor will take due care by using either mechanical equipment or care should be taken to unload the pipes on timber skids with steadying ropes so that the pipes do not bump hard against one another. The pipes should be stored properly. The rubber gaskets should be stored properly in a cool dark place protected from heat. HDPE pipes shall, in no case, be exposed to the sunlight during storage &shall be kept in the proper covered space.

4.6.3 Laying of pipes:

Before laying of the pipes, the bottom of the trench should form a continuous bed. Contractor has to to do the bedding design for rigid pipes and flexible pipes separately as per international standards and get it approved by Engineer before going for construction. Where rock is encountered, trenches should be dug deeper, then filled and compacted to the required grade with a bedding material such as sand or selected soil (Murum). At the end of each day, the end of the pipe should be plugged to prevent the entry of animals, foreign material or water. Sufficient space must be provided for jointing of the pipes. Push on joints requires space for socket. The pipe should never be allowed to drop into the trench and should be lowered carefully into the position.

4.6.4 Jointing of DI pipes (Tyton push on joint):

a) In case of push on joints, the socket & spigot shall be thoroughly cleaned before inserting the rubber gasket. While inserting the gasket, it shall be made sure that it faces the proper direction and that it is correctly seated in the groove. After cleaning the dirt or foreign material from the plain end, lubricant shall be applied in accordance with the pipe manufacturer's recommendations.

b) The contractor shall make sure that the plain end is bevelled as square or sharp edge may damage or dislodge the gasket and cause a leak. When the pipe is cut at site, the plain end shall be bevelled with a heavy file or grinder to remove all sharp edges.

c) The plain end of the pipe shall be pushed into the socket of the pipe and while pushing, the pipe shall be kept straight. If any deflections are to be made in the alignment, it may be made after the joint is assembled. A timber header shall be used between the pipe and crowbar or jack to avoid damage to the pipe while the plain end of the pipe is pushed into the socket either with a crow bar or jack, or lever puller.

4.6.5 Jointing of DI pipes (Flanged Joints)

Wherever the pipes (DI) jointing is required by flanges, the gasket used between flanges of pipes shall compressed fibre board or natural/synthetic rubber (as per IS 638: 1979) of thickness between 1.5 to 3 mm.

Each bolt should be tightened a little at a time taking care to tighten diametrically opposite bolts alternatively. The practice of fully tightening the bolts one after another is highly undesirable.

4.6.6 Jointing of HDPE pipes

Two methods are suggested here for jointing of HDPE pipes.

1. Butt-welding is a very economical and reliable jointing technique for making non-detachable welded joints, requiring only butt-welding equipment. All spigot fittings can be joined by this welding method. Butt-welding is extremely suitable for prefabricating pipe sections and special fittings. Both fittings with short spigot ends and fittings with long spigot ends are suitable for butt-welding. It is only allowed to butt-weld PE products to each other from the same wall thickness series.

2. Electro-fusion is a simple and rapid jointing technology for realising non-detachable welded joints. The efficient assembly on site of pipes, fittings or prefabricated pipe segments can be achieved using electro-fusion couplers and electro-fusion welding equipment. Fittings made of pipe with long spigot end are suitable for electro-fusion.

4.6.7 Welding of DI pipes will not be allowed for the damaged pipes. But, during the construction if Engineer-in-charge finds it necessary to weld certain pipe/fitting due to constraints at site then the contractor shall have to carry out the welding work with Fe-Ni welding rods with low electric current at no extra cost.

4.6.8 Standard Flange Drilling of Flanged DI Pipes and Fittings:

Wherever it is required to drill the flange on pipes or fittings, the standard dimensions shall be as per clause 9.1, IS 1538:1993, as given below:

Pipe Nominal Diameter (DN)	Outer Diameter of flange	Dia of drilled hole centre line	No. of Holes	Holes Diameter	Diameter of Bolts
80	200	160	4	19	16
100	220	180	8	19	16
125	250	210	8	19	16
150	285	240	8	23	20
200	340	295	8	23	20
250	395	350	12	23	20
300	445	400	12	23	20
350	505	460	16	23	20
400	565	515	16	28	24
450	615	565	20	28	24

4.6.9 Testing of DI pipeline:

DI pipeline will be tested for 1.5 times the works pressure. Observations can then be made by site or by checking if there is any loss of pressure on the meter placed on the lower point. No pipe installation shall be accepted until the leakage is less than the No of Cubic Centimetre per hour as per following formula:

QL= (N x D / P) / 3.3 (Ref: clause 7.3.2 of IS3114: 1994)

Where QL = allowable leakage in cubic cm per hour N = No of joints in the length of pipeline

D = Dia of pipe in mm

P = Average test pressure during the leakage test in Kgf / Square cm

4.6.10 Testing of HDPE pipeline:

a. Pressure Testing Outside the Trench:

- If specified by the engineer, pressure testing may be conducted prior to pipe installation.
- After the pipe has been joined, fill it with water, carefully bleed off any trapped air. Subject the pipe to a hydrostatic test pressure that is 1.5 times the system design pressure for a maximum of 3 hours. During this time, add water periodically to maintain the test pressure; this compensates for the initial stretching of the pipe. The line pressure tightness is determined by visual observation; therefore, it is not necessary to measure the make-up water. Examine every fused joint; any leakage must be repaired and then retested.

  NOTE: It shall be the responsibility of the contractor to ensure that appropriate safety precautions are observed during hydrostatic testing above ground.

b. Testing In The Trench:

- Fill the pipeline with water after it has been laid; bleed off any trapped air. Subject the lowest element in the system to a test pressure that is 1.5 times the design pressure, and check for any leakage. When, in the opinion of the engineer, local conditions require that the trenches be backfilled immediately after the pipe has been laid, apply the pressure test after backfilling has been completed but not sooner than a time which will allow sufficient curing of any concrete that may have been used. Typical minimum concrete curing times are 36 hours for early strengths and 7 days for normal strengths.
- The test procedures consist of two steps; the initial expansion and the test phase. When test pressure is applied to a water filled pipe, the pipe expands. During the initial expansion of the pipe under test, sufficient make-up water must be added to the system at hourly intervals for 3 hours to maintain the test pressure. After about 4 hours, initial expansion should be complete and the actual test can start.
- When the test is to begin, the pipe is full of water and is subjected to a constant test pressure of 1.5 times the system design pressure. The test

phase should not exceed 3 hours, after which time any water deficiency must be replaced and measured. Add and measure the amount of make-up water required to return to the test pressure and compare this to the maximum allowance in the table below.

- An alternate leakage test consists of maintaining the test pressure (described above) over a period of 4 hours and then dropping the pressure by 10 psi (0.69 MPa). If the pressure then remains within 5% of the target value for 1 hour, this indicates there is no leakage in the system.
- NOTES:
    - Under no circumstances shall the total time under test exceed 8 hours at 1.5 times the system pressure rating. If the test is not complete within this time limit (due to leakage, equipment failure, etc.), the test section shall be permitted to "relax" for 8 hours prior to the next test sequence.
    - Air testing is not recommended. Additional safety precautions may be required.

4.7 Providing & Fixing Of Water supply and TSE Appurtenances:

All appurtenances shall be of an approved make and the manufacturer shall be nominated with the tender. In the case of unavailability of the specified item, the tenderer shall nominate an alternative supplier to be approved by the Engineer in Charge.

All valves/ Meters and other appurtenances should be compatible with GIS and remote operable (SCADA controlled) electrically actuated / automated. The valves and meters, pressure loggers etc.. should be fitted with GPRS, which will communicate with the SCADA and remote control of those appurtenances should be possible. Contractor shall submit the details of the valves / maters manufacturers details and contractor shall proceed with execution only after client approval of manufacturer, specification, chamber construction details and size and construction details of the electrical control panel etc.

4.7.1 Sluice Valves

Specifications for C.I. sluice valves should be as per IS: 780 class PN 1.0 up to 300 mm diameter including brass spindle and as per IS: 2906 class PN 1.0 for diameter more than 300 mm.

Selection and installation of sluice valves should be as per IS: 2685- 1971.

Considering high pressure in pipelines, sluice valves used should be of PN 1.0 or 1.6 as mentioned in BOQ.

Testing: Each valve shall be subjected to hydrostatic tests as described in 3.1.5 to the test pressure for a duration according to table given below and the valve shall show no sign of leakage under these tests. Unless otherwise specified, the valve shall be tested for closed- end test only.

4.7.2 Test Pressure (Gauge) and Test duration of Sluice Valves

PN Rating of Valve	Test	Test Pressure (Gauge), *Min* MPa	Test Duration, *Min* Minute
PN 1.0	Body Test Seat Test	1.8 1.0	5 2

4.7.3 Closed End Test (IS: 780:1984 & 2906:1984)

The testing machine, which may be of either the hydraulic or the mechanical type, shall make the joint at each end of the valve and the force applied shall be sufficient to compress a joint ring made of flexible material without exerting undue load on the valve body.

Each valve shall be subject to three hydrostatic testes. The first test shall be made with the wedge open and the pressure applied for a period of minimum 5 min to the whole body of the valve after releasing air through the gland. The second and third tests shall be made to determine water tightness of the face with the wedge closed. After the first test, the body pressure shall be reduced to working pressure and the wedge shall be closed so that the bonnet remains filled with water. The second test shall be conducted with the pressure applied to one face and the third test with the pressure applied to the other face of the wedge. Under this condition, the valve seating on the downstream side shall be watertight.

4.7.4 Information to be supplied with Enquiry or Order:

The following information shall be supplied with the enquiry or order:

- Nominal pressure of valve
- Size of valve
- Whether handwheel or cap is required
- Whether handwheels are required with special finish.
- Whether the water is specially corrosive and, if so, details should be given.
- Whether open-end test is required.
- Whether additional tests other than those specified are required.
- Maximum static pressure.
- Nature operation- vertical, horizontal or inclined; and
- Whether flanges other than those covered in IS: 1538-1976 are required to be drilled and the type of flange facing required.

4.7.5 The following information shall be cast on each valve body in raised letters: The manufacturer's name or trademark.

- The nominal pressure of valve (PN 1 or PN 1.6).
- The size of valve.
- Heat number of cast.
- Serial number in punch, and
- Where a valve has been tested for only open-end test, it should be marked 'O' distinctly and permanently.
- The product may also be marked with Standard Mark (BIS Certification marking).

4.7.6 Package and storage:

All valves shall be supplied with the wedge closed. Bright parts shall be protected against rust. Valve of small diameter may be packed in wooden cases. Valves with smooth finished flanged joint faces shall be suitably protected against damage. Parts liable to injury in transit shall be wrapped with wood-wool or similar material as a protection. Valves shall be stored in covered stores away from dirt.

4.7.7 Air Valves

Providing and fixing of cast iron double acting air valves (ISI mark) with isolating hex- nipple for air vent ebonite and rubber ball for large and small orifice respectively mounted on moulded rubber dexin with forged bronze or high tensile extruded brass rod spindle, flange drilled as per IS: 1538 table no. 4 and 5 to 20 Kg/cm2 body and 10 Kg/cm2 seat. Valves are to be fitted with a sluice valve between the valve and the tee connection from the main line.

4.7.8 Pressure Reduction Stations at subzones

The dual sluice valve arrangement is used to control the pressure at the subzones. The chamber will have two sluice valves with one pressure gauge in between. First valve will be used to set the pressure in the subzone by referring the pressure gauge. Once the pressure is set, it's spindle shall not be touched. Second sluice valve (at downstream end) will be used for regular on-off operation during the maintenance.

4.7.9 Water Meter

The domestic water meter shall be horizontal inferential, Woltmann type bulk water meter with magnetic drive and dry dial suitable for ambient 500C temperature duly sealed against tampering complete with at both end and confirming to Class B ISO 4064 (Part I) with IP 68, ECC Mark. For house connections, Multi-jet type flow meter shall be used. Both types shall include built-in sensor for pulse output.

4.7.10 C.I. Strainer

The strainer shall be "Y" type, stainless or brass mesh suitable for working pressure 16 Kg/sqcm.

4.7.11 C.I.NRV

The C.I. NRV shall have working pressure of 16kg/sqcm, both end threaded and approved make as mention in manufacturer list.

4.7.12 Valve Chambers

The Valve chamber shall be constructed with approved cement concrete solid block masonry manufactured with 1:3:6 (M-15) on a automatic block making machine, mechanically vibrated and hydraulically pressed to size 400 x 200 x 100 mm. The jointing of chamber shall be in 1:4 cement mortar, PCC 1:2:4 raft, CI Covers and frame of medium duty fixed with 160 mm thick M20 grade RCC slab as detail given in the BOQ and drawings.

These shall be facilitated for Water meter chamber, Sluice valve, Scour valve and Air Release Valves.

Size of chambers shall be 900mm x 600mm x 700mm deep inside size for water meter; 900 mm x 900 mm x 1500 mm deep inside size for 100 mm & below valves; 1000 mm x 1100 mm x 1500 mm deep inside size for above 100 mm valves and 1000 mm x 1500 mm x 1500 mm deep inside size for subzonal dual sluice valves used for pressure setting. The sizes which are not mentioned above, shall not be constructed without the consent in writing by the Engineer-In-Charge.

SECTION B:

CLAUSE 2 SEWERAGE DISPOSAL SERVICES

5.1 Scope:

There is no scope of shifting or relocating the sewer lines envisaged in the present scope of work. However incase of any requirement like for raising manholes or any other work related to sewerage arises during the execution of work, these specifications shall be incorporated.

5.2 Excavation

5.2.1 Excavation for sewers trenches

Alignment and grade: The sewers are to be laid to the alignment and gradients shown in the layout drawings. No deviations from the lines, depths of cuttings or gradients of the sewers in the plans and the sections shall be permitted except by the consent in writing by the engineer-in-charge.

Setting out sight rails boning rods etc: The sewers shall be laid and constructed to their proper levels by the aid of suitable boning rods sight rails, which shall be fixed according to the requirements of the engineer-in-charge at intervals not exceeding 15 meters and also levelling along the invert line of the sewer by means of levelling instruments. The contractor shall be responsible for the correctness of the levelling

throughout. He shall, also provide at his own expenses all labour and materials necessary to enable the engineer-in- charge and his staff to check the levels and the dimensions of the work whenever they require him to do so. All bends and curves shall be set out mathematically in a manner to be approved by the engineer-in-charge.

Construction of boning staves: Boning staves shall be prepared by the Contractors about 75 mm x 50 mm of various lengths each length being of a certain number of Meter and with a fixed tee-head and a fixed intermediate cross piece each about 300 mm long. The top-edge of the cross piece must be fixed at a distance below the top-edge of this tee-head, equal to as the case may be, the outside diameter of the pipe or the thickness of the concrete bed to be laid. The boning staff must be marked on both sides to indicate its full length. According to the circumstances of each case, a suitable length of boning staff will be determined upon, and the reduced level of the bed of the pipe of bottom of concrete of drain ate each sight rail added to the selected length of boning staff, will be marked by a horizontal line on both posts, or on walls or fences to which the sight rail is to be fixed.

Sight rails: The sight rails (about 25cm wide and 40 mm thick) is to be screwed with top- edge against the level marks. The centre-line of the pipe sewer or the drain will be marked on the rail and this mark will denote also the meeting point of the centre lines of any converging drains or pipe sewers. A line drawn from the top-edge of one rail to the top- edge of the next rail will be vertically parallel with the bed of the sewer or drain and the depth of the bed of the sewer or drain at any intermediate point may be easily determined by letting down the selected boning staff until the tee-head comes in the line of sight from rail to rail.

The posts and rails are to be perfectly square and planned smooth on all sides and edges. The rails are to be painted white on both side and the tee-heads and cross-piece of the boning stages are to be painted black.

If the pipes of drains converging to a manhole come in at various levels there must be a rail fixed for every different level. When a rail comes with 0.60 M of the surface of the ground a higher sight rail must be fixed for sue with the rail over the next point.

The posts and rails must in on case be removed until the trench is excavated, the drains are constructed or the pipes are laid and permission given to proceed with the filling in.

5.3 Foundation in soft grounds

When the work of constructing the sewers has to be carried out in soft under ground strata, such as puddle, etc or in a reclaimed land, a good foundation shall be provided for the pipes and manholes. For the former, excavation in the trench shall be taken 75 mm deeper than what is ordinarily required and for this depth the whole of the trench shall be covered over with M 150 concrete slab of the required width, reinforced with

B.R.C fabric No.9 or any other fabric approved by the Engineer. The foundation concrete of the manholes shall similarly be reinforced with the same fabric, spread to cover the whole area of the foundation.

The fabric shall be suitably cut to the requirements and securely joined together with adequate laps which should not less than 200 mm. The fabric in the line and manhole must also be securely jointed together. The rates in both the cases shall be held to include all lapping, joining and also any probable wastage.

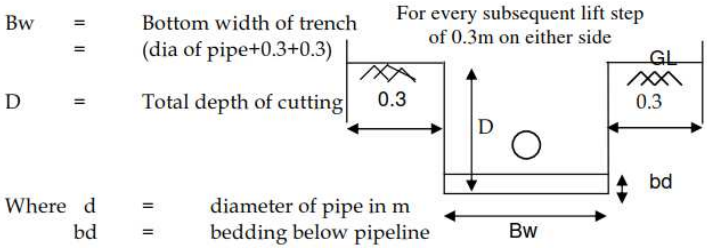
The excavation for sewers shall be in open cutting unless the permission of the engineer-in- charge.

5.4 Removal of water from sewer trenches etc

The contractor shall keep the trenches and the excavations free from the water at all the times during the progress of the work which shall be disposed-off by him in a manner as will neither cause injury to the public health nor to public or private property nor to the work completed or in progress, nor to the surface of any road etc.

5.5 Timbering shoring and supports

All timbering, shoring, supporting and underpinning shall be carried out and maintained by the contractor at all times at his own cost, in a manner so as to effectively prevent slipping or collapse of sides of trenches or adjacent buildings, walls and other structures to the full satisfaction and the requirements of the Engineer-in-charge. All work, materials and labour provided for this work shall be deemed as temporary work incidental to the construction work and the full costs there off shall be included in the rates for various items for the completed items in the schedule and no other payment, therefore shall be made to the contractor.



The excavated soil will be stacked not more than 3 meters from the edge of the excavation.

5.6 Backfilling:

5.6.1 After the pipeline or the other work has been executed and proved to be watertight, the trench and other excavation is to be refilled. The utmost care shall be taken in doing this so that no damage shall be caused to the pipeline and other permanent work.

5.6.2 The refilling will be done carefully in 15 cm layers with selected excavated material, each layer being watered to assist the consolidation and properly rammed to

the satisfaction of the Engineer-in-charge. In service corridors along roads and roadway crossings, field density tests shall be carried out on the trench backfill to ensure 98% standard relative density has been achieved with in all leads and lifts in all kind of soil such as pick work, jumper work, blasting work &chiseling work will be directed by the Engineer in charge.

5.7 Pipe Material:

5.7.1 For gravity sewer main lines, the material of construction for the pipeline shall be HDPE PN 8 & PE 100 for the diameter from 160mm upto 250mm inclusive. For the diameter above 250mm, RCC NP3 pipes with sulphate resistant cement coating shall be used.

For sewer plot connections, HDPE pipe of PN 8, PE 80 shall be used. All pipes shall be procured from approved manufacturers which shall be nominated in the tender.

5.8 Supplying, Laying, Jointing & Testing of Pipelines:

5.8.1 High Density Polyethylene (HDPE) Pipes and Fittings

HDPE pipes and fitting shall comply with:

- IS 14333 Polyethylene Pipe Extrusion Compounds
- Indian Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer & Drain Pipes
- Pipes shall be manufactured from high density polyethylene Type 50 conforming to AS 1463.
- The minimum pipe stiffness of SR24 shall be 0.032N/mm2 in accordance with DIN 16961.
- Inside pipe surface shall be smooth but the outside surface may include ribs and other profiles.
- Jointing shall be rubber ring joints unless joined to concrete with a coupling designed by the Manufacturer to make the joint watertight.

For construction purposes, HDPE pipe shall be considered as flexible pipe.

5.8.2 Reinforced Concrete Pipes (NP3 Class) suitable for Rubber Rings Joints:

5.8.2.1 The R.C. pipes shall confirm to I.S. 458 of 1988 and I.S. 3597 of 1998 or its equivalent standard as amended up to date.

5.8.2.2 The Contractor shall have to purchase R.C. pipes from manufacturers, who shall have arrangement for the testing of pipes of various diameters in their factory as per I.S. 3597 of 1998 and I.S. 458 of 1988. If required by the Engineer, the contractor shall have to arrange for such tests at manufacturer premises at Contractor’s cost.

5.8.2.3 The contractor shall have to furnish the name of the manufacturers of R.C. pipe and also submit the test report for each consignment of R.C. pipes at the time of delivery.

2.8.2.4 Rubber Rings: The rubber rings for the purpose of pipe jointing, shall confirm to I.S. 5328 of 1985 or its equivalent standards as amended up to date which gives requirements for the grade of rubber used for joints of all kinds of drainage pipe works.

5.8.3 Carting of pipes and fittings from factory to works site:

Each pipe / fittings consignment will be inspected with care by Engineer-in-charge up on arrival at site even though the pipes/ fittings have been inspected and loaded with due care at factory using methods acceptable to the carrier appointed by the contractor. It is the responsibility of the contractor to deliver the goods in good condition without any loss or damage during transit. Every consignment shall be fully insured by the contractor. While unloading the pipes the contractor will take due care by using either mechanical equipment or care should be taken to unload the pipes on timber skids with steadying ropes so that the pipes do not bump hard against one another. The pipes should be stored properly. No payment will be made for damaged pipes.

5.8.4 Jointing of HDPE pipes

Two methods are suggested here for jointing of HDPE pipes.

1. Butt-welding is a very economical and reliable jointing technique for making non- detachable welded joints, requiring only butt-welding equipment. All spigot fittings can be joined by this welding method. Butt-welding is extremely suitable for prefabricating pipe sections and special fittings. Both fittings with short spigot ends and fittings with long spigot ends are suitable for butt-welding. It is only allowed to butt-weld PE products to each other from the same wall thickness series.
2. Electro-fusion is a simple and rapid jointing technology for realising non-detachable welded joints. The efficient assembly on site of pipes, fittings or prefabricated pipe segments can be achieved using electro-fusion couplers and electro-fusion welding equipment. Fittings made of pipe with long spigot end are suitable for electro-fusion.

5.8.5 Jointing RCC pipes

Each concrete pipe with the rubber ring accurately positioned on the spigot shall be pushed well home into the socket of the previously laid pipe by means of uniformly applied pressure with the aid of a jack or similar appliance.

Concrete pipes of the spigot and socket type with roll on rubber rings shall be used and the manufacturer's instructions shall be deemed to form a part of this specification.

Rubber rings shall be lubricated before making the joint and the lubricant shall only be soft soap water or an approved lubricant supplied by the manufacture.

In case of R.C.C. Pipe entering or leaving a manhole, a flexible joint may be provided at least within 0.60 M from the outer end of the manhole.

5.8.6 Testing of RCC pipeline:

The testing of the rubber rings of RCC pipeline joints shall confirm to IS 3400 of 1995 and also I.S. 5328 of 1985. However, after the delivery of the pipes made at sites, the contractor shall have to arrange for 100% visual tests for whole of the lot, received from time to time at site. The Engineer or his representatives are at liberty to inspect the manufacturer's factory and to supervise the tests carried out on R.C. pipes with prior appointment and shall be arranged by the contractor.

The rejected material/pipes shall have to be removed from the site by the contractor at his own cost and no payment will be made for the rejected material. Testing of R.C. pipes of various diameters shall confirm to I.S. 3597 of 1998 and I.S. 458 of 1988.

5.8.7 Testing of HDPE pipeline:

a) Pressure Testing Outside the Trench:
   - If specified by the engineer, pressure testing may be conducted prior to pipe installation.
   - After the pipe has been joined, fill it with water; carefully bleed off any trapped air. Subject the pipe to a hydrostatic test pressure that is 1.5 times the system design pressure for a maximum of 3 hours. During this time, add water periodically to maintain the test pressure; this compensates for the initial stretching of the pipe. The line pressure tightness is determined by visual observation; therefore, it is not necessary to measure the make-up water. Examine every fused joint; any leakage must be repaired and then retested.

NOTE: It shall be the responsibility of the contractor to ensure that appropriate safety precautions are observed during hydrostatic testing above ground.

b) Testing in the Trench:
   - Fill the pipeline with water after it has been laid; bleed off any trapped air. Subject the lowest element in the system to a test pressure that is 1.5 times the design pressure, and check for any leakage. When, in the opinion of the engineer, local conditions require that the trenches be backfilled immediately after the pipe has been laid, apply the pressure test after

backfilling has been completed but not sooner than a time which will allow sufficient curing of any concrete that may have been used. Typical minimum concrete curing times are 36 hours for early strengths and 7 days for normal strengths.

- The test procedures consist of two steps; the initial expansion and the test phase. When test pressure is applied to a water filled pipe, the pipe expands. During the initial expansion of the pipe under test, sufficient make-up water must be added to the system at hourly intervals for 3 hours to maintain the test pressure. After about 4 hours, initial expansion should be complete and the actual test can start.
- When the test is to begin, the pipe is full of water and is subjected to a constant test pressure of 1.5 times the system design pressure. The test phase should not exceed 3 hours, after which time any water deficiency must be replaced and measured. Add and measure the amount of make-up water required to return to the test pressure and compare this to the maximum allowance in the table below.
- An alternate leakage test consists of maintaining the test pressure (described above) over a period of 4 hours and then dropping the pressure by 10 psi (0.69 MPa). If the pressure then remains within 5% of the target value for 1 hour, this indicates there is no leakage in the system.

NOTES:

- Under no circumstances shall the total time under test exceed 8 hours at 1.5 times the system pressure rating. If the test is not complete within this time limit (due to leakage, equipment failure, etc.), the test section shall be permitted to "relax" for 8 hours prior to the next test sequence.
- Contractor should arrange his own tankers/ water/ machinery etc.. for conducting any test.
- Air testing is not recommended for HDPE pipes. Additional safety precautions may be required.

5.8.8 Water tightness:

The drains, manholes and all joints of pipes must be made thoroughly sound and water tight and any joint which may be proved to be leaky at any time during the progress of the works or during the contractors subsequent period of maintenance shall be immediately made sound by the contractors at their own expenses. The contractors, when required by the Engineer shall at their own cost prove all works to be watertight by filling it with water to such height as the Engineer any determine. Any additional precautionary measure or appliances that may be found necessary to ensure the water tightness of the manholes, flush tanks, disc plug in junctions and the

joints of pipes shall be adopted by the Contractors without extra charge, the responsibility of making them completely water tight resting upon the contractors.

5.8.9 Immediately after the test with the double disc or cylinder has been completed and any defect hereby disclosed have been made good, the Contractor shall prove the joints of the stretch of under-ground pipes whether of HDPE or R.C. Pipes, to be water tight by filing in pipes with water before filling in the trench to the level of 1.50 M above the top of the highest pipe in the stretch and heading the water up for the period of one hour of such further time as the Engineer may direct. The apparatus used for the purposes of testing shall be approved by the Engineer. The contractor if required by the Engineer shall make the excavation dry and keep it so during the period of testing. No test applied to part of a stretch of pipes shall be considered conclusive nor shall it be deemed to obviate the necessity of an application of the test to the whole of stretch when completed. The loss of water over a period of 30 minutes should be measured by adding water from a measuring vessel at regular 10 minutes and noting the quantity required maintaining the original water level. For the purposes of this test the average quantity added should not exceed 1 litre/hour/100 linear metres/10 mm of nominal internal diameter (0.2-gallons/hours/100 linear feet/inch). Any leakage including excessive sweating which causes a drop in the test water level will be visible and the defective part of the work should be removed and made good.

5.8.10 Testing of Manholes: The manholes shall similarly be tested of water tightness as for the pipe lines. The mouths of all pipes entering the manholes shall be suitably plugged with brick masonry or wooden or any other type of plug. The manhole under test shall then be filled with water up to the general sub-soil water level and observed for a period of one hour. If the level does not drop by more than 50 mm in one hour, it shall be assumed that the manhole is watertight.

During the period of the test, the outside trench shall be kept free from any accumulation of subsoil water. In case of a drop of more than 50 mm takes place in the water level, the contractor shall rectify the places from where the leakage is taking place & take steps to stop the leakage.

5.8.11 Inspection of the Joints

After the joints of any pipes in underground work have thoroughly set, the Engineer (or any person whom he may appoint) may inspect any of the joints and if he has any doubt as to their soundness he may required the Contractors to cut open and clean away the cement or lead as the case may be of any joint that he may select and to make good the same at their expense provided that unless some defect be found, they shall not be required to open more than one joint in 20 M of pipe length if the defect be found the Engineer may direct them to open as many joints as he may deem necessary.

5.8.12 Cleaning of the pipes

5.8.12.1 As soon as a stretch of pipes whether of HDPE or R.C. Pipes has been laid completed from manhole to manhole, the Contractor shall run through the pipes both backwards and forwards a double disc or solid or closed cylinder 75 mm less in diameter than the internal diameter of the pipes. The open end of an incomplete stretch of pipeline shall be securely closed as may be directed by the Engineer to prevent entry of mud or silt etc.

5.8.12.2 If as a result of the removal of any obstruction, the Engineer considers that damages may have been caused to the pipe lines, he shall be entitled to order the length to be retested at the expense of the Contractor and if such retest prove unsatisfactory, the contractor shall at this own expenses amend the work and carry out such further tests as are required by the Engineer.

It shall also be ascertained by the Contractors that each stretch from manhole to manhole is absolute clear and without any obstruction by means of visual examination of the interior of the pipe line suitably enlightened by projected sunlight or otherwise.

5.8.13 Fracture of pipes

5.8.13.1 In the event of pipes being fractured after being to all appearances properly laid, whether due to imperfect loads have been formed or the material for refilling have been improperly selected or to any other cause, the Contractor in every instance will be held responsible and will be called upon to replace such defective pipes at his own cost, if such defect appears before the expiration of the period of maintenance.

5.8.13.2 Any pipe or length of pipes found to be defective shall be immediately removed and replaced at the Contractor's expense and leaking joints shall be remade the inspections and tests shall then be repeated as often as necessary until the whole line under inspection or test is accepted by the Engineer.

5.8.14 All works to be clear clean and perfect.

5.8.14.1 The contractors shall after completion or whenever required by the Engineer, prove all pipes and fitting to be clear clean and perfect, and for this purpose shall at their own expense and in the presence of the Engineer or his appointee, provide suitable instruments and appliances and pass them through the pipes and shall if required, throw in water and show that it passes freely through every portion of the work. Brick, mortar and rubbish shall not be allowed to fall into the manholes of sewer lines while fixing or if allowed, shall be removed by the Contractors at their own expense.

5.8.14.2 During the cleaning-operation of newly constructed sewer and manholes, contractors shall take for the safety of laborers, all precautions.

5.8.15 Contractors to clean and use existing pipes met with

The contractors are, if and when required, to take up any existing pipes that may be met with and clean and prepare them for reuse. For such work, they will be paid at their contract rates for excavation and filling. Such excavation will be measured 0.90 wide for 225 mm to 450 mm pipes, 0.60 M wide for smaller pipes and only in case to the depth of the pipe bed. The filling, consolidation, etc shall be done as described for new work and under the same condition in every respect.

5.8.16 Measurement of pipes

5.8.16.1 All pipes shall be measured according to the work actually done by them and no allowance will be made for any waste in cutting to the exact length required. The Contractors shall be under obligation to use the pieces or part of the pieces cut off from 100 mm stoneware pipes, if it is be deemed by the Engineer practicable to do so; and no further payments shall be made for the same to the Contractors. A socket attached to be straight pipe will not be measured, but a spigot end of a straight pipe whether such end be free for entering into a socket will be measured to its full length. Pieces of cut pipe not used in the work will become the property of the Contractors, for which they have been or may be paid direct. When an HDPE pipe may have necessarily been cut for the exigencies of the work, the Contractors will be given credit for the piece not used in the work at the rate at which they are charged by the Commissioner, provided that the cuttings have been properly done & that the portion used in the work be sound.

5.8.16.2 A bend, junction, or any separate piece of fitting which may have necessarily been cut for the exigencies of the work will be taken into account as if whole provided that the cutting has been done properly and that the portion used in the work is sound. This clause shall not apply to a straight pipe under any circumstances. In measuring the lengths of pipes laid, deduction shall be made for the lengths of channels between the inside face of the walls of manholes.

5.9 The manholes, depth of manholes

The manholes on the sewers shall be constructed in the form of the dimensions shown on the drawing. The depth of the manholes shall be measured from the top of cover to the invert level of the manhole.

The manholes shall be constructed at places shown on the drawings or wherever directed by the Engineer. Type designs for these manholes are shown on the drawings but the actual dimension shall in each case be determined by the Engineer referring to the manhole invert levels as the circumstances may require.

The manholes recommended for the sewerage schemes are circular & rectangular shapes. The circular manholes are of three types:

- 1200mm dia having depth upto 2m
- 1500mm dia having depth upto 5m
- 1500mm dia having depth upto 9m

The rectangular manholes which are also called scrapper manholes are of two types:

- 1520mm x 1520mm size
- 2430mm x 2430mm size

52.10 Providing and Fixing Of Sewerage Appurtenances:

5.10.1 Vent Shafts

5.10.1.1 Vent shafts are to be provided at the heads of all sewers of construction elsewhere as shown on the drawings or as directed by the Engineer. The height of pipe will be 5m and the material will be Cast Iron. The aesthetic value of vent shafts will be as per the directions of the Engineer in Charge.

5.10.1.2 These shall be provided and laid etc on the locations as per site conditions. These shall comprise of the following:

A 150-mm dia Stone ware Pipe in the direction from manhole up to the bend. A90 degree ducks foot bend of 150-mm dia.

A 150-mm dia cast iron pipe LA Class of 5-m length vertically A cast iron cowl on top of the pipe.

5.10.1.3 The bend shall be encased in concrete of M15 mix.

5.10.1.4 The rate shall be quoted per number.

5.10.2 Ductile Iron Frames

5.10.2.1 Ductile iron frames are to be bedded in cement mortar on the cement concrete with splayed fillet all around and in such position that the top may be 13 mm above the original surface of the road. The covers are to be placed in position and the whole left neat and dry. The weight of DI frame and cover shall confirm to I.S.S 1865 of 1991 as per type design drawings.

5.10.2.2 Covers shall be of DI, circular/rectangular of the required pattern. They shall be coated with Dr. Angus Smith's composition. They shall be of three varieties heavy, medium and light according to their weight. Heavy type shall be used in places exposed to very heavy traffic medium one for medium traffic and light one in fields and lanes.

6.1 SOURCE OF AGGREGATES FOR PAVING LAYERS

6/1.1 All aggregates for use in the construction of the Pavement Layers shall be obtained only from sources approved by the Engineer.

6/1.2 The contractor shall have determined the location, suitability and quantity of material available before tendering as well as the cost and the amount of work required to extract, crush, screen and clean the material and the length of haul to the job site.

6/1.3 The Contractor shall provide the Engineer, within thirty (30) days prior to the scheduled beginning of the crushing and screening operations, with a complete report on the origin and composition of all stone and/or gravel aggregates to be used in the Work (Aggregate Resources Report). All materials shall comply with the specified requirements for the various aggregates.

6/1.4 The source and manufacture of the aggregates which will meet the requirements of the Specification is the sole responsibility of the Contractor. It is also the contractor's sole responsibility to manufacture such aggregates at the rates and in the quantities required to complete the work within the specified Contract Period.

6/1.5 The approval of the Contractor's crushing and screening plant equipment by the Engineer shall in no way relieve the Contractor of the responsibility of producing aggregates which meet the Specifications and in the quantities required for the completion of the work within the specified Contract Period.

6/1.6 No aggregate producing equipment shall be put into operation prior to the approval of the equipment by the Engineer. If after the equipment is put into operation it fails to perform as proposed, the Contractor shall provide additional equipment or replace the original equipment with more suitable equipment, as may be directed by the Engineer.

6/1.7 The Contractor shall commence crushing and screening of aggregate immediately after the Contractor receives approval of his aggregate sources.

6.2 TESTING OF AGGREGATES

6/2.1 Testing to ascertain the properties of all aggregate materials shall be carried out in accordance with relevant clause specified.

6.3 APPROVAL AND INSPECTION OF AGGREGATES

6/3.1 All sources of aggregates shall be approved by the Engineer prior to the processing of material from such sources. An individual source of aggregate is deemed to be a particular location within a quarry or borrow pit where material of a constant specific gravity is obtained (with possible variation due to minor changes in characteristics of rock). Test certificates obtained by the Contractor or tests performed by the Contractor at his expense are intended to assist him in his estimate of the location, extent and quantities which will

comply with the Specifications, when properly processed, and will in no way obviate the need for future testing by the Engineer.

6/3.2 Only materials from approved sources shall be processed for incorporation into the work. Approval of specific sources of materials shall not be considered as final approval and acceptance of materials from such sources. The presence of weathered materials discovered in the quarry areas shall be a cause of rejection of the source of materials.

6/3.3 After having received approval of specific sources of material the Contractor cannot change these without prior written approval of the Engineer.

6/3.4 All processed materials shall be tested and approved before being stored on the site or incorporated in the works and may be inspected and tested at any time during the progress of their preparation and use. Questionable materials, pending laboratory testing and subsequent approval shall not be unloaded and incorporated with materials previously approved and accepted.

6/3.5 If the grading and quality of the material delivered to the site does not conform to the grading and quality as previously inspected and tested, or does not comply with the Specifications, the Engineer reserves the right to reject such material at the site of the work.

6/3.6 Samples must meet all test requirements as specified under the Specifications. The Contractor shall permit- the Engineer to inspect any and all material used or to be used, at any time during or after its preparation, or while being used during the process of the work or after the work has been completed. All such materials not complying with the required specifications, whether in place or not, shall be rejected and shall be removed promptly from the work. The Contractor shall supply, or arrange with any producers or manufacturers to supply, all necessary material, labor, tools and equipment for such inspection.

6.4 STORAGE OF AGGREGATES

6/4.1 The stockpile site shall be prepared by clearing and smoothing and must be approved by the Engineer. Prior to any stockpiling of aggregates, cross-sections of the stockpile site shall be taken and control points established for use in determining the quantity of subsequently stockpiled material.

6/4.2 The equipment and methods used for stockpiling aggregates and for removing aggregates from the stockpiles must be approved by the Engineer and shall be such that no segregation of the aggregate will result and no foreign material will contaminate the aggregate.

6/4.3 Material shall be stored in a manner that will ensure preservation of their specified quality and fitness for the work. They shall be placed on hard, clean surfaces and, when required by the Engineer they shall be placed under cover. Stored materials shall be located in such a manner to facilitate prompt inspection and control. Private property shall not be used for storage purposes

without written consent of the owner or lessee and payment to him, if necessary, at the Contractor's expense.

6/4.4 The center of the storage area shall be elevated and sloped to the sides in order to provide proper drainage of excess moisture. The material shall be stored in such a way to prevent segregation and to allow proper control of moisture. Aggregate stockpiles shall be built up in layers not exceeding one (1) meter. The height of each stockpile shall be limited to a maximum of five (5) meters.

6/4.5 Sufficient material must be stored in stockpiles to allow for testing and approval of such materials prior to use in the works.

6.5 TIDYING-UP OF QUARRY AREA

6/5.1 The Contractor shall tidy-up the quarry areas on completion and ensure that side-slopes are not steeper than 1 to 2 and in a condition acceptable to the Employer and to the Engineer.

6.6 GRANULAR SUB-BASE

6/6.1 DESCRIPTION

Granular sub-base shall consist of furnishing, spreading, and compacting sub-base in accordance with the details shown on drawings and these Specifications.

6/6.2 MATERIALS

Granular sub-base material for Road sub-base shall consist of hard, durable natural/screened gravel or crushed stone, and shall be free from clay balls or other deleterious substances. Granular sub-base shall be well graded and lie within the grading envelope stated below when tested in accordance with BS 1377 : Part 2 : Test 9.2. The material should have a minimum 4 days soaked C.B.R. of 30 % at 95 % of maximum dry density and should comply with Clause 3/6.4. organic impurities (BS .1377 Part 3 Method 3) shall not exceed 0.2%.

SIEVE SIZE		PERCENTAGE PASSING
75	mm	100
37.5	mm	85 - 100
10	mm	40 - 85
5	mm	25 - 45
0.6	mm	8 - 25
0.075	mm	0 - 10

6/6.3 CONSTRUCTION

Road sub-base material shall be delivered to the roadbed as uniform mixture and shall be spread in layers or windrows. Segregation shall be avoided and the sub-base shall be free from pockets of coarse or fine materials.

Each road sub-base layer shall be spread by finisher and or grader or other approved mechanical methods, watered shaped to a compacted thickness not exceeding 150 mm and compacted to the required grade and cross-section.

The compaction procedure and plant shall be to the satisfaction of the Engineer. At the time of compaction the moisture content of the laid material shall not vary by more that ± 2% from the optimum moisture content.

The granular sub-base shall be compacted to not less than 95% of the maximum density determined in accordance with BS 1377: Part 4 Method 3.6. Particle size analysis of soils for sieve analysis of fine and coarse aggregate shall be carried out in accordance with BS 1377:Part 2:Test 9.2. The surface on completion of compaction shall be well closed, free from movement under compaction plant and free from ridges cracks or loose material. The finished surfaces of the road sub-base shall not vary at any point more than 10 mm above or below the grade established by the Engineer. The road sub- base shall be maintained in a condition satisfactory to receive any subsequent base or surfacing material. Sub-base which does not conform to the above requirements shall be reshaped or reworked, watered and thoroughly re-compacted to conform to the specified requirements.

6/6.4 RELEVANT TEST AND STANDARDS

Relevant lasted BS standards shall be referred and followed wherever applicable

6/6.5 MINIMUM TEST REQUIREMENTS

One sample every 1,000 cu.m. or as directed by the Engineer shall be tested for Grading, Plasticity Index, Maximum Dry Density, soaked CBR and Loss by Abrasion, at least three field density tests shall be carried out per unit as indicated in ASTM D75 and D979 (one unit being 1,500 sq.m.)or as directed by the Engineer.

6.7 AGGREGATE ROAD BASE DESCRIPTION

6/7.1 This work shall consist of furnishing and placing one or more courses of aggregate, including binder soil if required, on a prepared subgrade or sub-base in accordance with sub-section 6 of the Specifications, in conformity with the lines, grades, thickness and typical cross-sections shown on the drawings or established by the Engineer.

6.8 AGGREGATE ROADBASE MATERIAL

6/8.1 All aggregate roadbase material shall be free from dirt, shale or other deleterious matter and shall be of such quality that it will bind readily to form a stable aggregate roadbase.

6/8.2 The requirements for aggregate roadbase are:-

Liquid Limit (BS1377:Part 2:Test 4.5)	25% maximum
Plasticity Index (BS1377:Part 2:Test5)	6 maximum

Sand Equivalent (ASTM D-2419)	40% minimum
Loss by Abrasion (ASTM C-131 or C-535)	40% maximum
Flakiness Index (BS812 Part 105.1) (Coarse Aggregate)	35 maximum
Elongation Index (BS812 Part 105.2) (Coarse Aggregate)	35 maximum
Soundness (ASTM C88) (Magnesium Sulphate 5 cycles)	12% maximum
Organic Impurities (BS 1377 Part 3 Method 3)	0.2% maximum
Acid Soluble Chlorides (BS 812 Part 117) (Combined Aggregate)	1% maximum
Acid Soluble Sulphates (BS 812 Part 118) (Combined Aggregate)	0.5% maximum
Maximum Dry Density (BS 1377:Part 4:Test 3.6)	2.00 Mg/m^3 minimum
CBR on Re-molded Samples after 4 days soaking at 100% of the maximum dry density (BS 1377: Part 4 : Test 7)	80% minimum

Sampling method in accordance with ASTM D75 for all tests.

At least three field density tests shall be carried out per unit as indicated in ASTM D979.

6/8.3 The gradation limits when tested in accordance with BS 1377 : Part 2 shall be as follows:-

SIEVE SIZE (BS)	PERCENT PASSING
50 mm	100
37.5 mm	70 - 100
28 mm	55 - 85
20 mm	50 - 80
10 mm	40 - 70
5 mm	30 - 60
2.0 mm	20 - 50
0.425 mm	10 - 30
0.063 mm	5 - 15

Aggregate roadbase shall consist of uniform mixtures of gravel and/or crushed gravel with sand, silt and clay, conforming to the specified gradation limits.

6.9 SPREADING AGGREGATE ROADBASE

6/9.1 Aggregate roadbase shall be spread on subgrade or sub-base, which has been approved by the Engineer. Aggregate roadbase which has been placed on a

subgrade or sub-base not approved by the Engineer shall be removed at the Contract's expense.

6/9.2 Aggregate roadbase shall be spread on the approved subgrade in layers not exceeding fifteen (15) centimeters in compacted depth.

6/9.3 The material shall be handled in a manner, which avoids segregation. Segregated materials shall be remixed until uniform. Suitable precautions shall be taken to prevent rutting of the subgrade or sub-base during the spreading of aggregate road base materials. No hauling or placement of material will be permitted when, in the judgment of the Engineer, the weather or road conditions are such that the hauling operations will cause cutting or rutting of the subgrade or cause contamination of aggregate roadbase material.

6.10 COMPACTION OF AGGREGATE ROADBASE

6/10.1 The moisture content of the aggregate road base. Material shall be adjusted prior to compaction, by watering with approved sprinkler trucks or by drying out, as directed by the Engineer, to that required to obtain the specified density for aggregate road base. Aggregate road base shall be compacted to Ninety Eight (98) percent of the maximum dry density, as determined according to BS 1377:Part 4 at a moisture content between $\pm$ 2 % of the O.M.C. The field density and actual moisture content shall be determined according to BS 1377:Part 9

6/10.2 The aggregate road base shall be compacted by means of' approved compaction equipment progressing gradually from the outside of the road towards the center with each succeeding pass uniformly overlapping the previous pass. Rolling shall continue until the entire thickness of each layer is thoroughly and uniformly compacted to the specified density. Rolling shall be accompanied by sufficient blading in a manner approved by the Engineer, to ensure a smooth surface free from ruts or ridges and having the proper section and crown.

6/10.3 The surface of the material shall on completion of compaction be well closed, free from movement under the compaction plant and free from compaction planes, ridges, cracks, or loose material.

6/10.4 Any areas inaccessible to normal compaction equipment shall be compacted by means of mechanical tampers until satisfactory compaction is obtained.

6/10.5 The Contractor shall program his operations to avoid the drying out of the sub-base during construction. If any layer of aggregate road base material, or part thereof, is permitted to dry out after compaction, or does not conform to the required density or finish, the Contractor shall, at his own expense, rework, water and recompact the material, as directed by the Engineer, to the

density specified, before the next layer of aggregate road base or subsequent pavement layers is placed.

6.11 COMPACTION TRIALS FOR AGGREGATE ROADBASE

6/11.1 If directed by the Engineer, prior to the commencement of the aggregate road base operations, the Contractor shall construct trial lengths not to exceed 250 meters. The materials used in the trials shall be those approved for use as aggregate road base, and the equipment used shall be that according to the Contractor's approved detailed program of work.

6/11.2 Trial lengths may not form part of the permanent works but may be permitted in the construction of temporary detours of sufficient length.

6/11.3 The object of these trials is to determine the adequacy of the Contractor's equipment, the loose depth measurements necessary to result in the specified compact layers depths, the field moisture content, and the relationship between the number of compaction passes and the resulting density of the material.

6/11.4 The Contractor may proceed with the aggregate road base work only after the methods and procedures established in the compaction trials have been approved by the Engineer.

6.12 FINISHING OF AGGREGATE ROADBASE

6/12.1 Immediately prior to the placing of the first layer of the next pavement course on to the aggregate road base the final layer of aggregate road base shall be at the specified density and to the required grade and section. In order to maintain these requirements while placing the next course it may be necessary to water and reshape the surface of the aggregate road base. This work shall be at the Contractor's expense.

6/12.2 The surface of the finished aggregate road base will be tested with a three (3) metre straightedge by the Engineer at selected locations. The variations of the surface from the testing edge of the straight edge between any two (2) contacts with the surface shall at no point exceed twelve (12) millimeters when placed on or parallel to the centerline, or twelve (12) millimeters when placed perpendicular to the centerline of the roadway. The aggregate cross section as shown on the drawings and shall not vary by more than ten (10) millimeters from the required elevation. All humps and depressions and thickness deficiencies exceeding the specified tolerance shall be corrected by removing the defective work or by adding new material as directed by the Engineer.

6.13 MINIMUM TEST REOUIREMENT FOR AGGREGATE ROADBASE

6/13.1 One sample every 1,000 cu. m. shall be tested for Grading Plasticity Index, Sand Equivalent, Maximum Dry Density, C.B.R. and Loss by Abrasion. one

in-situ Density test shall be made every 300 sq. m. of aggregate road base laid.

6.14 WET-MIX MACADAM ROADBASE, DESCRIPTION

6/14.1 This work shall consist of furnishing and placing one or more courses of high quality crushed aggregate, bound by means of carefully controlled moisture content, on the prepared subgrade or sub-base in conformity to the line, level and thickness shown on the drawings or as directed by the Engineer.

6.15 WET-MIX MACADAM ROADBASE MATERIAL

6/15.1 The coarse aggregate shall consist of crushed rock (each particle shall have a minimum of one crushed face - DM DCLD : Test Method DM 301) and the fine aggregate shall be crushed rock or naturally occurring material. The aggregate shall conform to the following gradation :

SIEVE SIZE (BS)		PERCENT PASSING
50	mm	100
37.5	mm	95 -100
20	mm	60 - 80
10	mm	40 - 60
5	mm	25 - 40
2	mm	15 - 30
0.6	mm	8 - 22
0.063	mm	2 - 8

The particle size shall be determined in accordance with the requirements of BS 1377 Part 2 (Method 9.2 or 9.3).

6/15.2 The gradation shall be adjusted as required or as directed by the Engineer within the above limits to ensure the mix has adequate binding properties.

6/15.3 Wet-mix road-base material shall have physical properties which do not exceed the following values :

Liquid Limit (BS 1377: Part 2 : Test 4.5)	25%
Linear Shrinkage (BS 1377 Part 2 Method 6.5)	3%
Plasticity Index (BS 1377 : Part 2 : Test 5)	6
Aggregate Crushing Value (BS 812 Part 110)	25%
Water Absorption (ASTM C128/Cl27)	2%
Flakiness Index (BS 812 Part 105.1)	30
Elongation Index (BS 812 Part 105.2)	30
Los Angeles Abrasion Loss (ASTM C-131 or C-535)	30%
Soundness Loss (ASTM C 88) (Magnesium Sulphate 5 cycles)	12%
Organic Impurities (BS 1377 Part 3 Method 3)	0.2%
Chloride Content (Acid Soluble) BS 812 Part 117	1% max.
Sulphate Content (Acid Soluble) BS 812 Part 118	0.5 max.

The sand equivalent shall not be less than 45 (ASTM D-2419). Sampling shall be in accordance with ASTM D75.

6/15.4 The moisture content of the wet-mix macadam at the time of laying shall be the optimum $\pm$ 1 %. Water required to achieve this moisture content shall be added at the mixing plant. Moisture content determination shall be in accordance with BS 1377 Part 2:Test 3.2.

6.16 TRANSPORT AND SPREADING WET-MIX MACADAM ROADBASE

6/16.1 Transport vehicles carrying the plant mixed material shall have a capacity suited to the output of the mixing plant and the site conditions and be capable of discharging cleanly. Material when mixed shall be removed at once from the mixer transported directly to the point where it is to be laid and protected from the weather both during transit from the mixer to the laying site and whilst awaiting tipping.

6/16.2 The material shall be placed and spread evenly. The material shall be spread using a paving machine or spreader box operated with a mechanism which levels off the material at an even depth and without delay. Except where otherwise specified, the material shall be laid and compacted in layers of maximum thickness of 150 mm.

6.17 COMPACTION TRIALS OF WET-MIX MACADAM ROADBASE

6/17.1 If directed by the Engineer, prior to the commencement of the Wet-mix Macadam Road base operations, the contractor shall construct trial lengths, not to exceed 250 meters. The materials used in the trials shall be those approved for use as Wet-mix Macadam Road base and the equipment used shall be that according to the Contractor's approved detailed programme of work.

6./17.2 Trial lengths may not form part of the permanent works but may be permitted in the construction of temporary detours of sufficient length.

6/17.3 The objective of these trials is to determine the adequacy of the Contractor's equipment, the loose depth measurements necessary to result in the specified compacted layer depths, the field moisture content, and the relationship between the number of compaction passes and the resulting density of the material.

6/17.4 The Contractor may proceed with the Wet-mix Macadam Road base work only after the methods and procedures established in the compaction trials have been approved by the Engineer.

6.18 COMPACTION OF WET-MIX MACADAM ROADBASE

6/18.1 The material shall be compacted to a field density equal to or greater than 100 % of maximum dry density value obtained when tested in accordance

with BS 1377:Part 4 Test 3.7 and shall have a minimum 4 days soaked CBR of 80% at 100% of maximum dry density (BS 1377:Part 4 Test 7). Field Density tests shall be carried out in accordance with BS 1377: Part 9: Test 2.2 At least 3 field density tests shall be carried out per unit as indicated in ASTM D75 & D979.

6/18.2 Compaction shall be completed as soon as possible after the material has been spread.

6/18.3 Special care shall be taken to obtain full compaction in the vicinity of both longitudinal and transverse joints.

6/18.4 The surface of any layer of material shall on completion of compaction be well closed free from movement under compaction plant and free from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of layer and re compacted.

6/18.5 Where directed by the Engineer a Sieve analysis shall be carried out on the material recovered from 5 consecutive field density tests. Where this sieve analysis shows oversize material content of 10% or greater the area of construction will be removed and the source of the material rejected until further notice. Where considered necessary other areas of work which were carried on using material from the same source shall be tested in a similar manner.

6.19 FINISHING OF WET-MIX MACADAM ROADBASE

6/19.1 Immediately prior to the placing of the first layer of the next pavement course on to the Wet-mix Macadam Road base the final layer of Wet-mix Macadam Road base shall be at the specified density and to the required grade and section. In order to maintain these requirements while placing the next course it may be necessary to water and reshape the surface of the Wet-mix Macadam Road base. This work shall be at the Contractors expense.

6/19.2 The surface of the finished Wet-mix Macadam Road base will be tested with a three (3) meter straight edge by the Engineer at selected locations. The variations of the surface from the testing edge between any two (2) contacts with the surface shall at no point exceed ten (10) millimeters when placed on or parallel to the centerline, or ten (10) millimeters when placed perpendicular to the centerline of the roadway. The Wet-mix Macadam Road base shall be compacted to the thickness and cross sections as shown on the drawings and shall not vary by more than ten (10) millimeters from the required elevation. All humps and depressions and thickness deficiencies exceeding the specified tolerance shall be corrected by removing the defective work or by adding new material as directed by the Engineer.

6/19.3 Before placing the next construction layer or applying prime coat, the wet-mix road base shall be mechanically swept then cleaned with compressed air to remove loose material. As soon as possible after cleaning of the surface, the wet-mix road base shall be sealed by the application of a prime coat as specified. Should the surface of the material be allowed to dry out before the seal is applied, it shall be lightly watered and re-compacted immediately prior to spraying with prime-coat. In the event of a section of wet mix road base failing to comply, either by level or degree of compaction, and where the full depth of the layer has been allowed to dry out, it shall be removed and replaced at the Contractor's expense, with fresh material. Watering and re-mixing in place will not be permitted.

6.20 MINIMUM TEST REOUIREMENTS FOR WET-MIX MACADAM ROADBASE

6/20.1 One sample every 1,000 cu. m. or part of as directed by the Engineer shall be tested for Grading Plasticity Index, Sand Equivalent value, Maximum Dry Density, C.B.R. and Loss by Abrasion.

6/20.2 For compaction and moisture content; two tests per 500 sq. m. (max.) of each layer of carriageway and one test per 150 line. m. of shoulder or as directed by Engineer.

6/20.3 Special care shall be taken to obtain full compaction in the vicinity of both longitudinal and transverse joints.

6.21 BITUMINOUS PAVING COURSES DESCRIPTION

6/21.1 This work shall consist of the construction of the following hot-mix bituminous courses which shall be either Asphaltic Concrete or Dense Bitumen Macadam as shown on the drawings.

- Bituminous Base Course
- Bituminous Binder Course
- Bituminous Wearing Course

Bituminous Paving Courses shall consist of coarse aggregates, fine aggregates, filler material, and bitumen binder.

6.22 COARSE AGGREGATES FOR BITUMINOUS PAVING COURSE

6/22.1 Coarse aggregates, which is the material retained on a 4.75 mm sieve, shall consist of crushed rock or crushed gravel. It shall be clean, hard, tough, durable and sound, and shall be of uniform quality and free from decomposed stone, shale, clay, lumps and other deleterious substances. Sampling of coarse aggregate shall be in accordance with ASTM D75.

6/22.2 Crushed gravel for use as coarse aggregate shall consist of the product obtained by crushing material that has first been screened in such a manner

that not less than ninety (90) percent of the material to be crushed is retained on an ASTM 9.5mm.

6/22.3 Percentage of partially crushed faces With minimum one crushed face shall be 100% by weight of each (stockpile) of aggregate. In addition, at least 85% by weight of each separate stockpile of aggregate shall have all faces crushed. This 85% value may be reduced to 50% for certain categories of road where indicated on the drawings.

Crushed face determination shall be as per Dubai Municipality DCLD Test Method DM 300 and 301.

6/22.4 Each Stock Pile of Coarse aggregate shall have properties which comply with the following values:-

Los Angeles Abrasion Loss (ASTM C131 or C535)	
Base Course and Binder Course	30% max.
Wearing Course	25% max.
Aggregate Crushing Value (BS 812 Part 110)	
Base Course and Binder Course	25% max.
Wearing course	20% max.
Soundness Loss (ASTM C88)	10% max.
(Magnesium Sulphate 5 cycles)	
Flakiness Index (BS 812 Part 105.1)	
Base Course and Binder Course	30 max.
Wearing Course	25 max.
Elongation Index (BS 812 Part 105.2)	
Base Course and Binder Course	30 max.
Wearing Course	25 max.
Water Absorption (ASTM C127)	2.0% max.
Acid soluble Chlorides (BS 812 Part 117)	0.1% max
Acid soluble Sulphate (BS 812 Part 118)	0.5% max

6.23 FINE AGGREGATE FOR BITUMINOUS PAVING COURSE

6/23.1. Fine aggregate shall consist of the material passing a 4.75 mm sieve.

6/23.2 Fine aggregate including filler shall be obtained from 100% crushed gravel or crushed rock pre-screened to exclude natural uncrushed fine material or Weathered unsound fines. The use of dune sand shall not be permitted. Sampling of fine aggregate shall be in accordance with ASTM D75.

6/23.4 Fine aggregates shall have properties which comply with the following values:-

Soundness Loss (ASTM C88)	10% max.
(Magnesium Sulphate 5 Cycles)	
Plasticity Index	Non Plastic

(BS 1377:Part 2:Test 5)
Acid Soluble Chlorides 0.1% max.
(BS 812 Part 117)
Acid Soluble Sulphates 0.5% max.
(BS 812 Part 118)
Water Absorption (ASTM C 128) 2.3% max

6.24 MINERAL FILLER FOR BITUMINOUS PAVING COURSE

6/24.1 When the combined grading of the coarse and fine aggregates is deficient in material passing the ASTM No.200 sieve, mineral filler shall be added as approved by the Engineer at the Contractor's expense.

6/24.2 Mineral filler shall consist of finely ground particles of limestone or cement in accordance with ASTM D 242. It shall be thoroughly dry and free from organic substances and clay and meet the grading requirements following:-

MINERAL FILLER		
B.S. SIEVE	ASTM SIEVE SIZE MASS PASSING	PERCENTAGE BY
600 micron	No. 30	100
300 micron	No. 50	95 - 100
150 micron	No. 100	90 - 100
75 micron	No. 200	70 - 100

6.25 COMBINED AGGREGATE FOR BITUMINOUS PAVING COURSES

6/25.1 The combined mineral aggregate shall meet the following physical requirements:-

Sand Equivalent (ASTM D 2419)
determined after all processing
except for addition of asphalt binder 65 minimum
Plasticity Index
(BS 1377:Part 2: Test 5) Non Plastic

6/25.2 When tested according to ASTM C-117 and ASTM C-136, the combined mineral aggregate shall conform to Table 1 for Asphaltic Concrete and Tables 2, 3 and 4 for Dense Bitumen Macadam:-

6/ 25. 3 The grading given in Tables 1, 2, 3 and 4 represent the extreme limits which shall determine suitability of aggregate for use from all sources of supply. The aggregate as finally selected for use in the work shall have a

grading within the limits designated in Tables 1, 2, 3 and 4 as appropriate and for Table 1 may with the Engineers agreement.

6/25.4 The coarse aggregate, shall show no detrimental amount of stripping when tested in accordance with ASTM D1664. The minimum value of non stripped area shall be 95%. If stripping occurs, the aggregate shall be rejected and an approved method of treatment specified to change the material from a hydrophilic to a hydrophobic state as directed by the Engineer, or an approved additive shall be used with the bituminous binder.

6/25.5 When necessary to improve the coating of aggregate by bitumen, additives of approved type will be added to the bituminous material in such percentage as required to obtain satisfactory results in the affinity with bitumen test performed in accordance with ASTM D 1664. The approved additive will be used in accordance with Technical Specifications issued by the manufacturer and approved by the Engineer after appropriate testing.

6/25.6 No extra payment will be made for required antis tripping additives.

6.26 BITUMEN BINDER

6/26.1 Bitumen Binder for the "Bituminous Paving Courses" shall be Bitumen Binder penetration grade 60 – 70 unless otherwise specified as 40 - 50. Sampling shall be in accordance with ASTM D140.

6/26.2 The bitumen shall be prepared by refining crude petroleum by suitable methods and shall be homogeneous, free from water And shall not foam when heated to 175 degrees C (347 F).

6/26.3 Bitumen penetration grade 60-70 and 40-50 shall conform to the requirements as per latest BIS/IRC standards

6/26.4 A sample of the bitumen that the Contractor proposes to use in the work, together with a statement as to its source and properties shall be submitted to and approved by the Engineer at least 45 days before the asphalt work begins.

6/26.5 No bitumen other than that represented by the approved sample shall be used by the contractor. Blending of bitumen from different refineries will not be permitted.

6/26.6 For Asphaltic Concrete the percentage range of bitumen by weight of total mix to be added to the aggregate shall be as prescribed in Table 6 For Dense Bitumen Macadam the range shall be as prescribed in Table 9.

TABLE 6 - BITUMEN CONTENT FOR ASPHALTIC CONCRETE

PAVEMENT COURSE	*BITUMEN PERCENTAGE BY WEIGHT OF* TOTAL MIX INCLUSIVE OF TOLERANCES
Base	3.2 to 4.4
Binder	3.4 to 4.4
Wearing	3.4 to 4.4

6.27 JOB MIX FOR BITUMINOUS PAVING COURSES

6/27.1 The mix approved for use in the works shall be designed using Marshall tests and field trials with the following recommendations taken into account:

- For base course the Marshall shall be modified by substituting all aggregate sizes over 25 mm with an equal weight of aggregate sizes in the next lower grading size, as specified in Tables 1, 2, 3 and 4.

- The combined aggregate gradation should be adjusted within the allowable limits to achieve maximum stability whilst not going below the minimum requirement for void content.

- The minimum bitumen binder content according to the results of the Marshall Method of Mix Design should be used provided that it will still satisfy the durability, the stability and the void content requirements.

- Prior to final approval, the proposed job mix, but with a bituminous content at the upper percentage limits shall be compacted to refusal, .(400 to 600 blows) and the resulting voids in the mix shall not be less than 2% f or asphaltic concrete or 3% for DBM.

- The final job mix must display the Marshall characteristics specified in BIS / IRC standards.

6/27.2 Determination of VIM, VMA & VFB shall be in accordance with DM 404.

6/27.3 At least thirty (30) days prior to the date he intends to begin production of plant-mix "Bituminous Paving Course" Mixes, and after receiving approval of the aggregates and bitumen from the Engineer the Contractor shall make a written request for the approval of the job-mix formula from the Engineer. The job-mix formula will be prepared by the Contractor under the supervision of the Engineer in the Laboratory. The job-mix design and the calibration factor of aggregate shall be checked at the Dubai Municipality DCLD.

6/27.4 The laboratory job mix formula shall fix a single definite percentage of aggregate passing each required sieve size, a single definite percentage of bitumen binder to be added to the aggregate, a single definite temperature at which the mix is to be emptied from the mixer, and a single definite, temperature at which the mix is to be delivered to the works site.

6/27.5 The laboratory job mix formula shall be used for the basis of approval of the job standard mixture.

6/27.6 Trials areas having lengths of at least 30 m and to the specified layer thickness shall be laid outside the area of the permanent work by the Contractor for the Engineer's approval, before the start of the permanent work. At least two samples of non- compacted material from the trial area shall be taken in accordance with ASTM D979 and shall be analyzed in the presence of the Engineer to determine the aggregate grading, binder content, stability, flow, Marshall density and voids. The results shall be submitted to the Engineer and shall be approved by him before further mixing or laying is carried out.

6/27.7 Trial areas may form part of a temporary traffic detour subject to the approval of the Engineer. The compaction trials according to sub-section 6/42 should be performed on the trial mixes. If the trial areas form part of the temporary traffic detour they shall not be paid for under the relevant Bill item.

6/27.8 Should the laboratory job mix formula after passing the mixing plant and laid and compacted with approved plant fail to produce a satisfactory trial area, the mix proportions may be modified by agreement with the Engineer, as necessary and within the requirements of Table 7, 8 and 9 as applicable to produce a mix of satisfactory workability and acceptable surface finish subject to the mix being rechecked in accordance with the proceeding Clauses of 6/27. After approval of the trial area by the Engineer this mix shall be designated the 'Job Standard Mix' and shall thereafter be the approved mix.

6/27.9 All mixes produced shall conform to the Job Standard. Mix approved by the Engineer, within the ranges of tolerance specified in Table 7 (within the limits of Table 1, 6 and 8 for Asphaltic Concrete and Tables 2, 3, 4 and 9 for Dense Bitumen Macadam). Each day the Engineer shall take as many samples of the materials and mix as he considers necessary and minimum of one sample for every 300 tons laid or part thereof for checking their required characteristics. When unsatisfactory results or changed conditions make it necessary, the Engineer shall instruct the Contractor to establish a new job-standard following approval of the new mix design in accordance with the proceeding Clauses of 6/27.

6/27.10 Should a change in a material be encountered or should a change in a source of material be made, a new Job-Standard Mix shall be submitted by the Contractor in accordance with the proceeding Clauses of 6/27 and approved

by the Engineer before the mix containing the new material is delivered. Job materials will be rejected if they are found not to have the characteristics required by the approved Job Standard mix.

6/27.11 Samples of bituminous paving course mixes shall be taken from the mixing plant and/or behind the paver prior to compaction, as decided by the Engineer, to check compliance with the approved job mix requirements including Tables 1, 6, 7 and 8 for asphaltic concrete and Tables 2, 3, 4, 7 and 9 for Dense Bitumen Macadam.

6/27.12 The density of the compacted mixes shall be related to the daily Marshall Density which shall be determined by making four standard Marshall specimens from samples of the mix taken from the mixing plant or paver. The density of each sample shall be determined and compared with the mean value. Any individual result, which varies from the mean by more than 0.015 gm/cc.shall be rejected. Marshall tests shall be repeated on a daily basis to establish the daily Marshall Density for that particular day's production. The daily Marshall Density shall not vary from the Job Mix Design Density by more than ± 1.0%.

6/27.13 The assistance of the Engineer in the preparation of the job standard mix in no way relieves the Contractor of the responsibility of producing a bituminous mix meeting the requirements of the Specifications.

6.28 EQUIPMENT FOR BITUMINOUS PAVING OPERATIONS

6/28.1 Method statement and equipment list shall be according to the type and number outlined in the Contractors detailed Programme of Work, as approved by the Engineer. Requirements for major plant are outlined in Clause 1/29 of these Specifications.

6/28.2 In addition to the above requirements, trucks used for hauling bituminous mix shall have tight, clean, smooth metal beds which have been thinly coated with a minimal amount of paraffin oil, lime solution, or other approved material to prevent the mix from adhering to the beds. When required by the Engineer, each vehicle shall be equipped with a canvas cover or other suitable material of such size as to protect the mix from the weather.

6/28.3 Rolling-equipment shall be self-propelled. The wheels on the rollers shall be equipped with adjustable scrapers and the rollers shall have water tanks and sprinkling apparatus, which shall be used to keep the wheel wet and prevents the surface material from sticking.

6.29 PREPARATION OF BITUMEN BINDER

6/29.1 The heating of the bitumen binder for mixing and compacting shall be in accordance with ASTM D1559.

6.30 PREPARATION OF MIENERAL AGGREGATE FOR BITUMINOUS MIX

6/30.1 i) Coarse and fine aggregate shall be stored at the asphalt plant in such a manner that the separate stockpiles will not become 'intermixed. The stockpiles shall be of sufficient size to provide a minimum quantity of one week's continuous production of asphalt mix taking into consideration frequency of aggregate testing as mentioned in clause 6/47.2. Aggregates brought to the asphalt plant to supplement stocks should be tested and approved prior to placing in the existing approved stockpiles.

ii) The cold bins shall be calibrated with the materials to be used and the settings shall be such as to produce a combined gradation in accordance with the job mix formula. The proportioning shall be such that surpluses and shortages in the hot bins will not cause breaks in the continuous operation. All the above shall be as approved by the Engineer.

iii. The materials shall be thoroughly dried and heated so that their-temperature is within 8 deg.C of the temperature needed to satisfy the viscosity requirements of the asphalt cement. The moisture content of the heated and dried materials shall not exceed 0.5 per cent. The quantity of materials fed through the drier shall in all cases be held to an amount which can be thoroughly dried and heated within the limits specified.

6/30.2 Immediately after heating, the aggregate or aggregates shall be screened into at least five (5) sizes and conveyed into separate bins ready for batching and mixing with bituminous material. When the aggregates supplied are of such size and grading that separating into five (5) bins is impractical, the number of required separations may be reduced to four (4) or to three (3) with the approval of the Engineer. The efficiency of the screening operations shall be sufficient to produce, at plant operating capacity, gradations in each of the sizes of heated and dried aggregates which are reasonably uniform and result in the production of a mix complying with the limits specified for the aggregate gradation.

6.31 PREPARATION OF BITUMINOUS MIX

6/31.1 Dried aggregate as specified and prepared as prescribed above shall be combined in the plant conforming to ASTM D 995 - 88 in the approved proportions. The bitumen binder shall be introduced into the mix in the proportion specified by the job-mix formula.

6/31.2 The initial mixing time will be designated by the Engineer. Mixing time may be increased by the Engineer if additional time is necessary to obtain a homogeneous mix and satisfactory coating.

6/31.3 The batch plants, timing shall begin at the start of the introduction of the bitumen into the pug mill.

6/31.4 The length of mixing time for continuous plants will be determined by the following formula or other approved methods:-

$$\text{Mixing time in seconds} = \frac{\text{Pug mill dead load capacity in Kg}}{\text{Pug mill output in Kg/second}}$$

6/31.5 The temperature of the aggregate immediately prior to mixing shall be within ± 8 deg.C of the temperature of the asphalt cement and the temperature of the aggregate and asphalt prior to mixing shall be approximately that of the completed mix as defined in the job mix formula approved by the Engineer. The mix temperature shall be within the limits set out in the job mix formula when emptied from the mixer.

6.32 SURFACE PREPARATION

6/32.1 When the Bituminous Mix is placed on a prepared road base and whether or not a prime coat is designated on the Drawings, the Granular Road base shall be even and firm and within the construction tolerances specified for the road base. to the satisfaction of the Engineer.

6/32.2 When the paving layer is constructed on an existing bituminous surface, the surface shall be cleaned of all foreign material and broomed free of dust. In addition any loose, broken or shattered bituminous material along the edges of the existing surface shall be removed, and the exposed sub grade and a sufficient width of the shoulder adjacent to the edge of the existing surface to receive the'. new bituminous mix shall be shaped, bladed, compacted and broomed and primed to provide a uniform firm subgrade for the new surface course.

6/32.3 The existing bituminous surface, base, or subgrade shall be removed if broken, shattered, or unstable. The areas shall be excavated to a depth as directed by the Engineer, and refilled with the Bituminous Mix according to the Specifications.

6/32.4 Prior to the placing of the mix, when designated on the Drawings or directed by the Engineer, a prime coat or tack coat shall be applied to the roadbase or surface in accordance with the Specification for Prime Coat or Tack Coat.

6.33 PLACING OF THE MIX

6/33.1 All bituminous mixes shall be introduced to the paver at a temperature not less than 135 deg.C and not more than 163 deg.C. Mixes outside this temperature range shall be discarded.

6/33.2 The bituminous mix shall be spread and finished to crown and grade by automatically controlled bituminous paver. Bituminous mix may be spread

and finished by hand methods only where machine methods are impractical as determined by the Engineer.

6/33.3 The automatically controlled paver shall lay the bituminous mix without tearing the surface and shall strike a finish that is smooth, true to cross-section, uniform in density and texture, free from hollows, transverse corrugations and other irregularities.

6/33.4 The paver shall be operated at a speed which will give the best results for the type of paver being used and which co-ordinates satisfactorily with the rate of delivery of the mix to the paver, to provide a uniform rate of placement without intermittent operations of the paver.

6/33.5. The mix shall be delivered to the paver in time to permit completion of spreading, finishing and compaction of the mix during daylight hours.

6/33. 6 The longitudinal joints in successive layers shall be offset not less than fifteen (15) centimeters. The width of surface or top course placements shall conform to traffic lane edges as shown on the Drawings.

6/33 .7 The leading half of half roadway paving shall not get ahead of the trailing half of the pavement by more than one (1) average full-day of paving and, in no case, shall the leading half be more than one half (1/2) kilometer ahead of the trailing half without the written permission of the Engineer. If the Contractor fails to comply with this requirement, the Engineer may suspend paving on the leading half until such time, as the Contractor shall pave the trailing half to a point approximately even with the leading half.

6/33.8 Unless otherwise directed by the Engineer, where successive layers are to be placed, the surface of the existing layer shall be swept clean with a power broom, or by other means as approved by the Engineer, and a tack coat applied. Tack coat may not be required where the delay between courses laying is less than 48 hours and when the surface is fresh and clean and at the discretion of the Engineer. The rate of application of Tack Coat to be between 0.2 to 0.6 L/m^2.

6/33 . 9 Asphaltic concrete mixes, except leveling courses shall be laid at an uncompacted thickness such that, after rolling the thickness of the compacted layer shall be:-

Base Course	:	Min. 6 cm	Max. 10 cm
Binder Course	:	Min. 5 cm	Max. 8 cm
Wearing Course	:	Min. 4 cm	Max. 6 cm

However, DBM thick nesses shall be as specified in tables 3 and 4.

6/33.10 The maximum thickness for layers may be increased slightly when such increase is more adaptable to total pavement thickness and when in the opinion of the Engineer it is not detrimental to placement and rolling conditions.

6.34 PRELIMINARY SURVEY AND REFERENCE STRING LINE

6/34.1 The Contractor shall make the necessary survey required for the reference grade. When the survey is approved by the Engineer, the Contractor shall erect and maintain an approved reference string line and operate the paver to conform to the reference string line for the initial layer and/or any other layers as directed. Elevation control point stakes for the first layer of bituminous paving course shall be set at a maximum spacing of twenty (20) meters. For subsequent layers, control points shall be set at ten (10) meters maximum spacing. The Contractor shall furnish and maintain an approved mobile string line for all layers not laid with the erected string line. The string line shall be erected parallel to the reference grade, and the bituminous mix shall be spread at a constant elevation above, below or at the string line elevations as directed.

6/34.2 The use of the automatically controlled bituminous paver, to provide both longitudinal and traverse control, shall include the furnishing and maintaining of a string line, fixed or mobile, by the Contractor. The longitudinal and traverse controls shall operate independently of each other, to the extent that the surface of the bituminous mix will conform to the string line and will be uniform in cross-section and crown.

6/34.3 The Contractor shall establish the center-line points and shall maintain the location of the points until the completion of the surfacing or as directed. When directed by the Engineer, the Contractor shall erect a string line, to be used as a guide for the finishing machine, in order to maintain a uniform edge alignment. If any other method is proposed by the Contractor, it shall first be approved by the Engineer.

6.35 BITUMINOUS LEVELLING COURSE

6/35.1 A leveling course, consisting of a layer of bituminous material of variable thickness may be used to eliminate irregularities in existing surfaces or bases and to vary existing cross-section elements of roadways.

6/3 5. 2 In areas where leveling courses are required, as shown in the Drawings or determined by the Engineer, the Contractor shall make a survey of the existing surface or base. When the survey is approved, the Engineer will determine and inform the Contractor of the precise locations and thickness of leveling course to obtain the smoothest possible riding surface. Upon receipt of the locations and thickness from the Engineer, the Contractor shall proceed with the placement of the Leveling Course.

6.36 THICKNESS CORES

6/36.1 The depth of each bituminous paving course shall be measured by cored samples. The Contractor shall furnish and operate an approved core drill for cutting samples from the compacted mix on the road. The equipment shall

be capable of cutting the mix without shattering the edges of the specimen or otherwise disturbing the density of the specimen. Cored samples shall be ten (10) centimeters in diameter for binder course and wearing course and fifteen (15) centimeters in diameter for base course and road base.

6/36.2 Cores extracted for thickness measurement may be used for density determination and density samples may be used for thickness measurements. Determination of thickness and density of core samples shall be determined in accordance with ASTM D3549 & ASTM D1188 or ASTM D2726 respectively and as required by Engineer.

6.37 COMPACTION OF BITUMINOUS LAYERS

6/37.1 After spreading and strike off, and as soon as the mix conditions permit the rolling to be performed without excessive shoving or tearing, the mixture shall be thoroughly and uniformly compacted. Rolling will not be prolonged to an extent that cracks appear.

6/37.2 Rollers shall be of the steel-wheel and pneumatic tire type and shall be in good condition, capable of reversing without backlash, and shall be operated at speeds slow enough to avoid displacement of the bituminous mix. The number and weight of rollers shall be sufficient to compact the mix to the required density while it is still in a workable condition. The use of equipment which results in excessive crushing of the aggregate will not be permitted. A minimum of three (3) rollers, two (2) steel-wheel and one (1) pneumatic-tire type, shall be used with each spreading operation for each lane.

6/37.3 The Contractor shall provide adequate back-up equipment for use in the event of mechanical failure, all to the satisfaction of the Engineer.

6/37.4 Initial or breakdown rolling shall be done by means of either a tandem power steel roller or three-wheel roller followed by a pneumatic-tire roller or, as agreed by the Engineer. Rolling shall begin as soon as the mix will bear the roller without undue displacement. Rolling shall be longitudinal, beginning at the low side of the spread of material and proceeding toward the high side, overlapping on successive passes by at least one half (1/2) the width of the near wheels. Alternate passes of the roller shall be of slightly different lengths.

6/37.5 The motion of the roller shall at all times be slow enough to avoid displacement of the mix. To, prevent adhesion of the mix to the rollers, the wheels of the rollers shall be kept properly moistened with water, but an excess of water will not be permitted. Under no circumstances shall the use of diesel fuel or any other asphalt stripping agent be used for preventing adhesion of the asphalt to the roller wheels.

6/37.6 Final compaction and finish rolling shall be done by means of a tandem power steel roller, unless otherwise directed. When the specified density is not obtained, changes in the size and/or number of rollers shall be made as corrective measures, to satisfy the density requirements.

6/37.7 Rollers shall be operated by competent and experienced roller men and shall be kept in operation continuously if necessary, so that all parts of the pavement will receive substantially equal compaction at the time desired. The Engineer will order the mixing plant to cease operation at any time proper rolling is not being performed.

6/37.8 The road density requirements shall be equal to or greater than ninety eight (98) percent of the average Marshall density of each day's production for wearing course and ninety seven (97) percent of the average Marshall density of each day's production for roadbase, base course and binder course. However, densities in excess of 101.8% shall not be permitted.

6/37.9 Any mix that becomes loose, broken, mixed with foreign material, or which is in any way defective in finish or density, or which does not comply in other respects with the requirements of the Specification shall be removed, replaced with new materials, and finished in accordance with the Specifications.

6.38 RE-ROLLING OF BITUMINOUS COURSES

6/38.1 Should any bituminous course fail to achieve the specified density, at the discretion of the Engineer rerolling may be allowed subject to the following conditions:-

a. The densification to be achieved shall be 1% or less.
b. Only PTR's to be used weighing no greater than 18 tons.
c. Re-rolling to take place within 72 hours from the time of the initial rolling of the asphalt.
d. Re-rolling to take place at the time of the day when the asphalt has attained its maximum natural temperature.
e. Re-rolling to be applied for a maximum of two hours.
f. Re-rolling to be carried out in the presence of the Engineer's Representative and representative from D.M. DCLD.
g. The section of the works in question shall be cored for density determination immediately after the completion of re-rolling.
h. If after re-testing, the density achieved is 0.5% below the specified density, the asphaltic material will be accepted in the works subject to a 20% reduction to the billed rates. If, on the other hand, the density is greater than 0.5% below the specified density, the asphaltic

material shall be removed and new material to the specification laid at the Contractor's cost.

6.39 CONTACT SURFACES

6/39.1 Contact surfaces between the bituminous paving and of kerbing, gutters, manholes, and other appurtenances shall be painted with a thin uniform coating of tack coat as approved by the Engineer.

6.40 JOINTS IN BITUMINOUS PAVING

6/40.1 Joints between old and new pavement or between successive day's works shall be made, to ensure thorough and continuous bonding between the two. All construction joints in previously laid material shall be constructed by cutting the material back vertically for its full depth to expose a fresh surface.

6/40.2 Before placing the fresh mix against a cut joint or against old pavement, the contact surface shall be sprayed or painted with a thin uniform coat of tack coat. Where a finishing machine is used the longitudinal joint shall be made be overlapping the screed on the previously laid material for a width of at least three (3) centimeters and depositing a sufficient amount of mix so that the joint formed will be smooth and tight.

6.41 PROTECTION OF COMPACTED LAYER

6/41.1 The Contractor shall protect all sections of newly compacted pavement from traffic until they have hardened sufficiently to the approval of the Engineer. On heavily trafficked roads during the summer months a minimum period of 7 days must elapse before the newly compacted pavement is trafficked.

6.42 COMPACTION TRIALS FOR BITUMINOUS COURSES

6/42.1 Prior to the commencement of the bituminous paving operations, the Contractor shall construct trial lengths, of at least 30 meters. The materials used in the trials shall be those approved for use in the bituminous paving courses and the equipment used shall be that according to the Contractor's approved detailed Method Statement and equipment list and the program of work.

6/42.2 The effect of these trials is to determine the adequacy of the Contractor's equipment, the loose depth measurements necessary to result, in the specified compacted layer depths, the field moisture content, and the relationship between the number of compaction passes and the resulting density of the material.

6/42.3 The Contractor may proceed with the bituminous paving operations only after the method and .procedures established by the compaction trials have been approved by the Engineer.

6.43 SURFACE TOLERANCE FOR BITUMINOUS COURSES

6/43.1 At final compaction the finished surfaces of 'the individual layers shall fall within the following maximum tolerances, measured with a 3 m straightedge laid in any direction.

- Base Course 6 mm
- Binder Course 6 mm
- Wearing Course 4 ram

6/43.2 i) The ride ability of the finished wearing course when tested with a laser
Road Surface Testing Machine shall have an IRI (International Roughness Index) not exceeding the following values:

Average Value over a 400 meter section ≤ 0.90

Peak Value over a 25 meter section ≤ 1.5
(Not More Than 2 Values per 400 meters)

ii) The amplitude of the longitudinal profile of the road, filtered between (a) 1 meter and 3.3 meters and (b) 3.3 meters ad 13 meters shall not exceed the following values:

1m - 3.3m ≤ 1.8 mm

3.3 m - 13m ≤ 3.5 m

6/43.3 All humps and depressions exceeding the specified tolerance shall be corrected by removing the defective work and replacing it with new material as directed by the Engineer at the Contractors cost.

6.44 TOLERANCE IN BITUMINOUS PAVING THICKNESS

6/44.1 The thickness of the bituminous paving courses shall be determined in accordance with ASTM D3549.

6/44.2 For the purpose of establishing an adjusted unit rate for bituminous paving courses, units to be considered separately are defined as three hundred (300) linear meters in each traffic lane. The last unit in each lane shall be three hundred (300) meters plus the fractional part of three hundred (300) meters remaining. At least three cores shall be taken at random from each unit being sampled.

6/44.3 Other areas such as intersections, entrances, crossovers, ramps, etc.. will be considered as one unit and the thickness of each unit shall be determined

separately. Small irregular unit areas may be included as part of another unit. At such point as the Engineer may select in each unit, one core shall be taken for each seven hundred fifty (750) square meters of bituminous paving course.

6/44.4 If the core so taken is not deficient by more than three (3) millimeters from the specified thickness, full payment will be made. If the core is deficient in thickness by more than three (3) millimeters, from the specified thickness, two (2) additional cores shall be taken from the area represented and if the average of the three (3) cores is not deficient by more than three (3) millimeters from the specified thickness, full payment will be made. If the average thickness of three (3) cores is deficient by more than three (3) millimeters, but not more than ten (10) millimeters, or fifteen (15) percent (whichever is less), from the specified thickness, an adjusted unit price as provided in. the Bill of Quantities will be paid for the area represented by these cores.

6/44.5 In calculating the average thickness of each bituminous paving course, measurements which are in excess of the specified thickness by more than three (3) millimeters will be considered as the specified thickness plus three (3) millimeters, and. measurements which are less than specified thickness by more than ten (10) millimeters or fifteen (15) percent (whichever is less), will not be included in the average.

6/44.6 When the measurement of any core is less than specified thickness by more than ten (10) millimeters, or fifteen percent (whichever is less), the actual thickness of the bituminous paving course in this area will be determined by taking additional cores at not less than three (3) meter intervals parallel to the center-line in each direction from the affected location until, in each direction, a core is found which is not deficient by more than ten (10) millimeters, or fifteen (15) percent (whichever is less). Asphalt areas which are deficient by more than ten (10) mm or 15% (whichever is less) shall be removed and replaced at the Contractor's expense. Exploratory cores for deficient thickness may be used in average for adjusted unit price. (Refer to the Bill of Quantities - Preambles for Pavement Construction for price adjustments).

6.45 COMPACTION SAMPLING AND TESTING OF BITUMINOUS COURSES

6/45.1 The density of the mix as placed and compacted on the road shall be determined from cores cut from the compacted courses on the road at locations specified by the Engineer. Samples shall be obtained in accordance with ASTM D979 in sets of two (2) from the same location on the road. The frequency of testing shall be one (1) set of samples per traffic lane per three hundred (300) linear meters per layer or a minimum of one (1) set per day for

shorter runs, and such additional tests to determine limits of area deficient in density, or for recheck. The density of these samples will be referred to as "Road Density"

6/45.2 The Contractor shall cut the samples with an approved core drill in the presence of the Engineer. The equipment shall be capable of cutting the material without shattering the edges of the specimen. Samples shall be ten (10) centimeters in diameter f or binder course and wearing course and fifteen (15) centimeters in diameter for base course and road base.

6/45.3 All test holes shall be filled and made good with approved material by the Contractor at his expense.

6.46 WEATHER LIMITATIONS FOR PAVING OPERATIONS

6/46.1 Hot bituminous mix shall be placed when the air temperature is eight (8) degrees C or above, and when the weather is not dusty, foggy or rainy and when the existing surf ace is free from moisture. Bituminous mix shall not be placed during sand storms.

6/46.2 No paving, operations shall be started if rain is imminent.

6.47 MINIMUM TEST REOUIREMENTS FOR BITUMINOUS COURSES

6/47.1 Bitumen material : One sample shall be tested for penetration and ring ball test every 80 tones or part thereof.

6/47.2 Aggregate : one samples for each stockpile every 2,000 cu.m. or part thereof shall be taken and all the required tests shall be performed.

6/47.3 Bituminous mix : One sample of mix shall be obtained from at least every 300 tones or part thereof and tested for bitumen content ASTM D6307 grading (ASTM D 5444). Density in accordance with ASTM D1188 or D2726 and as required by the Engineer. Stability in accordance with ASTM D1559 and voidage contents in accordance with DM 404 shall be determined on Marshall Specimens which are prepared from lab mixes.

6/47.4 Loss of Marshall stability in accordance with DM 405 shall be carried out for specimens prepared from lab mix.

6/47.5 Thickness cores and compaction cores shall be taken as specified in Clause 6/44 and 6/45 respectively.

6.48 BITUMINOUS PRIME COAT

6/48.1 Bituminous Prime Coat shall consist of supplying and applying liquid asphalt to a previously prepared and approved subgrade, sub base, aggregate base course or wet mix road-base in accordance with ASTM D140.

6/48.2 Material for Prime Coat shall be:-

LIOUXD ASPHALT for prime coat shall be medium curing cut back asphalt MC-70 to the requirements of ASTM D-2027 as modified or as directed by the Engineer.

6/48.3 Prime coat shall be applied at a rate of not less than 0.7 liters per square meter and not more than 1.5 liters per square meter.

6/48.4 The exact rate of application, which may be varied to suit field conditions, will be determined by the Engineer following trials to be carried out by the Contractor.

6/48.5 The surface to be prime coated shall be uniformly smooth and firm and true to the grades and cross-sections shown on the drawings within specified tolerances, and so maintained throughout prime coating. Prime coat shall not be placed on a soft, uneven base. Any holes, depressions or irregularities shall be repaired by the removal of loose and unsuitable material and its replacement with suitable material compacted to produce a dense, even surface of uniform texture. When required, the surface to be primed shall be lightly bladed and compacted and the Engineer may instruct a light application of water to facilitate penetration. Priming will not be permitted when the surface is wet.

6/48.6 Prime coat shall not be applied when the ambient temperature is less than 13 deg. C or during rain, fog dust storms or other unsuitable weather. The application temperature for MC-70 liquid asphalt shall be between 50 deg. C and 80 deg. C as approved by the Engineer. It shall be applied to one lane of the carriageway width at a time. When applied in two or more lanes there shall be a slight overlap along adjoining edges. Overlapping will not be permitted at transverse joints and thick paper shall be used to protect the previous application.

6/48.7 Traffic shall be kept off the prime coat until it has penetrated the subgrade or roadbase and fully cured. It should be left undisturbed for a period of 48 hours or as otherwise directed by the Engineer.

6/48.8 The Contractor shall furnish and spread at his cost sufficient clean fine sand, of an approved quality, to blot up areas which show an excess of prime coat.

6/48.9 The primed surface shall be maintained in a good, clean condition at all times until the next course is placed. Any surface irregularities or holes in the primed surface, however caused, shall be repaired and corrected to the Engineer's satisfaction.

6.49 BITUMINOUS TACK COAT

6/49.1 Bituminous tack coat shall consist of supplying and applying emulsified asphalt diluted with an equal quality of water (1:1) to a previously prepared bituminous base course or binder course or to an existing bituminous surface. The sampling shall be in accordance with ASTM D140.

6/49.2 The material for bituminous tack coat shall be slow setting emulsified asphalt, grade SS-lh (anionic) conforming to requirements of ASTM D977.

6/49.3 The tack coat (diluted emulsion) shall be applied in quantities of not less than 0.3 liters per square meter and not more than 0.6 liters per square meter.

6/49.4 Immediately before applying the tack coat, all loose material, dirt, clay or other objectionable material, shall be removed from the surface with a power broom or blower supplemented with hand brooms, as directed by the Engineer. After the cleaning operation, and prior to the application of the tack coat, an inspection of the area to be coated will be made by the Engineer.

6/49.5 The application temperature for the tack shall be between 10 deg. c and 60 deg. C as directed by the Engineer. The material should not be applied when the ambient temperature is less than 13 deg. C or during rain, fog, and dust storms or other unsuitable weather.

6/49.6 After application the surface shall be allowed to dry to the proper condition of tackiness to receive the following pavement course. Tack coat shall be applied only so far in advance to pavement courses to obtain the proper condition of tackiness and the Contractor shall protect the tack coat from damage during this period.

6/49.7 If the completed tack coat is damaged by rain or dust, it shall be allowed to dry, cleaned by power broom or blower and, if required by the Engineer, an additional light application of tack coat shall be applied. No additional payment shall be made for this work.

6/49.8 Where, in the opinion of the Engineer, a tack coat is not necessary, the contractor shall clear, at his expense the existing surface free of dust and other deleterious material as paragraph 6/49.4above.

6.50 APPLICATION AND HEATING EOUIPMENT FOR LIOUID ASPHALT

6/50.1 A self-powered pressure distributor should be-.used for applying asphalt mixture. The distributor shall have pneumatic tires of such width and number that the load produced on the base surface shall not exceed 110 Kg per centimeter of tire width, and shall be so designed and equipped as to distribute the bituminous material uniformly at even heat on variable width of surface at readily determined and controlled rates from 0.2 to 7.5 liters per sq.m. with a pressure range of 1.25 Kg to 5.2 Kg per sq.m. and with an allowable variation from any specified rate not exceeding 5 percent. Distributors and booster tanks shall be so maintained at all times that no dripping of bituminous material will occur from any part of the equipment.

6/50.2 Distribution equipment shall include an independently operated bitumen pump, techno meter pressure gauges, volume measuring devices, a thermometer for reading the temperature of tank contents, and a hose attachment for applying bituminous material to spots unavoidably missed by the distributor. The distributor shall be equipped for circulation and agitation of the bituminous material during the heating process.

6/50.3 The equipment for heating shall consist of steam coils and equipment for producing steam, so designed that steam will not be introduced into the material. In the event of storage tanks being used, an armoured thermometer with a range from 10 deg. C to 150 deg. C shall be fixed to the tank so that the temperature of the bituminous material may be determined at all times.

6/50.4 Other heating facilities may be used subject to the approval of the Engineer.

6.51 DOUBLE BITUMINOUS SURFACE TREATMENT, DESCRIPTION

6/51.1 This work shall consider of a wearing surface composed of a bituminous prime followed by two (2) applications of bituminous seal coats with each seal coat receiving an application of cover material in accordance with the specifications and in conformity with the lines shown on the drawings or established by the Engineer.

6.52 MATERIALS FOR DOUBLE BITUMINOUS SURFACE TREATMENT

6/52.1 PRIME COAT

The prime coat shall be medium curing cut-back asphalt grade MC-70. Therate of application shall be between 1.00 to 1.75 liters per square meter as specified by the Engineer.

6/52.2 SEAL COAT

The seal coat shall be 85/100 as per ASTM D946 penetration grade bitumen. The bitumen may be cut back with up to 2% by weight of kerosene to improve adhesion to the stone. The characteristics of the bitumen are shown in the following table:-

85/100 PENETRATION GRADE BITUMEN			
TEST	METHOD TESTING(ASTM)	MIN.	MAX.
Penetration at 25 deg.C, 100 g, 5 sec.	D-5	85	100
Flash Point, Cleveland open Cup, deg.C	D-92	232	-
Ductility at 25 deg.C, cm	D-113	100	-
Solubility in trichloro ethylene,%	D-2042	99	-
Thin film oven test 3.2mm, 163 deg.C5 hour loss			

	onheating, percent	D-1754		-	1.0	
	Penetration of residue percentof original	D-5		47	-	
	Ductility of residue at 25 deg.C 5 cm/min	cm	D-113		75	-

6/ 52. 3 COVER MATERIAL

Aggregate for cover material shall be screenings of crushed stone which are clean, tough, durable and free from dirt and other objectionable matter. The percentages of wear shall not be more than thirty (30) as determined by ASTM C131 or C535. When subjected to five (5) cycles of magnesium sulphate soundness testing, as determined by ASTM C88, it shall have a weight loss not greater than ten (10) percent and a flakiness index of 30% (BS 812: Part 105.1) and ACV of 20% (BS 812: Part 110) . No less than sixty (60) percent by weight of crushed stone shall consist of crushed pieces having two or more faces produced by fracture when tested by DM standard test method DM 301. Aggregate shall conform to the following gradations and shall be approved by the Engineer.

DOUBLE BITUMINOUS SURFACE TREATMENT

	6/4"	1/21" 6/81"	1/4"'	No.4	No.10	No.30	No.200	
4.6.1	**First Course**	**100**	**70-90**	**0-15**	**-**	**0-2**	**-**	**-**	**-**
	Second Course	-	-	100	90-100	60-85	0-25	0-5	0-2

6.53 EQUIPMENT FOR DOUBLE BITUMINOUS SURFACE TREATMENT

6/53.1 The equipment used by the Contractor shall include a power broom or a power blower, or both; a self propelled, pneumatic-tyred roller, or steel-wheeled tandem roller (4 to 8 tons) or both; self-propelled aggregate spreading equipment that can be adjusted to spread accurately the specified amount per square meter; a bitumen distributor and equipment for heating the asphaltic materials.

6/53.2 Other equipment may be used in addition to the specified equipment when approved or requested by the Engineer.

6.54 PREPARATION OF MATERIAL FOR DOUBLE BITUMINOUS SURFACE TREATMENT

6/54.1 HEATING OF BITUMINOUS MATERIALS shall be with the equipment as specified. The use of any method or agitation or heating. that introduces free steam or moisture into the bituminous material is prohibited. Materials heated

to temperatures' above twenty eight (28) degrees C higher than the maximum application temperature specified shall be considered as overheated and shall be rejected until the material can be resample and retested. The reacceptance or final rejection will be made by the Engineer on the same requirements under which the material was originally tested.

5/54.2 If aggregates are deemed by the engineer to be dusty or dirty they shall be washed after which their use shall not be permitted until all free water has evaporated or been drained.

6.55 APPLICATION OF DOUBLE BITUMINOUS SURFACE TREATMENT

6/55.1 After the prime coat has been applied and has thoroughly penetrated the surface and cured as specified, the Contractor shall apply 80/100 penetration bitumen and shall apply the cover material and roll and manipulate the surface, all in accordance with the requirements specified hereinafter. The material shall be uniformly applied at the rate designated to the surface being sealed.

6/55.2 Bituminous material shall be applied by means of a pressure distributor in a uniform, continuous speed over the section to be treated and within the temperature range specified. The quantity of bituminous material to be used per square meter shall be within the limits hereinafter specified and as directed by the Engineer.

6/55.3 A strip of building paper, at least one (1) meter in width and with a length equal to that of the spray bar of the distributor plus thirty (30) centimeters, shall be used at the beginning of each spread. The paper shall be removed and disposed of in an approved manner. The distributor shall be moving forward at proper application speed at the time the spray bar is opened. Any skipped areas or deficiencies shall be corrected in an approved manner. Junctions of spreads shall be carefully made to ensure a smooth riding surface.

6/55.4 The length of spread of bituminous materials shall not be in excess of that which trucks loaded with cover coat material can immediately cover.

6/55.5 The spread of bituminous material shall not be more than fifteen (15) centimeters wider than the width covered by the cover coat material from the spreading device. Under no circumstances shall operations proceed in such manner that bituminous material will be allowed to chill, set up, dry or otherwise impair retention of the cover coat.

6/55.6 The distributor, when not spreading, shall be so designed that the spray bar or mechanism will not drip bituminous material on the surface of the traveled way.

6/55.7 Distribution of the bituminous material shall be so regulated and sufficient bituminous material must remain in the distributor at the end of each application so that there will be a uniform distribution of bituminous material.

In no case shall the distributor be allowed to expel air with the bituminous material thereby causing uneven coverage.

6/55.8 The angle of the spray nozzles and the height of the spray bar shall be so adjusted and frequently checked so that uniform distribution is ensured. If the raise of the spray bar as the load is removed is excessive and contributes to drilling and streaking of the seal course, the frame of the distributor shall be blocked or snubbed to the axle of the truck to maintain a constant height of the spray bar above the road surface. The distribution shall cease immediately upon any clogging or interference of any nozzle and corrective measures shall be taken before distribution is resumed.

6/55.9 APPLICATION OF AGGREGATE

Immediately following the application of the bituminous material, cover material shall be spread with an approved aggregate spreader in quantities as specified by the Engineer and within the limits specified herein. Spreading shall be accomplished in such a manner that the tires of the trucks or aggregate spreader at no time contact the uncovered and newly applied bituminous material.

6/ 55. 10 The operations of distributing bituminous material shall not be in excess of one hundred (100) linear meters ahead of the spreading of the aggregate.

6/55.11 Procedures of starting, stopping or turning of any piece of equipment which results in displacement of the cover material or damage to the seal courses shall be prohibited.

6/55.12 The spreading equipment shall be of such width and arrangement that as the aggregate is placed, complete coverage will be obtained. No brooming, dragging or blading of the cover material shall be permitted prior to initial rolling. Any rearrangement of the cover material shall be done by hand methods. Overlapping the applications of cover material shall be avoided and all spillage shall be removed from the surface. Before rolling, the bituminous material shall be uniformly covered.

6/55.13 The rates of application for bituminous material and aggregate for "Double Bituminous Surface Treatment" shall be within the following limits:

RATES OF APPLICATION OF ASPHALT AND AGGREGATE FOR DOUBLE BITUMINOUS SURFACE TREATMENT

	80/100 PENETRATION KG/SQ.M.		AGGREGATE KG/SQ.M.	
	MIN.	MAX.	MIN.	MAX.
First application (Course)	0.70	1.10	12.5	15.00
Second application	0.70	0.90	6.5	8.5

(Course)

6/55.14 MANIPULATION

Immediately after the application of bituminous material and aggregate to the road surface and after the aggregate has been rearranged as may be necessary to provide uniform and complete coverage, the surface shall be sufficiently rolled with an approved pneumatic-tyred roller to embed the aggregate thoroughly into the bituminous material. Sufficient rollers shall be provided such that the initial rolling consisting of a single pass of a 10-12 ton tandem steel wheel roller followed by at least two (2) complete coverage's with the pneumatic tyred roller shall be completed within thirty (30) minutes after the cover material is applied. The rollers shall be operated on each coverage so that each, succeeding trip of the roller will overlap at least fifty (50) percent of the width of the previous trip. No blading or dragging of the aggregate will be permitted for the first seal coat. Any rearrangement of the cover material before or during the initial rolling shall be done by approved hand methods. Rolling shall be continued after the rolling specified above is completed until a maximum amount of the aggregate is satisfactorily embedded in the bituminous material. Pneumatic-tyred rollers shall be operated at a maximum speed of eight (8) kilometers per hour.

6/55.15 SECOND SEAL COAT

Unless otherwise designated on the drawings, or directed by the Engineer, the second seal coat shall not be applied for 48 hours after the application of the first seal coat.

6/55.16 Immediately prior to the second application of bituminous material for sealing, the surface shall be cleaned in an approved manner ofall dust and excess cover material which is not embedded in the first application of bituminous material for sealing. Care shall be exercised not to dislodge any cover material which is embedded in the bituminous material. The second seal coat shall be applied as previously specified. Brooms or drag brooms shall not be used to shift the cover material until the initial rolling with the pneumatic-tyred roller is completed and until the bituminous material has cooled and set up sufficiently to hold the cover material, preferably not earlier than the day following the application of the second seal coat. Any rearrangement of the cover material during the initial rolling shall be done by approved hand methods.

6/55.17 The rolling shall be longitudinal and shall commence at the outer edge of the shoulder and then progress towards the inner edge. Rolling shall continue until the entire surface has been completely covered at least three (3) times with a pneumatic tyred roller. Maximum speed of rollers shall be as previously specified.

6/55.18 ADDITIONAL MANIPULATION OF COMPLETED SURFACES

The Contractor shall manipulate the surface for a period of five (5) days after the second seal coat has been applied. The manipulation shallconsist of the application of additional aggregate or additional dragging and rolling or all of these operations to portions of the surface that,. as determined by the Engineer, require such additional treatment. The manipulation shall also include the dragging and one (1) complete rolling over the entire surface each day from the time the surface is completed until and including the fifth (5th) day after. A light blade equipped with a broom drag shall be operated immediately ahead of the roller throughout all rolling during the manipulation period. The daily dragging 'and rolling under manipulation may be omitted, if in the opinion of the Engineer, the weather and roadbed conditions are such that the dragging and rolling would not be beneficial to the surface.

6/55-19 Aggregate and additional manipulation ordered by the Engineer, in this work, will not be paid for separately but will be considered subsidiary to the item of 'Double Bituminous Surface Treatment included in the "Bill of Quantities".

6/55.20 Except for times when it is necessary for hauling equipment and/or pilot trucks to travel on the newly applied seal coat, traffic of all types shall be kept off the seal coat until it has had time to set properly. The minimum traffic free period shall be 24 hours.

6/55.21 WEATHER LIMITATIONS

Surface treatment operations shall be carried on only when the surface is dry, when the atmospheric temperature is above fifteen (15) degrees C, and when the weather is not dusty, foggy or rainy. The above requirements may be waived, but only when so directed and in writing by the Engineer.

6.56 PROTECTION OF ADJACENT STRUCTURES FROM BITUMEN SPLASHING

6/56.1 When bituminous materials are being applied, the surface of all structures, wheel guards, guard rail, kerbs and gutters, and other roadway appurtenances shall be protected in an approved manner to prevent them from being splattered-with bituminous material or marred by equipment operation. In the event that any appurtenances become splattered or marred, the Contractor shall at his own expense, remove all traces of bituminous materials, and repair all damage, and leave the appurtenances in an approved condition.

Annexures

Annexure 1: Design Intent

Annexure 2: Existing System

Annexure 3: Drawings

Annexure 4: Bill of Quantities

Annexure 5: Technical Specifications

PART 3 – Conditions of Contract and Contract Forms

Section VIII. General Conditions of Contract

General Conditions of Contract

A. General

1. Definitions	1.1 Boldface type is used to identify defined terms. (a) The **Accepted Contract Amount** means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects. (b) The **Activity Schedule** is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events. (c) The **Adjudicator** is the person appointed jointly by the Employer and the Implementing Agency to resolve disputes in the first instance, as provided for in GCC 29.1 [Appointment of Adjudicator] hereunder. (d) GOI means Government of India. (e) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid. (f) **Compensation Events** are those defined in GCC 51.1 [Compensation Events] hereunder. (g) The **Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC 69.1 [Completion]. (h) The **Contract** is the Contract between the Employer and the Implementing Agency to execute, complete, and maintain the Works. It consists of the documents listed in GCC 2.3 below. (i) The **Implementing Agency** is the party whose Bid to carry out the Works has been accepted by the Employer. (j) The **Implementing Agency's Bid** is the completed bidding document submitted by the Implementing Agency to the Employer. (k) The **Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.

	(l)	**Days** are calendar days; months are calendar months.
	(m)	**Dayworks** are varied work inputs subject to payment on a time basis for the Implementing Agency's employees and Equipment, in addition to payments for associated Materials and Plant.
	(n)	A **Defect** is any part of the Works not completed in accordance with the Contract.
	(o)	The **Defects Liability Certificate** is the certificate issued by the Project Manager upon correction of defects by the Implementing Agency.
	(p)	The **Post ConstructionPhase Period** is the period calculated from the Completion Date where the Implementing Agency remains responsible for remedying defects.
	(q)	"Drawings" means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.
	(r)	The **Employer** is the party who employs the Implementing Agency to carry out the Works, as specified in the **PCC.**
	(s)	**Equipment** is the Implementing Agency's machinery and vehicles brought temporarily to the Site to construct the Works.
	(t)	**Force Majeure** means an exceptional event or circumstance: which is beyond a Party's control; which such Party could not reasonably have provided against before entering into the Contract; which, having arisen, such Party could not reasonably have avoided or overcome; and, which is not substantially attributable to the other Party.
	(u)	**In writing** or **written** means hand-written, type-written, printed or electronically made, and resulting in a permanent record.
	(v)	The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.
	(w)	The **Intended Completion Date** is the date on which it is intended that the Implementing Agency shall complete the Works. The Intended Completion Date is specified in the **PCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of

	time or an acceleration order. (x) **Letter of Acceptance** means the formal acceptance by the Employer of the Bid and denotes the formation of the Contract at the date of acceptance. (y) **Materials** are all supplies, including consumables, used by the Implementing Agency for incorporation in the Works. (z) **Party** means the Employer or the Implementing Agency, as the context requires. (aa) **PCC** means Particular Conditions of Contract. (bb) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function. (cc) The **Project Manager** is the person named in the **PCC** (or any other competent person appointed by the Employer and notified to the Implementing Agency, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract. (dd) **Retention Money** means the aggregate of all monies retained by the Employer pursuant to GCC 55.1 [Retention]. (ee) **Schedules** means the document(s) entitled schedules, completed by the Implementing Agency and submitted with the Letter of Tender, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices. (ff) The **Site** is the area defined as such in the **PCC**. (gg) **Site Investigation Reports** are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site. (hh) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager. (ii) The **Start Date** is given in the **PCC**. It is the latest date when the Implementing Agency shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates. (jj) A **Sub-Implementing Agency/ Sub-Contractor** is a person or corporate body who has a Contract with the - to carry out a part of the work in the Contract, which

	includes work on the Site. (kk) **Temporary Works** are works designed, constructed, installed, and removed by the Implementing Agency that are needed for construction or installation of the Works. (ll) A **Variation** is an instruction given by the Project Manager which varies the Works. (mm) The **Works** are what the Contract requires the Implementing Agency to construct, install, and turn over to the Employer, as defined in the **PCC.**
2. Interpretation	2.1 In interpreting these GCC, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.
	2.2 If sectional completion is specified in the **PCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).
	2.3 The documents forming the Contract shall be interpreted in the following order of priority: (a) Contract Agreement, (b) Letter of Acceptance, (c) Letter of Bid, (d) Particular Conditions of Contract, (e) the List of Eligible Countries that was specified in Section 5 of the bidding document, (f) General Conditions of Contract, (g) Specifications, (h) Drawings, (i) Completed Activity Schedules or Bill of Quantities, and (j) any other document listed in the **PCC** as forming part of the Contract.
3. Language and Law	3.1 The language of the Contract and the law governing the Contract are stated in the **PCC**. 3.2 Throughout the execution of the Contract, the Implementing Agency shall comply with the import of goods and services

	prohibitions in the Employer's country when (a) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods from, or any payments to, a particular country, person, or entity. Where the borrower's country prohibits payments to a particular firm or for particular goods by such an act of compliance, that firm may be excluded.
4. Contract Agreement	4.1 The Parties shall enter into a Contract Agreement within 21 days after the Implementing Agency receives the Letter of Acceptance, unless the Particular Conditions establish otherwise. The Contract Agreement shall be based upon the attached Contract forms in Section 8. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.
5. Assignment	5.1 Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Part.
6. Care and Supply of Documents	6.1 The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, one (01) copies of the Contract and of each subsequent Drawing shall be supplied to the Implementing Agency, who may make or request further copies at the cost of the Implementing Agency.
	6.2 Each of the Implementing Agency's Documents shall be in the custody and care of the Implementing Agency, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Implementing Agency shall supply to the Engineer four copies of each of the Implementing Agency's Documents.
	6.3 The Implementing Agency shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Implementing Agency's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times. 6.4 If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party

	shall promptly give notice to the other Party of such error or defect.
7. Confidential Details	7.1 The Implementing Agency's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Implementing Agency's compliance with the Contract and allow its proper implementation.
	7.2 Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Implementing Agency shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.
	7.3 Notwithstanding the above, the Implementing Agency may furnish to its Sub-Implementing Agency(s) such documents, data and other information it receives from the Employer to the extent required for the Sub-implementing agency/Sub Contractor (s) to perform its work under the Contract, in which event the Implementing Agency shall obtain from such Sub-Implementing Agency(s) an undertaking of confidentiality similar to that imposed on the Implementing Agency under this Clause.
8. Compliance with Laws	8.1 The Implementing Agency shall, in performing the Contract, comply with applicable Laws.
	8.2 Unless otherwise stated in the Particular Conditions, (a) the Employer shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer's Country or country where the Site is located] which (i) such authorities or undertakings require the Employer to obtain in the Employer's name, and (ii) are necessary for the execution of the Contract, including those required for the performance by both the Implementing Agency and the Employer of their respective obligations under the Contract; (b) the Implementing Agency shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer's Country or country

	where the Site is located] which such authorities or undertakings require the Implementing Agency to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Implementing Agency's and Subcontractor's personnel and entry permits for all imported Implementing Agency's Equipment. The Implementing Agency shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Employer under Subclause 8.2(a) hereof and that are necessary for the performance of the Contract. The Implementing Agency shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Employer or its personnel, including the Subcontractors and their personnel, but without prejudice to Subclause 8.1 hereof.
9. Joint and Several Liability	9.1 If the Implementing Agency is a joint venture of two or more persons, all such persons shall be jointly and severally liable to the Employer for the fulfillment of the provisions of the Contract, and shall designate one of such persons to act as a leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.
10. Project Manager's Decisions	10.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Implementing Agency in the role representing the Employer.
11. Delegation	11.1 The Project Manager may delegate any of his duties and responsibilities to other people except to the Adjudicator, after notifying the Implementing Agency, and may cancel any delegation after notifying the Implementing Agency.
12. Communica-tions	12.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.
13. Subcontracting	13.1 The Implementing Agency may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Implementing Agency's obligations.
14. Other Contractors/ Implementing	14.1 The Implementing Agency shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other

Agency's	Contractors, as referred to in the **PCC.** The Implementing Agency shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Implementing Agency of any such modification.
15. Personnel and Equipment	15.1 The Implementing Agency shall employ the key personnel and use the equipment identified in its Bid to carry out the functions stated in the Schedule or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.
	15.2 If the Project Manager asks the Implementing Agency to remove a person who is a member of the Implementing Agency's staff or work force, stating the reasons, the Implementing Agency shall ensure that the person leaves the Site within 7 days and has no further connection with the work in the Contract. 15.3 If the Employer, Project Manager, or Implementing Agency determines, that any employee of the Implementing Agency be determined to have engaged in corrupt, fraudulent, collusive, coercive, or other prohibited practices during the execution of the Works, then that employee shall be removed in accordance with Clause 15.2 above.
16. Employer's and Implementing Agency's Risks	16.1 The Employer carries the risks which this Contract states are Employer's risks, and the Implementing Agency carries the risks which this Contract states are Implementing Agency's risks.
17. Employer's Risks	17.1 From the Start Date until the Post Construction Completion Certificate has been issued, the following are Employer's risks: (a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to (i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works, or (ii) negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Implementing Agency. (b) The risk of damage to the Works, Plant, Materials, and

	Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.
	17.2 From the Completion Date until the Post Construction Phase Completion Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to (a) a Defect which existed on the Completion Date, (b) an event occurring before the Completion Date, which was not itself an Employer's risk, or (c) the activities of the Implementing Agency on the Site after the Completion Date.
18. Implementing Agency's Risks	18.1 From the Starting Date until the Post Construction Phase Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risks, are Implementing Agency's risks.
19. Insurance	19.1 The Implementing Agency shall provide, in the joint names of the Employer and the Implementing Agency, insurance cover from the Start Date to the end of the Post ConstructionPhase Period, in the amounts and deductibles stated in the **PCC** for the following events, which are due to the Implementing Agency's risks: (a) loss of or damage to the Works, Plant, and Materials; (b) loss of or damage to Equipment; (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and (d) personal injury or death.
	19.2 Policies and certificates for insurance shall be delivered by the Implementing Agency to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.
	19.3 If the Implementing Agency does not provide any of the policies and certificates required, the Employer may effect the insurance, which the Implementing Agency should have provided and

	recover the premiums the Employer has paid from payments otherwise due to the Implementing Agency or, if no payment is due, the payment of the premiums shall be a debt due.
	19.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.
	19.5 Both parties shall comply with any conditions of the insurance policies.
20. Site Investigation Reports	20.1 The Implementing Agency, in preparing the Bid, shall refer the Reports provided RFP for information purpose, unless other wise specified in the **PCC.**However the agency shall recheck with the site conditions.
21. Implementing Agency to Construct the Works	21.1 The Implementing Agency shall construct and install the Works in accordance with the Specifications and Drawings.
22. The Works to Be Completed by the Intended Completion Date	22.1 The Implementing Agency may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Implementing Agency, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.
23. Designs by Implementing Agency and Approval by the Project Manager	23.1 TheImplementing Agency shall carry out design to the extent specified in the **PCC**. The Implementing Agency shall promptly submit to the Employer all designs prepared by him. Within 14 days of receipt, the Employer shall notify any comments or shall ask for additional information for approvals. The Implementing Agency shall not construct any element of the permanent work designed by him within 14 days after the design has been submitted to the Employer or where the design for that element has been rejected. Design that has been rejected shall be promptly amended and resubmitted. The Implementing Agency shall resubmit all designs commented on, taking these comments into account as necessary.
	23.2 The Implementing Agency shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them if they comply with the Specifications and Drawings..
	23.3 The Implementing Agency shall be responsible for design of Temporary Works.

	23.4 The Project Manager's approval shall not alter the Implementing Agency's responsibility for design of the Temporary Works.
	23.5 The Implementing Agency shall obtain approval of third parties to the design of the Temporary Works, where required.
	23.6 All Drawings prepared by the Implementing Agency for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.
	23.7 Employer's Use of Implementing Agency's Documents:As between the Parties, the Implementing Agencymay retain the copyright and other intellectual property rights in the Implementing Agency's Documents and other design documents made by (or on behalf of) the Implementing Agency. The Implementing Agency shall be deemed (by signing the Contract) to give to the Employer a transferable exclusive royalty-free license to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This license shall: (a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works, (b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Implementing Agency's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and (c) in the case of Implementing Agency's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Implementing Agency.
24. Safety	24.1 The Implementing Agency shall be responsible for the safety of all activities on the Site.
25. Discoveries	25.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Implementing Agency shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.
26. Possession of	26.1 The Employer shall give possession of all parts of the Site to the

the Site	Implementing Agency. If possession of a part is not given by the date stated in the **PCC,** the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.
27. Access to the Site	27.1 The Implementing Agency shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.
28. Instructions, Inspections, and Audits	28.1 The Implementing Agency shall carry out all instructions of the Project Manager, which comply with the applicable laws where the Site is located. 28.2 The Implementing Agency shall keep, and shall make all reasonable efforts to cause its Sub-Implementing Agency's and sub-consultants to keep accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.
	28.3 The Implementing Agency shall permit GOI/GAP/KMC (GOI-Government of India, GAP-Government of Andhra Pradesh, Kakinada Municipal Corporation) to inspect the Implementing Agency's accounts, records, and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by KMC. The Implementing Agency shall maintain all documents and records related to the Contract for a period of three (*3*) years after completion of the Works. The Implementing Agency shall provide any documents necessary for the investigation of allegations of fraud, collusion, coercion, or corruption and require its employees or agents with knowledge of the Contract to respond to questions from KMC.
29. Appointment of the Adjudicator	29.1 The Adjudicator shall be appointed jointly by the Employer and the Implementing Agency, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the **PCC**, to appoint the Adjudicator within 14 days of receipt of such request.
	29.2 Should the Adjudicator resign or die, or should the Employer and the Implementing Agency agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Employer and the Implementing Agency. In case of disagreement between the Employer and the Implementing Agency, within 30 days, the

	Adjudicator shall be designated by the Appointing Authority at the request of either party, within 14 days of receipt of such request.
30. Procedure for Disputes	30.1 If the Implementing Agency believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager's decision.
	30.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.
	30.3 The Adjudicator shall be paid by the hour at the rate specified in the **PCC,** together with reimbursable expenses of the types specified in the **PCC**, and the cost shall be divided equally between the Employer and the Implementing Agency, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.
	30.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the **PCC**.
B. Staff and Labor	
31. Forced Labor	31.1 The Implementing Agency shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor–contracting arrangements.
32. Child Labor	32.1 The Implementing Agency shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where national laws have provisions for employment of minors, the Implementing Agency shall follow those laws applicable to the Implementing Agency. Children below the age of 18 years shall not be employed in dangerous work.
33. Workers'	33.1 In countries where national law recognizes workers' rights to

Organizations	form and to join workers' organizations of their choosing without interference and to bargain collectively, the Implementing Agency shall comply with national law. Where national law substantially restricts workers' organizations, the Implementing Agency shall enable alternative means for the Implementing Agency's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where national law is silent, the Implementing Agency shall not discourage the Implementing Agency's Personnel from forming or joining workers' organizations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Implementing Agency's Personnel who participate, or seek to participate, in such organizations and bargain collectively. The Implementing Agency shall engage with such workers representatives. Worker organizations are expected to fairly represent the workers in the workforce.
34. Nondiscrimination and Equal Opportunity	34.1 The Implementing Agency shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Implementing Agency shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where national law provides for non-discrimination in employment, the Implementing Agency shall comply with national law. When national laws are silent on nondiscrimination in employment, the Implementing Agency shall meet this Subclause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.

C. Time Control

35. Program	35.1 Within the time stated in the **PCC**, after the date of the Letter of Acceptance, the Implementing Agency shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in

	the Program shall be consistent with those in the Activity Schedule.
	35.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.
	35.3 The Implementing Agency shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the **PCC.** If the Implementing Agency does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the **PCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Implementing Agency shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.
	35.4 The Project Manager's approval of the Program shall not alter the Implementing Agency's obligations. The Implementing Agency may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.
36. Extension of the Intended Completion Date	36.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Implementing Agency taking steps to accelerate the remaining work, which would cause the Implementing Agency to incur additional cost.
	36.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Implementing Agency asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Implementing Agency has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.
37. Acceleration	37.1 When the Employer wants the Implementing Agency to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Implementing Agency. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted

	accordingly and confirmed by both the Employer and the Implementing Agency.
	37.2 If the Implementing Agency's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.
38. Delays Ordered by the Project Manager	38.1 The Project Manager may instruct the Implementing Agency to delay the start or progress of any activity within the Works.
39. Management Meetings	39.1 Either the Project Manager or the Implementing Agency may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
	39.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.
40. Early Warning	40.1 The Implementing Agency shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Implementing Agency to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Implementing Agency as soon as reasonably possible.
	40.2 The Implementing Agency shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

D. Quality Control

41. Identifying Defects	41.1 The Project Manager shall check the Implementing Agency's work and notify the Implementing Agency of any Defects that are found. Such checking shall not affect the Implementing

	Agency's responsibilities. The Project Manager may instruct the Implementing Agency to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.
42. Tests	42.1 If the Project Manager instructs the Implementing Agency to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Implementing Agency shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.
43. Correction of Defects	43.1 The Project Manager shall give notice to the Implementing Agency of any Defects before the end of the Post Construction phase (Defects Liability Period), which begins at Completion, and is defined in the **PCC.** The Post ConstructionPhase Period shall be extended for as long as Defects remain to be corrected.
	43.2 Every time notice of a Defect is given, the Implementing Agency shall correct the notified Defect within the length of time specified by the Project Manager's notice.
44. Uncorrected Defects	44.1 If the Implementing Agency has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Implementing Agency shall pay this amount at the rate of thrice the expenditure incurred by the employer.

E. Cost Control

45. Contract Price	45.1 In the case of an admeasurement contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Implementing Agency. The Bill of Quantities is used to calculate the Contract Price. The Implementing Agency will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.
	45.2 The Implementing Agency shall provide updated Activity Schedules within 14 days of being instructed to by the Project Manager. In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Implementing Agency. The Activity Schedule is used to monitor and control the performance of activities on which basis the Implementing Agency will be paid. If payment for Materials on Site shall be made separately, the Implementing Agency shall show delivery of Materials to the Site separately on

	the Activity Schedule.
46. Changes in the Contract Price	46.1 In the case of an admeasurement contract: (a) If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25%, provided the change exceeds 1% of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. (b) The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 10%, except with the prior approval of the Employer. (c) If requested by the Project Manager, the Implementing Agency shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.
	46.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Implementing Agency to accommodate changes of Program or method of working made at the Implementing Agency's own discretion. Prices in the Activity Schedule shall not be altered when the Implementing Agency makes such changes to the Activity Schedule.
47. Variations	47.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Implementing Agency.
	47.2 The Implementing Agency shall provide the Project Manager with a detailed proposal for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the proposal following applicable procedures, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.
	47.3 If the Implementing Agency's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Implementing Agency's costs.
	47.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the

	Variation shall be treated as a Compensation Event.
	47.5 The Implementing Agency shall not be entitled to additional payment for costs that could have been avoided by giving early warning.
	47.6 In the case of an admeasurement contract, if the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in GCC 46.1 [Changes in the Contract Price] or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Implementing Agency shall be in the form of new rates for the relevant items of work.
48. Cash Flow Forecasts	48.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, is updated, the Implementing Agency shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.
49. Payment Certificates	49.1 The Implementing Agency shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
	49.2 The Project Manager shall check the Implementing Agency's monthly statement and certify the amount to be paid to the Implementing Agency.
	49.3 The value of work executed shall be determined by the Project Manager.
	49.4 The value of work executed shall comprise, (a) in the case of an admeasurement contract, the value of the quantities of work in the Bill of Quantities that have been completed; or (b) in the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.
	49.5 The value of work executed shall include the valuation of

	Variations and Compensation Events.
	49.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.
50. Payments	50.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Implementing Agency the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Implementing Agency shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.
	50.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Implementing Agency shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
	50.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.
	50.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.
	50.5 The certified payment shall be made as specified in PCC
51. Compensation Events	51.1 The following shall be Compensation Events: (a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC 26.1 [Possession of the Site]. (b) The Employer modifies the Schedule of Other Implementing Agencys in a way that affects the work of the Implementing Agency under the Contract. (c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for

	execution of the Works on time. (d) The Project Manager instructs the Implementing Agency to uncover or to carry out additional tests upon work, which is then found to have no Defects. (e) The Project Manager unreasonably does not approve a subcontract to be let. (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to Bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site. (g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons. (h) Other Implementing Agencys, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Implementing Agency. (i) The advance payment is delayed. (j) The effects on the Implementing Agency of any of the Employer's Risks. (k) The Project Manager unreasonably delays issuing a Certificate of Completion.
	51.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.
	51.3 As soon as information demonstrating the effect of each Compensation Event upon the Implementing Agency's forecast cost has been provided by the Implementing Agency, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Implementing Agency's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Implementing

	Agencyshall react competently and promptly to the event.
	51.4 The Implementing Agency shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Implementing Agency's not having given early warning or not having cooperated with the Project Manager.
52. Tax	52.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Implementing Agency, provided such changes are not already reflected in the Contract Price or are a result of GCC 54.1 [Price Adjustment].
53. Currencies	53.1 Where payments are made in currencies other than the currency of the Employer's country specified in the **PCC,** the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Implementing Agency's Bid.
54. Price Adjustment	54.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the **PCC.** If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency: $$\mathbf{P_c = A_c + B_c\ Imc/Ioc}$$ where: P_c is the adjustment factor for the portion of the Contract Price payable in a specific currency "c." A_c and B_c are coefficients[7] specified in the **PCC,** representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency "c;" and Imc is a consolidated index prevailing at the end of the month being invoiced and Ioc is the same consolidated index prevailing 28 days before Bid opening for inputs payable; both in the specific currency "c."

[7] The sum of the two coefficients A_c and B_c should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulas for all currencies, since coefficient A, for the nonadjustable portion of the payments, is a very approximate figure (usually 0.10 ~ 0.20) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency is added to the Contract Price.

	54.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.
55. Retention	55.1 The Employer shall retain from each payment due to the Implementing Agency the proportion stated in the **PCC** until Completion of the whole of the Works.
	55.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 69.1 [Completion], half the total amount retained shall be repaid to the Implementing Agency and half when the Post Construction Phase Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Implementing Agency before the end of this period have been corrected. The Implementing Agency may substitute retention money with an "on demand" bank guarantee.
56. Liquidated Damages	56.1 The Implementing Agency shall pay liquidated damages to the Employer at the rate per day stated in the **PCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the **PCC.** The Employer may deduct liquidated damages from payments due to the Implementing Agency. Payment of liquidated damages shall not affect the Implementing Agency's liabilities.
	56.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Implementing Agency by adjusting the next payment certificate. The Implementing Agency shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC 50.1 [Payments].
57. Bonus	57.1 The Implementing Agency shall be paid a Bonus calculated at the rate per calendar day stated in the **PCC** for each day (less any days for which the Implementing Agency is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.
58. Advance	58.1 The Employer shall make advance payment to the Implementing

Payment	Agency of the amounts stated in the **PCC** by the date stated in the **PCC,** against provision by the Implementing Agency of an unconditional bank guarantee in a form and by a bank acceptable to the Employer in amounts and currencies 110% to the advance payment. The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Implementing Agency. Interest shall be charged on the pending advance payment at the rate of 7.5% per annum.
	58.2 The Implementing Agency is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Implementing Agency shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.
	58.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Implementing Agency, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.
59. Securities	59.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the **PCC,** by a bank acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 60 days from the date of issue of the Certificate of Completion in the case of a bank guarantee including defect liability period.
60. Dayworks	60.1 If applicable, the Dayworks rates in the Implementing Agency's Bid shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
	60.2 All work to be paid for as Dayworks shall be recorded by the Implementing Agency on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within 2 days of the work being done.
	60.3 The Implementing Agency shall be paid for Dayworks subject to obtaining signed Dayworks forms.

61. Cost of Repairs	61.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Implementing Agency at the Implementing Agency's cost if the loss or damage arises from the Implementing Agency's acts or omissions.
F. Force Majeure	
62. Definition of Force Majeure	62.1 In this Clause, "Force Majeure" means an exceptional event or circumstance, (a) which is beyond a Party's control; (b) which such Party could not reasonably have provided against before entering into the Contract; (c) which, having arisen, such Party could not reasonably have avoided or overcome; and (d) which is not substantially attributable to the other Party.
	62.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied: (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies; (b) rebellion, terrorism, sabotage by persons other than the Implementing Agency's Personnel, revolution, insurrection, military or usurped power, or civil war; (c) riot, commotion, disorder, strike or lockout by persons other than the Implementing Agency's Personnel; (d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Implementing Agency's use of such munitions, explosives, radiation or radio-activity; and (e) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.
63. Notice of Force Majeure	63.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance

	constituting Force Majeure.
	63.2 The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.
	63.3 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.
64. Duty to Minimize Delay	64.1 Each Party shall at all times use all reasonable endeavors to minimize any delay in the performance of the Contract as a result of Force Majeure.
	64.2 A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.
65. Consequences of Force Majeure	65.1 If the Implementing Agency is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Implementing Agency shall be entitled subject to GCC Subclause 30.1 [Procedure for Disputes] to (a) an extension of time for any such delay, if completion is or will be delayed, under GCC Subclause 36 [Extension of the Intended Completion Date]; and (b) if the event or circumstance is of the kind described in sub-paragraphs (a) to (d) of GCC Subclause 62.2 [Definition of Force Majeure] and, in the case of subparagraphs (b) to (d), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destructed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in GCC Subclause 19 [Insurance].
	65.2 After receiving this notice, the Project Manager shall proceed in accordance with GCC Subclause 10 [Project Manager's Decisions] to agree or determine these matters.
66. Force Majeure Affecting Subcontractor/ Sub-Implementing	66.1 If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Implementing Agency's nonperformance or

Agency	entitle him to relief under this Clause.
67. Optional Termination, Payment and Release	67.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Implementing Agency shall proceed in accordance with GCC Subclause 73.5 [Termination].
	67.2 Upon such termination, the Project Manager shall determine the value of the work done and issue a Payment Certificate, which shall include (a) the amounts payable for any work carried out for which a price is stated in the Contract; (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Implementing Agency, or of which the Implementing Agency is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Implementing Agency shall place the same at the Employer's disposal; (c) other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Implementing Agency in the expectation of completing the Works; (d) the Cost of removal of Temporary Works and Implementing Agency's Equipment from the Site and the return of these items to the Implementing Agency's works in his country (or to any other destination at no greater cost); and (e) the Cost of repatriation of the Implementing Agency's staff and labor employed wholly in connection with the Works at the date of termination.
68. Release from Performance	68.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises, which makes it impossible or unlawful for either or both Parties to fulfill its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance,

	(a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract; and (b) the sum payable by the Employer to the Implementing Agency shall be the same as would have been payable under GCC Subclause 67 [Optional Termination, Payment and Release] if the Contract had been terminated under GCC Subclause 67.

G. Finishing the Contract

69. Completion	69.1 The Implementing Agency shall request the Project Manager to issue a certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the work is completed.
70. Taking Over	70.1 The Employer shall take over the Site and the Works within 7 days of the Project Manager's issuing a certificate of Completion.
71. Final Account	71.1 The Implementing Agency shall supply the Project Manager with a detailed account of the total amount that the Implementing Agency considers payable under the Contract before the end of the Post ConstructionPhase Period. The Project Manager shall issue a Post ConstructionCompletion Certificate and certify any final payment that is due to the Implementing Agency within 56 days of receiving the Implementing Agency's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Implementing Agency and issue a payment certificate.
72. Operating and Maintenance Manuals	72.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Implementing Agency shall supply them by the dates stated in the **PCC.**
	72.2 If the Implementing Agency does not supply the Drawings and/or manuals by the dates stated in the **PCC** pursuant to GCC 72.1**,** or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount stated in the **PCC** from payments due to the Implementing Agency.
73. Termination	73.1 The Employer or the Implementing Agency may terminate the

	Contract if the other party causes a fundamental breach of the Contract.
	73.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following: (a) the Implementing Agency stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager; (b) the Project Manager instructs the Implementing Agency to delay the progress of the Works, and the instruction is not withdrawn within 28 days; (c) the Employer or the Implementing Agency is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation; (d) a payment certified by the Project Manager is not paid by the Employer to the Implementing Agency within 84 days of the date of the Project Manager's certificate; (e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Implementing Agency fails to correct it within a reasonable period of time determined by the Project Manager; (f) the Project Manager gives two consecutive Notices to update the Program and accelerate the works to ensure compliance with GCC Subclause 22.1 [The Works to be Completed by the Intended Completion Date] and the Implementing Agency fails to update the Program and demonstrate acceleration of the works within a reasonable period of time determined by the Project Manager; (g) the Implementing Agency does not maintain a Security, which is required; (h) the Implementing Agency has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in the **PCC**; and (i) if the Implementing Agency, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, pursuant to GCC 74.1 [Fraud and Corruption].
	73.3 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those

	listed under GCC 73.2 above, the Project Manager shall decide whether the breach is fundamental or not.
	73.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.
	73.5 If the Contract is terminated, the Implementing Agency shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.
74. Fraud and Corruption	74.1 GOI's Anticorruption Policy requires that Borrowers (including beneficiaries of GOI-financed activity), as well as Implementing Agencys, Subcontractors, Manufacturers, and Consultants under GOI-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the GOI (a) defines, for the purposes of this provision, the terms set forth below as follows: (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party; (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party; (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party; (v) "obstructive practice" means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an GOI investigation; (b) making false statements to investigators in order to materially impede an GOI investigation; (c) failing to comply with requests to provide information, documents or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d)

threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
(e) materially impeding GOI's contractual rights of audit or access to information; and

(vi) "integrity violation" is any act which violates GOI's Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of GOI sanctions, retaliation against whistleblowers or witnesses, and other violations of GOI's Anticorruption Policy, including failure to adhere to the highest ethical standard.

(b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the borrower or of a beneficiary of GOI-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the borrower having taken timely and appropriate action satisfactory to GOI to remedy the situation; and

(d) will impose remedial actions on a firm or an individual, at any time, in accordance with GOI's Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate[8] in GOI-financed, administered, or supported activities or to benefit from an GOI-financed, administered, or supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations.

[8] Whether as almplementing Agency, Nominated Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document). A Nominated Subcontractor is one which either has been: (i) included by the Bidder in its prequalification application or bid because it brings specific and critical experience and know-how that are accounted for in the evaluation of the Bidder's prequalification application or the bid; or (ii) appointed by the Employer.

75. Payment upon Termination	75.1 If the Contract is terminated because of a fundamental breach of Contract by the Implementing Agency, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as indicated in the **PCC.** Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Implementing Agency, the difference shall be a debt payable to the Employer.
	75.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Implementing Agency's personnel employed solely on the Works, and the Implementing Agency's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.
76. Property	76.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Implementing Agency's default.
77. Release from Performance	77.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Implementing Agency, the Project Manager shall certify that the Contract has been frustrated. The Implementing Agency shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterward to which a commitment was made.
78. Suspension of GOI Loan or Credit	78.1 In the event that GOI suspends the Loan or Credit to the Employer, from which part of the payments to the Implementing Agency are being made, (a) the Employer is obligated to notify the Implementing Agency, with copy to the Project Manager, of such suspension within 7 days of having received GOI's suspension notice. (b) if the Implementing Agency has not received sums due it within the 28 days for payment provided for in GCC 50.1 [Payments], the Implementing Agency may immediately

	issue a 14-day termination notice.
79. Eligibility	79.1 The Implementing Agency shall have the nationality of an eligible country as specified in Section 5 [Eligible Countries] of the bidding document. The Implementing Agency shall be deemed to have the nationality of a country if the Implementing Agency is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
	79.2 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries as specified in Section 5 [Eligible Countries] of the bidding document and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Implementing Agency may be required to provide evidence of the origin of materials, equipment, and services.
	79.3 For purposes of GCC 79.2, "origin" means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

Section IX. Particular Conditions of Contract

Except where otherwise specified, all PCC *should be filled in by the* Employer *prior to issuance of the Bidding Documents. Schedules and reports to be provided by the* Employer *should be annexed.*

A. General	
GCC 1.1 (d)	The financing institutions is : Government of India (GoI) and Government of Andhra Pradesh (GoAP)
GCC 1.1 (r)	The Employer is :Kakinada Smart City Corporation Limited (KSCCL)
GCC 1.1 (w)	The Intended Completion Date for the whole of the Works shall be : (a) Pre Construction Phase- 3 Months (b) Construction/Implementation Phase- 12 Months (c) Post Construction Phase- 12 Months(DLP)
GCC 1.1 (cc)	The Project Manager is :……
GCC 1.1 (ff)	The Site is located at Kakinada Main road from Sappavaram Junction to Balayogi statue junction 8.00km
GCC 1.1 (ii)	The Start Date shall be 15 days after the signing of the date of Contract Agreement
GCC 1.1 (mm)	The Works consist of Implementation of Smart Streets as per Section 7, Employer's requirement
GCC 2.3(j)	The following documents also form part of the Contract: any addendum , corrigendum, queries and replies
GCC 3.1	The language of the contract is English The law that applies to the Contract is the law of India
GCC 13.1	Not Allowed

GCC 19.1	The minimum insurance amounts & deductibles shall be:**10 %** of the Contract Value: (a) for loss or damage to the Works, Plant and Materials: **1.5%** (b) for loss or damage to Equipment:**1.5%** (c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract ;**2%** (d) for personal injury or death: (i) of the Contractor's employees: **2.5%** (ii) of other people: **2.5%**
GCC 23.1	The soft copy of survey details done by Total Station and the soft copy of the drawing in Dwg format shall be provided to the implementing agency by the Employer. The Implementing Agency shall do required surveys , investigations, complete designs, prepare Good for Construction (GFC) Drawings and get all the same vetted by the Employer/Employer's Representative at different stages.
GCC 26.1	The Site Possession Date(s) shall be: within 7 days from the date of signing the contract
GCC 30.3	Hourly rate&reimbursable expenses to be paid to the Adjudicator shall be notified at the time of appointment of Adjudicator.
GCC 30.4	Institution whose arbitration procedures shall be used: Government of India (a) **Contracts with foreign contractors:** International arbitration shall be conducted in accordance with the rules of India Arbitration shall be administered by Engineers Association-India The place of arbitration shall be: the place of the institution administering the arbitration. (b) **Contracts with domestic contractors:** Arbitration shall be conducted in accordance with the laws of the India.
C. Time Control	
GCC 35.1	The Contractor shall submit for approval a Program for the Works within 28 days from the date of the Letter of Acceptance.
GCC 35.3	The period between Program updates is30 days. The amount to be withheld for late submission of an updated Program is 1% of the total Contract Price

D. Quality Control

GCC 43.1	The Post Construction Phase Period is: One (1) Year

E. Cost Control

GCC 50.5

Deliverable and Payment Stages

Sr. No	Package	Report Submission / Delivery / Stage	Duration	Payment in % of the total Agreed Contract Value
1	**Mobilization Advance**	On submission of the Bank Guarantee from Scheduled commercial Bank for 110% value of of the 5% of value of the acceptedContract Price.		5%
2	**Pre Construction Stage**	Submission & Approval of Surveys / Investigations / Designs & Good for Construction Drawings	90 Days	5%
3	**Construction Stage**		365 Days	
	8Km Road(both side) work including all respect as specified in Employer's Requirements	Min. 1Km must be completed in all respect for claim of Intermediate Payment certificate(IPC). ***Note :*** *A). 1 Km mean completion of the 1 Km. Smart Street length on both side of the smart street including median and Junctions.* *Or* *1 Km. means on One completion of smart street on one side of the median 2 Km including median and junctions.*	Actual	65% (per Kilometer payment on Prorata basis)
		On Completion of each Junction the payment shall be made on the		20%

			prorate basis i.e. per junction payment = 20% of the contract value/Nos. of Smart Street junctions		
	4	**Post Construction Phase Period**	(i) Quarterly payment on Prorata basis- 75% (iii) Quarterly payment on Prorata basis after submission of Quarterly Post construction completion certificate- 25%. .	365 Days	10%
GCC 53.1	The currency of the Employer's country is: INR (Indian Rupees)				
GCC 54.1	The Contract is notsubject to price adjustment in accordance with GCC Clause 54.				
GCC 55.1	The proportion of payments retained is: 5% of the certified payments				
GCC 56.1	The liquidated damages for the whole of the Works are 0.05 % of the final Contract Price per day. The maximum amount of liquidated damages for the whole of the Works is 10% of the final Contract Price.				
GCC 57.1	Not Applicable				
GCC 58.1	The Advance Payments shall be 5%.				
GCC 58.3	Repayment of the Advance Payments shall be: 16.67% from each payment certificate.				
GCC 59.1	The Performance Security amount is 5% of the accepted Contract Price in the form of Bank Guarantee as per the Sec-9 Contract Forms.				
G. Finishing the Contract					
GCC 72.1	The date by which operating and maintenance manuals are required is during Implementation Stage and at least 30 days the completion of the work. The date by which "as built" drawings are required is within 30 days after completion of the work.				
GCC 72.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required in GCC 72.1 is 1% of the Contract Price.				
GCC 73.2 (h)	The maximum number of months is: Fifteen (15) months				

Section X - Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

Table of Forms

Letter of Acceptance

[on letterhead paper of the Employer***]***

. . . . . ***[date].*** . . . . . .

To: . . . . . ***.[name and address of the Implementing Agency]*** . . . . . .

Subject: . . . . . ***.[Notification of Award Contract No].*** . . . . . .

This is to notify you that your RfP/Bid dated . . . ***.[insert date]*** . . . . for execution of the . . . . . ***.[insert name of the contract and identification number, as given in the PCC].*** . . . . . for the Accepted Contract Amount of . . . . . ***.[insertamount in numbers and words and name of currency]***, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 21(twenty one) days in accordance with the Conditions of Contract, using for that purpose the of the Performance Security Form included in Section X. Contract Forms, of the Bidding Document.

Authorized Signature: .....

Name and Title of Signatory: .....

Name of Agency: .....

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the . . . . .day of . . . . . ., ..., between . . . . . ***[name of the*** Employer***]***. . . . . (hereinafter "the Employer"), of the one part, and . . . . . ***[name of the Implementing Agency]***. . . . .(hereinafter "the Implementing Agency"), of the other part:

WHEREAS the Employer desires that the Works known as . . . . .***[name of the Contract]***. . . . .should be executed by the Implementing Agency, and has accepted a Bid by the Implementing Agency for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Implementing Agency agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

(i) the Letter of Acceptance

(ii) the Letter of Bid

(iii) the addenda Nos _____(if any)

(iv) the Particular Conditions

(v) the General Conditions of Contract, including appendix;

(vi) the Specification

(vii) the Drawings

(viii) Activity Schedule and

(ix) any other document **listed in the PCC** as forming part of the Contract,

3. In consideration of the payments to be made by the Employer to the Implementing Agency as specified in this Agreement, the Implementing Agency hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Implementing Agency in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of . . . . . ***[name of the borrowing country]***. . . . .on the day, month and year specified above.

Signed by:	Signed by: .....
for and on behalf of the Employer	for and on behalf the Implementing Agency
in the presence of:	in the presence of: .....
Witness, Name, Signature, Address, Date	Witness, Name, Signature, Address, Date

Performance Security (Bank Guarantee)

Option 1: (Bank Guarantee)

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of* Employer*]*

Date: _ *[Insert date of issue]*

PERFORMANCE GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _ *[insert name of Implementing Agency, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the execution of _ *[insert name of contract and brief description of* Works*]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (_____) *[insert amount in words]*,[1] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the …. Day of ……, 2… [2], and any demand for payment under it must be received by us at this office indicated above on or before that date.

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[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.*

[2] *Insert the date twenty-eight days after the expected completion dateas described in GC Clause 53.1. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Advance Payment Security

[Guarantor letterhead or SWIFT identifier code]

Beneficiary:*[Insert name and Address of* Employer*]*

Date: *[Insert date of issue]*

ADVANCE PAYMENT GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the execution of *[insert name of contract and brief description of* Works*]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum *[insert amount in figures]* () *[insert amount in words]* is to be made against an advance payment guarantee.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures] [insert amount in words]*[1] upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

(a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or

(b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to

[1] *The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.*

above has been credited to the Applicant on its account number *[insert number]*at *[insert name and address of Applicant's bank]*..

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (80) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the *[insert day]* day of *[insert month]*, 2 *[insert year]*,[2] whichever is earlier.Consequently, any demand for payment under thisguarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[2] *Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*